



Estd. 1892

# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ Khalsa College Amritsar

An Autonomous College affiliated to G.N.D.U., Amritsar

UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

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## PROGRAMME OUTCOMES UNDERGRADUATE PROGRAMMES

UNDERGRADUATE PROGRAMMES ensure in students	
PO1.	<b>Critical Thinking</b> to help them take informed actions after identifying the assumptions that frame their thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at their ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO2.	<b>Effective Communication</b> to speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
PO3.	<b>Social Interaction</b> to elicit views of others, mediate disagreements and help reach conclusions in group settings.
PO4.	<b>Effective Citizenship</b> to demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
PO5.	<b>Ethics</b> to recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO6.	<b>Environment and Sustainability</b> to understand the issues of environmental contexts and sustainable development.
PO7.	<b>Self-directed and Life-long Learning</b> to acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.



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## PROGRAMME OUTCOMES

### POSTGRADUATE PROGRAMMES

POST GRADUATE PROGRAMMES prepare the students to:	
PO1.	Acquire Ability to function in multidisciplinary domains and attain profound expertise in discipline.
PO2.	Apply the domain knowledge and specialization to solve complex problems in professional and personal life.
PO3.	Attain ability to exercise Research Intelligence in investigations and Innovations and pursue socially relevant research to solve problems with sustainable approach and create new knowledge in their respective domain.
PO4.	Incorporate Self-directed and Life-long Learning.
PO5.	Develop sensitivity to social issues and become proactive citizens.
PO6.	Become competent individuals who are employed and emerge as entrepreneurs.
PO7.	Learn Ethical Principles and be committed to Professional Ethics.



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## PROGRAMME OUTCOMES

### M.PHIL. PROGRAMMES

#### M. PHIL. PROGRAMME prepares the students to:

<b>PO1.</b>	Imbibe comprehensive ideas of different subjects so that they can undertake methodical research work, identify, formulate, review research literature and pursue socially relevant research to create new knowledge in their respective domain
<b>PO2.</b>	Develop the ability to demonstrate research strategies and methods of designing experiments, case analysis and interpretation of data with application of statistical tools and synthesis of the inference that provide valid conclusions
<b>PO3.</b>	Provide adequate skills for competent problem solving and evaluate one's own research in relation to important and recent issues in their specialised field.
<b>PO4.</b>	Formulate solutions for complex problems through high impact and cutting edge research
<b>PO5.</b>	Evolve as high thinking individuals with social consciousness and contribute to the nation building process.
<b>PO6.</b>	Gain thorough and up-to-date knowledge in the disciplines of their choice at the forefront of a particular field.



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## COURSE OUTCOMES (COs) FOR M.PHIL. PROGRAMMES

**The Course Outcomes (COs) are mapped to the revised Bloom's Taxonomy using the following abbreviations:**

**R- Remembering**

**U – Understanding**

**Ap- Applying**

**An- Analyzing**

**E- Evaluating**

**C- Creating**





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### M.Phil. Commerce

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

Sr. No.	On completion of M.Phil (Commerce), the students will be able to:
PSO 1	Demonstrate an extensive and in-depth knowledge on research methodology and in the area of specialization
PSO 2	Undertake research in the field of Accounting & Finance, Marketing, HRM, Banking, Insurance, Taxation and other related areas
PSO 3	Enhance research proficiency in the application of quantitative techniques
PSO 4	Communicate the research ideas proficiently, write analytically and clearly present complex information to different groups

#### COURSE OUTCOMES (COs)

##### Semester: I

Course Title: Research Methodology

Course Code: MP-101

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the basic concepts in Research in Social Sciences and business enquiry.	1,3,4	U, R, An
CO2	Develop the skills for scientific collection of data and determining the sample size for research.	1,3,4	An, Ap, E
CO3	Develop the analytical skills of business research.	1,3,4	An, Ap, C, E
CO4	Gain knowledge with regard to the various statistical tools and tests of significance that are applied in social and business research.	1,3,4	An, U, Ap, E
CO5	Prepare the project report.	3,4	C, E

Course Title: Contemporary Issues in Commerce

Course Code: MP-102

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Recognize the numerous direct and indirect taxes that applies to Indian	2,3	R,U, Ap



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	businesses and basics of financial markets in India		
CO2	Learn the contemporary issues in business like Corporate Social Responsibility, Corporate Governance, and Social Audit.	2,3,4	R, U, An
CO3	Understand and increase the awareness relating to various contemporary issues in HRM and Marketing.	2,3,4	U, An, E, C

<b>Course Title: Marketing Management</b>		<b>Course Code: MP-104</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand the various concepts used in Marketing.	1,2,3,4	R,U, Ap, E
CO2	Identify, assess and select marketing opportunities	2,3,4	E, An, C
CO3	Gain insight on the new technologies of marketing research	2,3,4	U, E, An

<b>Course Title: Strategic Financial Management</b>		<b>Course Code: MP-105</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Learn the various skills which are used to apply financial principles relevant to strategic management in organizational contexts.	1,2,3,4	R, U, An
CO2	Understand the Strategic planning for profit as well as non-profit organizations with a global focus.	1,2,3,4	R, U, An, Ap, E
CO3	Develop knowledge of concepts and frameworks to develop effective strategic plans.	2,3,4	R, U, An, Ap, E, C

<b>Course Title: Human Resource Management</b>		<b>Course Code: MP-106</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>



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CO1	Manage and plan key human resource functions within organizations	1,2,3,4	R, U, An, Ap
CO2	Examine current issues, trends, practices and processes in HRM	1,2,3,4	An, Ap, E, C
CO3	Understand the organizational culture and manage cultural diversity	2,3,4	U, An, Ap, E
CO4	Get knowledge about the industrial relations and different methods used to solve industrial disputes	2,3,4	R, U, An

Course Title: International Business Environment		Course Code: MP-107	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the implications of various theories of International trade	1,2,3,4	R, U, Ap
CO2	Get knowledge about the developments in International Monetary System	1,2,3,4	R, U, Ap
CO3	Get acquainted with different export and import strategies, export financing and counter trade	2,3,4	An, Ap, E,
CO4	Get an insight on International Indebtedness and its implications	2,3,4	U, An, Ap, E

Course Title: Psychology (ID Course)		Course Code: MPPSY-6108	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the general notions of Psychology and how it is related to their field.	1,2,3,4	R, U, Ap
CO2	Know their as well as others' personality with the help of different personality theories and their assessment.	1,2,3,4	R, U, Ap
CO3	Gain knowledge about motivation and intelligence.	2,3,4	An, Ap, E, C
CO4	Cope with frustrating and provoking situations in a socially useful way.	2,3,4	An, Ap, E, C
CO5	Become an effective teacher as well as learner.	2,3,4	An, Ap, E, C
CO6	To perform action research appropriately by understanding its implications.	1, 2,3,4	U, Ap, E



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## M.Phil. English Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

### PROGRAMME SPECIFIC OUTCOMES (PSOs)

Sr. No.	On completion of M.Phil. (English), the students will be able:
PSO 1	To generate an ability to understand various literary genres and texts in English literature.
PSO 2	To develop critical and analytical skills within the students.
PSO 3	To build up their proficiency in English language which enhances their chance to pursue the careers in various other sectors.
PSO 4	To create skills for enhancement of employment in the field of education.
PSO 5	To make students empathetic towards society and self.
PSO 6	To develop a comparative awareness about literature from the west and the east.
PSO 7	To learn to write Research Papers and Articles.
PSO 8	To develop critical thinking, reading and writing skills.

### COURSE OUTCOMES (COs)

#### Semester-I

Course Title: Research Methodology

Course Code: MPEN-1101

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO1	Write with a purpose	2,4,7,8	U,Ap,An
CO2	Develop critical thinking, reading and writing skills	1,2,3,8	U,Ap,An
CO3	Learn how to write Research Papers and Articles	2,4,7,8	U,Ap,An
CO4	Find employability in the field of content writing and publications	2,4,7,8	Ap

Course Title: Approaches to Literature

Course Code: MPEN-1102

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO1	Acquire knowledge about the basics of Literary approaches theory and criticism.	1,2,6,8	U,Ap,An
CO2	Acquire knowledge of various social and intellectual	1,2,3,4,5,8	U,Ap,An





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	movements and their impact on literature.		
CO3	Learn the techniques of close readings of the literary texts.	2,6,8	U,Ap,An
CO4	Analyze, interpret, explicate and evaluate literary texts.	1,2,5,8	U,Ap,An
CO5	Gain knowledge of the practical and applied criticism.	2,8	U

Course Title: Modern Literature

Course Code: MPEN-1103(i)

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO1	Get acquainted with the diversity of modern novel, its techniques, approach and thematic concerns	1,2,5,8	U,Ap,An
CO2	Understand the concept of absurd works	1,3	U
CO3	Comparatively analyse the prescribed texts	1,2,8	U,Ap,An
CO4	Enhance their Multicultural sensibilities by getting introduced to the concepts of multiculturalism and modernism.	1,2,3,5,8	U,An

Course Title: World Literature

Course Code: MPEN-1103(ii)

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO1	Learn features of the World Literature	1,6	U,Ap,An
CO2	Do comparison between Indian Literature and World Literature and understand the world issues such as Gender, Social ethics, etc.	1,2,5,6	U,Ap,An
CO3	Prepare for higher studies in literature in abroad	1,4,6	Ap
CO4	Find job in teaching literature worldwide.	3,4	Ap





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**Course Title: Post-Colonial and Diasporic Literature**

**Course Code: MPEN-1103(iii)**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO1	Acquire knowledge about basic concepts in the Post-Colonial Literature.	1,2,4,8	U
CO2	Evaluate how race, class, gender, history and identity are presented and problematized in the literary text	1,2,4,8	U,Ap,An
CO3	Compare ideas, representations and strategies of the politics and cultural resistance with reference to historical and special contexts.	1,2,3,5,8	U,Ap,An
CO4	Find employability in the field of teaching particularly in teaching Literature.	1,2,4	Ap

### Semester-II

**Course Title: Dissertation**

**Course Code: MPEN- 1201**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Impart the techniques of close readings of the literary texts	1,2,7,8	U,Ap,An
2.	Analyze, interpret, explicate and evaluate literary texts.	1,2,7,8	U,Ap,An
3.	Acquire knowledge of practical and applied criticism.	1,2,7,8	U,Ap,An
4.	Write with a purpose	1,3,4,7,8	U,Ap,An
5.	Learn to write Research Papers and Articles	1,3,4,7,8	U,Ap,An



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### M.Phil. Political Science

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

**PSO-1** Provides in-depth knowledge about the traditional and modern theories and concepts of Political Science.

**PSO-2** Provides thorough information about the various research methods, tools and techniques and their application in research work.

**PSO-3** Develops writing and teaching skills and research techniques by enabling the students to write Term Paper and Dissertation.

**PSO-4** Prepares the students for competitive examinations like U.G.C (J.R.F.) and pursuing higher studies.

**PSO-5** Provides thorough information and helps in analysing the working, major problems and concerns of Indian Poetics.

**PSO- 6** Develops understanding about state politics and helps in analyzing the problems and politics of socio-economic issues in the state of Punjab.

**PSO-7** Helps in understanding, analysing and evaluating the political economy of international economic issues, institutions and major concerns.

COURSE OUTCOMES (COs)			
Semester-I			
Course Title: Methods and Techniques of Social Science Research			
Course Code: MPPS-6101			
Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Acquire knowledge about purpose and importance of research in Social Sciences	1,2,5	R,U
CO-2	Understand various research methods in Social Sciences.	2	U, Ap
CO-3	Get acquainted with various tools and techniques of social research	2	U,Ap



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CO-4	Examine and evaluate various social and political issues	3,4	An, E
CO-5	Learn as to how research and research project could be undertaken	1,2,5,6	U,C
<b>Course Title: Contemporary Political Theory</b>			
<b>Course Code: MPPS-6102</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Acquire in-depth knowledge about the main political ideologies and their relevance in contemporary times.	1,4	R, U
CO-2	Develop critical and analytical thinking about the functioning of state and its agencies.	3	U,An,E
CO-3	Understand Human Rights, issues of ethno- nationalism and get updated with modern political theories like Multiculturalism, Post-Modernism and Feminism etc.	1,4	U,C
CO-4	Understand the importance of theory and its utility in solving problems at ground level.	1,4	U,An,E
CO-5	Pursue higher studies like Ph.D.	4	Ap, An,C
<b>Course Title: Emerging Trends in Indian Politics</b>			
<b>Course Code: MPPS-6103 (Opt. I)</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Get awareness about the changes taking place and crises being faced by Indian democracy and its democratic institutions.	2,5	R,U,An
CO-2	Understand the political economy of Indian politics	4,5	U,An,E
CO-3	Develop objective, rationale and critical thinking to analyze sensitive issues like ethnicity and regionalism	4,5	U,An,E
CO-4	Evaluate the limitations and various dimensions of Indian leadership and various tendencies in the contemporary Indian politics.	4,5	U,An, E
<b>Course Title: State Politics in India with Special Reference to Punjab</b>			
<b>Course Code:MPPS-6104 (Opt. II)</b>			



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Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Acquire conceptual and theoretical knowledge about state politics in India	1,6	U, Ap
CO-2	Learn about the actual working of Indian federation and subsequently strained relationships between the Centre and states.	4,6	U, An
CO-3	Understand major political developments/ issues and their implications for the society and polity of Punjab.	4,6	U, An
CO-4	Evaluate as to how increasing sense of alienation among the minority community leads to disintegrative tendencies, threatening the very roots of unity and integrity of the country.	4,6	U, An, E
CO-5	Pursue higher studies in state politics especially in political issues/ problems of Punjab.	3,4	U, An
<b>Course Title- International Politics and Political Economy</b>			
<b>Course Code- MPPS- 6105 (Option III)</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Enhance their knowledge about the changing contours of international politics in the era of globalization.	7,4	U, An, E
CO-2	Become aware about the working of non-state actors and their role in international politics.	7,4	U, An
CO-3	Understand about the working of Bretton Woods System and its implications for the world especially the global south.	7,4	U, An
CO-4	Analyze the pros and cons of international political economy	7,4	An, E
CO-5	Understand the global concerns that may have far reaching implications for the mankind.	7,4	An, E, U





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### M.Phil. Punjabi

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

**PSO 1:** Acquire knowledge about the history of Research, Research Methodology, Research techniques and new techniques of Research in Literature.

**PSO 2:** Acquire knowledge about different Indian and World class study methods.

**PSO 3:** Acquire knowledge about Modern and Medieval Realization; also get a new vision of understanding the analysis and evaluation trends of literature.

**PSO 4:** Acquire deep knowledge about modern Poetry, Prose, Drama, Theatre, Gurbaani, Fiction, Literary Criticism and Punjabi Language etc us a new perspective.

**PSO5:** Acquire knowledge about Urdu (Shahmukhi script and inter-disciplinary subject psychology).

#### COURSE OUTCOMES (Cos)

##### Semester-I

Course Title:	Khoj Vidhi	Course Code:	MPPB-611
Sr. NO.	On completing the course, the students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Know about literary meaning and Resolution of the Research.	1	U,An
CO2	Acquire knowledge about the history of Research.	1	R,U
CO3	Know about the Research techniques.	1	R,U,An
CO4	Gain Ability to Research.	1	An
Course Title:	Adhyan Taknikaan	Course Code:	MPPB-612
Sr. NO.	On completing the course, the students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Gain knowledge about modern and medieval Realization.	3	R,U
CO2	Gain an understanding of Classical modern methods.	1,2	R,U,An
CO3	Acquire new vision of the study of literature.	3	U,An
Course Title:	ID Urdu Option I	Course Code:	MPPB-613a
Sr. NO.	On completing the course, the students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Get basic knowledge of Urdu language.	5	R,U
CO2	Gain Knowledge about the meaning of urdu words used in Punjabi Language.	5	R,U,C





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CO3	Improve Urdu Skills.	5	R,U
CO4	Establish affinity with Urdu language.	5	R,U,C
<b>Course Title:</b>	<b>ID Manovigyan Option II</b>	<b>Course Code:</b>	<b>MPPSY-6108</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand the general motions of Psychology.	5	R,U
CO2	Gain knowledge about different personality theories.	5	R,U
CO3	Gain knowledge about Motivation and intelligence.	5	R,U
<b>Course Title:</b>	<b>Adhunik Punjabi Kaav Option I (Paper IV)</b>	<b>Course Code:</b>	<b>MPPB-614A</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
CO1	Know about modernity and modern understanding.	1,2,3	R,U
CO2	Learn about the new techniques and methods of Research followed in the field of poetry.	1,2	R,U,C
CO3	Will understand the text of Punjabi poetry form a new perspective.	1,2,3	U,C
<b>Course Title:</b>	<b>Punjabi Vaartak Option II (Paper IV)</b>	<b>Course Code:</b>	<b>MPPB-614B</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand the new trends in Punjabi Prose.	1,4	R,U
CO2	Understand the origin and development of Punjabi Prose.	1,4	R,U
CO3	Gain knowledge about different genres of prose.	1,4	R,U,C
<b>Course Title</b>	<b>Punjabi Natak te Rangmanch Option III (Paper IV)</b>	<b>Course Code</b>	<b>MPPB-614C</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
CO1	Get information about the origin and development of Punjabi Drama and Theatre.	4	R,U
CO2	Learn about the techniques and art of theatre.	1,4	R,U
CO3	Gain information including the detail of theatrical criticism	4	R,U



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CO4	Gain knowledge of the analysis and evaluation of drama and theatre.	4	R,U,C
<b>Course Title:</b>	<b>Punjabi Sahit Alochana Option IV (Paper IV)</b>	<b>Course Code:</b>	<b>MPPB-614D</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
CO1	Know about the history of Punjabi Criticism.	4	R,U
CO2	Understand different versions of Criticism.	3,4	R,U,An
CO3	Understand theories of Criticism.	4	U,An
<b>Course Title:</b>	<b>Punabi Bhasa Option V (Paper IV)</b>	<b>Course Code:</b>	<b>MPPB-614E</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
CO1	Know the descriptive knowledge about Punjabi Bhasa.	4	R,U
CO2	Gain Knowledge about Punjabi Koshkaari and Gurmukhi script.	4	R,U
CO3	Gain knowledge about linguistics techniques.	1,4	R,U,An
<b>Course Title:</b>	<b>Birtant Shastra ate Adhunik Birtant Galap Option VI (Paper IV)</b>	<b>Course Code:</b>	<b>MPPB-614F</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
CO1	Gain Knowledge about Birtant Shaster.	3	R,U
CO2	Know about the trends of fiction.	3,4	R,U
CO3	Aquire knowledge to understand literary texts	3,4	R, U, An
<b>Course Title</b>	<b>Gurmat Kaav Option VII (Paper IV)</b>	<b>Course Code</b>	<b>MPPB-614E</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
CO1	Know the history of Gurmat kaav.	4	U,R
CO2	Understand the Classical understanding of Gurmat.	4	U, An
CO3	Gain knowledge about Classical methods of Gurmat interpretation.	2,3,4	U, An



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## COURSE OUTCOMES (COs) FOR PG PROGRAMMES

**The Course Outcomes (COs) are mapped to the revised Bloom's Taxonomy using the following abbreviations:**

**R- Remembering**

**U – Understanding**

**Ap- Applying**

**An- Analyzing**

**E- Evaluating**

**C- Creating**



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### M.A. PUNJABI

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs)

<b>PSO-1.</b> Students acquire knowledge about history, origin and development, basic concerns of medieval, modern and classic literature; and also study techniques used in the field of literature.
<b>PSO-2.</b> Gain knowledge about genres of literature – modern poetry, novel, short story, drama, prose etc. and specialise in various subjects by learning the practical methods and developing critical vision of studying and evaluating.
<b>PSO-3.</b> Gain knowledge about Punjabi literature (medieval and modern), Punjabi culture and folklore, Punjabi language and also about Urdu, Islam and Pakistani Punjabi Sahit.
<b>PSO-4.</b> Become the holder of inter-disciplinary access by acquiring deep knowledge about the relation of literature with other phenomena like human mind, human values and ethics, cultural aspects, religion, mass media(print and electronic)and computer technology.
<b>PSO-5.</b> Gain knowledge about the limitations and prospects of migrant life and also about human mind through inter disciplinary subject Psychology.

#### COURSE OUTCOMES (COs)

##### Sem-I

Course Title:	Gurmat Kaav	Course Code	MPBI-4101
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand Gurmat Kaav.	1,2	R,U,An
CO2	Understand the importance of Gurbani.	1,2	R,U,An
CO3	Understand the philosophical aspect of the Bani of Guru Teg Bahadur Ji.	1,2	U,An
CO4	Develop Critical Vision of reading and studying Gurmat literature.	1,2,3	U,An
Course Title:	Punjabi Sufi Kaav	Course Code:	MPBI-4102
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>





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CO1	Understand Islam and suffivaad.	1,2,3	R,U
CO2	Understand the klaam of Shekh fareed, Shah Hussian and Bulle Shah.	1,2,3	R,U,An
CO3	Understand medieval vision.	1,2,3	U,An
<b>Course Title:</b>	<b>Sahit Sidhant Ate Kaav Shaster</b>	<b>Course Code:</b>	<b>MPBI-4103</b>
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand the nature of literature.	1,2,3	U,An
CO2	Understand about Sahit Sidhaant and Bharti kaav Shastra.	1,2,3	U,An
CO3	Develop kaav shastri understanding of reading and examining literature.	1,2,3	U,An
<b>Course Title:</b>	<b>Lokhara ate Punjabi Lokdhara</b>	<b>Course Code:</b>	<b>MPBI-4104</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand the folklore.	3	R,U
CO2	Understand the meaning and importance of cultural values.	1,2,3,4	U,An
CO3	Enrich themselves by acquiring multifaceted knowledge.	1,2,3,4,5	U,An
<b>Course Title:</b>	<b>Vishv Classici Sahit</b>	<b>Course Code:</b>	<b>MPBI-4105</b>
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Engage with World Classic literature.	1	R,U
CO2	Develop understanding of universal values.	1	R,U
CO3	Develop understanding of literature reading	1,2,3	U,An
<b>Sem-II</b>			
<b>Course Title</b>	<b>Bhagat Baani</b>	<b>Course Code</b>	<b>MPBI-4206</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand Bhagat Baani	1	R,U
CO2	Understand Bhagti Movement.	1	U,An
CO3	Understand the Baani of Bhagat Naamdev, Bhagat Kabir and Bhagat Ravidas.	1	U,An





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<b>Course Title:</b>	<b>Punjabi Kissa ate Birtaant</b>	<b>Course Code</b>	MPBI-4207
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand Punjabi Kissa and Birtaant Kaav.	1	R,U
CO2	Understand the relation between Birtaant and Kaav.	1	R,U,An
CO3	Understand the medieval social-cultural society with the help of Kissa and Beer kaav.	1	U,An
<b>Course Title:</b>	<b>Khoj ate Punjabi Alochna</b>	<b>Course Code:</b>	MPBI-4208
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand the nature of Research.	1	U
CO2	Understand the Research tools.	1,2	U,An
CO3	Acquire knowledge about Sahit Alochna and Punjabi Alochna	1,2	R,U,An,E
<b>Course Title:</b>	<b>Sabiachaar ate Punjabi Sabiachar</b>	<b>Course Code:</b>	MPBI-4209
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand culture and its aspects.	3	R,U,An
CO2	Understand the effects of Culture on the society.	3,4	R,U,An
CO3	Understand the importance of Punjabi Culture in human life.	3,4	U,An
CO4	Get information about the current cultural challenges.	3	U,An
<b>Course Title</b>	<b>Punjabi Media ate Pattarkaari (Option I) Sem-II)</b>	<b>Course Code</b>	MPBI-4210 A
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Associate themselves with Punjabi Media and Journalism.	4	U
CO2	Get knowledge about the past, present and future history of Punjabi media and journalism.	4	U,An
CO3	Develop an understanding about the nature of Journalism and its future challenges.	4	U,An



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CO4	Get information about employment prospects in Punjabi Journalism.	4	C
<b>Course Title</b>	<b>Punjabi Bhasha ate Computer Application (Option II) (sem-II)</b>	<b>Course Code</b>	<b>MPBI-4210 B (Option 2)</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Gain knowledge about the role of computer in Punjabi language.	3	U
CO2	Get knowledge about Punjabi Language and computer techniques.	3	U
CO3	Acquire Punjabi Typing Skills.	3	U
<b>Course Title</b>	<b>Urdu (Option III) (Sem-II)</b>	<b>Course Code</b>	<b>MPBI-4210 C (Option 3)</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Acquire basic knowledge about Urdu language.	3	U,An
CO2	Read and write Urdu perfectly.	3	U,An
CO3	Get attached with Urdu literature.	3	U,An
<b>Sem III</b>			
<b>Course Title</b>	<b>Adhunik Punjabi Kavita(Upto1960)</b>	<b>Course Code</b>	<b>MPBI-5311</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand the poetic language.	1,2	R,U
CO2	Increase creativity skills.	1,2	An,C
CO3	Know about Comparative study.	1,2	R,U,An
CO4	Gain critical understanding on the poems of Dhani Ram Chatrik, Prof. Mohan Singh and Bawa Balwant.	1,2	R,U,An,C
<b>Course Title</b>	<b>Punjabi Novel</b>	<b>Course Code</b>	<b>MPBI-5312</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Get Knowledge about the history of Novel and its principles.	1,2	R,U
CO2	Get information about various aspects of Novel, its historical growth and trends.	1,2	R,U,An



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CO3	Get knowledge about the social and global events.	1,2,3	U,An
<b>Course Title</b>	<b>Punjabi Bhasha ate Bhasha Vigyan-1</b>	<b>Course Code</b>	<b>MPBI-5313</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand linguistic Structure.	3	R,U
CO2	Get information about the basic concepts related to grammatical categories and units.	3	R,U
CO3	Get information about Saussure and Noam Chomsky's grammatical theories.	3	U,An
<b>Course Title</b>	<b>Puratan Punjabi Vaartak (Sem-III)</b>	<b>Course Code</b>	<b>MPBI-5314</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Get information about prose and vocabulary.	1,2	R,U
CO2	Know about the origin, development and major forms of Medieval prose	1,2	R,U,An
CO3	Get information about medieval and modern prose.	1,2,3	U,An
<b>Course Title</b>	<b>Punjabi Natak ate Ikangi (Sem-III)</b>	<b>Course Code</b>	<b>MPBI-5315</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Get information about Drama and One Act Play.	1,2	R,U,An
CO2	Get in touch with theatre.	1,2	R,U
CO3	Gain knowledge about the writing of Balwant Gargi, Ajmer Singh Aulakh and Sawraajbir.	1,2	U,An
<b>Course Title</b>	<b>Adhunik Punjabi Kavita (after1960) Sem-IV</b>	<b>Course Code</b>	<b>MPBI-5316</b>
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Understand the history of Poetry.	1,2	R,U
CO2	Understand the growth and development of Punjabi Poetry.	1,2	U,An



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CO3	Understand the poetic art of Prof. Shiv Kumar Batalwi, Dr. Surjit Patar and Pash.	1,2	U,An
<b>Sem-IV</b>			
<b>Course Title:</b>	<b>Punjabi Nikki Khaani</b>	<b>Course Code</b>	MPBI-5317
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Get to know about the growth and development of Punjabi Nikki Khaani.	1,2	R,U,An
CO2	Get to know about the trends and contribution of prominent story writers to literature.	1,2	R,U,An
CO3	Gain a critical understanding of the compositions of Kulwant Singh Virk and Ajit Kaur.	1,2	U,An
<b>Course Title</b>	<b>Punjabi Bhasa Ate Bhasa Vigyan-II (Sem-IV)</b>	<b>Course Code</b>	MPBI-5318
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Get information about Punjabi Language, Gurmukhi Script and Arthrography.	3	R,U
CO2	Learn about Semantic layers.	3	R,U,An
CO3	Gain knowledge about Bharti Bhasa vigyan and origin and development of Gurmukhi script.	3	R,U,An
CO4	Know about the relationship of Punjabi language with technology and the status of computerization of Punjabi language.	4	U,An
<b>Course Title</b>	<b>Adhunik Punjabi Vaartak (Sem-IV)</b>	<b>Course Code</b>	MPBI-5319
<b>Sr. NO.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Get information about the origin and development of Modern Prose.	1,2	R,U
CO2	Gain knowledge on various subjects from literary point of view.	1,2	R,U,An,C
CO3	Study Prof. Puran Singh, Teja Singh and Narindra Singh Kapoor's writings.	1,2	U,AN





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Course Title	Parwaasi Punjabi Sahit (Sem-IV)	Course Code	MPBI-5320A (Options I)
Sr. NO.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Get information related to parvasi literature by quoting Parvaasi Chetna.	5	U
CO2	Get information about the basic concepts of parvaasi literature.	5	U,An
CO3	Understand the Punjabi life style by quoting the works of Parvaasi Sahitkaars.	5	U,An
CO4	Know the problems of immigrants.	5	U,An,E
Course Title	Pakistani Punjabi Sahit (Sem-IV)	Course Code	MPBI-5320A (Options II)
Sr. NO.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Get information about Pakistani Punjabi writers.	3	U
CO2	Understand Pakistani Punjabi Culture	3	U,An
CO3	Develop a critical vision of the poems, plays and novels of Pakistani Punjabi writers.	3	U,An,E





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### M.A. FINE ARTS

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Programme specific Outcomes (PSOs)

**PSO- 1.** To get knowledge about the Indian and western philosophical views and concepts of beauty through the different art movements.

**PSO- 2.** Provides students with an opportunity to experience and explore their original and creative skills through various medium and technologies.

**PSO- 3.** To understand and learn the drawings skills of making portraits, understand different media and techniques of painting both traditional and experimental.

**PSO- 4.** To develop professional skills in students, based on research in various styles of painting and related technologies along with shaping the overall personality of the students.

**PSO- 5.** To develop independent & life- long learning skills in the field of art.

**PSO- 6.** To develop ability to work as professional artist.

#### COURSE OUTCOMES (COs)

##### Semester-I

Course Title: Aesthetics & Principle of Art Appreciation (T)

Course Code: MAFA-4101

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Understand the theory of aesthetics and the principles of arts appreciation which help students in valuing art.	1,2	R, U, An
CO-2	Understand the history behind the art work and the period from which it is originated.	1,5	U, An



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CO-3	Have thoughtful conversation and the understanding that there is more than one approach to everything	2,,4,5	U, E
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Course Title: History of Indian Art (T)

Course Code: MAFA-4102

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Examine and analyze the sequence of events in the prehistoric Indian art and investigate art objectively.	1,3	U, An, E
CO-2	Get acquainted with art chronologically, socially and ideologically form expression's points of view.	1,5	U, An, E
CO-3	Understand the concept of art in Indian stylistic contexts	1,2,6	R, U, An, E
CO-4	Comprehend the art movement, which finish that expression of art throughout history.	1,2,5	R, U
CO-5	Be aware of different terms, concepts, forms and subject matter of these works.	1,3,5	U, Ap, E

Course Title: Landscape Painting (Option- A) (P)

Course Code: MAFA-4103

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn the depiction of natural scenery such as mountains, valleys, trees, rivers, forests etc. while learning the elements of art arranged in coherent composition.	2,4	U, Ap, C



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CO-2	Represent or replicate the nature's beauty on their canvas by using various elements and principles of art.	2,5,	U, Ap, C
CO-3	Focus on aesthetic elements to enhance beauty of nature through landscape.	1,2,5	U, Ap, C
CO-4	Study the development and formation of landscape painting in the open which enables them to know how to capture space in front of them on canvas.	2,3,4,5	U, Ap, E, C

Course Title: Graphic Arts (Option- B) (P)

Course Code: MAFA-4103

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Imagine graphics.	2,3	U, C
CO-2	Learn how to anticipate the process of gathering impressions with various fundamental methods of taking prints.	2,3,4	U, Ap, E, C
CO-3	Acquire knowledge of process of Lino, wood and the techniques of taking prints	3,5,6	U, Ap, C
CO-4	Learn how to take print in monochromatic.	2,4	U, Ap, C
CO-5	Study the process of printmaking and do experiments with surface arrangement as composition	2,,4,5	U, Ap, C



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Course Title: Composition (P)

Course Code: MAFA-4104

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Study the creative composition in art which enhances their imagination and creativity power.	2,4	U, Ap, C
CO-2	Connect with the beauty around them.	2,3,4	U, Ap, E, C
CO-3	Understand creative composition which stimulates their brain and improves cognitive ability.	2,4,5	U, Ap, E, C
CO-4	Do arrangement or placement of visual elements in a piece of art work.	3,4,5	U, Ap, C
CO-5	Get exposed to activities that enable their physical and mental development and develop fine motor skills, neural development and problem solving abilities.	2,3,4,6	U, Ap, An, C

### Semester-II

Course Title: Aesthetics & Principle of Art Appreciation (T)

Course Code: MAFA-4205

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Understand the theory of aesthetics and principles of arts appreciation which help students in valuing the art as how it appeals to them and what it means to each person.	1,2	R, U, An,
CO-2	Understand the history behind the art work and the period from which it originated.	1,5	R, U, An,





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CO-3	Analyse the artist work by putting themselves in the mind of the artist.	1,4,5	R, U, An, E
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Course Title: History of Indian Art A.D. 1850 (T)

Course Code: MAFA-4206

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Examine and analyze the sequence of events in the prehistoric Indian art, and attempt to investigate art objectively.	1,3	R, U, An, E
CO-2	Get acquainted with art chronologically, socially and ideologically from expression's view of points.	1,5	R, U, An, E
CO-3	Establish the concept of art in Indian stylistic contexts	1,2,6	R, U, An, E
CO-4	Comprehend the art movement, which finish that expression of art throughout history.	1,2,5	R, U
CO-5	Become aware of different terms concepts, forms and subject matter of these works.	1,3,5	R, U, Ap, E

Course Title: Landscape Paintings (Option- A) (P)

Course Code: MAFA-4207

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn the depiction of natural scenery such as mountains, valleys, trees, rivers, forests etc. while learning the elements of art arranged in coherent composition.	2,4	U, Ap, C
CO-2	Represents or replicate the nature's beauty on their canvas by using various elements and principles of art.	2,5	U, Ap, C



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CO-3	Focus on aesthetic elements to enhance beauty of nature through landscape.	1,2,5	U, Ap, C
CO-4	Get knowledge of perspective	4,5	U, Ap, C
CO-5	Study the development and formation of landscape painting in the open air which enables them to know how to capture space in front of them on canvas.	2,3,4,5	U, Ap, E, C

Course Title: Graphic Arts (Option- B) (P)

Course Code: MAFA-4207

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Imagine graphics.	2,3	U, C
CO-2	Learn how to anticipate the process of gathering impressions with the various fundamental methods of taking prints.	2,3,4	U, Ap, E, C
CO-3	Acquire knowledge on the process of Lino, wood and the techniques of taking prints	3,5,6	U, Ap, C
CO-4	Learn how to take print in monochromatic.	2,4	U, Ap, C
CO-5	Study the process of printmaking and do experiments with surface arrangement as composition	2,4,5	U, Ap, C

Course Title: Composition (P)

Course Code: MAFA-4208

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Study the creative composition in art which develops their imagination and creativity power.	2,4	U, Ap, C
CO-2	Connect with the beauty around them.	2,3,4	U, Ap, E, C



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CO-3	Study creative composition which stimulates their brain and improves cognitive ability.	2,4,5	U, Ap, E, C
CO-4	Do arrangement or placement of visual elements in a piece of art works.	3,4,5	U, Ap, C
CO-5	Get exposed to activities that enable their physical and mental development and develop fine motor skills, neural development and problem solving abilities.	2,3,4,6	U, Ap, An C

### Semester-III

Course Title: History of European Art (T)

Course Code: MAFA-5309

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Know the socio cultural background of the European thoughts.	1,3	R, U, An, E
CO-2	Analyse the works according to the aim and objectives of the European approach to art.	1,2	R, U, An, E
CO-3	Do comparative study of different art forms and applications of art elements.	1,2,4	U, An, E
CO-4	Use western techniques and materials for the depiction of their own ideas.	1.3,5	U, Ap, An, E
CO-5	Identify the artwork and understand the movements of European painting	1,4,5	U, Ap, An, E



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Course Title: Modern Movement in Art in Europe, U.S.A. and India (T)

Course Code: MAFA-5310

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Study the modern movement's which help them in studying changes in art and society due to industrial revolution till the French revolution in Europe.	1,5	R, U, E
CO-2	Study the history of modern movements in Europe through available sources like magazines, books, photographs and videos.	1,3	R, U, An, E
CO-3	Study history which provides means by which we can understand our human past and its relationship with our present	1,2,4	U, An, E
CO-4	Learn past societies, systems, ideologies, government, culture and technologies and how they were built, operated and changed.	1,3,4,5	U, Ap, An, E

Course Title: Life Drawing & Painting (P)

Course Code: MAFA-5311

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Study life drawing and paintings which enhance their power of observation and memory while studying visual art.	2,3	U, Ap, C
CO-2	Learn skills in life drawing which are applied in future studies, including figure construction, modeling to create volume and form.	3,4	U, Ap, C





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CO-3	Use different medium while learning life drawing and how to express themselves in different mediums.	2,3,5	U, Ap, An, C
CO-4	Learn three dimensional forms.	4,5	U, C
CO-5	Know how different body parts move together as one whole unit such as hips and shoulders moving at the same time.	3,4,5	U, Ap, E, C

Course Title: Creative Composition (Option-A) (P)

Course Code: MAFA-5312

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Study the creative composition in art which develop their imagination and creativity power.	2,4	U, Ap, C
CO-2	Connect with the beauty around them.	2,3,4	U, Ap, E, C
CO-3	Creative composition stimulates the brain and improves cognitive ability of students.	2,4,5	U, Ap, E, C
CO-4	Do arrangement or placement of visual elements in a piece of art works.	3,4,5	U, Ap, C
CO-5	Get exposed to activities that enable their physical and mental development and develop fine motor skills, neural development and problem solving abilities.	2,3,4,6	U, Ap, An, C

Course Title: Graphic Arts (Option- B) (P)

Course Code: MAFA-4103

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Imagine graphics.	2,3	U, C



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CO-2	Learn how to anticipate the process of gathering impressions with the various fundamental methods of taking prints.	2,3,4	U, Ap, E, C
CO-3	Acquire the knowledge of process of Lino, wood and the techniques of taking prints	3,5,6	U, Ap, C
CO-4	Learn how to take print in monochromatic.	2,4	U, Ap, C
CO-5	Study the process of printmaking and do experiments with surface arrangement as composition	2,4,5	U, Ap, C

### Semester-IV

Course Title: History of European Art (T)

Course Code: MAFA-5413

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Know the socio cultural background of the European thoughts.	1,3	R, U, An, E
CO-2	Analyse the works according to the aim and objectives of the European approach to art.	1,2	R, U, An, E
CO-3	Do the comparative study of different art forms and applications of art elements.	1,2,4	U, An, E
CO-4	Use western techniques and materials for the depiction of their own ideas.	1,3,5	U, An, Ap, E
CO-5	Identify the artwork and understand the movements of European painting	1,4,5,6	U, Ap, An, E



Estd. 1892

# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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Course Title: Modern Movement in Art in Europe, U.S.A. and India (T)

Course Code: MAFA-5414

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Study the modern movements which help them in studying changes in art and society due to industrial revolution till the French revolution in Europe.	1,5	R, U, E
CO-2	Study history of modern movements in Europe through magazines, books, photographs and videos	1,3	R, U, An, E
CO-3	Study history which provides means by which we understand our human past and its relationship to our present	1,2,4	R, U, An, E
CO-4	Learn past societies, systems, ideologies, government, culture and technologies and how they were built, operated and changed.	1,3,4,5	U, An, Ap, E

Course Title: Life Drawing & Painting (P)

Course Code: MAFA-5415

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Study life drawing and painting which enhance their power of observation and memory while studying visual art.	2,3	U, Ap, C



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CO-2	Learn skills in life drawing which are applied in future studies, including figure construction, modeling to create volume and form.	3,4	U, Ap, C
CO-3	Use different medium while learning life drawing and how to express themselves in different mediums.	2,3,5	U, Ap, An, C
CO-4	Learn three dimensional forms.	4,5	U, C
CO-5	Know how different body parts move together as one whole unit such as hips and shoulders moving at the same time.	3,4,5	U, Ap, E, C

Course Title: Creative Composition (Option-A) (P)

Course Code: MAFA-5416

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Study the creative composition in art which develop their imagination and creativity power .	2,4	U, Ap, C
CO-2	Connect with the beauty around them.	2,3,4	U, Ap, E, C
CO-3	Improve their cognitive ability by creative composition.	2,4,5	U, Ap, E, C
CO-4	Do arrangement or placement of visual elements in a piece of art works.	3,4,5	U, Ap, C
CO-5	Get exposed to activities that enable their physical and mental development and develop fine motor skills, neural development and problem solving abilities.	2,3,4,6	U, Ap, An, C





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Course Title: Graphic Arts (Option- B) (P)

Course Code: MAFA-5416

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Imagine graphics.	2,3	U, C
CO-2	Learn how to anticipate the process of gathering impressions with the various fundamental methods of taking prints.	2,3,4	U, Ap, E,C
CO-3	Acquire knowledge of process of Lino, wood and the techniques of taking prints	3,5,6	U, Ap, C
CO-4	Learn how to take print in monochromatic.	2,4	U, Ap, C
CO-5	Study the process of printmaking and do experiments with surface arrangement as composition	2,4,5	U, Ap, C



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### M.A. POLITICAL SCIENCE

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1	This programme develops critical and rational mind set of the students by discussing various political concepts and theories of the discipline.
PSO-2	Develops students' inclusive personality and research aptitude based on logic, rationality and critical thinking.
PSO-3	Make the students familiar with International political issues, politics of economic issues, structures and working of regional and international bodies and rules followed by the state.
PSO-4	Enables the students to understand national and global concerns in the light of foreign policy choices.
PSO-5	Encourages and trains the students for competitive examinations, including pursuing higher education.
PSO-6	Provides detailed account of structures and working of Indian Polity, contemporary political issues and the process of policy making in India.
PSO-7	Provides conceptual knowledge about public administration, structures of administrative units, financial and personnel administration and major issues of Public administration in India.
PSO-8	Develops understanding about the Political system of US, UK and France and enables to make comparative analysis of the political structures of institutions of these countries.

#### COURSE OUTCOMES (COs)

##### Sem-I

Course Title- Western Political Thought -II

Course Code- MPOL-4206

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Understand the origin and evolution of Western Political Thought.	1	R,U
CO-2	Widen their knowledge about the basic political concepts.	1,2	U, Ap
CO-3	Have a deep look at the history of Western Political Thought to understand the present paradigm of political philosophy.	1,2	U, An, Ap, E
CO-4	Inculcate the values for developing rational and critical thinking.	2,5	An, E, C

Course Title - Modern Political Analysis

Course Code- MPOL-4207

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
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CO-1	Understand the dynamics of politics from the perspective of Modern Political Analysis.	1,5	U, An
CO-2	Develop a critical appraisal of the traditional and modern approaches to the study of Politics.	1,2	U, An, Ap
CO-3	Learn new concepts of Political Science.	1,5	U, An
CO-4	Develop understanding of behavioural aspects of politics.	1,5	An, Ap, E

**Course Title -Comparative Political Systems (UK, USA and FRANCE)**  
**Course Code- MPOL-4208**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Acquire knowledge about the evolution and working of British political system.	1,5,8	U, An
CO-2	Understand deeply the US Constitution and its various features.	5,8	U, An, E
CO-3	Widen their knowledge about French Constitution and its distinctiveness with Presidential and Parliamentary system.	8	U, An, E
CO-4	Make a comparative study of the constitutions of United Kingdom, United States of America and France	8	U, An, E

**Course Title- Issues and Trends in Indian Politics**  
**Course Code- MPOL-4209**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Get practical knowledge about the actual working of the Indian Political System.	1,2,5,6	R, U, An
CO-2	Know about Caste, language, religion and region based problems in a multi-dimensional society like India and the nature of the state response to solve such problems.	1,2,6	U, An, Ap
CO-3	Learn about the new issues and emerging trends in Indian politics.	2,5,6	U, E, C
CO-4	Present a systematic analysis of the working of Centre-State relations in a quasi- federal state and reactions of the states against the increasing tendencies towards centralization.	1,2,6	An, E
CO-5	Understand the actual working of Indian polity which is very useful during interviews of competitive examinations.	1,5,6	U, An, E



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<b>Course Title- Public Policy</b>			
<b>Course Code- MPOL-4210</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Acquire knowledge regarding the policy making process in a country like India, including knowledge about various agencies and challenges involved.	1,2,5	R, U, An
<b>CO-2</b>	Learn about as to how public policy and administration are closely knitted and get comprehensive knowledge of each domain required for better results.	1,2,5	R, U, C
<b>CO-3</b>	Get knowledge about various approaches of the discipline in order to understand the depth of public policy making process.	1,2,6	U, Ap
<b>CO-4</b>	Enrich their knowledge as to how delivery modes in policy making are significant, hence emphasis equally should be on the implementation part of public policies.	2	A, Ap, C
<b>CO-5</b>	Learn the importance of the evaluation and feedback of policy-making process.	25	An, E, C
<b>Semester-III</b>			
<b>Course Title- Politics of International Economic Relations</b>			
<b>Course Code- MPOL-5311</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Develop theoretical and conceptual knowledge about the close relationship between economics and politics at international level.	1,2	R, U, An, Ap
<b>CO-2</b>	Present a systematic analysis of the working of capitalist system in the contemporary world and response of the anti-capitalist forces.	3,5	U, An, E
<b>CO-3</b>	Enhance their knowledge about new issues like Global Warming, growing struggle and resultant wars to control the energy resources like Oil and Gas among the super powers.	3,4,5	U, An, E
<b>CO-4</b>	Understand the new social movements in the age of globalization.	3,4,5	U, An, E
<b>CO-5</b>	Prepare for the written examinations and Interviews for Civil Services.	5	R, U, An, C
<b>Course Title- Foreign Policy of India</b>			
<b>Course Code- MPOL-5312</b>			





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Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Describe the overall thrust of India's foreign policy that reveals India's global outlook.	3,4,5	U, An, E
CO-2	Understand that foreign policy of any country begins from home itself, hence deep acquaintance with country's socio-economic and politico-cultural settings is essential.	2,4	U, An, E
CO-3	Get familiar with external challenges and India's possible response.	3,4,5	U, An
CO-4	Analyze India's stand on International issues, including know-how about country's participation in global institutions.	3,4,5	U, An
CO-5	Learn how to choose career in the subject	5	U, An, Ap, C

**Course Title- International Law**  
**Course Code- MPOL-5313**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Familiarize themselves with the concept of International Law, its sources and its distinction from Municipal Law.	1,3,5	R, U, An
CO-2	Understand various international interactions done by states like State Recognition, Government Recognition, State Succession and State Responsibility.	1,3,4	U, An, Ap
CO-3	Learn about various laws regulating the behaviour of states during war, while granting asylum or extraditing and dealing with prisoners of war.	3,4,5	U, An, Ap, E
CO-4	Understand the powers, immunities and role of diplomatic envoys and rules related to state jurisdiction over land, air and sea.	3,4,5	U, An, Ap, E, C

**Course Title- International Organizations**  
**Course Code- MPOL-5314**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Learn about International Organizations and their historical development.	3,4	R, U
CO-2	Develop understanding of United Nations, its aims and objectives.	3,4	U, An
CO-3	Understand the working of various organs of UN.	3,4,5	U, An, E



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CO-4	Analyse the role of specialized agencies in the fulfillment of objectives of the UN.	3,4,5	U, An, E
CO-5	Evaluate the role of UN in various International crises.	3,4,5	An, E

**Course Title- Human Rights**  
**Course Code- MPOL-5315**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Understand the meaning and significance of Human Rights.	1,2	R, U
CO-2	Enhance their skills by discussing key approaches of Human Rights.	1,2	R, U, An, Ap
CO-3	Discuss historical events and agreements that proved bed rock for discipline's growth.	4,5,6	U, An, E
CO-4	Analyse Human Rights through Indian perspective.	2,5,6	U, An
CO-5	Learn about the possible misuse of human rights.	6	U, An, E

**Semester-IV**

**Course Title: Recent Political Theory**  
**Course Code- MPOL-5416**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Acquire in depth knowledge of the main political ideologies and their relevance in prevailing circumstances.	1,2	R,U
CO-2	Understand the key concepts and develop critical and analytical thinking about the functioning of state and its agencies.	1,2	U, An, Ap, E
CO-3	Learn about human rights, issues of ethno- nationalism and update their knowledge on modern political theories like Multiculturalism, Feminism etc.	3,4,5	U, An, E
CO-4	Develop understanding about the relevance of political theory in solving socio-economic and political problems.	2,5	U, An
CO-5	Pursue higher studies like Ph.D.	5	U, An, C

**Course Title- Indian Political Thought**  
**Course Code- MPOL-5417**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
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CO-1	Build their thought process in order to develop their cognitive skills.	1,2	U, An
CO-2	Understand the valuable political ideas of Indian scholars and their approaches to usher the country into a cohesive nation.	1,4	U, An, Ap
CO-3	Learn rich historical domain of civilizational knowledge.	6	U, An
CO-4	Infuse a sense of fair aptitude of studying comparative political thoughts.	2,5	U, An, C
CO-5	Inculcate values to develop rational and critical thinking.	2,5	U, An, E, C

**Course Title- Government and Politics in Punjab**  
**Course Code- MPOL-5418**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Understand the political developments and subsequent problems in a border state and nature of the state initiatives to deal with such a politically sensitive region.	5,6	U, An, E
CO-2	Learn as to how an increasing sense of alienation among minority communities lead to separatist tendencies, ultimately challenging the unity and integrity of the state.	2,6	U, An, E
CO-3	Grasp knowledge about identity politics and its social and political implications.	2,6	U, An
CO-4	Make systematic analysis of the working of political structures and process in the state of Punjab	2,4,6	U, An, E

**Course Title- Research Method in Social Science**  
**Course Code- MPOL-5419**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Acquire knowledge about purpose and importance of research in Social Sciences.	1,2,5	U, An, E
CO-2	Understand various research methods in Social Sciences.	2	U, Ap
CO-3	Get acquainted with various tools and techniques of social research.	2	U, An, Ap
CO-4	Examine and evaluate various social and political issues.	3,4,6	An, E
CO-5	Learn as to how research and research project could be undertaken.	3,4,5	An, E, C



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**Course Title- Politics in South Asia (India, Pakistan, Nepal, Bangladesh and Sri Lanka)**  
**Course Code- MPOL-5420**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Understand the theories associated with the study of politics of South Asian countries.	1,2	U, An
CO-2	Get acquainted with the socio-political conditions and their impact on the working of executive, judiciary and administrative machinery of South Asian countries.	3,4	U, An, E
CO-3	Understand the situation of Human Rights, role of Civil Society, Terrorism, Ethnicity and Human Development along with their comparative analysis.	3,4,6	U, An, E
CO-4	Learn that these countries are blue eyed for investment by MNCs and therefore its study updates their information about social, political, economic and cultural impacts of globalization on the politics of these countries.	3,4,5,6	U, An, E





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### M.A. Economics

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

<b>PSO-1</b>	To analyse economic problems having economic implications on various sectors of national economy
<b>PSO-2</b>	To develop ability to explain basic economic terms, concepts and theories
<b>PSO-3</b>	To develop ability to use critical thinking skills about important economic issues
<b>PSO-4</b>	To prepare the students to apply economic theory to real life practical issues and to study the effect of economic policy, technological advancement and demographic changes on the economy
<b>PSO-5</b>	To use various mathematical and statistical techniques for economic analysis.

#### COURSE OUTCOMES (COs)

##### Semester I

Course Title: Micro Economics I

Course code :MAE - 101

S. No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Become aware about the optimal behaviour of various economic agents given the scarce economic resource and other constraints.	1,2, 3	R ,U
CO- 2	Understand various economic issues and applied part of the economics.	1,3, 4	U, Ap, An, E
CO- 3	Gain knowledge about various types of production functions	2,4	U, E, C
CO- 4	Apply micro economics in managerial and public policy decision making	1,2,5	Ap, An
CO- 5	Get knowledge about fundamental principles of microeconomics.	4,5	U, R



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### Course Title: Macro Economics-I

Course code : MAE - 102

S. No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Get an overview on the major developments in macroeconomic theory	1,2	U,R
CO- 2	Become familiar about National income and its related concepts.	1,2,3	U,An
CO- 3	Analyse the income determination through Classical and Keynesian approaches	2,3,4	U, Ap, An, E
CO- 4	Study the relationship between investment and savings and understand the meaning of MEC , MEI and multiplier.	2,3,4,5	U, Ap, An, E
CO- 5	Understand the concept of money and different approaches to demand for money	1,2,3	U, Ap, An, E

### Course Title: Quantitative Methods for Economists-I

Course code :MAE - 103

S. No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Study the concepts of differentiation, partial derivatives and integration and their application in economics	3,5	R,U,Ap
CO- 2	Understand the concepts of Matrices, Determinants and input output analysis	3,5	R,U,Ap
CO- 3	Understand the concept of maxima and minima of functions.	3,5	U,Ap
CO- 4	Gain knowledge about the concept of linear programming, its formulation and solution through Graphical and Simplex method.	3,5	U,Ap
CO- 5	Understand the basic concepts of Game theory and its applications.	3,5	U, Ap



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**Course Title: Money, Banking and Finance****Course Code: MAEO-4**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Become familiar with different approaches to define money, types, role and function of money	1,2,3,4	U, Ap, An, E
CO-2	Study Money Multiplier Process and its Determinants	1,2,3	U, Ap, E
CO-3	Understand commercial banks and Non-banking financial intermediaries as well as central banking in India	1,3,4	U, An, E,An
CO-4	Develop an understanding about regional rural banks and cooperative banks in India	1,3,4	U, An, E,C
CO-5	Get knowledge about the concept of rate of interest , determination of rate of interest and term structure of interest rates	1,3,4	U, An, E

**Course Title: Economics of Public Enterprises****Course Code: MAEO-10**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Understand the role, importance and growth of public enterprises	1,2,3	U, An, E
CO-2	Understand the management of public enterprises	1,2,3	U, An, E
CO-3	Understand different project selection techniques	2, 3, 4, 5	U, An, E,Ap
CO-4	Understand various efficiency measurement units	2, 3, 4, 5	U, An,Ap, E
CO-5	Analyse case studies regarding growth, performance, pricing and management of public sector steel industry in India	3, 4	U, An, E



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**Course Title: Micro Economics II**

**Course code :MAE - 201**

S. No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Become aware about different market conditions prevailing in an economy.	1,4	Ap, An, E
CO- 2	Understand and analyse the pricing and output decisions under various market structure.	1,2	U, An
CO- 3	Understand factor pricing and different theories of distribution	2,4	U, Ap
CO- 4	Study about partial and general equilibrium analysis	2, 3	U, Ap
CO- 5	Understand basic tools in analysing the welfare of an economy and evaluate different criteria to assess the economic welfare.	1,2	U, An, E

### Semester II

**Course Title: Macro Economics-II**

**Course code : MAE - 202**

S. No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Understand the IS–LM model and its extension with government sector, labour market and flexible prices.	1,2	U,An
CO- 2	Illustrate the meaning of inflation, deflation, identify different types of inflation, Philips curve.	1,2,3,5	U,An
CO- 3	Understand meaning and different phases of business cycles and demonstrate various theories of business cycles	1,2,3	U, Ap, An, E





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CO- 4	Analyse Mundell–Fleming model–Asset markets and Monetary approach to balance of payments.	1,2,3	U, Ap, An, E
CO- 5	Understand Recent Developments in Macroeconomics	3,4,5	U, C

### Semester II

**Course Title: Quantitative Methods for Economists-II**      **Course code :MAE - 203**

S. No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Understand the estimation of simple, partial and multiple correlation and regression coefficients and their interpretation	3,5	R,U,Ap
CO- 2	Understand the definition and components of Time series analysis and measurement of secular Trend and Seasonal variations	3,5	U,Ap
CO- 3	Understand the concepts and estimation of nonlinear regression	3,5	U,Ap
CO- 4	Understand the concept of probability, mathematical expectations, moments and the properties of theoretical probability distributions.	3,5	U,Ap
CO- 5	Understand various techniques of sampling and testing of hypothesis in case of large samples.	3,5	U, Ap

**Course Title: Economics of Agriculture**

**Course Code: MAEO-9**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Understand the role of agriculture in economic development	1,2,3,4,5	U, Ap, An, E



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CO-2	Acquire knowledge about various models of agricultural development	1,2,3	U, Ap, An, E
CO-3	Understand the concepts of New Agricultural strategy with reference to Green revolution and its implications for income distribution and employment	1,2,4	U, An, E
CO-4	Understand various types of agrarian structures with emphasis on cooperative farming with special reference to India and the concepts of sustainable development and organic farming	1,3,4,5	U, An, E,C
CO-5	Understand various aspects of agricultural price policy and agriculture marketing	1,3,4	U, An, E

**Course Title : Operations Research**

**Course Code: MAEO-12**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Get knowledge about the concepts and tools of Operations Research	2, 3, 4, 5	U, Ap, An, E
CO-2	Apply different techniques to make effective business decisions	3, 4, 5	U, Ap, An, E
CO-3	Construct linear programming models and discuss their solution techniques.	3, 4, 5	U, Ap, An, E
CO-4	Understand transport and assignment models	3, 4, 5	U, Ap, An, E
CO-5	Analyse PERT CPM models for developing critical thinking and objective analysis of decision problems.	3, 4, 5	U, Ap, An, E



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### Semester III

**Course Title: Economics of Development****Course code : MAE - 301**

S. No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Understand the concepts of economic growth and economic development	1,2,3	R, C, U
CO- 2	Learn about various growth models and theories of development	1,2,3	U, Ap, An
CO- 3	Understand the conceptual bases of Human development index and physical quality of life index	3,4,5	U, Ap, An
CO- 4	Understand the importance of human capital as an essential component for economic development	1,2,3	R, U
CO- 5	Understand different strategies of economic development	3,4	U, Ap, An, E

**Course Title: International Economics-I****Course Code: MAE-302**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Recall the meaning of internal and International trade	2,3,4	R,U, An
CO-2	Analyse different theories governing international trade and their empirical testing	2,3,4	R,U, An,E
CO-3	Understand the causes and importance of Intra-industry trade and describe trade as an engine of growth	2,3,4	U, An,E
CO-4	Understand various concepts of terms of trade and the empirical relevance of the hypothesis of secular	2,3,4,	U, An, E



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	deterioration in terms of trade for less developed countries.		
CO-5	Understand the meaning and types of various tariff and non-tariff barriers and their impact on different economic variables	2,3,4	U, An, E

**Course Title: Indian Economy**

**Course Code: MAE-303**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Develop comprehensive understanding about the growth and structure of National Income in India.	1, 3	R, U, An
CO-2	Evaluate Indian economic planning, have knowledge about various objectives of planning along with introduction to Niti Aayog	1, 3	R, U, An,E
CO-3	Analyse the major economic problems of India and understand various policies pursued/implemented for their effective redressal.	1,3	U, An,E
CO-4	Understand the importance, progress and changing nature of agriculture sector and its contribution to the economy as a whole	1,3	U, An, E
CO-5	Examine the pattern and performance of the industrial sector of the economy, transformative changes therein and analyse various industrial policies implemented so far.	1,3	U, An, E

**Course Title : Public Finance**

**Course Code: MAEO-1**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Attain the knowledge about the sources of Public Revenue and taxable capacity	1, 2, 3	R, U, An, E





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CO-2	Understand the causes of growing public expenditure and the impact of public expenditure on production and distribution	1, 2, 3	R, U, An, E
CO-3	Analyse the possible burden, benefits and distribution of various types of taxes	1, 2, 3, 4	U, An, E
CO-4	Gain understanding of different kinds of budget and budget of Union Government in India	1, 2, 3, 4	U, An, E
CO-5	Learn about central state financial relations in India and its fiscal Policy	1, 2, 3, 4	U, An, E

**Course Title: Economics of Labour**

**Course Code: MAEO-2**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Analyse different theories of labour market	1,3,4,5	U, Ap, An, E
CO-2	Understand the influence of labour unions on the operation of labour markets	1,3,5	U, An, E
CO-3	Learn about the nature of unemployment in India , employment policy and different concepts of wages	1,2,4	U, Ap, An, E
CO-4	Understand the concepts of social security and labour welfare with respect to India	1,3,4,5	U, An, E,C
CO-5	Understand the relationship between current phase of globalisation and labour markets	1,3,4	U, An, E



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### Semester IV

**Course Title: Economics of Planning**

**Course code : MAE - 401**

S.No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Understand different planning systems and the relevance of planning in third world countries	1,2,3	R, C, U, E
CO- 2	Learn about project evaluation and cost benefit analysis	2,3,4	U, Ap, An, E
CO- 3	Understand Indian plan models and evaluation of Indian planning	1,2,3	U, An E
CO- 4	Gain knowledge about choice of technique	2,3,4	U, An
CO- 5	Understand the importance of and problems in international transfer of technology	2,3,4	U, Ap, An, E

**Course Title: International Economics-II**

**Course Code: MAE-402**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Recall the meaning and components of Balance of payments and understand the process of adjustment in Balance of Payment under the system of fixed and flexible exchange rates.	2,3,4	R,U, An
CO-2	Understand the meaning of foreign rate of exchange and analyse the theories for the determination of exchange rate	2,3,4	U, An, E
CO-3	Understand various forms of economic co-operation and the objectives and achievements of GATT, WTO, UNCTAD, SAARC, ASEAN, NAFTA and EU.	2,3,4	U, An,E
CO-4	Understand the working of current international monetary system and the functions of major international financial institutions like World Bank and IMF.	2,3,4,	U, An, E
CO-5	Analyse the importance of international capital movements	2,3,4	U, An, E



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**Course Title: Punjab Economy****Course Code: MAE-403**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Effectively comprehend the structure of state's economy and understand major problems of Punjab economy	1, 3	U, An, E
CO-2	Analyse the issues involved in the slow growth of industries and explore potential areas of industrial growth in the state.	1, 3	U, An,E
CO-3	Examine the impact and implications of green revolution and scrutinize various issues involved in the diversification of agriculture.	1,3	U, An,E
CO-4	Understand the pattern of devolution of resources from Centre to state.	1,3	U, An, E
CO-5	Examine fiscal crisis in Punjab, its causes and potential solutions so as to devise effective policies.	1,3	U, An, E

**Course Title: Economics of Environment and Demography Course Code: MAEO-13**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Realize the importance and the influence of economy on the environment and vice-versa	1, 2, 3	R, U, An, E
CO-2	Study the role and importance of individuals to keep the environment clean.	1, 2, 3	U, An, E
CO-3	Understand global issues related to environment	1, 2, 3	U, An, E



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CO-4	Understand various concepts of demography and population policy of India	1, 2, 3, 4	U, An, E
CO-5	Gain knowledge about trade and environment under WTO regime	1, 2, 3, 4	U, An, E

**Course Title: Industrial Economics**

**Course Code: MAEO-5**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Understand the structure, concept and organization of a firm – ownership, control and objectives of the firm	1,3,4,5	U, Ap, An, E
CO-2	Learn about the concepts of product pricing, mergers, diversification, productivity, efficiency and capacity utilization	1,2,3,5	U, An, E,Ap
CO-3	Understand recent trends in Indian Industrial growth and the critical evaluation of Industrial policy in India	1,3,4	U, Ap, An, E
CO-4	Understand the costs and benefit analysis	1,2,3,4,5	U, An,Ap, E
CO-5	Learn about the structure of industrial labour in India, changes with respect to globalisation and exit policy	1,3,4	U, An, E





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### M.A. ENGLISH

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

<b>PSO-1</b>	To generate an ability to understand various literary genres and texts in English literature.
<b>PSO-2</b>	To develop critical and analytical skills within the students.
<b>PSO-3</b>	To build up their proficiency in English language which enhances their chance to pursue the careers in various other sectors.
<b>PSO-4</b>	To create skills for enhancement of employment in the field of education.
<b>PSO-5</b>	To make students empathetic towards society and self.
<b>PSO-6</b>	To develop a comparative awareness about literature from the west and the east.
<b>PSO-7</b>	To understand the history of Britain and other countries.
<b>PSO-8</b>	To understand the basic and advanced grammar of English and grasp basic linguistics skills.

#### COURSE OUTCOMES (COs)

##### Sem-I

Course Title: Poetry (Renaissance to Romantic)

Course Code: MENG-1101

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Understand various emotions and inculcate in them the right perspective towards human philosophy and ethics.	1,2,5,6,8	R,U,Ap,An,E,C
CO-2	Understand the features of Renaissance period like humanism, individualism, secularism and rationalism.	1,2,5,6,8	U,Ap,An,E,C
CO-3	Develop four skills of language: - Listening, Speaking, Reading and Writing.	1,2,3,4,8	U,Ap,An,E,C

Course Title: Drama (Elizabethan & Jacobean)

Course Code: MENG-1102

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Understand the concepts of performing art.	1,2,3,4,5,6,7,8	R,U,Ap,An,E,C



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CO-2	Develop four skills of language: - Listening, Speaking, Reading and Writing.	2,3,4,8	R,U,Ap,An,E,C
CO-3	Analyse human personalities	5	U,Ap,An,E,C

**Course Title: English Novel (Upto 19<sup>th</sup> Century)****Course Code: MENG-1103**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Get acquainted with the major trends in English novel up to nineteenth century	1,2,5,8	R,U,Ap,An
CO-2	Understand the genre of the realistic fiction by studying Hard Times	2,8,9	R,U,An
CO-3	Understand the genre of the regional novel by studying Thomas Hardy's Jude the Obscure.	1,5,8	R,U,Ap,An
CO-4	Appreciate the typical life of gentility of the Georgian era as depicted by Jane Austen in Pride and Prejudice	5,8	R,U,An
CO-5	Understand the growing importance of novel, its background and the reasons behind its evolution	3,4,6	R,U,An

**Course Title: Phonetics and Spoken English****Course Code: MENG-1104**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Identify and articulate various sounds i.e., vowels, diphthongs and consonants of English language.	3,4	R,U,Ap,An,E,C
CO-2	Understand the rhythmic patterns and functions of English language.	3,4	R,U,Ap,An,E,C



Estd. 1892

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CO-3	Enhance their pronunciation and spoken English.	3,4	U,Ap,An,E,C
CO-4	Inculcate self-confidence through enhancing spoken skills which enable them to get accommodated to the growing language based economy.	3,4	U,Ap,An,E,C

**Course Title: Prose Writings****Course Code: MENG-1105**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Get acquainted with the major trends of English Prose especially with reference to Bacon, Lamb, Russell and Joseph Addison	1,2,5,8	U,Ap,An
CO-2	Understand the social, historical and cultural contexts of the age.	8	U,Ap,An
CO-3	Understand the growth of English prose styles from Elizabethan to Modern period and identify the relation of prose styles to the historical developments.	1,2,7,8	U,Ap,An
CO-4	Understand various literary key concepts used in the prose writing like Irony, Satire, Pathos, Humour etc.	1,2	U,Ap,An,E
CO-5	Get awareness about the moral and ethical qualities from Elizabethan to modern period and also have the lesson of tolerance in religious matters, civilization of mind and the importance of rational thinking, etc.	5,7,8	U,Ap,An



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### Semester: II

**Course Title: Poetry (Victorian & Modern)**

**Course Code: MENG-1201**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Have a balanced perspective towards science and religion.	1,2,4,6,8	U,An,E
CO-2	Inculcate moral and ethics rights, spiritualism, futility of war and sanctity of relationships.	1,2,4,6,8	U,An,E
CO-3	Get knowledge about the historical and political events of Victorian & modern ages.	1,2,6,7	U,An,E

**Course Title: Modern Drama**

**Course Code: MENG-1202**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Recognize the importance of drama which opens the new vistas and avenues of career in theatre.	1,2,3,6,8	R,U,Ap,An,E,C
CO-2	Acquire knowledge of culture and the civilization of the Western world.	1,2,3,6,7,8	U,Ap,An,E,C
CO-3	Acquire knowledge of political, social and literary history of England.	1,2,3,6,7,8	U,Ap,An,E,C

**Course Title: Modern Novel**

**Course Code: MENG-1203**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Get acquainted with the diversity of modern novel- its techniques, approaches and thematic concerns.	1,2	R,U,Ap,An





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CO-2	Understand the Freudian concept of 'Oedipus Complex' by studying Lawrence's Sons and Lovers.	2,5,6	U,Ap,An
CO-3	Learn the genre of 'Stream of Consciousness Novel' through the study of Virginia Woolf's Mrs. Dalloway.	5,6	U,Ap,An
CO-4	Understand the dark side of humanity, the savagery that is present even in civilised human beings, through the study of Golding's The Lord of the Flies.	5,6,7	R,U,Ap,An
CO-5	Understand the motives and complexities of the human mind through the psyche of the characters in the novels.	5,7,8	U,Ap,An

**Course Title: English Grammar and Writing****Course Code: MENG-1204**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Know the basic concepts of English grammar.	3,4	R,U,Ap,An,E,C
CO-2	Acquire knowledge of word, sentence formation and discourse analysis.	3,4	R,U,Ap,An,E,C
CO-3	Gain proficiency in their writing skills in order to meet the challenges of the world.	3,4	R,U,Ap,An,E,C
CO-4	Develop an insight into the structure of English language and develop their skills of grammatical analytical and descriptive skills.	3,4	U,Ap,An,E,C



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**Course Title: Irish Literature****Course Code: MENG-1205**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Get acquainted with some major works of Irish literature from 17th century up to 20th century.	1,7,8	U
CO-2	Understand novels and plays in Irish Literature representing major concerns of Irish people and their identity.	2,5,7,8	U,Ap,An
CO-3	Understand the social, cultural, religious and political environment of Ireland and the relation of the country to the outer world.	2,5,7,8	U,An
CO-4	Acquire critical and analytical reading skills.	2,3,4	U,Ap,An
CO-5	Gain awareness about the moral and ethical qualities of the Irish people and understand that human race can make progress and development if the people shed their petty and narrow thinking of greed and self-centeredness. Students understand the importance of rational thinking and learn the lesson of cultural and religious tolerance if a society or nation is to make progress.	2,5,7,8	U,Ap,An

**Semester: III****Course Title: Literary History I****Course Code: MENG-2301**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Understand the way particular ideologies, movements and worldviews about life, politics, religion and the world at large have	1,2,4,5	R,U,Ap,E



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	found expression in different writers through various techniques, concepts, devices etc.		
CO-2	Develop an understanding about the works, thematic as well as stylistic concerns of the prominent literary writers	1,2	R,U,An,C
CO-3	Know about the works, and thematic as well as stylistic concerns of the major poets and novelists of the prescribed texts	8	R,U,Ap,E
CO-4	Relate various literary texts in their historical, socio-cultural, political and economic contexts and understand their contemporary as well as universal significance	1,2,5	U,An

**Course Title: General Linguistics**

**Course Code: MENG-2302**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Understand the basic nature, branches, history of linguistics and language.	1,2,4,5,8,9	U,An,E
CO-2	Get knowledge of discourse analysis.	1,2,4,7,8	U,An,E
CO-3	Get job opportunities at global level in the field of teaching language.	3,4	U,An,E,C
CO-4	Get job opportunities in clinical psycho and content writing.	3,4,6,8	U,An,E,C



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**Course Title: Literary Criticism**

**Course Code: MENG-2303**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Acquire knowledge of the basics of Literary Approaches Theory and Criticism.	2,5,7,8	U,Ap,An,E,C
CO-2	Acquire knowledge of various social and intellectual movements and their impact on literature.	2,3,5,7,8	U,Ap,An,E,C
CO-3	Learn the techniques of close readings of the literary texts.	1,2,5,7,8	U,Ap,An,E,C
CO-4	Analyze, interpret, explicate and evaluate literary texts.	2,5,7,8	U,Ap,An,E,C
CO-5	Gain knowledge of practical and applied criticism.	2,3,5,7,8	U,Ap,An,E,C

**Course Title: Indian Writing in English**

**Course Code: MENG-2304**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Get familiarize with the emergence, growth and flowering of Indian writing in English through the turbulent ties of pre independence to the Modern times.	1,2,5,6,8	U,An,E
CO-2	Analyse and appreciate the 'Indianness' of the writers which make their writing unique.	1,2,5,6,8	U,An,E
CO-3	Appreciate, as they trace and study the cultural, mythological, historical, traditional learning in the texts.	1,2,5,6,7,8	U,An,E





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**Course Title: Rhetoric and Advanced Composition**

**Course Code: MENG-2305(ii)**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Analyze and respond to diverse rhetorical situations.	1,2,3	U,Ap,An
CO-2	Write with a purpose	3,4	Ap
CO-3	Develop critical thinking, reading and writing	2,3,4	U,Ap,An
CO-4	Learn to write Research Papers and Articles	3,4	Ap
CO-5	Find employability in journalism, content writing and publications	3,4	Ap

**Semester: IV**

**Course Title: Modern Literary Theory**

**Course Code: MENG-2401**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Acquire knowledge of the basics of Literary Approaches Theory and Criticism.	2,5,7,8	R,U,Ap,An,E,C
CO-2	Acquire knowledge of the various social and intellectual movements and their impact on literature.	2,3,5,7,8	R,U,Ap,An,E,C
CO-3	Impart the techniques of close readings of the literary texts.	1,2,5,7,8	R,U,Ap,An,E,C
CO-4	Analyze, interpret, explicate and evaluate literary texts.	2,5,7,8	U,Ap,An,E,C
CO-5	Acquire knowledge of practical and applied criticism.	2,3,5,7,8	U,Ap,An,E,C



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**Course Title: American Literature****Course Code: MENG-2402**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Understand the historical and political background of America from Colonialism to Modern times	1,2,6,7,8	R,U,An,E
CO-2	Understand the influence of American culture	1,2,6,7	U,An,E
CO-3	Have an ability to read and understand various literary genres	1,2,7,8	U,An
CO-4	Display a critical aptitude and reflexive thinking to systematically analyse the prescribed texts	1,2,7,8	U,An,E

**Course Title: Literary History II****Course Code: MENG-2403**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Understand the way particular ideologies, movements and worldviews about life, politics, religion and the world at large have found expression in different writers through various techniques, concepts, devices etc.	1,2,4,5	R,U,Ap,E
CO-2	Develop an understanding about the works, and thematic as well as stylistic concerns of the prominent literary writers	1,2	R,U,An,E
CO-3	Know about the works, and thematic as well as stylistic concerns of the major poets and novelists of the prescribed texts	2,3	R,U,Ap,E
CO-4	Relate various literary texts in their historical, socio-cultural, political and economic contexts and understand their contemporary as well as universal significance	7,8	R,U,Ap,An



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### Course Title: Post Colonial Literature

Course Code: MENG-2404

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Acquire knowledge about basic concepts in Post Colonial Literature.	1,2,3,4,6	U
CO-2	Evaluate how race, class, gender, history and identity are presented and problematized in the literary text.	1,2,3,4,5,8	U,Ap,An
CO-3	Compare ideas, representations and strategies of politics and cultural resistance with reference to historical and special contexts.	1,2,3,4,5,6,8	Ap,An,E
CO-4	Find employability in the field of teaching particularly in teaching Literature.	3,4	Ap

### Course Title: Greek Drama

Course Code: MENG-2405(ii)

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
CO-1	Recognize the importance of translation which opens the new vistas and avenues of career of translation to them.	3,4,5,8	R,U,Ap,An,E,C
CO-2	Acquire knowledge of an ancient culture and the beginning of an organized and a brilliant civilization of the Western world.	1,2,3,5,6,8	R,U,Ap,An,E,C
CO-3	Acquire knowledge of political, social and literary history of Greece.	2,3,5,6,7,8	U,Ap,An,E,C
CO-4	Facilitate the classical dramatists and their approaches towards literature.	1,2,3,4,7,8	U,Ap,An,E,C



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### M.A. HISTORY

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs)

<b>PSO-1</b>	Students become acquainted with the political processes and structures, society and culture, political Ideas and Institutions, historical thought and historiography, economy and society in the Punjab, India and the World.
<b>PSO-2</b>	Students become familiar with the social, political, religious, economic and cultural institutions of the present, and also their evolution and development in the past.
<b>PSO-3</b>	Students learn about old coins and other historical material, enact historical dramas, make visits to places of historical interests, archeological sites, museums and archives, learn to use historical maps, charts and write articles on historical topics.
<b>PSO-4</b>	After completing this programme, students can become familiar with excellent opportunities in the higher studies (M. Phil., Ph.D. and other research programmes and their related sponsorships and fellowship programmes run by government and other agencies). They may get employment in the field of teaching, as a consultant with museums, media centres and historical monuments.
<b>PSO-5</b>	History students learn about moral and environmental education, and also develop a feeling of nationalism and patriotism in their hearts for our nation.

#### COURSE OUTCOMES (COs)

##### Semester-I

**Course Title: POLITICAL PROCESSES AND STRUCTURES IN INDIA UPTO A.D. 1200**

**Course Code: MHIS-4101**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
<b>CO-1</b>	Study the origin of political ideology and structure in India in Ancient times.	1,2,4	R, U
<b>CO-2</b>	Learn the different political ideologies and structures of different ancient Indian dynasties.	1,2,4	R, U





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<b>CO-3</b>	Understand historical arguments on the primary source material research.	3,4,4	U, E
<b>CO-4</b>	Develop critical understanding of the policies of different Ancient dynasties.	1,2,4	U, E
<b>CO-5</b>	Evaluate the different categories of historical sources such as Literary and archaeological.	3,4	U, E
<b>Course Title: SOCIETY AND CULTURE IN INDIA UPTO A.D. 1200</b>			
<b>Course Code: MHIS-4102</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Understand that Indian culture is an amalgamation of several cultures.	1,2,4	R,U,E
<b>CO-2</b>	Study about the origin, philosophy and development of various religions in the period under study.	1,2,4	U,AN,E
<b>CO-3</b>	Learn the social and moral values.	1,2,4	U,AN
<b>CO-4</b>	Study about the position of women during ancient times.	1,2,4	U,AN,E
<b>CO-5</b>	Study about the richness of language and literature, script, art and architecture, Science and technology.	1,2,3,4	R,U,E
<b>Course Title: POLITY AND ECONOMY OF INDIA (A.D. 1526-1750)</b>			
<b>Course Code: MHIS-4103</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Study new changes brought by the Mughals in political sphere	1,2,4	R,U,E
<b>CO-2</b>	Study new changes brought by the Mughals in economic sphere.	1,2,4	R,U,E
<b>CO-3</b>	Understand the nature of the Mughal monarchy and nobility and their relationship.	1,2,4	R,U,E
<b>CO-4</b>	Analyse the conflicts inherent in the System and Collapse of the Mughals.	1,2,4	R,U,AN
<b>CO-5</b>	Understand the rise and role of regional states in Indian polity.	1,2,4	R,U,E
<b>Course Title: POLITICAL IDEAS AND INSTITUTIONS IN INDIA (A.D.1757-1947)</b>			



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<b>Course Code: MHIS-4104</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Understand the political ideology and institutions of the British in India.	1,2,4,5	R,U
<b>CO-2</b>	Learn different strategies of the British to expand their empire in India.	1,2,4,5	R,U,E
<b>CO-3</b>	Analyse the growth of Western education and press under the British and their impact.	2,3,4,5	U,AP,E
<b>CO-4</b>	Study the judicial system of the British in India.	1,2,3,4	R,U,E
<b>CO-5</b>	Study the constitutional development under the British in India.	1,2,3,4,5	R,U,AN
<b>Course Title: HISTORY OF THE PUNJAB (A.D.1450-1708)</b>			
<b>Course Code: MHIS-4105</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Understand the prevalent political, social and religious condition in which the Sikhism originated and developed in Punjab.	1,2,3,4	R,U,AN
<b>CO-2</b>	Do critical analysis of the various categories of the sources of the history of the Punjab.	1,2,3,4	R,U,E
<b>CO-3</b>	Learn the teachings and the philosophy of the Sikhism.	1,2,3,4	R,U,E
<b>CO-4</b>	Study the Mughal-Sikh relations during the period under study.	1,2,3	R,U,E
<b>CO-5</b>	Learn the rise of various heterodox Sikh sects.	1,2,4	R,U,E
<b>Semester-II</b>			
<b>Course Title: AGRARIAN AND URBAN ECONOMY IN INDIA UPTO A.D.1200</b>			
<b>Course Code: MHIS-4206</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Study the origin and growth of agrarian economy.	1,2,3,4	R,U,AN,E
<b>CO-2</b>	Understand land rights, land grants and land revenue systems during Ancient period.	1,2,3,4	R,U,E
<b>CO-3</b>	Study about the trade and commerce system in Ancient India.	1,2,3,4	R,U,AN,E



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CO-4	Learn about rise of urban centres in Ancient India.	1,2,3,4	R,U,AN,E
CO-5	Study about economic role of temples during Ancient period.	1,2,3,4	R,U,AN,E
<b>Course Title- SOCIETY AND CULTURE OF INDIA (A.D. 1200-1750)</b>			
<b>Course Code: MHIS-4207</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Learn about society and culture of Medieval India from AD 1200 to 1750.	1,2,3,4	R,U,E
CO-2	Understand the rural and urban social structures and standard of living of people during this time.	1,2,3,4	R,U,AN,E
CO-3	Understand the different aspects of Islam, Sufism, Bhakti, Vaishnaism and Shaivism.	1,2,3,4	R,U,E
CO-4	Learn the art, architecture and different schools of painting.	1,2,3,4	U,E
CO-5	Study about the development of different languages, composition of the ruling classes and sectarian communities.	1,2,3,4	U,E
<b>Course Title- POLITY, ECONOMY AND SOCIETY IN THE PUNJAB (A.D. 1799-1849)</b>			
<b>Course Code: MHIS-4208</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the political condition of the Punjab on the eve of Ranjit Singh's accession to the throne.	1,2,3,4	R,U,E
CO-2	Study about the establishment, expansion and consolidation of the Sikh Empire by Ranjit Singh.	1,2,3,4	R,U,E
CO-3	Study about the secular rule of Ranjit Singh	1,2,3,4	R,U,E
CO-4	Understand the administrative, economic and social structure of the Punjab under Ranjit Singh.	1,2,3,4	R,U,E
CO-5	Role of Maharaja Ranjit Singh in the History of the Punjab.	1,2,3,4	R,U,E
<b>Course Title- MODERN WORLD: MAJOR TRENDS (A.D. 1500-1900)</b>			
<b>Course Code: MHIS-4209</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>



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<b>CO-1</b>	Study about the various events of the western world such as renaissance, reformation and enlightenment which brought new awakening in the world.	1,2,3,4,5	R,U,AN
<b>CO-2</b>	Learn about the basic concepts associated with the modern world such as liberty, equality and fraternity.	1,2,3,4,5	R,U,E
<b>CO-3</b>	Understand the differences between monarchical, democratic and parliamentary forms of government.	1,2,3,4,5	R,U,AN,E
<b>CO-4</b>	Learn the concepts of nationalism, secularism, imperialism, communism, Marxism and socialism.	1,2,3,4,5	R,U,E
<b>CO-5</b>	Study the causes of the decreasing influence of the medieval institutions such as Church, feudalism, and monarchy.	1,2,3,4	R,U,AN,E

### Course Title- ECONOMIC HISTORY OF MODERN INDIA (A.D.1757-1857)

Course Code: MHIS-4210

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
<b>CO-1</b>	Understand the major changes brought in Agriculture by the British East India Company.	1,2,3,4,5	R,U,AN,E
<b>CO-2</b>	Study the commercial policies of the British and their impact in India.	1,2,3,4,5	U,E
<b>CO-3</b>	Learn about decline of the handicrafts and de-industrialization under the British rule.	1,2,3,4,5	R,U,AN,E
<b>CO-4</b>	Study about financial control system of the British in India.	1,2,3,4	R,U,E
<b>CO-5</b>	Understand the impact of Economic Drain on India under the British rule.	1,2,3,4	R,U,AN,E

### Semester-III

### Course Title- SOCIO-CULTURAL HISTORY OF INDIA (A.D.1858-1947)

Course Code: MHIS-5311

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
<b>CO-1</b>	Understand the socio-cultural awakening by the various Socio-Religious Reform Moments.	1,2,3,4,5	R,U,AN,E





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<b>CO-2</b>	Study about the growth of modern education, press and literature and their role in Socio-cultural awakening.	1,2,3,4,5	R,U,AN,E
<b>CO-3</b>	Understand the rise and role of the middle classes in Socio-cultural awakening.	1,2,3,4,5	R,U,AN,E
<b>CO-4</b>	Learn about the position of women under the British.	1,2,3,4	R,U,E
<b>CO-5</b>	Understand the contribution of Gandhi Ji and Dr. Ambedkar in improving the condition of the depressed classes.	1,2,4,5	R,U,AN,E

### Course Title – EMERGENCE OF INDIAN NATIONALISM (A.D. 1857-1919)

Course Code: MHIS-5312

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
<b>CO-1</b>	Study the role of the Uprising of 1857 in the rise of national consciousness among the Indians.	1,2,3,4,5	R,U,AN,E
<b>CO-2</b>	Understand the role of the Regional Associations in the foundation of a national party known as The Indian National Congress.	1,2,3,4,5	R,U,AN,E
<b>CO-3</b>	Learn about the role of Indian National Congress in the freedom movement of the country.	1,2,3,4,5	R,U,AN,E
<b>CO-4</b>	Study about the British Divide and Rule policy to weaken the feeling of nationalism among the Indians.	1,2,3,4,5	R,U,AN,E
<b>CO-5</b>	Study about the early Satyagraha campaigns of Gandhi ji and their role in the National Movement.	1,2,3,4,5	R,U,E

### Course Title - PUNJAB UNDER COLONIAL RULE (A.D. 1849-1947)

Course Code: MHIS-5313

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
<b>CO-1</b>	Learn major administrative changes brought by the British in Punjab after its annexation to their Empire in 1849.	1,2,3,4,5	R,U,AN,E
<b>CO-2</b>	Study major steps taken by the British to consolidate their Empire in the Punjab.	1,2,3,4,5	R,U,E



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<b>CO-3</b>	Learn about the emergence and role of the middle classes in awakening the social and national consciousness among the Punjabis.	1,2,3,4,5	R,U,AN,E
<b>CO-4</b>	Study the role of the Punjab in the freedom struggle of India.	1,2,3,4,5	R,U,AN,E
<b>CO-5</b>	Study the rise of communal politics and subsequent partition of the Punjab in 1947.	1,2,3,4,5	R,U,AN,E

**Course Title- TWENTIETH CENTURY WORLD (A.D 1901-2000)**

**Course Code: MHIS-5314**

<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Study the growth of Nationalism and Imperialism.	1,2,3,4,5	R,U,AN,E
<b>CO-2</b>	Analyse the world Wars I & II and their impact.	1,2,3,4,5	R,U,E
<b>CO-3</b>	Evaluate the role of UNO in political, social and economic spheres of the world.	1,2,3,4,5	R,U,AN,E
<b>CO-4</b>	Study about the Human Rights.	1,2,3,4,5	R,U,AN,E
<b>CO-5</b>	Understand about the concerns in Ecology and the Emerging trends of Globalization.	1,2,3,4,5	R,U,AN,E

**Course Title- HISTORICAL THOUGHT AND HISTORIOGRAPHY**

**Course Code- MHIS-5315**

<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Study the definition, nature, scope and purpose of history.	1,2,4	R,U,AN,E
<b>CO-2</b>	Understand the relation between the historian and his facts in writing history.	1,2,4	R,U,E
<b>CO-3</b>	Learn the inter-disciplinary approach in writing history.	1,2,4	R,U,AN,E
<b>CO-4</b>	Understand the Greek-Roman and Christian philosophical and historical thoughts.	1,2,4	R,U,E
<b>CO-5</b>	Analyse the Enlightenment and Marxist philosophical and historical thoughts.	1,2,4,5	R,U,AN,E

**Semester-IV**

**Course Title- ECONOMIC HISTORY OF MODERN INDIA (A.D. 1858-1947)**

**Course Code- MHIS 5416**



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Sr. No	On Completing the Course, the Students will be able to learn:	PSOs addressed	Cognitive Levels
CO-1	Study about the occupational structure of India under the British rule.	1,2,3,4	R,U,AN,E
CO-2	Learn about agrarian policy of the British in India.	1,2,3,4,5	R,U,E
CO-3	Study the development and Role of railways under the British rule.	1,2,3,4,5	R,U,AN,E
CO-4	Learn about the commercial policies of the British in India.	1,2,3,4,5	R,U,AN,E
CO-5	Study about the development of the modern banking system under the British rule.	1,2,3,4,5	R,U,E
<b>Course Title- THE NATIONAL MOVEMENT (A.D 1920-1947)</b>			
<b>Course Code- MHIS 5417</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Study about the role of Gandhi Ji in the freedom struggle of India.	1,2,3,4,5	R,U,E
CO-2	Understand the rise and role of revolutionary movements in the Indian Nationalism.	1,2,3,4,5	R,U,AN,E
CO-3	Learn about the constitutional development in India during the British rule.	1,2,3,4,5	R,U,AN,E
CO-4	Analyse the rise and role of communist movement and left wing politics in the Indian Nationalism.	1,2,3,4,5	R,U,E
CO-5	Study the rise of communalism and partition of India.	1,2,3,4,5	R,U,AN,E
<b>Course Title- CONTEMPORARY PUNJAB (1947-2011)</b>			
<b>Course Code- MHIS 5418</b>			
Sr. No:	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Study the process of partition of the Punjab and rehabilitation of the refugees after 1947.	1,2,3,4,5	R,U,AN,E
CO-2	Learn about the creation of Punjabi Suba and Territorial Reorganization of the Punjab in 1966.	1,2,3,4	R,U,AN,E
CO-3	Understand about Green Revolution and its impact on the Punjab.	1,2,3,4,5	R,U,AN,E



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<b>CO-4</b>	Analyse Centre State relations and emergence of militancy in the Punjab.	1,2,3,4,5	R,U,AN,E
<b>CO-5</b>	Study about agrarian and other social problems in the Punjab during the period under study.	1,2,3,4,5	R,U,E

### Course Title- INDIAN HISTORIOGRAPHY

Course Code- MHIS 5419

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
<b>CO-1</b>	Learn the ideology and methodology of Imperialist historians such as V.A. Smith, W.H Moreland and Vera Anstey.	1,2,3,4,5	R,U,AN,E
<b>CO-2</b>	Study about the ideology and methodology of Nationalist historians such as R.C. Majumdar, Dadabhai Naoroji and Ravindra Kumar.	1,2,3,4,5	R,U,AN,E
<b>CO-3</b>	Analyze the ideology and methodology of Marxist historians such as D.D. Kosambi, Irfan Habib and R.P. Dutt.	1,2,3,4,5	R,U,AN,E
<b>CO-4</b>	Understand the ideology and methodology of Subaltern historians such as Ranajit Guha, Shahid Amin and Gyanendra Pandey.	1,2,3,4,5	R,U,AN,E
<b>CO-5</b>	Analyze the historical writings of different school of thoughts.	1,3,4,5	R,U,AN,E

### Course Title- HISTORY OF IDEAS

Course Code- MHIS 5420

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
<b>CO-1</b>	Understand the philosophical ideas of ancient schools of Indian philosophy, Jainism and Buddhism.	1,2,3,4	R,U,AN,E
<b>CO-2</b>	Study about medieval philosophical ideas of Bhakti and Sufi Saints.	1,2,3,4	R,U,AN,E
<b>CO-3</b>	Learn the different modern philosophical concepts and ideas such as colonialism and Imperialism.	1,2,3,4,5	R,U,AN,E
<b>CO-4</b>	Analyse the concepts and ideas of Utilitarianism, Liberalism, Nationalism, Individualism, Secularism, Socialism, Communism and Humanism.	1,2,3,4,5	R,U,AN,E





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CO-5	Understand the critical analysis of different ideologies of different times.	1,2,3,4,5	R,U,AN,E
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### MASTERS OF COMMERCE (M.Com.) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

PSO-1	Get the knowledge of business, accounting and auditing practices, financial markets and financial instruments.
PSO-2	Become well versed in national as well as international trends of the economy.
PSO-3	Understand all core areas specifically Accounting, International Accounting, Management, Security Market Operations, Business Environment, Research Methodology , Tax planning, Marketing, Human Resource Management and Services sector.
PSO-4	Develop knowledge of conventional as well as contemporary areas in the discipline of Commerce.
PSO-5	Get a rigorous insight into details of new dimensions of all commerce related activities and transactions.
PSO-6	Apply various concepts and techniques of managerial economics in solving managerial issues and in evaluating business decisions taken by the firms concerning customers, suppliers and competitors.

#### COURSE OUTCOMES (COs)

##### Semester: I

Course Title: Managerial Economics

Course Code: MC-101

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO- 1	Learn about Various concepts related to managerial economics.	2, 6	R, U, An
CO- 2	Gain in depth knowledge about consumer behaviour	2, 6	R, An, E
CO- 3	Understand theory of production and costs	2, 6	U, An
CO- 4	Learn about various market forms, their features and equilibrium	2, 6	U, An
CO- 5	Learn about theory of consumption and problem of inflation, its causes, effects and solutions.	2, 6	U, An, E
CO-6	Get knowledge about National income and its related concepts	2, 6	U, An, E



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### Course Title: Research Methodology

Course Code: MC-102

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquaint themselves with the process and techniques of conducting research and get training to plan and execute the research studies in business, using SPSS statistical software.	1,2	R,U
CO2	Select and define appropriate research problems and parameters.	2,4	R,U,Ap
CO3	Prepare a project proposal to undertake a project.	1,2,4,5	U, Ap, An

### Course Title: Management Principles and Organization Behaviour

Course Code: MC-103

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand about management principles and organizational behaviour.	1,2	R,U
CO2	Analyze and compare different models used to explain individual behaviour related to motivation and rewards.	2,4	R, U, Ap
CO3	Identify the processes used in developing communication and resolving conflicts.	1,2,4,5	Ap, An, E
CO4:	Explain group dynamics and demonstrate skills required for working in groups (team building)	3,4,5	Ap, An, C
CO5:	Discuss the implementation of organizational change.	1,3,5	Ap, E, C



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### Course Title: Business Environment

Course Code: MC-104

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Evaluate business and its environment.	1,2	R,U
CO2	Acquaint themselves with nature, scope and structure of business environment and become familiar with recent trends and developments in Business Environment and policy framework.	2,4	R, Ap, C
CO3	Understand the contemporary issues in business	1,2,4,5	U, Ap, C

### Course Title: Management and Cost Accounting

Course Code: MC-105

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the fundamental concepts of Management and Cost Accounting.	1,2	R,U
CO2	Understand the position, role and responsibilities of Management Accountant in the accounting world.	2,3,4	R, U, Ap
CO3	Apply the techniques of Budgetary Control, Standard Costing and Marginal Costing in the process of managerial decision making.	1,2,4,5	U, E,C
CO4:	Apply the performance evaluation techniques like Balanced Score Card, EVA etc. to improve the operations of the business.	3,4,5	Ap, An, E
CO5	Understand the contemporary issues in Management Accounting such as Value Chain	1,3,5	U, An, C



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	Analysis, Quality Costing, Activity Based Costing and Target Costing.		
CO6	Comprehend the reporting needs at different managerial levels.	3,4,5	R, An, E

**Course Title: SEMINAR****Course Code: MC-106**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Gain practical competencies, presentation skills, attributes required for managerial position.	-	-
CO2	Develop insights on various aspects of Commerce and Business.	-	-

**Course Title: Computer Application in Business –I****Course Code: CS-MC-107**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Learn the technical aspects of MS-Office 2010 and accounting package Tally ERP 9.0.	1,2	R,U
CO2	Develop an understanding towards all the operations of major MS-Office 2010 components like Word, Excel, PowerPoint and use of Tally ERP 9 accounting package.	2,4	R, U, Ap
CO3	Know and use the application of various tools of MS Word 2010, MS Excel 2010, MS PowerPoint 2010 and techniques and commands with operations in handling accounts using Tally software.	1, 3, 4	U, Ap, An





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### Semester: II

**Course Title:** Corporate Financial Accounting and Auditing

**Course Code:** MC-201

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the regulatory framework for preparing accounts as well as auditing in a company.	1,2,4	R, U, An
CO2	Apply the different approaches adopted for the valuation of goodwill and shares of a company	3,4,5	R, U, Ap
CO3	Comprehend the concept and rationale of Financial Audit, Cost Audit, Management Audit, Internal Audit, Propriety Audit, Efficiency Audit and Audit by CAG.	1,2,4,5	Ap, E, C
CO4:	Gain knowledge about the provisions of Companies Act, 2013 relating to appointment, qualification, removal, duties and liabilities of a Statutory Auditor.	3,4,5	Ap, An, C

**Course Title:** Financial Management

**Course Code:** MC-202

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand various issues involved in the financial management of a firm and get familiar them with advanced analytical tools and techniques that are used for making sound financial decisions and policies.	1, 2, 4	R,U,An
CO2	Develop knowledge about Business Finance and the background of Accounting and Management	2,3,4,5	R,U,Ap



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CO3	Get awareness about the challenges and opportunities of Financial Management.	1,2,3,4,5	R, An, E
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### Course Title: Statistical Analysis for Business

Course Code: MC-203

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Enhance decision making ability by learning the concepts of correlation	2,4,5	U, An, E
CO2	Understand decision making under risk by learning the theory of probability	2, 3, 5	Ap, An, E
CO3	Understand various probability distributions	2, 3, 5	U, Ap, An
CO4	Learn various concepts of sampling	1,3	U, Ap, An, C
CO5	Learn tests of significance	1,2,4	U, Ap, An
CO6	Understand the practical application of all these techniques	2, 3, 4, 5	An, E, C

### Course Title: Marketing Management

Course Code: MC-204

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Enhance their understanding about relevant functional areas of marketing management and its applications.	1,2,3	R,U
CO2	Become aware about the fundamentals of marketing to gain ability to take better marketing decisions	2,3,4	R, U, An
CO3	Detect and recognize the nuances and complexities involved in marketing mix, advertising, communications, consumer behavior, public relations, marketing strategy and research.	1,2,4,5	Ap, E,C



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**Course Title: HUMAN RESOURCE MANAGEMENT**

**Course Code: MC-205**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the HR Management and system at various levels in general and in certain specific industries or organizations.	1,2	R,U, An
CO2	Focus on the issues and strategies required to select and develop manpower resources	2,3,4	R, U, Ap
CO3	Develop relevant skills necessary for application in HR related issues.	1,2,4,5	U, Ap, E
CO4:	Integrate the understanding of various HR concepts along with the domain concept in order to take correct business decisions	2,3,4,5	Ap, E, C

**Course Title: VIVA-VOCE**

**Course Code: MC-206**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquire knowledge and face the expert panel and present the knowledge, skills and problems in most efficient way.	-	-

**Course Title: Operations Management**

**Course Code: MC-207**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Get fundamental knowledge of production and operation management, production systems, product decisions and operations strategy.	1,2,3	R, U, An
CO2	Understand the aspects of plant location and layout and scheduling for manufacturing systems.	2,3,4	R, Ap, An



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CO3	Learn the concepts of work study, motion economy, just in time manufacturing system, inventory management, supply chain management and material resource planning	1,3,4,5	Ap, An, C
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**Semester: III****Course Title: Banking and Insurance Services****Course Code: MC-301**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Appraise technical aspects of banking and insurance in India.	1,2	R,U
CO2	Develop an understanding about changes required in banking and insurance sector in the present context.	2,4	R, U, Ap
CO3	Know the application of various tools and techniques in banking and insurance sector	1,2,4,5	U, Ap, E

**Course Title: SEMINAR****Course Code: MC-302**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Gain practical competencies, presentation skills and attributes required for managerial position.	-	-
CO2	Develop insights on various aspects of Commerce and Business.	-	-

**Course Title: Security Analysis and Portfolio Management****Course Code: MC-311**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Develop an understanding of the theoretical and practical background in the field of investments.	2,3	R,U
CO2	Know the Designing and management of bond as well as equity portfolios in the real world.	2,3,4	R, U, Ap
CO3	Appraise valuing equity and debt instruments.	1,2,4,5	U, E, C





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<b>CO4</b>	Get awareness regarding the measurement of portfolio performances	1,2,5	R, Ap, E
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Course Title: Contemporary Accounting

Course Code: MC-312

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
<b>CO1</b>	Apply modes of inquiry to investigate and engage in contemporary financial accounting issues reflective of changes in human resource accounting, corporate social reporting and price level accounting	2,3	R,U,Ap
<b>CO2</b>	Demonstrate advanced understanding in corporate reporting and corporate reporting by web	2,3,4	R,U,Ap
<b>CO3</b>	Apply critical and reflective thinking to contemporary accounting issues regarding value added reporting and accounting standards.	1,2,4,5	An,E,C

Course Title: Strategic Management

Course Code: MC-321

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
<b>CO1</b>	Get awareness regarding concepts and formulation of strategy, major initiatives taken by a company's top management involving resources and performance in external environment.	1,2,3	R, U, Ap
<b>CO2</b>	Acquire knowledge regarding evaluation and control of strategies, types and barriers involved in such evaluation.	2,3,4	R, U, Ap

Course Title: Security Market Operations

Course Code: MC-322

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
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CO1	Understand the Structure of Capital Market in India and the diverse Capital Market Instruments	2,3	R,U,Ap
CO2	Acquire knowledge about New Issue Market, its guidelines and mechanisms and Stock Exchange Regulation in India	2,3,4	R, U, Ap
CO3	Learn about Derivatives market, Debt Market, Euro Issues and FIIs.	1,2,4,5	U, An, E
CO4	Comprehend the knowledge about Legal environment, Depository and Credit Rating.	1,3,5	R,U,Ap,E

Course Title: International Economic Organisations

Course Code: MC-331

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Learn different types of international economic integration by understanding the purpose and significance of international organizations such as IMF, World bank, IFC, IDA, UNCTAD and MIGA.	2,3	R,U,Ap
CO2	Become aware about international labour organization and the role of international agencies in conflict resolutions.	2,3,4	R,U,Ap
CO3	understand the multilateral trade system and the role of GATT and WTO in international business	2,4,5	An,E,C

Course Title: Management of International Business Operations Course Code: MC-332

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the rationale of multinational firms and their orientations.	2,3	R,U,Ap



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<b>CO2</b>	Become aware about the variables concerning strategic alliance.	<b>2,3,4</b>	<b>R, U, Ap</b>
<b>CO3</b>	Comprehend the cultural contexts for international management including Japanese, American, European and Indian Management culture.	<b>1, 4, 5</b>	<b>Ap, E, C</b>
<b>CO4</b>	Become aware of global strategy and organization and the role of strategy in Integration including International Human Resource Strategy.	<b>2,3,4</b>	<b>U,R,E,C</b>

**Course Title: Consumer Behaviour**

**Course Code: MC-351**

<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Become aware about consumer behaviour, its relationship with interdisciplinary fields and its applications such as psychological influences, social influences and decision process.	<b>1,2,3</b>	<b>R,U,Ap</b>
<b>CO2</b>	Become a Product Manager, Brand Manager and Consumer Behaviour Analyst.	<b>2,3,4,5</b>	<b>R,U,Ap</b>

**Course Title: Retail Management**

**Course Code: MC-352**

<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Understand the functions of retail business, various retail formats and retail channels.	<b>2,3</b>	<b>R,U,Ap</b>
<b>CO2</b>	Understand the difference between Retail and Manufacturing Supply Chain.	<b>2,3,4</b>	<b>R,U,Ap</b>
<b>CO3</b>	Understand key drivers of retail supply chain and how to select a retail store location.	<b>1,2,4,5</b>	<b>An,E,C</b>
<b>CO4</b>	Analyze Retail Market and Financial Strategy including product pricing.	<b>2,3,4</b>	<b>U, E, C</b>



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<b>CO5</b>	Integrate various supply chain partners and understand the way to collaborate with them.	<b>3,4</b>	<b>U,R,E</b>
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**Semester: IV****Course Title: INTERNATIONAL ACCOUNTING****Course Code: MC-401**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Explain the accounting issues uniquely confronted by companies involved in international business.	2,4,5	U, Ap, E
CO2	Learn and compare the differences in financial reporting, taxation, rules and regulations issued by international organizations most notably International and other accounting practices that exist across the countries.	1,3,4	R,U, Ap
CO3	Get knowledge of International Financial Reporting Standards (IFRS) issued by International Accounting Standard Board (IASB).	2,4,5	Ap, An, E

**Course Title: E-COMMERCE****Course Code: MC-402**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Grasp the basic concept of E-Commerce and its process and understand the opportunities and challenges offered by E-Commerce.	2,3,4	R, U, Ap
CO2	Handle electronic payment technology and understand the requirements for internet based payments, the categories of E-Commerce and different applications of E commerce.	3,4	Ap, An, C
CO3	Understand and identify security issues of E-Commerce.	1,4,5	U, C, Ap





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CO4	Get knowledge in the fields of E-Commerce, E-Markets, E-Payments Systems etc.	1,2,4	Ap, C, E
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**Course Title: VIVA-VOCE**

**Course Code: MC-403**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquire knowledge and learn how to face the expert panel and present the knowledge, skills and problems in the most efficient way.	-	-

**Course Title: International Financial Management**

**Course Code: MC-411**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Recall and discuss the need of Derivatives market with the changing business scenario. They would be aware of derivative products like forward contracts, futures contract, etc.	2,3,4	R, Ap, C
CO2	Understand various terms related to Foreign Exchange accounts, foreign exchange quotes and major foreign currencies around the world.	4,5	R, Ap, C
CO3	Discuss about various risks in foreign exchange dealings and the management of these risks using various hedging techniques and understand the theories for the determination of foreign exchange rate and the calculation of forward rate and spot rate of exchange.	1,3,5	C, U

**Course Title: FINANCIAL MARKETS AND FINANCIAL SERVICES**

**Course Code: MC-412**



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Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the Indian Financial System.	1,2,3	U, Ap, C
CO2	Understand the role, problems and progress of RBI, NBFC's and various markets in India.	4,5	U, An, E
CO3	Understand the role and functions of CCIL.	2,4	U, An
CO4	Understand various sources of finance available in the market.	3,5	C,An

**Course Title: Corporate Tax Law and Planning****Course Code: MC-413**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Identify the difference between Tax evasion and Tax planning.	4,5	U,R
CO2	Understand the provisions of corporate tax law to be used for tax planning.	3,4,5	E, Ap, An, C
CO3	Explain different types of incomes, their taxability, expenses and their deductibility.	2,3	U, As, E
CO4	Explain the use of deductions of expenses to reduce the taxable income.	1,3,5	R, C

**Course Title: GOODS AND SERVICES TAX (GST)****Course Code: MC-421**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquire conceptual knowledge of Indirect Tax.	2,3,5	R, Ap, An



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CO2	Compute the assessable value of transactions related to goods and services for levy and the determination of tax liability.	2,4,5	Ap, E
CO3	Identify and analyze the procedural aspects under different applicable statutes related to Indirect Taxation.	3,4	U, An
CO4	Describe how the provisions can be used for Tax planning.	1,3,5	R, U, Ap
CO5	Examine the method of tax credit, inflows and outflows, tax exemption and deductions and various returns to be filed.	2,4	E, C

**Course Title: ENTREPRENEURSHIP DEVELOPMENT AND PROJECT MANAGEMENT**  
**Course Code: MC-422**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Identify qualities of entrepreneurship.	3,5	U, Ap
CO2	Use entrepreneurship models for setting and development business.	3	U, An, C
CO3	Understand various schemes supporting entrepreneurship.	2,4,3	U, Ap, An
CO4	Write project proposal and its management.	4,5	C, E
CO5	Understand technical and financial analysis for developing effective business plans.	2,3,4	C, Ap

**Course Title: BUSINESS ETHICS AND ENVIRONMENT MANAGEMENT**  
**Course Code: MC-423**



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Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the model of management in the Indian Context and its various parameters.	2,4,5	U, Ap
CO2	Understand the effect of culture on the management practices in the Indian business management.	1,3,5	U, An, Ap
CO3	Understand the energy management in India , EMS standards and ISO 14000	4,5	An, C
CO4	Understand the legal provisions and procedures for environment auditing and other legal Laws.	1,2	U, Ap

**Course Title:** INTERNATIONAL FINANCIAL MARKETS AND FOREIGN EXCHANGE  
**Course Code:** MC-431

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the history of European Market and its growth.	2,1,3	R, An, C
CO2	Understand the International Financial System.	1,2,5	U, Ap, E
CO3	Recall and discuss the need of Derivatives market with the changing business scenario. They would be aware of derivative products like forward contracts, futures contract, etc.	2,3,4	R, Ap, C
CO4	Get well versed with various terms related to foreign exchange accounts, foreign exchange quotes and major foreign currencies around the world.	4,5	R, Ap, C
CO5	Study about various risks involved in foreign exchange dealings and the management of these risk using various hedging techniques and understand theories for the determination of foreign exchange rate and the methods for the calculation of forward rate and spot rate of exchange	1,3,5	C, U





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**Course Title: INTERNATIONAL FINANCIAL MANAGEMENT**

**Course Code: MC-432**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Discuss the need of Derivatives market with the changing business scenario. They would be aware of derivative products like forward contracts, futures contract etc.	2,3,4	R, Ap, C
CO2	Get versed with various terms related to foreign exchange accounts, foreign exchange quotes and major foreign currencies around the world.	4,5	R, Ap, C
CO3	Discuss about various risks in foreign exchange dealings and management of the risks using various hedging techniques and theories for the determination of foreign exchange rate and the methods for the calculation of forward rate and spot rate.	1,3,5	C, U

**Course Title: INTERNATIONAL MARKETING**

**Course Code: MC-433**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the International Marketing Environment and the role of various international institutions like – World Bank, IMF etc.	4,5	U, An
CO2	Analyse various tariff and non-tariff barriers in International Marketing.	1,2	E, C
CO3	Understand Bilateral Trade agreements of India and world and export promotion policies of Indian Government.	4,5	



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CO4	Learn legal formalities of the exporters and the payments instruments available to exporters and importers.	2,3	R, Ap,An
CO5	Understand International Marketing Mix and product life cycle.	2,3,5	U, An, C

**Course Title: ADVERTISING AND SALES MANAGEMENT****Course Code: MC-451**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Describe different types of advertisements and Identify key players in advertising industry	1,2,4	Ap, C
CO2	Discuss the ethics in advertisement, identify and make decisions regarding the most feasible advertising appeal and media mix.	3,4,5	Ap, C
CO3	Conduct pre-testing, post testing and concurrent testing of ads to determine their effectiveness	1,3,4	E, An
CO4	Describe different types of sales persons and explain the steps involved in sales force management.	2,5	Ap, C
CO5	Identify the dealer oriented promotion techniques, customer oriented promotion techniques and the salesmen oriented promotion techniques.	5	E, An,An

**Course Title: BRAND AND DISTRIBUTION MANAGEMENT****Course Code: MC-452**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the key aspects of branding and retail management.	2,4	U, Ap
CO2	Develop brand development ability.	3,4	U, E



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CO3	Develop constructive attitude towards entrepreneurship	3,4	C, Ap
CO4	Coordinate various marketing environment variables and interpret them for designing marketing strategy for business firms.	1,4	C, An, Ap
CO5	Plan the marketing communication skills relevant to the corporate world.	1,5	C, Ap, E

**Course Title: SERVICES MARKETING**

**Course Code: MC-453**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the concept of Services and intangible products.	1,2	U, An
CO2	Discuss the relevance of the services industry to Industry.	5,4	E, An
CO3	Analyse the role and relevance of quality in services.	2,3	E, Ap
CO4	Visualise future changes in the Services industry.	3,1	C, An, Ap
CO5	Understand the relationship marketing.	1,2,3	U, C



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### M.A. Music (Vocal)

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs):

<b>PSO-1</b>	Students understand the chronological development of various technical terms, schools of vocal.
<b>PSO-2</b>	Promote interest in and motivation for music and music related activity.
<b>PSO-3</b>	Facilitate and promote the overall development of the personality of the students.
<b>PSO-4</b>	Sensitize the youth.

#### COURSE OUTCOMES (COs)

#### Semester-I

Course Title: PAPER-I(T), Theoretical survey of Indian music

Course Code: MAMV-4101

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Get deep knowledge of Hindustani music such as avirbhav, tirobhav etc.	1	R, U, An,
CO-2	Learn the historical life of musicians	2	U, Ap,C
CO-3	Learn to sing in practical and as well as theoretical form.	2	R, U, Ap,E,
CO-4	Get knowledge about two systems of music, Uttari and Dakshani.	1	U, E
CO-5	Understand gram system in music	4	U, An, E

Course Title: PAPER-II (T), History of Indian music





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### Course Code: MAMV-4102

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Get introduced with history of music	1	R,U, Ap,E
CO-2	Learn different moods of Raga and their nature	4	U, Ap, C
CO-3	know about great musicians and their style of singing	2	R,,CU, Ap, C

### Course Title: Paper-III (P) Stage Performance

### Course Code: MAMV-4103

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Increase their ability to sing various raga with complete swar lgav	4	R,U, Ap, C

### Course Title: Paper-IV (P) Critical and comparative study of Raga(viva-voce)

### Course Code: MAMV-4104

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Understand complete learning of ragas ,their structure , mood and nature	4	R, U, Ap,E,An

## Semester-II

### Course Title: Paper-V (T) Critical Study of raga and aesthetic

### Course Code: MAMV-4205

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Understand the aesthetical part of music with season and time.	3	U, Ap, C

### Course Title: Paper-VI (T) An analytical Study of Granthas



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**Course Code: MAMV-4206**

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Get complete knowledge of music from granthas	1	R,U, Ap,An

**Course Title: Paper-VII (P) Stage Performance**

**Course Code: MAMV-4207**

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Increase their ability to sing various raga with complete swar lgav	4	R,U, Ap, C

**Course Title: Paper-VIII (P) Critical and comparative study of Raga (viva-voce)**

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Have complete learning of raga , structure mood and nature	4	R, U, Ap,An

**Semester-III**

**Course Title: Paper-IX (T) scientific study of Indian music**

**Course Code: MAMV-5309**

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Learn the significance aspect of music such as drone correct intonation of raga	1	U, Ap, C



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**Course Title: Paper-X (T) Study of Gurmat Sangeet**

**Course Code: MAMV-5310**

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Learn Gurmat sangeet havng great source of musical terms and history with various raga and different style of singing	1	R,U, C

**Course Title: Paper-XI (P) Stage performance**

**Course Code: MAMV-5311**

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Increase their ability to singing of various raga with complete swar lgav	4	U, Ap, C

**Course Title: Paper-XII (P) Critical and comparative study of Raga (viva-voce)**

**Course Code: MAMV-5312**

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Have complete knowledge of raga and structure mood and nature	4	R, U, An

### Semester-IV

**Course Title: Paper-XIII (T) Music as a commercial Art**

**Course Code: MAMV-5413**

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Get knowledge of various method of work and profession in music	3	U,Ap, An, E,

**Course Title: Paper-XIV (P) Essay on Indian music**



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### Course Code: MAMV-5414

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Knowledge of various music topics such as globalization yoga psychology	1	U, Ap, C

### Course Title: Paper-XV (P) Stage performance

### Course Code: MAMV-5415

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Increase their ability to sing various raga with complete swar lgav	4	R,U, Ap, C

### Course Title: Paper- XVI (P) Critical and comparative study of Raga(viva-voce)

### Course Code: MAMV-5416

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Have complete learning of raga and structure mood and nature	4	R, U, Ap,An

### Course Title: Paper-XVII Research methodology in Indian music

### Course Code: MAMV-5417

S.NO	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO-1	Understand the research methodology with its technical terms, synopsis and footnote etc	1,3	U, Ap,An, E





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### M.Sc. Chemistry

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

##### PROGRAM SPECIFIC OUTCOMES (PSOs)

<b>PSO-1</b>	Students develop the advanced theoretical and practical skills in the field of INORGANIC CHEMISTRY in specialized areas of Group Theory, Ligand Field Theory, Reaction Mechanism, Organometallics, Bioinorganic and Metal Clusters, Photoinorganic chemistry, Oxidative addition and Insertion reactions, Structure and bonding of d-Block elements, Techniques for Structure Elucidation of Inorganic Compounds, Practical Techniques of qualitative and quantitative analysis of inorganic compounds.
<b>PSO-2</b>	Students develop the advanced theoretical and practical skills in the field of ORGANIC CHEMISTRY through some specialized areas like Reaction Mechanism-Substitution reactions, Techniques for Structure Elucidation of Organic Compounds, Reaction Mechanism-Addition, Elimination and Rearrangements, Supramolecular, Reactive Intermediates and Disconnections, Natural Products, Pericyclic & Photochemistry, Asymmetric synthesis, Green Chemistry and Heterocyclic Chemistry, Practical Techniques of qualitative and quantitative analysis of organic.
<b>PSO-3</b>	Students develop the advanced theoretical and practical skills in the field of PHYSICAL CHEMISTRY through specialized areas of Thermodynamics, Quantum Chemistry, Electrochemistry and Chemical Dynamics, Analytical Techniques, Surface and Polymer Chemistry, practical techniques of qualitative and quantitative analysis and use of various electrical and non-electrical Instruments for analysis.
<b>PSO-4</b>	Students develop understanding regarding the use of mathematical tools, biological processes, computer and software's for chemistry purpose.
<b>PSO-5</b>	The students get knowledge of Research Methodology, Advance Analytical Techniques and learn about various tools of Organic and Inorganic synthesis



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### COURSE OUTCOMES (COs)

#### Semester I

**Course Title:** Inorganic Chemistry-I (Ligand Field and Group Theory)

**Course Code:** CHE 411

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Identify the elements of symmetry on chemical compounds on the basis of their structure and correlate these elements of symmetry with point groups to which the molecule belongs	1,4	R, U, Ap, An, E, C
CO2	Apply the mathematical concepts of matrices, determinants on various symmetry operations.	1,4	R, U, Ap, An, E, C
CO3	Apply the mathematical tool of 'Group Theory' on various molecules to derive reducible and irreducible representation. This also leads to the use of group theory derive the type of hybridisations and IR active and Raman active modes of vibrations in the molecules	1,4	R, U, Ap, An, E, C
CO4	Develop understanding of Bonding in coordination compounds in terms of CFT and LFT.	1,4	U, Ap, An, E
CO5	Construct Orgel diagrams, Correlation diagrams and Tanabe-Sugano diagrams along with the study of electronic, magnetic and spectrochemical properties of the coordination compounds.	1,4	U, Ap, An, E



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**Course Title:** Organic Synthesis-I (Reaction Mechanism-Substitution reactions)

**Course Code:** CHE 412

Sr. No.	On completing the course, Student will be able to	PSOs addressed	Cognitive levels
CO1	Understand various methods of generation of carbocations, carbanions, free radicals, carbenes, nitrenes and their applications in organic synthesis.	2,4	R,U,An
CO2	Study the mechanism of different types of free radical substitution reactions and free radical rearrangements.	2,4	R,U,An, Ap
CO3	Learn the mechanism of different aliphatic/aromatic nucleophilic and electrophilic substitution reactions	2,4	R,U,An, Ap
CO4	Assign R/S configuration to the molecules with one or more than one chiral centers, allenes, biphenyls, and spiranes and analyze the effect of structure on reactivity of compound quantitatively.	2,4	U, Ap,E
CO5	Develop interest in writing and finding mechanisms of substitution and rearrangement reactions.	2,4	An, Ap, C



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**Course Title:** Physical Chemistry-I: Thermodynamics

**Course Code:** CHE 413

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Learn about the classical thermodynamics and revise the basic concepts	3, 4	U, R, An
CO2	Learn to conceptualise the statistical mechanics derivations	3, 4	U, R, An
CO3	Understand the link between classical mechanics and quantum mechanics by studying statistical mechanics	3, 4	U, R, An
CO4	Derive the thermodynamic parameters from quantum chemistry	3, 4	U, R, An
CO5	Study the irreversible thermodynamics and correlating real life problems	3, 4	U, R, An





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**Course Title:** Spectroscopy A: Techniques for Structure Elucidation of Organic Compounds

**Course Code:** CHE 414

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Learn the basic principles to interpret u v-visible, vibrational, 1-D and 2-D NMR and Mass spectroscopy for the structure identification of organic compounds.	2,4,5	R, U
CO2	Gain an understanding of molecular-level critical thinking skills	2,4,5	R, U,C
CO3	Analyze and interpret u v-visible, vibrational, 1-D and 2-D NMR and Mass spectral data of organic compounds	2,4,5	An, Ap
CO4	Analyze the mass of organic molecule and fragments present in the molecule from mass spectral studies	2,4,5	An
CO5	Evaluate various structural possibilities and arrive at the most logical structure of organic compounds by analysis and interpretation of u v-visible, vibrational, 1-D/ 2-D NMR and Mass spectral data.	2,4,5	U,AN,AP, E



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**Course Title:** Inorganic Chemistry Lab-I (Quantitative Analysis)

**Course Code:** CHE 415

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Prepare the exact solution and Standardization for quantitative analysis of the solutions.	1,5	U, Ap
CO2	Determine different ions like Ca <sup>2+</sup> , Fe <sup>2+</sup> , Oxalate, nitrate, available chlorine in bleaching powder using oxidation reduction titrations	1,5	U, Ap, An, E
CO3	Perform Precipitation Titrations using Volhard's method and Mohr's methods	1,5	U, Ap, An, E
CO4	Determine different ions (Cu <sup>2+</sup> , Ni <sup>2+</sup> and Ca <sup>2+</sup> ) using Complexometric Titrations	1,5	U, Ap, An, E
CO5	Learn the estimation of ions using gravimetric techniques.	1,5	U, Ap, An, E



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**Course Title:** Organic Chemistry Lab

**Course Code:** CHE 416

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Predict the results and identify errors associated with chemical analysis based on the analytical technique and nature of the sample.	2,5	An
CO2	Justify the steps to prepare and standardize different solutions.	2,5	U, An, C
CO3	Get Hands on expertise to synthesize organic compounds, able to check purity of organic compounds & the progress of the reaction by performing TLC Techniques individually	2,5	R,U, Ap, C
CO4	Characterize the structure of the organic compound by interpreting IR, UV, <sup>1</sup> H NMR and Mass spectral data.	2,5	An, E
CO5	Gain hands-on practice to handle laboratory equipments.	2,5	Ap



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### Semester II

**Course Title:** Inorganic Chemistry-II: (Reaction Mechanism, Organometallics and Catalysis)

**Course Code:** CHE 421

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Get introduced to organometallic chemistry with focus on the transition metals and catalysis	1,5	R, U, C
CO2	Study the wide variety of organometallic compounds and the choice of hapticity in different conditions.	1,5	U, Ap, C
CO3	Understand the role of coordination number, coordination geometry and oxidation state of metal in catalytic cycles.	1,5	R, U, An
CO4	Study the structure and bonding issues in organometallic compounds from the point of view of the 18-electron rule.	1,5	U, An, Ap
CO5	Learn important emerging compounds especially multidecker sandwich compounds	1,5	U, R, C





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**Course Title:** Organic Synthesis-II (Reaction Mechanism-Addition, Elimination and Rearrangements)

**Course Code:** CHE 422

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Learn about the various chemical reagents available for addition to carbon-carbon/carbon-heteroatom multiple bonds.	2,4	R,U,Ap
CO2	Explain the mechanism of different types of elimination and rearrangement reactions.	2,4	R,U,Ap
CO3	Get insight into the utilization of Pd, Ni, Titanium and silicon in coupling of two molecular entities and their vast applications in organic synthesis.	2,4	U,Ap
CO4	Study important oxidizing agents and oxidation reactions used in organic synthesis.	2,4	U,Ap,C
CO5	Acquire knowledge of reducing agents and their applications in organic synthesis.	2,4	U,Ap,C



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**Course Title:** Physical Chemistry-II: Quantum Chemistry

**Course Code:** CHE 423

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Study the phenomenon of Black body radiation, photoelectric effect, Compton effect, De-Broglie hypothesis, the Heisenberg's uncertainty and classical wave equation and its solutions	3,4	R, U , Ap, An, E, C
CO2	Study the concepts of operators, their types, uses and Quantum Mechanical Model of atom.	3,4	R, U , Ap, An, E
CO3	Study the application of Quantum Mechanics to deduce the quantization of Translational, Rotational, Vibrational and Electronic energies.	3,4	R, U , Ap, An, E
CO4	Study the application of Quantum Mechanical model on Single electron system like H-atom and solution for multi-electron system through Approximation methods	3,4	U , Ap, An, E
CO5	Understand orbital and spin angular momentum and related Ladder Operators along with HMO theory and its application on various conjugated pi-electron systems	3,4	U , Ap, An, E, C



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**Course Title:** Spectroscopy B: Techniques for Structure Elucidation of Inorganic Compounds

**Course Code:** CHE 424

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Get basic idea and application of IR spectroscopy and Raman spectroscopy	1,4,5	R, U, Ap
CO2	Learn applications of Rotational spectroscopy in inorganic molecules.	1,4,5	R, U, Ap
CO3	Get introduced about NQR spectroscopy.	1,4,5	R, U, Ap
CO4	Understand the applications of photoelectron spectroscopy	1,4,5	R, U, Ap
CO5	Learn the principle of EPR spectroscopy and Mossbauer spectroscopy and structure elucidation of inorganic compounds	1,4,5	U, Ap



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**Course Title:** Organic Synthesis-III (Supramolecular, Reactive Intermediates and Disconnections)

**Course Code:** CHE 425

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Learn introductory concepts of supramolecular chemistry	2	R, U, An
CO2	Learn the binding of various metals with synthetic and natural cationic hosts	2	R, U, An
CO3	Understand the logics involved in anion binding by different hosts including solid state clathrates and fullerenes	2	R, U, An
CO4	Develop the concept involved in Crystal Engineering	2	R, U, Ap
CO5	Learn the construction of molecular devices such as molecular wires, rectifiers and switches	2	R, U, Ap
CO6	Acquire an in depth knowledge of various reactive intermediates viz. Carbocations, carbanions, free radicals, carbenes and nitrenes	2	U, An
CO7	Understand retrosynthetic methodology to go from a target molecule to simple starting compound	2	U, Ap, E
CO8	Learn the concept of disconnection, functional group interconversions, synthons and their corresponding synthetic equivalents	2	U, Ap, E





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**Course Title:** Physical Chemistry Lab-I

**Course Code:** CHE 426

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Learn the use of Electro-methods like conductivity meter pH-meter for quantitative analysis.	3,4,5	R, U , Ap, An
CO2	Understand the use of Electro-methods like pH-meter for quantitative analysis.	3,4,5	R, U , Ap, An
CO3	Understand the use of Optical-methods like Abbe's refractometer for quantitative analysis	3,4,5	R, U , Ap, An
CO4	Understand the use of Optical-methods like Polarimeter for quantitative analysis	3,4,5	R, U , Ap, An
CO5	Learn the use of non-electrical methods like surface tension, distribution law and study of equilibrium	3,4,5	R, U , Ap, An

**Course Title:** Inorganic Chemistry Lab- II

**Course Code:** CHE 427

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Learn how to synthesize inorganic complexes	1,5	R, U,
CO2	Synthesize the geometrical isomers of the complexes	1,5	Ap, An, C
CO3	Analyze structure of inorganic complexes from spectral data	1,5	R, U, An, Ap
CO4	Have hands-on experience/ practical knowledge to perform experiments	1,5	U, An, Ap
CO5	Get practical knowledge about UV and FTIR	1,5	U, An, Ap



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### Semester-III

**Course Title:** Inorganic Chemistry-III: (Bioinorganic and Metal Clusters)

**Course Code:** CHE 531

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Analyse the relation between oxidation state of metals and their biological behaviour.	1	U, An, R
CO2	Understand the role of metals and chemicals in biological systems.	1	U, R, An
CO3	Learn the use of porphyrins of different metal ions in biological systems	1	R, U, Ap
CO4	Make a correlation between enzymatic functions and metals.	1	U, Ap, C
CO5	Understand the structural features of biological systems involving metal ions and their activities and mechanisms	1	U, AP



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**Course Title:** Organic Synthesis-IV (Natural Products)

**Course Code:** CHE 532

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Draw structures of monosaccharides, disaccharides and polysaccharides and learn their functions.	2	R,U, C
CO2	Draw the structures of amino acids and proteins.	2	U, C
CO3	Learn general and advanced methods of structural elucidation and chemistry of important natural products such as steroids, alkaloids, Porphyrins, Nucleic acids, Peptides, antibiotics and prostaglandins.	2	U, An, Ap,C
CO4	Study biosynthesis and chemistry of terpenoids	2	U, Ap,
CO5	Become familiar with reagents used in organic synthesis and structure elucidation.	2	U, An, Ap,C



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**Course Title:** Physical Chemistry-III (Electrochemistry and Chemical Dynamics)

**Course Code:** CHE 533

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Learn various laws of electro chemistry and thermodynamic derivations of various electrochemical models	3,5	R,U,Ap
CO2	Study the semiconductor interface theory, semiconductor solution interface and the process of corrosion its monitoring and prevention	3,5	R,U,Ap,C
CO3	Understand the various theories of reaction rates like collision theory, activated complex theory, Lindemann-Hinshelwood theory in detail.	3,5	R,U,Ap,E
CO4	Learn the mechanisms of kinetics of various chain reactions ( thermal and photochemical) and enzyme catalysis.	3,5	R,Ap,C
CO5	Study the various methods Study the kinetics of fast reactions.	3,5	U,Ap,An
CO6	Learn about the polarographic and voltametric methods of analysis and the various applications of these methods of analysis.	3,5	U,Ap,An





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**Course Title:** Organic Synthesis-V (Pericyclic & Photochemistry)

**Course Code:** CHE 534

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Learn the fundamentals of pericyclic reactions	2	R, U
CO2	Understand the various types pericyclic reactions viz. Cycloaddition reactions, Electrocyclic reactions and Sigmatropic reactions	2	R, U, An
CO3	Understand the logic of working out the reaction pathway of pericyclic reactions using Woodward-Hoffmann rules, Frontier Molecular Method(FMO) and Orbital correlation method(OCD) etc.	2	R, U, An, E
CO4	Acquire knowledge to control the kinetics of pericyclic reactions.	2	R, U
CO5	Develop an insight into various types of pericyclic reactions like cope, claisen and ene and learn flutinality due to these reactions.	2	R, U, An, E
CO6	Learn the fate of an excited state molecule, various ways of excitation energy transfers and actinometry	2	U
CO7	Determine the rate constants and develop stern volmer plots	2	U, Ap
CO8	Learn photochemical reactions of various functional groups viz. Alkenes, carbonyl compounds and aromatic compounds.	2	U, An, Ap
CO9	Develop an insight into Photo fries, barton, singlet molecular oxygen reactions	2	U, An, Ap
CO10	Understand the photochemical formation of smog, photodegradation of polymers and photochemistry of vision	2	U, An



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**Course Title:** Physical Chemistry-IV (Analytical Techniques)

**Course Code:** CHE 535

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Learn about structure and working of different reference electrodes and working electrodes	3,5	R, Ap, An
CO2	Develop study skills of potentiometric method of analysis of various analytes	3,5	U, Ap, An
CO3	Learn about various thermal methods of analysis like DTA, TG, DSC and their applications	3,5	An, E
CO4	Understand solids and point defects in solids	3,5	U
CO5	Understand coulometric methods of analysis and current-voltage relation and coulometric titrations.	3,5	U, Ap

**Course Title:** Organic Chemistry Lab- II

**Course Code:** CHE 536

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Study the synthesis of new products via different named reactions	2,5	R, U, Ap
CO2	Do confirmation of data using spectroscopic techniques	2,5	Ap
CO3	Justify and compare the results with literature	2,5	U, Ap
CO4	Write and represent the outcomes of scientific finding in graphical and electronic formats.	2,5	U, Ap
CO5	Generate technical skills in the handling of instruments and calculation methods	2,5	U, Ap



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**Course Title:** Physical Chemistry Lab-II

**Course Code:** CHE 537

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Understand the concept of partial molar volume and Measure it through a simple experimental technique.	3,4,5	R, U , Ap, An
CO2	Learn the use of Electrical methods to study various laws of electrochemistry like Oswald dilution law, Kohlrausch's law and Debye-Huckel -Onsager equation	3,4,5	R, U , Ap, An
CO3	Learn the use of physical methods like surface tension and molar refraction to correlate the physical properties of compounds with molecular structure	3,4,5	R, U , Ap, An
CO4	Learn the use of spectroscopic techniques for the study of complex formation and chemical kinetics.	3,4,5	R, U , Ap, An
CO5	Understand the use of other electrical techniques like potentiometry, pH metry, turbiditymetry for measurement of physical properties and complex formation studies.	3,4,5	R, U , Ap, An



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### Semester - IV

**Course Title:** Inorganic Chemistry-IV: (Advanced Inorganic Chemistry)

**Course Code:** CHE 541

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Get an overview on different oxidative- reductive reactions and their applications	1	R, U, An
CO2	Understand the structure, bonding and reactivity of - Coordination of C-C multiple bonds	1	R, U, E
CO3	Characterize theoretically the type of bond of hydrogen with the transition metal.	1	U, Ap, An, E
CO4	Learn the structure and bonding of different inorganic complexes.	1	U, Ap, C
CO5	Learn to make difference of terminal and bridging hydrogen bonds	1	U, Ap, An, C





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**Course Title:** Organic Synthesis-VI (Asymmetric synthesis, Green Chemistry and Heterocyclic Chemistry)

**Course Code:** CHE 542

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Study the effective and modern synthetic techniques aimed at the production of enantiomerically pure organic molecules. Know how to apply the Felkin-Anh model to predict which face nucleophilic attack will occur on an enantiotopic carbonyl group.	2	R,U,Ap
CO2	Explain and exemplify different enzyme catalyzed processes for stereoselective chemical production and define the mechanisms of enzyme activity regulation	2	U,Ap
CO3	Know the importance and applications of green chemistry techniques	2	U,An,AP
CO4	Learn nomenclature, structure, properties, syntheses, and reactions of the simple 5 and 6-membered ring heterocycles, the benzene ring fused ring heterocycles, the pyridine group, and the quinoline and isoquinoline groups.	2	C, U



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**Course Title:** Physical Chemistry-V (Surface and Polymer Chemistry)

**Course Code:** CHE 543

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Understand about the surface tension, adsorption and various theories of adsorption	3,5	U,R,Ap
CO2	Learn about the surface films, catalytic activity at surfaces and surfactants.	3,5	R, Ap,An
CO3	Understand the process of micellization, solubilization and the various factors affecting the process of micellization, solubilization.	3,5	U,Ap,E
CO4	Study about the polymers and polymer reactions, various types of polymerization. Kinetics and thermodynamics of polymerization.	3,5	R,U,An,Ap
CO5	Learn the structure and properties of polymers.	3,5	U,Ap,C



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### Course Title: Project Work

Sr. No.	On completing the course, students will be able to	PSOs addressed	Cognitive levels
CO1	Study synthesized Organic, Inorganic compounds and physical analysis	1.2.3.4.5	U, An, Ap
CO2	Interpret the spectral and analytical data of compounds	1.2.3.4.5	U, An, Ap
CO3	Develop the presentation skills through reviews	1.2.3.4.5	U, An, C
CO4	Analyse critically the new findings of their research	1.2.3.4.5	U, An, Ap
CO5	Understand the compilation of the procedure of manuscript and dissertation for their new research findings	1.2.3.4.5	C, Ap



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### M.SC. CHEMISTRY (UNDER THE HONOURS SCHEME) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs):

<b>PSO-1</b>	Students will develop the advanced theoretical and practical skills in the field of INORGANIC CHEMISTRY in specialized areas of Group Theory, Ligand Field Theory, Metal-Carbon bonding and its applications, Photoinorganic chemistry, Oxidative addition and Insertion reactions, Structure and bonding of d-Block elements, Techniques for Structure Elucidation of Inorganic Compounds, Practical Techniques of qualitative and quantitative analysis of inorganic compounds.
<b>PSO-2</b>	Students will develop the advanced theoretical and practical skills in the field of ORGANIC CHEMISTRY through some specialized areas like Modern Methods of Organic Synthesis, Techniques for Structure Elucidation of Organic Compounds, Reaction Mechanism-Addition, Elimination and Rearrangements, Supramolecular, Reactive Intermediates and Disconnections, Natural Products, Pericyclic & Photochemistry, Asymmetric synthesis, Green Chemistry and Heterocyclic Chemistry, Practical Techniques of qualitative and quantitative analysis of organic.
<b>PSO-3</b>	Students will develop the advanced theoretical and practical skills in the field of PHYSICAL CHEMISTRY through specialized areas of Thermodynamics, Quantum Chemistry, Biophysical Chemistry, Analytical Techniques, Surface and Polymer Chemistry Practical Techniques of qualitative and quantitative analysis and use of various electrical and non-electrical Instruments for analysis.
<b>PSO-4</b>	Student will develop the understanding regarding the use of mathematical tools, biological processes, use of computer and softwares for chemistry purpose.
<b>PSO-5</b>	The students to get knowledge of Research Methodology, Advance Analytical Techniques and learn about various tools of Organic and Inorganic synthesis
<b>PSO-6.</b>	To gain understanding about computing techniques, technologies and methods used in managing and implementing information technology systems.





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### COURSE OUTCOMES (COs)

#### Semester-I

**Course Title:** Inorganic Chemistry-I: (Ligand Field and Group Theory)

**Course Code:** CHH 411

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Identification of elements of symmetry on chemical compounds on the basis of their structure and correlate these elements of symmetry with point groups to which the molecule belongs	1, 4	R, U, Ap, An, E, C
CO2	Apply the mathematical concepts of matrices and determinants on various symmetry operations.	1, 4	R, U, Ap, An, E, C
CO3	Apply the mathematical tool of 'Group Theory' on various molecules to derive reducible and irreducible representation. This also leads to the use of group theory derive the type of hybridisations and IR active and Raman active modes of vibrations in the molecules	1, 4	R, U, Ap, An, E, C
CO4	Develop the understanding of Bonding in coordination compounds in terms of CFT and LFT.	1, 4	R, U, Ap, An, E
CO5	Construction of Orgel diagrams, Correlation diagrams and Tanabe-Sugano diagrams along with the study of electronic, magnetic and spectrochemical properties of the coordination compounds.	1, 4	R, U, Ap, An, E



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**Course Title:** Organic Synthesis-I Modern Methods of Organic Synthesis

**Course Code:** CHH 412

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Learn about carbon-carbon bond formation in both main group chemistry and transition metal chemistry	2,4	R, U, Ap
CO2	Develop the understanding of radical and carbene chemistry	2,4	U, Ap
CO3	Learn the concept of functionalization of alkenes	2,4	R, U, Ap
CO4	Learn about oxidation and reduction reactions	2,4	U, Ap
CO5	Study the formation of carbon-carbon double bond	2,4	U



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**Course Title:** Physical Chemistry-I: Thermodynamics

**Course Code:** CHH 413

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Learn about the classical thermodynamics and revise the basic concepts	3,4	R, U, Ap, An
CO2	Learn to conceptualise the statistical mechanics derivations	3,4	R, U, Ap, An
CO3	Understand the link between classical mechanics and quantum mechanics by studying statistical mechanics	3,4	R, U, Ap, An
CO4	Derive the thermodynamic parameters from quantum chemistry	3,4	U, Ap, An
CO5	Study the irreversible thermodynamics and correlating real life problems	3,4	U, Ap, An



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**Course Title:** Spectroscopy A: Techniques for Structure Elucidation of Organic Compounds

**Course Code:** CHH 414

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Learn the basic principles of interpret u v-visible, vibrational, 1-D and 2-D NMR and Mass spectroscopy for the structure identification of organic compounds	2,4,5	R, U
CO2	Gain an understanding of molecular-level critical thinking skills	2,4,5	R, U,C
CO3	Analyze and interpret u v-visible, vibrational, 1-D and 2-D NMR and Mass spectral data of organic compounds	2,4,5	An, Ap
CO4	Analyze the mass of organic molecule and fragments present in the molecule from mass spectral studies	2,4,5	An
CO5	Evaluate various structural possibilities and arrive at the most logical structure of organic compounds by analysis and interpretation of u v-visible, vibrational, 1-D/ 2-D NMR and Mass spectral data.	2,4,5	U,An,Ap, E





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**Course Title:** Inorganic Chemistry Lab-I (Quantitative Analysis)

**Course Code:** CHH 415

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Prepare the exact solution and Standardization for quantitative analysis of the solutions.	1,5	U, Ap
CO2	Study the determination of different ions like Ca <sup>2+</sup> , Fe <sup>2+</sup> , Oxalate, nitrate, available chlorine in bleaching powder using oxidation reduction titrations	1,5	U, Ap, An, E
CO3	Perform Precipitation Titrations using Volhard's method and Mohr's methods	1,5	U, Ap, An, E
CO4	Study the determination of different ions (Cu <sup>2+</sup> , Ni <sup>2+</sup> and Ca <sup>2+</sup> ) using Complexometric Titrations	1,5	U, Ap, An, E
CO5	Study the estimation of ions using gravimetric techniques.	1,5	U, Ap, An, E

**Course Title:** Organic Chemistry Lab-I (*Quantitative analysis and Multistep Synthesis*)

**Course Code:** CHH 416

S. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Predict the results and identify errors associated with a chemical analysis based on the analytical technique and nature of the sample.	2,5	U, Ap
CO2	Justify the steps to prepare and standardize different solutions.	2,5	U, Ap, An, E
CO3	Get hands on expertise to synthesize organic compounds, develop ability to check purity of organic compounds & the progress of the reaction by performing TLC techniques individually	2,5	U, Ap, An, E



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CO4	Characterize the structure of the organic compound by interpreting IR, UV, 1H NMR and Mass spectral data.	2,5	U, Ap, An, E
CO5	Gain hands-on practice of handling laboratory equipment and use of softwares.	2,5	U, Ap

**Course Title: Computer for Chemists****Course Code: CS-CH411/CS-MHCH411**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO-1	Figure out the basics of C programming.	6	An
CO-2	Secure information and abilities in programming. In addition, this programming will assist them with making programs and applications in C.	6	U
CO-3	Learn the essential programming builds so that they can undoubtedly switch over to any another language in future.	6	U
CO-4	Develop a basic understanding of computers, the concept of algorithms and algorithmic thinking.	6	An,C
	Develop the ability to analyse a problem and develop an algorithm to solve it.	6	Ap,C



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### Semester - II

**Course Title:** Inorganic Chemistry-II: (*Metal-Carbon bonding and its applications*)

**Course Code:** CHH 421

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Understand the concepts of organometallic chemistry with focus on the transition metals and catalysis	1	R, U, C
CO2	Study the wide variety of organometallic compounds and the choice of hapticity in different conditions.	1	U, Ap, C
CO3	Understand the role of coordination number, coordination geometry and oxidation state of metal in catalytic cycles.	1	U, An
CO4	Understand the structure and bonding issues in organometallic compounds from the point of view of the 18-electron rule.	1	U, An, Ap
CO5	Learn to go through some important emerging compounds especially multi decker sandwich compounds	1	U, C



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**Course Title:** Organic Synthesis-II (Reaction Mechanism-Addition, Elimination and Rearrangements)

**Course Code:** CHH 422

Sr. No.	On completing the course, Student will	PSOs addressed	Cognitive levels
CO1	Understand various methods of generation of carbocations, carbanions, free radicals, carbenes, nitrenes and their applications in organic synthesis.	2,4	R,U,An
CO2	Study the mechanism of different types of free radical substitution reactions and free radical rearrangements.	2,4	R,U,An, Ap
CO3	Learn the mechanism of different aliphatic/aromatic nucleophilic and electrophilic substitution reactions	2,4	U,An, Ap
CO4	Assign R/S configuration to the molecules with one or more than one chiral centers, allenes, biphenyls, and spiranes and analyze the effect of structure on reactivity of compound quantitatively.	2,4	U, Ap,E
CO5	Develop interest in writing and finding mechanisms of substitution and rearrangement reactions.	2,4	An, Ap, C





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**Course Title:** Physical Chemistry-II: Quantum Chemistry

**Course Code:** CHH 423

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Study the phenomenon of Black body radiation, photoelectric effect, Compton effect, De- Broglie hypothesis, the Heisenberg's uncertainty and classical wave equation and its solutions	3,4	R, U , Ap, An, E, C
CO2	Understand the concepts of operators, their types, uses and Quantum Mechanical Model of atom.	3,4	R, U , Ap, An, E
CO3	Study the application of Quantum Mechanics to deduce the quantization of Translational, Rotational, Vibrational and Electronic energies.	3,4	R, U , Ap, An, E
CO4	Study the application of Quantum Mechanical model on Single electron system like H-atom and solution for multi-electron system through Approximation methods	3,4	R, U , Ap, An, E
CO5	Understand the orbital and spin angular momentum and related Ladder Operators along with HMO theory and its application on various conjugated pi-electron systems	3,4	R, U , Ap, An, E, C



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**Course Title:** Spectroscopy B: Techniques for Structure Elucidation of Inorganic Compounds

**Course Code:** CHH 424

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Get basic idea and application of IR spectroscopy and Raman spectroscopy	1,4,5	R, U, Ap
CO2	Learn applications of Rotational spectroscopy in inorganic molecules.	1,4,5	R, U, Ap
CO3	Get introduced about NQR spectroscopy.	1,4,5	U, Ap
CO4	Study the applications of photoelectron spectroscopy	1,4,5	U, Ap
CO5	learn principle of EPR spectroscopy and Mossbauer spectroscopy and structure elucidation of inorganic compounds	1,4,5	U, Ap



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# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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**Course Title:** Organic Synthesis-III (Supramolecular, Reactive Intermediates and Disconnections)

**Course Code:** CHH 425

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Learn introductory concepts of supramolecular chemistry	2	R, U, An
CO2	Learn the binding of various metals with synthetic and natural cationic hosts	2	R, U, An
CO3	Understand the logics involved in anion binding by different hosts including solid state clathrates and fullerenes	2	R, U, An
CO4	Develop the concept involved in Crystal Engineering	2	R, U, Ap
CO5	Learn the construction of molecular devices such as molecular wires, rectifiers and switches	2	U, Ap
CO6	Acquire an in depth knowledge of various reactive intermediates viz. Carbocations, carbanions, free radicals, carbenes and nitrenes	2	U, An
CO7	Understand retrosynthetic methodology of going from a target molecule to simple starting compound	2	U, Ap, E
CO8	Learn the concept of disconnection, functional group interconversions, synthons and their corresponding synthetic equivalents	2	U, Ap, E



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**Course Title:** Physical Chemistry Lab-I**Course Code:** CHH 426

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Learn to calibrate the conductivity meter, operate and obtain conductance values from various solutions	3,4,5	R, U, Ap, An
CO2	Learn to calculate pH of titration reactions	3,4,5	R, U, Ap, An
CO3	Determine the relative cleaning action of detergents using surface tension techniques	3,4,5	U, Ap, An
CO4	Quantitatively measure refractive index of solutions by Abbes Refractometer	3,4,5	U, Ap, An
CO5	Study trouble shoot related to instruments or solution related problems.	3,4,5	U, Ap, An

**Course Title:** Inorganic Chemistry Lab- II**Course Code:** CHH 427

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Learn how to synthesize inorganic complexes	1,5	R, U,
CO2	Synthesize the geometrical isomers of the complexes	1,5	Ap, An, C
CO3	Analyze structure of inorganic complexes from spectral data	1,5	R, U, An, Ap
CO4	Have hands-on experience /practical knowledge to perform experiments	1,5	U, An, Ap
CO5	Get practical knowledge about UV and FTIR	1,5	U, An, Ap





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### Semester - III

**Course Title:** Inorganic Chemistry-III: (Bioinorganic and Metal Clusters)

**Course Code:** CHH 531

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Analyse the relation between oxidation state of metals and their biological behaviour.	1	U, An, R
CO2	Understand the role of metals and chemicals in biological systems.	1	U, R, An
CO3	Learn the use of porphyrins of different metal ions in biological systems	1	R, U, Ap
CO4	Make correlation between enzymatic functions and metals.	1	U, Ap, C
CO5	Understand the structural features of biological systems involving metal ions and their activities and mechanisms	1	U, AP



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**Course Title:** Organic Synthesis-IV (Natural Products)

**Course Code:** CHH 532

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Draw structures of monosaccharides, disaccharides and polysaccharides and learn their functions.	2	R,U, C
CO2	Draw the structures of amino acids and proteins.	2	R,U, C
CO3	Learn general as well as advanced methods of structural elucidation and chemistry of important natural products such as steroids, alkaloids, Porphyrins, Nucleic acids, Peptides, antibiotics and prostaglandins.	2	U, An, Ap,C
CO4	Study biosynthesis and chemistry of terpenoids	2	U, Ap,
CO5	Become familiar with reagents used in organic synthesis and structure elucidation.	2	U, An, Ap,C



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**Course Title:** Physical Chemistry III (Biophysical Chemistry)

**Course Code:** CHH 533

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Understand the chemistry of cell and small biological molecules	3	U, R, An
CO2	Study the detailed interpretation of structures and functions of proteins, nucleic acids and enzymes, biopolymer interactions and thermodynamics of biopolymer solutions	3	U, An
CO3	Study the working of cell membrane and functions in terms of transport, bioenergetics and statistical mechanics of biopolymers.	3	U, R, An
CO4	Study various physical techniques to obtain molecular weight of biomolecules	3	U, An
CO5	Understand light scattering, osmosis, diffusion, X-ray diffraction and CD spectroscopy.	3	U, An



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**Course Title:** Organic Synthesis-V (Pericyclic & Photochemistry)

**Course Code:** CHH 534

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Learn the fundamentals of pericyclic reactions	2	R, U
CO2	Understand various types pericyclic reactions viz. Cycloaddition reactions, Electrocyclic reactions and Sigmatropic reactions	2	R, U, An
CO3	Understand the logic of working out the reaction pathway of pericyclic reactions using Woodward-Hoffmann rules, Frontier Molecular Method(FMO) and Orbital correlation method(OCD) etc.	2	R, U, An, E
CO4	Acquire knowledge to control the kinetics of pericyclic reactions.	2	U
CO5	Develop an insight into various types of pericyclic reactions like cope, claisen and ene. Learning flutinality due to these reactions.	2	R, U, An, E
CO6	Learn the fate of an excited state molecule, various ways of excitation energy transfers and actinometry	2	R, U
CO7	Determine the rate constants and develop stern volmer plots	2	U, Ap
CO8	Learn photochemical reactions of various functional groups viz. Alkenes, carbonyl compounds and aromatic compounds.	2	RU, An, Ap
CO9	Develop an insight into Photo fries, barton, singlet molecular oxygen reactions	2	U, An, Ap
CO10	Understand the photochemical formation of smog, photodegradation of polymers and photochemistry of vision	2	U, An



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**Course Title:** Physical Chemistry-IV (Analytical Techniques)

**Course Code:** CHH 535

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Learn about structure and working of different reference electrodes and working electrodes	3,5	R, Ap, An
CO2	Develop complete study skills of potentiometric method of analysis of various analytes	3,5	U, Ap, An
CO3	Learn about various thermal methods of analysis like DTA, TG, DSC and their applications	3,5	An, E
CO4	Understand solids and point defects in solids	3,5	U
CO5	Understand coulometric methods of analysis and current-voltage relation and coulometric titrations.	3,5	U, ap





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**Course Title:** Project Work

**Course Code:** CHH 536

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Synthesize Organic compounds	1,2,3,4,5	U, An, Ap
CO2	Interpret the spectral data of compounds	1,2,3,4,5	U, An, Ap
CO3	Develop the presentation skills through reviews	1,2,3,4,5	U, An, C
CO4	Analyse critically the new findings of their research	1,2,3,4,5	U, An, Ap
CO5	write manuscript and dissertation for compiling their research findings	1,2,3,4,5	C, Ap



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### Semester-IV

**Course Title:** Inorganic Chemistry-IV: (Advanced Inorganic Chemistry)

**Course Code:** CHH 541

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Get an overview on different oxidative-reductive reactions and their applications	1	R, U, An
CO2	Understand the structure, bonding and reactivity of -Coordination of C-C multiple bonds	1	R, U, E
CO3	Characterize theoretically the type of bond of hydrogen with the transition metal.	1	U, Ap, An, E
CO4	Learn the structure and bonding of different inorganic complexes.	1	U, Ap, C
CO5	Learn to make difference of terminal and bridging hydrogen bonds	1	U, Ap, An, C



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**Course Title:** Organic Synthesis-VI (Asymmetric synthesis, Green Chemistry and Heterocyclic Chemistry)

**Course Code:** CHH 542

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Study effective and modern synthetic techniques aimed at the production of enantiomerically pure organic molecules, know how to apply the Felkin-Anh model to predict which face nucleophilic attack occur on an enantiotopic carbonyl group.	2	R,U,Ap
CO2	Explain and exemplify different enzyme catalyzed processes for stereoselective chemical production and define the mechanisms of enzyme activity regulation	2	U,Ap
CO3	Know the importance and applications of green chemistry techniques	2	U,An,Ap
CO4	Learn nomenclature, structure, properties, syntheses, and reactions of the simple 5 and 6-membered ring heterocycles, the benzene ring fused ring heterocycles, the pyridine group, and the quinoline and isoquinoline groups.	2	C, U
CO5	Become familiar with particular properties, reactions, and applications of the most important as well as less common heterocycles.	2	Ap, U



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**Course Title:** Physical Chemistry-V (Surface and Polymer Chemistry)

**Course Code:** CHH 543

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Understand about the surface tension, adsorption and various theories of adsorption	3,5	U,R,Ap
CO2	Learn about the surface films, catalytic activity at surfaces and surfactants.	3,5	R, Ap,An
CO3	Understand the process of micellization, solubilization and various factors affecting the process of micellization, solubilization.	3,5	U,Ap,E
CO4	Study about the polymers and polymer reactions, various types of polymerization. Kinetics and thermodynamics of polymerization.	3,5	U,An,Ap
CO5	Learn the structure and properties of polymers.	3,5	U,Ap,C



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### M.SC. COMPUTER SCIENCE

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO-1	Students gain knowledge in the areas like Soft Computing, Web Services, Cloud Computing, Paradigm of Programming language, Design and Analysis of Algorithms, Database Technologies, Advanced Operating System, Image Processing, Software Project Management and core computing subjects.
PSO-2	Students understand all dimensions of the concepts of software application and projects.
PSO-3	Students become employable according to current demand of IT Industry.
PSO-4	Work in a collaborative manner with others in a team, contributing to the management, planning and implementation of a computer system.

#### COURSE OUTCOMES (COs)

Semester: I

<b>Course Title: Advanced Data Structures</b>			
<b>Course Code: MCS-411</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Design and analyze programming problem statements.	1,2	Ap,An,U,C
CO2	Choose appropriate data structures and algorithms, understand the ADT/libraries, and use it to design algorithms for a specific problem.	2,3	U,R,An,Ap, C
CO3	Understand the necessary mathematical abstraction to solve problems.	2,3,4	U,R,An,E





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CO4	Come up with analysis of efficiency and proofs of correctness.		E,U,An
CO5	Comprehend and select algorithm design approaches in a problem specific manner.	1,3,4	An,AP,E,C

**Course Title : Advanced Computer Architecture**  
**Course Code: MCS-412**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Demonstrate concepts of parallelism in hardware/software.	2,3	R,U,An
CO2	Understand the parallel computing models.	1,2,3	U,An,E
CO3	Describe architectural features of advanced processors.	2,4	U,An,E
CO4	Interpret performance of different pipelined processors.	2,3	U,An,Ap,E
CO5	Understand the parallel processing mechanism in uniprocessor systems.	1,2,3	U,An
CO6	Become familiar with the concept of pipeline, array and multiprocessor systems.	1,2	U,E

**Course Title : Network Design & Performance Analysis**  
**Course Code: MCS-413**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Familiar with the concept of Network hardware and software requirements.	1,2	R,U,An
CO2	Understand the different protocols working at different layers of OSI and TCP/IP models.	2,3	U,An,E



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CO3	Learn the concepts of different networking devices like router, hub, and switch.	2,3	R,U,An,E
CO4	Understand the concept of traffic engineering and capacity planning.	1,2,3,4	U,An
CO5	Learn the concepts of switching and network performance modelling.	1,2	R,U,An
CO6	Compare between private and the public networking.	2,4	An,E
CO7	Understand the network design and network management.	2,3	U,An
CO8	Learn the concept of Network optimization.	2	An,U

<b>Course Title: Discrete Structures</b>			
<b>Course Code: MCS-414</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Identify sets, different properties of sets, set operations and set identities	1,2	R,U,An
CO2	Explain different methods for representing the relationship between sets.	2,3	U,An
CO3	Learn the basic concepts involving functions needed in discrete structures.	2	R,U
CO4	Define and interpret the concepts of divisibility, congruence etc.	2,4	Ap,An



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<b>Course Title : Soft Computing</b>			
<b>Course Code: MCS-415</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Explain Soft computing concepts like fuzzy logic, neural networks, genetic Algorithms & Probability.	1,2	R,U,An
CO2	Know about fuzzy systems, fuzzy logic and its applications.	2,3	Ap,U,C
CO3	Get introduced to artificial neural networks and fuzzy theory.	1,2,3	U,C,Ap
CO4	Learn the concepts of Probabilistic Reasoning.	2	U,R
CO5	Get knowledge related to Probability Distribution.	2,3	U,An,E

<b>Course Title :Programming Lab I (Based on Advanced Data Structures)</b>			
<b>Course Code: MCS-416P</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Formulate, design and analyse algorithms for problem statements.	1,2,3	Ap,C,An,U
CO2	Implement basic data structures and sorting algorithms.	2,3	Ap,U
CO3	Choose appropriate data structures and algorithms, understand the ADT/libraries, and use it to design algorithms for a specific problem.	3,4	R,An,Ap
CO4	Design and develop efficient algorithms for problem.	2,3	Ap,C,E
CO6	Implement algorithm using tree and graph structures.	2,3	Ap,C

Semester: II



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<b>Course Title: Image Processing</b>			
<b>Course Code: MCS-422</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Study the fundamental concepts of image processing	1	R,U
CO2	Learn about different image enhancement techniques	1,2	U,R,An
CO3	Analyze the basic algorithms used for image processing and image compression.	2,3	An,R,E
CO4	Study the practical applications of image processing	1,2,4	U,Ap
CO5	Contrast image segmentation and representation	2,3	An,E
<b>Course Title: Theory of Computation</b>			
<b>Course Code: MCS-421</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Learn about deterministic and non-deterministic finite state machines along with their designing, conversion from finite machines to regular grammar, conversion from regular grammar to finite automata, and their applications.	1,2	R,U,E,An
CO2	Comprehend the working and applications of pumping lemma.	2,3	An,E,U
CO3	Gain insight into the concept of Context free grammar and normal forms of context free grammar.	2,3,4	R,U,An
CO4	Design the pushdown automata.	3,4	Ap,C
CO5	Design the Turing Machines and get knowledge about the notions of time and space complexity in terms of Turing Machine.	1,2,3,4	Ap,C,An





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<b>Course Title : Design &amp; Analysis of Algorithms</b>			
<b>Course Code: MCS-423</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Analyze the asymptotic performance of algorithms.	1,2	An,E,U
CO2	Write rigorous correctness proofs for algorithms.	1,2	R,U,E
CO3	Demonstrate a familiarity with major algorithms and data structures.	2,3,4	R,U,An
CO4	Apply important algorithmic design paradigms and methods of analysis.	3,4	Ap,C,E,An
CO5	Synthesize efficient algorithms in common engineering design situations.	2,3,4	U,An

<b>Course Title: Cloud Computing</b>			
<b>Course Code: MCS-424</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Know the impact of engineering on legal and societal issues involved in addressing the security issues of cloud computing.	1,2,3,4	R,U,An
CO2	Apply and design suitable Virtualization concept, Cloud Resource Management and design scheduling algorithms.	3,4	Ap,C,E,An
CO3	Create combinatorial auctions for cloud resources and design scheduling algorithms for computing clouds.	3,4	C,Ap,E
CO4	Design different work flows according to requirements and apply map reduce programming model.	2,3,4	Ap,C,An,E
CO5	Address cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application.	2,4	U,An





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CO6	Analyze the Cloud computing setup with its vulnerabilities and applications using different architectures.	2,3	An,U
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<b>Course Title: Distributed Database Systems</b>			
<b>Course Code: MCS-425</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Learn the concepts of distributed database systems architecture and design.	1,2	R,U
CO2	Differentiate between horizontal and vertical fragmentation.	2,3	An,Ap,E
CO3	Get knowledge of different database recovery, 2PC and 3PC protocols.	3,4	An,E,U
CO4	Apply methods and techniques for distributed query processing and optimization.	2,3,4	Ap,C,E
CO5	Understand the broad concepts and properties of transaction management.	1,2,3	U,An

<b>Course Title: Programming Laboratory – II</b>			
<b>Course Code: MCS-426P</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Get understanding of applications of Data Structures	1,2	U,R
CO2	Understand problems by applying appropriate algorithms.	2,3,4	U,R,Ap



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CO3	Apply techniques of stacks and queues to solve problems.	2,4	Ap,C
CO4	Analyse the efficiency of various algorithms.	2,3	An,E
CO5	Solve a program in many ways using different techniques.	3,4	An,E,Ap

### Semestr: III

**Course Title : Advanced Software Engineering**

**Course Code: MCS-531**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Acquire the knowledge of software-engineering	1,2	R,U
CO2	Get Knowledge of basic Software Engineering methods and practices.	2	U,R,E
CO3	Understand Software Engineering appropriate applications.	1,2	U,An
CO4	Understand different measurements of object oriented.	2,3	U,R,An
CO5	Understand about software process models such as the water fall and evolutionary models.	1,2	U,R
CO6	Gain knowledge of UML for object-oriented design.	1,2	U,An
CO7	Identify some of the main risks involved in software development	3	U,An,E

**Course Title : System Software**

**Course Code: MCS-532**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Study the architecture of a hypothetical machine, its assembly language, macro language.	1,2	U,R,An
CO2	Understand the structure and design of assemblers, linkers and loaders.	1,2	U,R,An,E



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CO3	Understand the concepts and theory behind the implementation of high level programming languages.	1,2,3	R,U,An,E
CO4	Get familiarized with various software development tools.	1,2,3	U,An
CO5	Understand the fundamental principles in compiler design and identify the relationships among different phases of compiler.	2	U,An

**Course Title: Data Mining and Warehousing****Course Code: MCS-533**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Become familiar with mathematical foundations of data mining tools.	1,2	R,U
CO2	Understand and implement classical models and algorithms in data warehouses and data mining.	2,3,4	U,Ap,C,E
CO3	Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.	1,2	R,U,An
CO4	Master data mining techniques in various applications like social, scientific and environmental context.	2,3,4	An,E
CO5	Develop skills in selecting the appropriate data mining algorithm for solving practical problems.	3,4	An,E

**Course Title: Concept of Core and Advanced Java****Course Code: MCS-534**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Design and implement programs in the Java programming language that make strong use of classes and objects.	1,2	U,R,Ap,C
CO2	Learn to print formatted text to the console output and read/parse console input text using a Scanner object.	1,2	U,R,An



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CO3	Study logical constructs for branching and loops as well as use iterate objects when appropriate.	2,3	Ap,C,E,
CO4	Define classes and methods. In addition, students This syllabus is subject to change at any time and for any reason. Will learn the basics of polymorphism through use of super-classes and interfaces. Finally, students will develop an understanding of the Java language class hierarchy including the cosmic Object super class.	2,3,4	E,An,U
CO5	Learn to create and access arrays and array lists, including those with Books Prescribed to generalized objects types.	3,4	C,Ap,E

**Course Title: Network Programming****Course Code: MCS-535**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Develop applications based on techniques such as IPv4, IPv6 addressing schemes, child process creation using fork etc.	2,3	Ap,C,E
CO2	Elaborate existence of various system processes such as Zombies, Daemon processes etc.	2,3,4	U,R,An
CO3	Design sockets for implementation of client-server programming using java programming language.	2,3	Ap,C,E,An
CO4	Gain in-depth knowledge about various types of ports and their allotments in networks.	1,2	U,R,An
CO5	Post completing this course, a student will be able to make career in the field of network administration/management.	3,4	An,U,R





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<b>Course Title: Programming LAB III Based on Advanced Java&amp; Network Programming</b>			
		<b>Course Code: MCS-536P</b>	
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Understand the concept of OOPs as well as the purpose and uses of principal of inheritance, polymorphism in encapsulation and method overloading.	1,2	Ap,C,E,An
CO2	Identify classes, objects, members of a class and the relationship among them needed for a specific problem.	1,2	An,AP,C
CO3	Create a java applications programs using sound oops practices.	3,4	C,Ap,An
CO4	Develop programs using the java collection API as well as the java standard class library.	3,4	Ap,C,E
CO5	Develop and understand exception handling.	2,3,4	Ap,C,E,U

### Semester: IV

<b>Course Title : Advanced Web Technologies using ASP.NET</b>			
		<b>Course Code: MCS-541</b>	
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Evaluate C# and the .NET framework namespace contents.	1,2	E,U,R
CO2	Develop the console and GUI applications using C#.Net.	2,3	C,Ap
CO3	Set up various navigation techniques for integrating web pages within the site.	2,3,4	Ap,C
CO4	Create the dynamic web page using ASP.NET Controls which interact with databases.	3,4	Ap,E,C





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CO5	Manage cookies and sessions as state management techniques.	3,4	An,U
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**Course Title: Microprocessor and its Applications****Course Code: MCS-542**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Illustrate the architecture of 16 bit 8088 /8086 microprocessor.	1,2	U,R
CO2	Use the various addressing modes and data transfer instructions of the microprocessor.	2	U,R,An
CO3	Learn about higher processor architecture and embedded systems.	2,3,4	E,An,C
CO4	Understand the working of Programmable Peripheral interface.	1,2	U,An
CO5	Learn the operations and interfacing techniques of 8088/8086 microprocessor.	2,3,4	C,Ap,E

**Course Title : Object oriented modelling, analysis and design (Option I)****Course Code: MCS-543**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Select the basic elements of modeling such as Things, Relationships and Diagrams depending on the views of UML Architecture and SDLC.	1,2	R,U
CO2	Apply basic and Advanced Structural Modeling Concepts for designing real time applications.	2,3	Ap,An,C
CO3	Design Class and Object Diagrams that represent Static Aspects of a Software System.	2,3,4	Ap,C,E



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CO4	Analyse Dynamic Aspects of a Software System using Use Case, Interaction and Activity Diagrams.	2,3	An,E,U
CO5	Apply techniques of State Chart Diagrams and Implementation Diagrams to model behavioural aspects and Runtime environment of Software Systems.	1,2,3,4	Ap,An,E

### Course Title : Big Data Analytics (Option II)

Course Code: MCS-543

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Identify Big Data and its Business Implications.	1,2	R,U,An
CO2	Get knowledge about HDFS Concepts and Interfacing with HDFS and learn R language.	2,3	R,U,An
CO3	List the components of Hadoop and Hadoop Eco-System.	2	U,R
CO4	Access and Process Data on Distributed File System.	2,3	Ap,U,An,E
CO5	Manage Job Execution in Hadoop Environment and Develop Big Data Solutions using Hadoop Eco System.	2,3,4	U,An,Ap,C

### Course Title : Natural Language Processing (Option III)

Course Code: MCS-543

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Describe the fundamental concepts and techniques of natural language processing.	1,2	R,U,An
CO2	Distinguish among the various techniques, taking into account the assumptions, strengths, and weaknesses of each.	2,3	R,U,An



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CO3	Use appropriate descriptions, visualizations, and statistics to communicate the problems and their solutions.	2	U,R
CO4	Analyze large volume text data generated from a range of real-world applications.	1,2,3	An,Ap,E, C

**Course Title : Programming Laboratory-IV (Based on Advanced Web Technologies using ASP.NET)**

**Course Code: MCS-544P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Implement C# and the .NET framework namespace contents.	1,2	E,U,R
CO2	Develop the console and GUI applications using C# .Net.	2,3	C,Ap
CO3	Set up various navigation techniques for integrating web pages within the site.	2,3,4	Ap,C
CO4	Create the dynamic web page using ASP.NET Controls which interact with databases.	3,4	Ap,E,C
CO5	Manage cookies and sessions as state management techniques.	3,4	An,U

**Course Title : Project Work**

**Course Code: MCS-545P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Carry out time planning for the project.	1,2	E,U,R
CO2	Follow correct grounding and shielding practices	2,3	C,Ap
CO3	Do effective trouble-shooting of the mini project.	2,3,4	Ap,C
CO4	Demonstrate a thorough and systematic understanding of project contents.	3,4	Ap,E,C
CO5	Understand methodologies and professional way of documentation and communication	3,4	An,U
CO6	Know the key stages in development of the project.	2,4	U,E



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## M.SC. INFORMATION TECHNOLOGY Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

### PROGRAM SPECIFIC OUTCOMES (PSOs):

<b>PSO-1</b>	This programme provides understanding about techniques, technologies and methods used in managing and implementing information technology systems.
<b>PSO-2</b>	Widens and deepens the understanding of computing technologies and covers high level concepts that enable the effective management and planning of IT projects and services.
<b>PSO-3</b>	Students gain knowledge in the areas like Artificial Neural Networks, image processing, Programming languages, Database Technologies, Advanced Operating System, Mobile Technologies and core computing subjects. This make students employable according to current demand of IT Industry as they understand all dimensions of the concepts of software application and projects.

### COURSE OUTCOMES (COs)

#### Sem I

Course Title: Analysis & Design of Embedded		Course Code: MIT-411	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand different components of microcontroller and their interactions.	1,2	U,R
CO2	Learn debugging techniques for an embedded system.	1,2,3	R,U,An
CO3	Understand key concepts of an embedded system like IO timers, Interrupts, interaction with peripheral devices.	2,3	U,R,An





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Course Title: Distributed Computing		Course Code: MIT-412	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Demonstrate knowledge on the basic elements and concepts related to distributed system technologies.	1,2,3	U,R
CO2	Demonstrate knowledge on the core architectural aspects of distributed systems.	2,3	U,R,An
CO3	Design and implement distributed applications.	2,3	Ap,C,E
CO4	Demonstrate knowledge on the main underlying components of distributed systems (such as RPC, file systems).	1,2,3	An,R,U
CO5	Use and apply important methods in distributed systems to support scalability and fault tolerance.	2,3	U,Ap,C,E

Course Title: Advanced Computer Organization and Architecture		Course Code: MIT-413	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Demonstrate the concepts of parallelism in hardware/software.	1,2	U,R
CO2	Understand the parallel computational models.	2,3	U,R,An
CO3	Understand the parallel processing mechanism in uniprocessor systems.	2,3	R,U,E
CO4	Describe architectural features of advanced processors.	1,3	R,U,An
CO5	Interpret performance of different pipelined processors.	2	An,U,E
CO6	Become familiar with the concept of pipeline, array and multiprocessor systems.	1,2	U,R,An





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Course Title: Network Operating System		Course Code: MIT-414	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Learn about Network Operating System and its types and how it is important for Computer System and understand various services provided at different level.	1,2	U,R
CO2	Learn real life applications and management of Network Operating System.	2	U,R,An
CO3	Learn client-server and peer-to-peer models of distributed systems and creation of directories.	1,2	U,An
CO4	Understand protection and security provided to systems and various permission available to different types of users and admin.	2,3	U,An,E
CO5	Understand Telnet and FTP, Distributed Systems, Case and Comparative Studies of MySQL, Unix/Linux OR any other OS.	3	U,An

Course Title: R Programming		Course Code: MIT-415	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Know the key stages in development of the project.	1,3	U,An,R
CO2	Install, load and deploy the required packages, and build new packages for sharing and reusability.	1,2	C,E,Ap
CO3	Utilize R Data types for developing programs and learn all the basics of R Programming (Data types, Variables, and Operators.	1,3	C,Ap,E



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CO4	Join columns and rows in a data frame using bind functions, developing packages, data frames, and string manipulation functions.	1,2,3	AP,C,E,An
CO5	Learn different file systems and CSV file systems.	1,2,3	An,Ap,C
CO6	Visualize and summarize the data and design application with database connectivity for data analysis.	1,2,3	U,An,Ap

**Course Title: Programming Laboratory – I (R Programming)**  
**Course Code: MIT-416P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Study the installation of the R Programming Environment.	1,2	Ap,An,C
CO2	Utilize R Data types for developing programs and learn all the basics of R Programming (Data types, Variables, and Operators).	1,2,3	U,R,An,C
CO3	Study the implementation of R-loops with different examples and learn the basics of functions in R and implement them with examples.	2,3	Ap,C,E
CO4	Join columns and rows in a data frame using bind functions, developing packages, data frames and string manipulation functions.	1,2,3	C,Ap,E
CO5	Learn different file systems and CSV file systems.	1,2	U



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### Sem II

<b>Course Title: Mobile Computing</b>			
<b>Course Code: MIT-421</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Get knowledge about working process of wireless communications.	1,2,3	U,R,An
CO2	Implement knowledge of mobility and portability through various Wireless Communication Medias.	1,2	Ap,C,E
CO3	Get in-depth knowledge about cellular call management systems.	1,2	U,R,C
CO4	Get complete understanding about cellular networks and mobile adhoc networks.	1,3	U,An
CO5	Adapt TCP/IP extensions in mobile and cellular technology.	1,2,3	Ap,An,C,E

<b>Course Title: Option (i) Distributed Databases</b>			
<b>Course Code: MIT-422</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Get knowledge about Distributed Databases , their design and development	1,3	R,U
CO2	Learn intellectual Cognitive/ analytical skills; Data Distribution and Allocation strategies	2,3	R,U,An
CO3	Learn practical Skills; Algorithmic knowledge about distributed database design and allocation.	1,2,3	Ap,C,E
CO4	Learn transferable skills; Usage of DBMS design and allocation models	1,2,3	U,An,E



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<b>Course Title: Option(ii) Cloud Computing</b>			
<b>Course Code: MIT-422</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Understand the impact of engineering on legal and societal issues involved in addressing the security issues of cloud computing.	1	R,U,An
CO2	Apply and design suitable Virtualization concept, Cloud Resource Management and design scheduling algorithms.	1,2	U,R,An
CO3	Create combinatorial auctions for cloud resources and design scheduling algorithms for computing clouds.	1,2,3	U,R,An,E
CO4	Design different workflows according to the requirements and apply map reduce programming model.	2,3	U,An,E
CO5	Address cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application.	2,3	U
CO6	Analyze the Cloud computing setup along with it's vulnerabilities and applications using different architectures.	1,2	An,U,E
<b>Course Title: Image Processing</b>			
<b>Course Code: :MIT-423</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Review the fundamental concepts of a digital image processing system.	1,3	R,An,U
CO2	Analyse images in the frequency domain using various transforms.	2,3	An,E,U
CO3	Evaluate the techniques for image enhancement and image restoration.	1,2,3	E,An





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CO4	Categorize various compression techniques.	1,3	An,E,U
CO5	Interpret image segmentation and representation techniques.	1,2,3	U,An

<b>Course Title:Fuzzy Systems</b>			
<b>Course Code: MIT-424</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Study basic and advanced differences between Classical Sets versus Fuzzy sets, Classical Relations versus Fuzzy relations.	1,2,3	Ap,An,C,E
CO2	Design Membership functions.	1,3	C,Ap,E
CO3	Analyse Fuzzy rule based systems, graphical techniques of inference and develop these membership functions.	1,3	An,U,E
CO4	Apply decision making techniques with fuzzy information like fuzzy rank ordering, preference & consensus or Fuzzy c means clustering etc.	2,3	Ap,C,E,An

<b>Course Title: Network Design and Performance Analysis</b>			
<b>Course Code: MIT-425</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Become familiar with the concept of Network hardware and software requirements.	1	R,U,An
CO2	Understand the different protocols working at different layers of OSI and TCP/IP models.	1,2	U,R,An
CO3	Learn the concepts of different networking devices like router, hub and switch.	1,2,3	U,R,An,E





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CO4	Understand the concept of traffic engineering and capacity planning.	2,3	U,An,R,E
CO5	Learn the concepts of switching and network performance modeling.	2,3	R,U
CO6	Compare the private and the public networking.	1,2	An,U,E
CO7	Understand the network design and network security.	1,2	U,An
CO8	Learn the concept of Network optimization.	1,2,3	U,An

**Course Title: Programming Lab II****Course Code: MIT-426P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the basic use of MATLAB.	1,2	R,U
CO2	Study the applications of major concepts used in Fuzzy in MATLAB.	2,3	Ap,E,An
CO3	Understand the implementation of Fuzzy Logic Controller (FLC).	1,2,3	Ap,CAn

**Sem III****Course Title: Network Protocols****Course Code: MIT-531**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Define network protocol structures and functions	1	R,U
CO2	Explain the structures and functions of data link and MAC layers	1,2	R,An,U
CO3	Discuss the network layer concept and local area network (LAN) design	2	U,An,E



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CO4	Express the working principles of transport layer protocols (TCP and UDP)	1,2	Ap,C,E
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**Course Title: Advanced Web Technologies using ASP.NET**  
**Course Code: MIT-532**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Evaluate C# and the .NET framework namespace contents.	1,2	E,R,U
CO2	Develop the console and GUI applications using C# .Net.	1,2,3	Ap,E,U,R
CO3	Set up various navigation techniques for integrating web pages within the site.	2	Ap,An,C,E
CO4	Create the dynamic web page using ASP.NET controls which interact with databases.	1,2	Ap,C,E
CO5	Manage cookies and sessions as state management techniques.	1,2	U,An

**Course Title: Linux Administration**  
**Course Code: MIT-533**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Make appropriate decisions during the configuration process to create a properly functioning Linux environment.	1,2	R,U
CO2	Use programs and utilities to administer a Linux machine.	1,2,3	U,An,R
CO3	Explain how a Linux server can be integrated within a multi-platform environment.	1,2	R,U,An



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CO4	Analyse the need for security measures for a Linux environment.	1,2	An,E,R
CO5	Identify the different uses and advantages of Linux in a business environment in order to participate in discussions regarding network servers and services.	1,2,3	U,An

**Course Title: System Simulation****Course Code: MIT-534**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Analyse modelling and simulation.	1,2	R,U,An
CO2	Explain and conduct the transforming of continues function and dynamic equation into discrete computer representation.	1,3	An,R,U
CO3	Develop simulation model using heuristic methods.	1,2,3	Ap,C,An,E
CO4	Analyse the Simulation models using input analyser and output analyser	2,3	An,E,U
CO5	Explain Verification and Validation of simulation model.	1,2	E,An

**Course Title: Microprocessor and its Applications****Course Code: MIT-535**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Illustrate the architecture of 16 bit 8088 /8086 microprocessor.	1,2	U,R
CO2	Use various addressing modes and data transfer instructions of the microprocessor	2,3	Ap,E,An
CO3	Get prepared for higher processor architecture and embedded systems	1,2,3	U,An,R, Ap



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CO4	Understand the working of Programmable Peripheral interface.	2,3	U,An,R
CO5	Get introduced to the operations and interfacing techniques of 8088/8086 microprocessor.	1,3	C,E,Ap

**Course Title: Programming Laboratory-III (Based on Advanced Web Technologies using ASP.NET)**  
**Course Code: MIT-536P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Implement C# and the .NET framework namespace contents.	1,2	R,U
CO2	Develop the console and GUI applications using C# .Net.	1,2,3	C,Ap,E
CO3	Set up various navigation techniques for integrating web pages within the site.	1,2	C,Ap,E,An
CO4	Create the dynamic web page using ASP.NET Controls which interact with databases	2,3	U,An
CO5	Manage cookies and sessions as state management techniques.	1,2,3	U,C,Ap

### Semester: IV

**Course Title: Advanced Java Technology**  
**Course Code: MIT-541**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the concept of OOPs and the purpose and uses of the principles of inheritance, polymorphism, encapsulation and method overloading in core java as well all the advanced concepts like Multithreading, Applets, Servlets, AWT and I/O Basics in advanced java.	1,2	R,U





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CO2	Create java applications and programs using sound oops practices.	1,2,3	C,Ap,E
CO3	Develop programs using the java collection API as well as the java standard class library.	1,2	C,Ap,E,An
CO4	Develop ability of apply the conceptual approach of working with graphics	2,3	R,U,An
CO5	Develop and understand the concept of web applications through Applets & Servlets programming.	1,2,3	U,C,Ap

**Course Title: Option (i) Network Security)****Course Code: MIT-542**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the basics of Network Security.	1,2	R,U
CO2	Understand the concept of packet filtering and how to secure a message over insecure channel by various means	1,2,3	C,Ap,E
CO3	Understand various Security zones	1,2	C,Ap,E,An
CO4	Identify the function and types of a firewall, and how does it keep a computer secure and safe from viruses	2,3	R,U,An
CO5	Understand the implementation of IDS and IPS, Security policies, host Hardening and Host defence.	1,2,3	U,C,Ap

**Course Title: Option (ii) Big Data Analytics****Course Code: MIT-542**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Identify Big Data and its business implications and the working of R language.	1,2	R,U,An
CO2	Learn HDFS concepts and Interfacing with HDFS	1,3	An,R,U





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CO3	List the components of Hadoop and Hadoop Eco-System.	1,2,3	Ap,C,An,E
CO4	Access and Process Data on Distributed File System	2,3	An,E,U
CO5	Manage Job Execution in Hadoop environment and develop Big Data solutions using Hadoop eco system.	1,2	E,An

**Course Title: Option (iii) Ethical Hacking**  
**Course Code: MIT-542**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Plan a vulnerability assessment and penetration test for a network.	1,2,3	U,R,An,E
CO2	Execute a penetration test using standard hacking tools in an ethical manner.	2,3	U,An,R,E
CO3	Report on the strengths and vulnerabilities of the tested network.	2,3	R,U
CO4	Identify legal and ethical issues related to vulnerability and penetration testing.	1,2	An,U,E

**Course Title: Artificial Neural Network**  
**Course Code: MIT-543**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Describe various types of ANNs	2,3	Ap,E,An
CO2	Explain how ANNs can be trained.	1,2,3	U,An,R,Ap
CO3	Carry out simple simulations of ANNs.	2,3	U,An,R
CO4	Explain how ANNs is designed	1,3	C,E,Ap



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**Course Title: Programming Laboratory IV (Based on Advanced java Technology)**  
**Course Code: :MIT-544P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the concept of OOPs as well as the purpose and uses of the principle of inheritance, polymorphism in encapsulation and method overloading.	1,2	E,R,U
CO2	Identify classes, objects, members of a class and the relationship among them needed for a specific problem.	1,2,3	Ap,E,U,R
CO3	Create java applications programs using sound oops practices.	2	C,E,Ap,An
CO4	Develop programs using the java collection API as well as the java standard class library.	1,2	C,E,Ap
CO5	Understand exception handling.	1,2	U,R,An

**Course Title: Project Work**  
**Course Code: MIT-545P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Carry out time planning for the project.	1,2	U,R
CO2	Follow correct grounding and shielding practices	2,3	An,E
CO3	Do effective trouble-shooting of the mini project.	1,3	U,An,Ap
CO4	Demonstrate a thorough and systematic understanding of the project contents.	1,2,3	U,An,Ap
CO5	Understand methodologies and professional way of documentation and communication.	2,3	U,AnE
CO6	Know the key stages in the development of the project	1,2	An,U



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### M.Sc. Ag. (AGRICULTURAL ECONOMICS) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO-1	To apply the principles of micro, macro and production economic theory to farm decision making, farm business and its management
PSO-2	To enhance knowledge and experience to improve efficiency/performance of agricultural market structure, conduct and functionaries.
PSO-3	To help students to analyze agricultural economic problems by applying quantitative techniques.
PSO-4	To understand agricultural policies, organic farming techniques, globalization and their impact on sustainable development.
PSO-5	To acquire knowledge on disbursement of institutional finance, appraisal techniques in investment of agricultural projects.
PSO-6.	To help students learn the research process, techniques and methodology to be used in research.

#### COURSE OUTCOMES (COs)

##### Semester: I

Course Title: Micro Economics

Course Code: AGE-511

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic concepts and tools of micro-economic theory	1	R, U, C
CO2	Analyze consumer's equilibrium by assessing consumer's preferences, optimal choice under budget constraints and understand the concept of elasticities of demand and supply.	1	R,U, Ap, C
CO3	Understand various concept of cost and production.	1,3	U, Ap, An, C
CO4	Analyze production function, producer's equilibrium and producer's profit maximization	1,3,6	U, An, Ap



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CO5	Analyze marginal analysis of the firm under different market conditions and investigate price and output decisions of the firms under different market structures.	1	U, An, Ap
CO6	Understand different ways to measure welfare changes for individuals	1	U, An, Ap

### Course Title: Agricultural Marketing and Price Analysis

Course Code: AGE-512

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Define and explain the process of calculating the elasticities, price spread, price forecasting	1,2	R, U, Ap, C
CO2	Understand the market structure of regulated and market societies	1,2,3	U, Ap, C
CO3	Get themselves acquainted with different market cooperatives	1,2,5	U,An
CO4	Understand the role of the Government in promoting commodity trading and regulatory measures	2	U, An

### Course Title: Farm Management

Course Code: AGE-513

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Deal with the development of management strategies and skills among farmers for improved decision making in the use of resources	1	U, R, U, C
CO2	Understand how the farm life is organized , resources are allocated and activities are performed	1,5	U, An,Ap
CO3	Understand different types of enterprises and farm business	1,5,6	U, Ap, An, E, C





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**Course Title: Statistical Methods for Research Workers****Course Code: STA-415**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge on probability theory, sampling techniques , standard error etc.	6	R, U, An, Ap
CO2	Apply Correction and regression techniques.	6	R, U, E, An, Ap
CO3	Apply T-Test, chi-square and large sample tests	6	U, E, An, Ap

**Course Title: Organic Farming****Course Code: AGR-410**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquire knowledge on the concepts of organic agriculture.	1	R, U, An, E, Ap,
CO2	Get information about the impact of organic farming and indigenous practices on the environment.	1, 4	U, An, E Ap
CO3	Understand the procedure followed for organic certification	1, 4	U, An, Ap

**Course Title: Technical writing & communication skills, library & information services****Course Code: PGS-501**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the definitions, descriptions, process explanations and other common forms of technical writing	6	R, U, An
CO2	Understand how to follow the stages of the writing process and apply them to technical and workplace writing tasks	6	U, An, Ap, C
CO3	Synthesize and integrate material collected from primary and secondary sources with their own ideas while writing research papers	6	U, Ap, An, C





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**SEMESTER-II****Course Title: Agri. Finance and Project Management****Course Code: AGE-521**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Define and explain the key issues of finance in agriculture.	1,3,5	R, U, An, Ap
CO2	Get knowledge about different techniques of assessing the worth of a project.	1,3,5,6	U, An, Ap,
CO3	Understand the performance of micro-financial institutions like NGO's and self-help groups.	1,5	U, An

**Course Title: Macroeconomics****Course Code: AGE-522**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the methods of calculating national income, its various components and concepts	1	U
CO2	Understand the aggregate changes taking place in the economy such as unemployment growth rate, GDP and inflation.	1,3	U,An
CO3	Get themselves acquainted with the tools of fiscal policy and monetary policy.	4	U,An
CO4	Understand demand and supply of money, inflation and the role of monetary policy	1	U,An



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**Course Title: Research Methodology**

**Course Code: AGE-523**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get an introduction to research methodologies, both qualitative and quantitative	3,6	R, U, An, E, Ap
CO2	Study about the contemporary perspectives in educational research, with special focus on developing a range of skills involved in formulating a research proposal including framing the research questionnaires, reviewing the literature and choosing appropriate methodologies for different types of research studies.	3,6	U, An, E Ap

**Course Title: Agri -Business Management (Minor)**

**Course Code: MGT-430**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand different marketing concepts, various policies, strategies and marketing systems in context to agricultural inputs and output.	1,4	R, U, An, Ap
CO2	Have insight on the problems faced by processors in the processing of agricultural products.	1,4	U, An, Ap

**Course Title: Agricultural research and publication ethics**

**Course Code: PGS-502**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the moral judgment and reactions	6	R,U,An
CO2	Identify the publication misconduct, scientific misconduct, complaints and appeals	6	U, An



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**SEMESTER-III****Course Title: Micro Economics****Course Code: AGE-531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand various theories of consumer behavior	1	R,U,An
CO2	Understand production functions and various theories of costs	1,3	U,An,Ap,E
CO3	Study price determination under various market conditions	1,3	U,An,Ap,,E

**Course Title: Evolution of Economic Thought****Course Code: AGE-532**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge on the contribution of the galaxy of economists.	4	R,U,An
CO2	Comprehend the development of the theory of economics in historical perspective and understand the similarities and differences among different schools of economic thought	4	U,An
CO3	Comprehend emerging paradigms and aberrations with its reasons	4	U,An

**Course Title: Rural Marketing****Course Code: AGE-533**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Familiarize themselves about the nature of rural markets and different factors affecting rural marketing	1,2,4	R, U, An, E



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CO2	Get knowledge on different distribution channels and linkage of rural marketing with credit	1,2	U, An, E Ap
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**Course Title: Agri -Business Management (Minor)**

**Course Code: MGT-430**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand different marketing concepts, various policies, strategies and marketing systems in the context of agricultural inputs and output.	1,4	R, U, An, Ap
CO2	Have insight on the problems faced by processors in the processing of agricultural products.	1,4	U, An, E

### Semester-IV

**Course Title: Macro Economics and Policy**

**Course Code: AGE-541**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study various concepts of macro economics	1,3	R, U
CO2	Understand the concepts such as investment, saving, consumption, multiplier and their role in the economy	1,3	U, An, E Ap
CO3	Study the role and effectiveness of Monetary and Fiscal policy.	3	U, An, E Ap



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**Course Title: Agricultural Development and Policy**

**Course Code: AGE-542**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the economic development measures- NEW and MEW , PQLI, HDI, and Green GNP measures	1,3,4	R, U, An, E, Ap, C
CO2	Understand the theories of economic development propounded by different economists such as Rostow , Keynes , classical economists etc.	1,3,4,5	R, U, An
CO3	Study about free trade versus Protectionism, role of protection in Developing Countries, WTO Agreement and its impact on Agriculture	1,3,4	U, An





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### M.Sc. Ag. (AGRONOMY)

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES

PSO-1	To acquaint students with production technology i.e. sowing time, sowing method, seed treatment, nutrient management, weed management and water management of field crops.
PSO-2	To study recent updates in resource conservation. i.e. crop residue, water and soil, cropping and farming systems.
PSO-3	To acquire knowledge about the package of production for organic, sustainable, Integrated farming systems, precision farming and the certification of farm.
PSO-4	To understand biotic and abiotic stresses; dryland agriculture, moisture conservation techniques, water harvesting, climate change and the concept of ideal plant type
PSO-5	To understand the concepts of statistical methods and statistical inference that would help in understanding the importance of statistics. .
PSO-6.	To get knowledge of fertilizers and manures as sources of plant nutrients and apprise about the integrated approach of plant nutrition and sustainability of soil fertility.
PSO-7	To understand the characteristics of Indian monsoon, rainfall distribution, problematic soils and their management.
PSO-8	To familiarize students with the weeds, herbicides and methods of weed control.
PSO-9	To study crop husbandry of oilseed, pulses, fiber, sugar crops, fodder crops
PSO-10	To provide information about how to collect material related to research, how to write thesis, use scientific language in thesis, and publish the research papers in different journals.

#### COURSE OUTCOMES

Semester: I

Course Title: Modern Concepts in Crop Production Course Code: AGR-511

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the advanced concepts of crop growth and productivity in relation to climate change.	1,3	R, U, Ap
CO2	Acquire knowledge on modern concepts in tillage and farm mechanization.	1,6	U, Ap, An
CO3	Gain knowledge on the principles and components of organic farming and resource conservation technology.	2,3	U, An, Ap
CO4	Gain knowledge on ideal plant ideotypes and yield maximization	4	U, An, Ap



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### Course Title: Soil Fertility and Nutrient Management Course Code: AGR-512

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about soil pH EC.	7	R, U, Ap, C
CO2	Get detailed knowledge about the importance of organic manures, properties and methods of the preparation of farmyard manures, compost, green manures, vermicompost, biofertilizers and other organic concentrates	3,7	U, Ap, C
CO3	Get detailed knowledge on commercial fertilizers, relative fertilizers, their cost and value.	6,7	U, Ap, An, C
CO4	Study about different methods of fertilizer application, their time and dose	6	U, An, Ap, C

### Course Title: Principles and Practices of Water Management Course Code: AGR-513

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the principles involved in estimating water requirements of different crops.	1,2	U, An, Ap,
CO2	Gain knowledge on various methods of irrigation scheduling.	1,2,4	U, An, Ap,
CO3	Acquire knowledge on pressurized irrigation systems to economize the use of water.	1,2	U, An, Ap,
CO4	Construct ideologies pertaining to water management in problematic soils	2,7	U, An, Ap
CO5	Analyse the quality of irrigation water.	4,7	U, An, Ap

### Course Title: Statistical Methods for Research Workers Course Code: STA-415

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of probability, sampling techniques, standard error etc.	5,10	R, U, E, An, Ap
CO2	Apply correction and regression techniques.	5	R, U, E, An, Ap
CO3	Know the use of T-Test, chi-square and large sample tests	5	U, E, An, Ap



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### Course Title: Soil Chemistry and Bio-Chemistry (Minor)

Course Code: SSC-410

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about soil colloids, cation exchange & Anion exchange phenomena, con adsorption and Fixation.	7	U, An, Ap, E
CO2	Understand about Soil reaction & Buffering; distribution, genesis and amelioration of different problematic soils and their effects on plant growth.	1,7	U, An, Ap, E
CO3	Study chemical properties of submerged soils; biochemical decomposition of organic manures.	1,7	U, An, E Ap

### Course Title: Technical writing & communication skills, library & information services

Course Code: PGS-501

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic components like definitions, descriptions, process explanations and other common forms of technical writing	10	R, U,
CO2	Understand how to follow the stages of the writing process and apply them to technical and workplace writing tasks	10	U,An,Ap
CO3	Synthesize material collected from primary and secondary sources with their own ideas while writing research papers	10	U,An, Ap,C



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### SEMESTER-II

**Course Title: Principles and Practices of Weed Management**

**Course Code: AGR-521**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge on weed biology and survey weeds in varied ecosystem.	1,8	R, U, , Ap
CO2	Identify the nature, types and economic uses of weeds in varied habitats.	1,8	R, U, An,
CO3	Gain knowledge on herbicide application techniques	8	U, An, Ap
CO4	Formulate integrated weed management practices for different ecosystems	1,8	U, An, Ap,C

**Course Title: Agronomy of Oil Seeds, Fiber and Sugar Crops**

**Course Code: AGR-522**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquire practical knowledge about various commercial crops and their economic importance to the farming communities.	1,9	R, U, An, Ap
CO2	Gain knowledge about importance of sugar crops and their cultivation practices	1,9	U, An, Ap,
CO3	Formulate different cropping systems and production technologies for various fiber crops	1,9	U, An, Ap, C

**Course Title: Field Plot Techniques**

**Course Code: AGR-523**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the planning of field experiments.	5,10	R, U, An, E, Ap
CO2	Conduct and record observations by various experimental designs and draw inferences.	5,10	U, An, E Ap, C

**Course Title: Agronomy of Fodder and Forage crops**

**Course Code: AGR-524**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study about the adaptation, distribution, agro techniques, anti-quality factors for the improvement of fodder crops	1,9	R, U, An, E, Ap





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CO2	Know about the use of physical and chemical enrichment and biological methods for the improvement in nutrition	1,9	U, An, E Ap
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### Course Title: Soil Fertility and Fertilizer Use (Minor)

Course Code: SSC-420

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about plant growth, factors affecting growth, plant nutrients: deficiency symptoms, toxicity, transformation, interaction and removal by crops.	1,6	R, U, An, E, Ap
CO2	Study methods of Soil fertility evaluation, Fertilizers: application, integrated use of manures & fertilizers, current fertilizer production, future trend and need in India.	1,6	U, An, E Ap

### Course Title: Experimental Designs for Research Workers

Course Code: STA-425

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge on the designs, their principles, analysis of variance and interpretation of data.	5,10	R, U, An, E, Ap
CO2	Study various mechanical errors in field experiments, methods of reducing them and presentation of research results.	5,10	U, An, E Ap

## SEMESTER-III

### Course Title: Agronomy of Major Cereals and Pulses

Course Code: AGR-531

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge on the staple food crops and their cultivation practices with post-harvest technologies	1,9	R, U, An, Ap
CO2	Assess the nature of the farm site and develop a new cropping system with the available resources	1,9	R, U, An, Ap,C
CO3	Understand recent crop management practices on crop productivity and resource use efficiency.	1,9	U, An, Ap, C
CO4	Gain knowledge on the recent trends in the cultivation of crops	1,9	U, An, Ap, C
CO5	Develop post-harvest management practices and value addition.	1,9	U, An, Ap, C





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### Course Title: Principles and Practices of Organic Farming Course Code: AGR-532

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquire knowledge on the concepts of organic agriculture.	3	R, U, E, Ap, C
CO2	Get information about the impact of organic farming and indigenous practices on the environment.	1,3	U, An, E Ap, C
CO3	Understand the procedure followed for organic certification	6	U, An, E Ap

### Course Title: Fertilizer Technology (Minor) Course Code: SSC-430

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about fertilizer Industries, manufacturing of different type of fertilizers and changing trends in fertilizers technology.	2,6	R, U, An, E, Ap, C
CO2	Know recent changing trends in fertilizers technology.	1,6	U, An, E, Ap

### Course Title: Fundamentals of Agroclimatology Course Code: AGM 430

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquire knowledge on agro meteorology and its different variables affecting crop production	1,7	R, U, An, Ap
CO2	Understand the concept of onset and withdrawal of monsoon in relation to crop production	4,7	R, U, An, Ap,
CO3	Gain knowledge on evapotranspiration and its effect on crop production	4,7	U, An, Ap
CO4	Understand weather forecasting and the impact of weather in relation to pest and disease management	4,7	U, An, Ap, C
CO5	Design crop weather calendar for various agro climatic zones	4,7	U, An, Ap, C



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**Course Title: Physiology of growth and development****Course Code: BOT-430**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the growth and physiological processes in plants	1,4	R, U, An, E, Ap
CO2	Use different growth substances in crop production	1,4	U, An, E, Ap, C
CO3	Use growth retardants for yield enhancement.	1,4	U, An, E, Ap, C

**SEMESTER-IV****Course Title: Cropping Systems and Sustainable Agriculture****Course Code: AGR-541**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Prepare cropping schemes, evaluate cropping system and workout input requirements for crops.	1,2	R, U, An, Ap, E
CO2	Understand interaction between different farm enterprises.	3	U, An, Ap,
CO3	Prepare integrated farming system models for different eco systems.	3	U, An, Ap, C
CO4	Gain knowledge about drought mitigation strategies	4,7	U, An, Ap, C
CO5	Evaluate different resource management techniques in the conservation agriculture.	2	U, An, Ap, C

**Course Title: Dry Land Agriculture and Watershed Management****Course Code: AGR-542**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Construct mapping of arid and semi -arid regions	4	R, U ,An,C
CO2	Acquire skill on integrated dry farming technologies	4,7	R, U, An, Ap,
CO3	Gain knowledge on soil and moisture conservation approaches and contingent crop plan to evade risk in dry farming.	4,7	U, An, Ap, C



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### M.Sc. Ag. (ENTOMOLOGY)

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1	To enable students to categorise insects based on basic ecological, behavioural, developmental attributes and evolutionary history.
PSO-2	To understand comparative morphology, anatomy and physiology of insects including biochemistry of their habitats like plants and soil.
PSO-3	To know about collection, preservation and identification of insects of different orders from different habitats.
PSO-4	To have hands-on training for the preparation of artificial diets, rearing of insects and culturing of insect pathogens.
PSO-5	To get acquainted with the positive as well as negative impact of insects on agriculture, human health, and the environment.
PSO-6.	To have a deeper understanding of insect pest management strategies and new advancements in pest management in fields and in warehouses.
PSO-7	To get knowledge about population estimation of insect pests, losses caused by pests, crop modelling, designing and implementation of IPM and IDM.
PSO-8	To gain knowledge to check the efficacy of biocontrol agents and different groups of insecticides including botanicals and new promising compounds in laboratory as well as in the fields.
PSO-9	To learn about the estimation of insecticidal residues and their environmental implications.
PSO-10	To acquire skills for designing the experiments and to learn how to analyse statistical data and present results efficiently, write scientific articles and communicate with others.
PSO-11	To learn about the basics of plant pathology like epidemiology, detection, diagnosis and forecasting of plant diseases through survey, surveillance etc.
PSO-12	To study different diseases of crops along with their management



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### COURSE OUTCOMES (COs)

Semester: I

Course Title: Insect Morphology and Systematics

Course Code: ENT-511

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get detailed information regarding the evolution of insects, their segmentation and the theories regarding segmentation of insect head.	1,2	R,U
CO2	Get to know about comparative morphological characteristics, sense organs and flight mechanisms of insects.	1,2	U,Ap,An,
CO3	Get themselves acquainted with the history and importance of insect systematics, taxonomic categories and ethics in taxonomy.	3	U,Ap,An
CO4	Learn the important rules of zoological nomenclature, preparation of taxonomic keys and usage of these keys in the identification of insects.	1,3	U,Ap,An

Course Title: Insect Anatomy and Physiology

Course Code: ENT-512

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the importance and scope of insect anatomy and physiology.	1,2	R,U
CO2	Know about basic structure and physiology of the exoskeleton of insects.	2	U,Ap
CO3	Analyse and integrate information pertaining to specific physiological system; compare functioning of specific physiological systems in different insect orders.	2	U,Ap,An
CO4	Study embryonic and post-embryonic development of insects and role of nutrition in development of insects.	1,2,4	U,An,Ap





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### Course Title: Classification of Insects

Course Code: ENT-513

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about the history and importance of insect classification.	1,3	R,U
CO2	Get knowledge about phylogeny of insects and classification of superclass Hexapoda.	1	U,An,Ap
CO3	Learn about distinguishing morphological characters, habits and habitats of insects belonging to economically important families of different orders of class Insecta.	1,2,3	U,Ap,An

### Course Title: Technical writing & communication skills

Course Code: TWC- 514

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic definitions, descriptions, process explanations and other common forms of technical writing	10	R, U,
CO2	Know how to follow the stages of the writing process and apply them to technical and workplace writing tasks	10	U,An,Ap
CO3	Synthesize material collected from primary and secondary sources with their own ideas in research papers	10	U, Ap

### Course Title: Integrated Disease Management

Course Code: PPL-513

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the application of biological, cultural, chemical and biocontrol agents	7,12	U,Ap,An,E



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CO2	Study about compatibility and integration in IDM	7,12	An,E
CO3	Demonstrate their knowledge about IDM on certain crops as project work.	7,12	Ap,An,E,C
CO4	Study about IDM and its adaptation in important crops , kharif pulses, vegetable and fruit crops	7,12	An,Ap,E

**Course Title: Soil Chemistry and Bio-Chemistry (Minor)****Course Code: SSC-410**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about soil colloids, cation exchange & Anion exchange phenomena, con adsorption and Fixation.	2,3	U, An, Ap, C
CO2	Understand soil reaction & buffering, distribution, genesis and amelioration of different problematic soils & their effects on plant growth.	2,3,5	U, An, Ap, C
CO3	Study about chemical properties of submerged soils and biochemical decomposition of organic manures.	2,3	U, An, E Ap

**Course Title: Statistical Methods for Research Workers****Course Code: STA-415**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the statistical techniques applied in agricultural research.	10	R,U,Ap
CO2	Get knowledge on probability theory, frequency distributions, sampling techniques, standard error, correlation and regression	10	U,Ap,An,E
CO3	Acquire skills in analysing statistical data efficiently using various statistical methods	10	U,Ap,An,E



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**Semester: II****Course Title: Insect Ecology****Course Code: ENT-521**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic principles of ecology	1	R,U
CO2	Study relationships between the environment and population dynamics of insects	1,5	R,U,An,
CO3	Acquire expertise in sampling of insect population and preparation of life tables.	7	Ap,An,E,C

**Course Title: Toxicology of Insecticides****Course Code: ENT-522**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get to know about the importance, scope and basic principles of insecticide toxicology and its relationships with other disciplines.	6,8,9	R,U,An
CO2	Learn about the structure and mode of action of different groups of insecticides including botanicals and new promising compounds	8	U,An,Ap
CO3	Learn the mechanisms of resistance development in insects against insecticides and how to manage the problem of insecticide resistance.	6,9	U,Ap,An
CO4	Evaluate toxicity of insecticides and understand the factors affecting toxicity of insecticides. They will also learn about Insecticide Act 1968, safe handling of insecticides and treatment in case of insecticide poisoning.	8	U,Ap,An, E,C
CO5	Get acquainted with different methods of estimation of insecticide residues and the significance and environmental implications of insecticides residues.	9	U,Ap,An, E



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### Course Title: Plant resistance to insects

Course Code: ENT-523

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the relationship between host plants, insects and their natural enemies.	6,8	R,U
CO2	Get acquainted with the mechanisms of plant resistance to insects	6	U,Ap
CO3	Know the role of biotechnology in plant resistance to insects.	6	U,Ap,An,E,C

### Course Title: Techniques in plant protection

Course Code: TPP-524

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the principles, working, maintenance and uses of different pest control equipment.	6	R,U,Ap
CO2	Get expertise in protein isolation techniques and tissue culture techniques in plant protection.	6	U,Ap,E,C

### Course Title: Insect biochemistry

Course Code: IBC -524

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand insect biochemistry at various development stages	2	R,U,Ap
CO2	Estimate carbohydrates, lipids, amino acids and protein etc.	2	U,Ap,E,C
CO3	Know pheromone synthesis and regulation of neuropeptides, adipokinetic hormones etc.	2	U,An,Ap





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**Course Title: Fungal Diseases of Plant****Course Code: PPL-523**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the classification and characterization of fungi.	7,12	R,U,An
CO2	Know the importance of signs and symptoms for the detection of fungal diseases and their management.	7,11,12	U,Ap,An,E

**Course Title: Pesticide formulations****Course Code: BCH-420**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Prepare different formulations of pesticides	6,8	R,U,Ap,C
CO2	Learn the labelling and packaging standards of different pesticides, use of machinery and other equipment in the application of pesticides	6	U,Ap,E,C
C03	Know about the precautions in the use of pesticides	6,8	U,An,Ap

**Course Title: Experimental Designs for Research Worker****Course Code: STA-425**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the need for designing experiments; different designs of experiments, their characteristics and basic principles.	10	R,U,Ap
CO2	Learn about the selection of experimental designs, mechanical errors in field experiments and methods of reducing such errors, interpretation of data and presentation of research results efficiently.	10	U,Ap,An,E,C



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**Semester: III****Course Title: Biological Control of Insect Pests****Course Code: ENT-531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about various biocontrol agents used to prevent the attack of pests to promote eco-friendly control methods.	4,5,6	R,U,Ap
CO2	Learn the mass multiplication techniques of biocontrol agents through hands-on training.	3,4	U,Ap,An,E,C
CO3	Check the field efficacy of various formulations of biocontrol agents.	8	U,Ap,An,E
CO4	Understand the trends and future possibilities of biological control and the role of biotechnology and semiochemicals in biological control.	6	U,An,Ap

**Course Title: Integrated Pest Management****Course Code: ENT-532**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about origin, history, concept, philosophy and ecological principles of IPM.	6	R,U,An,Ap
CO2	Assess crop losses, economic thresholds and cost benefit ratios.	7	U,Ap,An,E
CO3	Get themselves acquainted with different sampling techniques and insect-pest population estimation methods.	7	U,Ap,An,E
CO4	Learn about designing and implementation of IPM programmes for different crops and constraints in IPM implementation.	6,7	U,Ap,An,E,C



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**Course Title: Epidemiology & Forecasting of Plant Diseases Course Code: PPL-531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about measuring diseases, spore dispersal and trapping of different plant diseases	11	R,U,Ap,An
CO2	Study about weather recording, survey, multiplication of inoculums of diseased samples	11	R,U,Ap
CO3	Know about computerized data analysis, function fitting, model preparation and validation.	11	U,Ap,An,E
CO4	Study about survey, surveillance, vigilance and crop loss assessment	11	U,Ap,An,E
CO5	Study about different principles, pre-requisites of forecasting systems and the factors affecting them.	11	U,An,Ap,E

**Course Title: Physiology of growth and development Course Code: BOT-430**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the growth and physiological processes in plants	2,3	R, U, An, E, Ap, C
CO2	Use different growth substances in crop production	2,3	U, An, E, Ap
CO3	Use growth retardants in yield enhancement.	2,3	U, An, E, Ap

**Semester: IV**

**Course Title: Commercial Entomology Course Code: ENT-541**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get acquainted with the insects which can be used for the commercial purpose and generate income by culturing them.	4,5	R,U,Ap



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CO2	Get comprehensive knowledge on Apiculture, Sericulture and Lac culture.	4,5	U,An,Ap
CO3	Learn about biology, nature of damage, management and economic importance of insect-pests for human health and habitation.	5	U,An,Ap

**Course Title: Storage Entomology**

**Course Code: ENT-542**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the history and basic concept of storage entomology, post-harvest losses, their estimation and factors governing post-harvest losses.	5,7	R,U,Ap,An
CO2	Get knowledge on different pests related to stored grains and agricultural products, the association of stored grain insects with other micro-organisms.	5,7	U,Ap
CO3	Know about different storage structures, ideal storage conditions and preventive as well as curative measures for the management of stored grain pests.	6	U,Ap,An,E





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### M. Sc. Ag. (AGRICULTURE EXTENSION AND COMMUNICATION) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES

PSO-1	To plan, communicate and impart farm technologies and entrepreneurial orientation effectively to empower farmers.
PSO-2	To plan, conduct the research and find out the solutions for the problems in an ecological and ethical manner.
PSO-3	To become excellent teachers, efficient extension workers, farm journalists and visual communication specialists equipped with the skills of using modern ICT tools, advanced AV aids, teaching methods and also with journalistic and advertising skills.
PSO-4	To identify, develop and manage human resources in an organizational environment.
PSO-5	To plan, start and manage new entrepreneurial ventures successfully.
PSO-6.	To provide information to the student about how to collect material related to their research, data analysis, how to write thesis, use scientific language in thesis, and how to publish the their research paper in different journals
PSO-7	To acquaint students with problematic soils and their management
PSO-8	To understand agricultural policies, globalization and their impact on sustainable development, organic farming techniques.
PSO-9	To get basic knowledge on vegetable science and its various branches relevant to their study.
<b>COURSE OUTCOMES (COs)</b>	

Course Title: Development perspectives of Extension Education

Course Code: EXT-511

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about the importance of extension education in agriculture development	1,2,3	R, U, An,
CO2	Know about various rural development programmes aimed at poverty alleviation	1,2	U, Ap, An,E
CO3	Know about new innovations being brought in the field of agriculture extension	1,2,3.	U, Ap, An,E



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**Course Title: Diffusion and adoption of innovations****Course Code: EXT-512**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn how do the agricultural innovations spread among the farmers in the society by getting insights on the diffusion concept	1,2,3	R, U, An, E,C
CO2	Identify the various adopter categories among the communities	1,2,3	U, Ap, An
CO3	Learn about the adoption process and various factors of adoption	1,2,3	U, Ap, An, E

**Course Title: Development of communication and information management****Course Code: EXT-513**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concepts, meaning and process of communication.	1,2,4	R,U,, E,C
CO2	Learn about the modern media of communication	1,2,3	U, Ap, An
CO3	Identify the information management methods of journalistic writing of various information materials	1,2,3,4	U, Ap, An, E

**Course Title: Technical writing & communication skills****Course Code: TWC-514**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic components of definitions, descriptions, process explanations and other common forms of technical writing	6	R, U,An
CO2	Understand various stages of the writing process and apply them to technical and workplace writing tasks	6	U
CO3	Integrate material collected from primary and secondary sources with their own ideas in research papers	6	U, Ap



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## Course Title: Soil Chemistry and Bio-Chemistry (Minor)

Course Code: SSC-410

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about soil colloids, cation exchange & Anion exchange phenomena, con adsorption and Fixation.	7	U, An, Ap, C
CO2	Understand about soil reaction & buffering, distribution, genesis and amelioration of different problematic soils and their effects on plant growth.	7	U, An, Ap, C
CO3	Study the chemical properties of submerged soils and biochemical decomposition of organic manures.	7	U, An, E Ap

## Course Title: Crop Ecology (Minor)

Course Code: AGR-410

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand about ecology in relation to crop, eco system, its components and energy flow- food chain and energy output relationships.	2,7	R, U, An, Ap,
CO2	Learn about various farming systems prevailing in the world.	2,	U, An, Ap, E
CO3	Learn about family, co-operative and collective farming, their adaptation and weaknesses; cropping systems, their characteristics and management.	2	U, Ap, An, E, C
CO4	Get information regarding cropping patterns; farm selection, size of the farm and farm layout, cropping schemes and crop plans.	2,7	U, An, Ap
CO5	Get knowledge regarding preparation of farm layout plans, different intensity crop rotations and cropping schemes.	2,7	U, Ap, An, C

## Course Title: Statistical Methods for Research Workers

Course Code: STA-415

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge on the concept of probability, sampling techniques, mean, standard error etc.	2,6	R, U, An, Ap
CO2	Understand the correction and regression analysis.	2,6	R, U, E, An, Ap
CO3	Apply T-Test, chi-square and large sample tests.	2,6	U, E, An, Ap



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### Semester: II

#### Course Title: Human Resource Development

#### Course Code: EXT-521

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get orientation about the need of human resource development	1,2,4	R, U, An, E,
CO2	Understand staff selection and development training methods	1,3,4	U, Ap, An
CO3	Know various skills like decision making skills , interpersonal skills and leadership skills etc.	1,2,3,4	U, Ap, An, E

#### Course Title: Research Methodology for social sciences

#### Course Code: AGE-522

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get introduced to research methodologies, both qualitative and quantitative	3,6	R, U, An, E
CO2	Study about contemporary perspectives in educational research with special focus on developing a range of skills involved in formulating a research proposal including framing research questionnaire, reviewing the literature and choosing appropriate methodologies for different types of research study.	3,6	U, An, E

#### Course Title: Entrepreneurship Development and Management in Extension

#### Course Code: EXT-523

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand about the planning and development of enterprises for extending the scope of sustainable livelihood for rural people	1,2,3,5	U, An, E,C
CO2	Get knowledge and skills about different management techniques in extension organizations	1,3,5	U, Ap, An
CO3	Use supervision techniques and take effective decisions	1,2,3,4,5,	U, Ap, An,,E,C





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**Course Title: Participatory Programme Management****Course Code: EXT-524**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concepts, principles, process of different participatory processes for technology transfer and development	1,2,4	R, U, An, E
CO2	Analyze and use various tools and techniques of participatory extension like space related, time related and relation related orientation methods	1,2,3,4,5	U, Ap, An,C
CO3	Prepare action plans for participatory monitoring and evaluations	1,2,3,4,5	U, Ap, An,E,C

**Course Title: Management Agri -Business cooperative (Minor)****Course Code: ABM 525**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand different marketing concepts, various policies, strategies and marketing systems in the context of agricultural inputs and output.	4,5	R, U, An, Ap
CO2	Have insight into the problems faced by processors in processing agricultural products.	4,5	U, An, Ap

**Course Title: Natural resource and forest resources economics****Course Code: AGE-525**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Analyze the classification and problems of natural resource economics	7,8	R,U
CO2	Study the concepts of market failure, public goods and common property rights	7,8	R,U,An
CO3	Understand the concept of sustainable development	7	R,U,An
CO4	Understand the environmental policy issues and alternative instruments of environmental policies	8	U,An,Ap



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**Course Title: Farm Cropping System (Minor)****Course Code: AGR-420**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about farming systems concept and its role in sustainability of agriculture; resource management in relation to farm cropping systems.	1,2	R, U, Ap, C
CO2	Get knowledge on crop yield appraisals; plant interaction and criteria for assessing the yield advantages.	1,2	U, Ap, C
CO3	Learn about evaluation and productivity of multiple cropping systems.	1,2	U, Ap, An,E
CO4	Get information regarding cropping systems with perennials; comparison of chemical and organic farming.	1,2	U, An, Ap
CO5	Visit farms and agro-based industries to get experimental knowledge of farm lay out plan, cropping scheme; estimation of crop yield, calculation of harvest index and land equivalent ratio in mixed crops/ intercrops.	1,6,7	U, Ap, An, C

**Course Title: fundamentals of vegetable production****Course Code: VSC420**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand basic concepts of vegetable production	9	U,An
CO2	Know production technology of vegetable production and marketing	9	U,An,Ap
CO3	Understand the role of vegetables in farm income	7,9	U,An

**Course Title: Advances in Agricultural Extension****Course Code: EXT- 531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get advanced knowledge about latest innovations in the field of extension education worldwide	1,2,4	R, U, An, E,C
CO2	Get information about various issues in extension and their possible solutions	1,2,3	U, Ap, An
CO3	Know about various government organizations and collaborations in improving efficiency of extension	1,2,4,5,	U, Ap, An,E



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### Course Title: Perspectives of Distance Education

Course Code: EXT- 532

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of distance education and characteristics of distance education	1,2,3	U, An, E,C
CO2	Get knowledge about various methods and modes of distance education	1,3.	U, Ap, An
CO3	Know various technologies used for distance education and different strategies for maximizing its reach and programme evaluation	1,3,4	U, Ap, An,E

### Course Title: Market-Led Extension

Course Code: AGE- 533

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the significance of post-harvest management and value addition in present market environment, challenges and future strategy for market led extension management	1,2,3,5	R, U, An, E
CO2	Identify the information sources and develop strategy for market intelligence and the marketing infrastructure	1,3,5	U, Ap, An,C
CO3	Learn the public-private partnership for market led extension management, contract farming; WTO, its implications on agriculture	1,2,3,4,5,	U, Ap, An,E

### Course Title: Agri -Business Management (Minor)

Course Code: MGT-430

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand different marketing concepts, various policies, strategies and marketing systems in the context of agricultural inputs and output	1,4	R,U,An
CO2	Get insight on the problems faced by processors in the processing of agricultural products.	1,4	R, U, An, Ap



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### Course Title: Gender Sensitization and Empowerment Course Code: EXT- 541

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the socio-cultural construction of gender that shapes the experience of men and women in the society	1,2,3,5	R, U, An, E,C
CO2	Get awareness about the gender equality in law, social systems and democratic activities	1,3	U, Ap, An
CO3	Reduce the barrier caused due the discrimination and gender bias	1,3,5	U, Ap, An,E
CO4	Practice various techniques used to sensitize people about gender roles.	1,2,3,5	U,Ap, An, C

### Course Title: Visual communication Course Code: EXT- 542

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the role, characteristics and functions of various visual and graphics in communication, which can be used in extension education	1,2,3	R, U, An, E
CO2	Select the type of visual aids according to different situations	1,3	U, Ap, An, C
CO3	Learn the use of various low cost visual aids and their preparations	1,2,3	U, Ap, An,E
CO4	Enhance their skills to generate computer aided graphical presentations.	1,3	U, Ap, C





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### M.Sc. Ag. HORTICULTURE (FRUIT SCIENCE)

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES

<b>PSO-1</b>	Students will be able to transfer knowledge of Horticulture in the field of research including fruits, vegetables, flowers, spices, aromatic and medicinal plants and their management.
<b>PSO-2</b>	Development of agro innovative techniques for enhancement of production of horticultural crops.
<b>PSO-3</b>	Adoption of hi-tech Horticulture to increase the farmer's income.
<b>PSO-4</b>	Teaching and training for the development of socially and economically depressed segment of society.
<b>PSO-5</b>	Conservation of plant diversity through crop improvement.
<b>PSO-6.</b>	Prolong the quality and shelf life of horticultural produce through value addition of the products and to reduce post-harvest losses.
<b>PSO-7</b>	Understand the biochemical reactions and their pathway in the cells for growth and plant development
<b>PSO-8</b>	This Programme provides information about how to collect material related to their research problem.
<b>PSO-9</b>	Provides information about how to write thesis and collect research papers related to their research work.
<b>PSO-10</b>	Student learn about the arrangement of books and journals in library and how to find a particular subject book from the library.
<b>PSO-11</b>	Provides information to the student about how to publish their research papers in different journals
<b>PSO-12</b>	Students learn about various sampling techniques and analyse the data on the basis of Probability, sampling techniques, standard error etc.
<b>PSO-13</b>	Find out a suitable design for the data analysis



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### COURSE OUTCOMES (COs)

#### SEMESTER-I

**Course Title: Tropical Fruit Production and Dry Land Horticulture**

**Course Code: FSC- 511**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain basic knowledge on the importance and management of tropical and dryland fruits of India.	1,3	R, U,An, Ap
CO2	Identify commercial varieties of tropical and dryland fruits of regional, national and international importance and study the recent trends of their propagation on compatible rootstocks.	1,2,3,5	Ap, An, E, C
CO3	Know the eco-physiological requirements for their cultivation.	1, 3	U, An, E,
CO 4	Acquaint themselves with the planting systems, canopy, nutrients and water management.	3,4,5	U,An, Ap, C
CO5	Adopt post-harvest handling techniques including grading, packaging, storage and ripening of fruit crops.	1,2, 3,4,5	U, Ap, An,E,C
CO6	Know the export potential of agricultural export zones and industrial support to fruit plants.	3,4,5	U,An, Ap



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**Course Title: Nutrient and Canopy Management in Fruit Crops**

**Course Code: FSC- 512**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquire knowledge about the essential elements and their role in fruit plants and their interaction	1,5	U, Ap, An
CO2	Manage canopy keeping in view its effect on vegetative growth and quality of crop plants.	2,3,4,5	U, Ap, An, E, C
CO3	Apply canopy development studies in relation to growth, flowering, fruiting and improving fruit quality in temperate, sub tropical and arid climate zones	2, 3,4	U,An, Ap

**Course Title: Systematic Pomology**

**Course Code: FSC-513**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Identify various types of fruits and their varieties	1,2,5	R, U, E
CO2	Know the nomenclature, speciation and classification of fruits grown in tropical, subtropical and temperate climate zones	1,3,	U, Ap, E
CO3	Learn the pomological description of fruits grown in tropical, subtropical and temperate climate zones	1,2, 6	U, Ap, An,E



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**Course Title: Technical writing & communication skills****Course Code: TWC- 514**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic definitions, descriptions, process explanations and other common forms of technical writing	9	R, U,An
CO2	Understand how to follow the stages of writing process and apply them to technical and workplace writing tasks	9	R, U,An,Ap
CO3	Synthesize material collected from primary and secondary sources with their own ideas in research papers	9	U, An,Ap,C

**Course Title: Fundamentals of Plant Biochemistry****Course Code: BCH-513**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic behavior and nature of the bio-molecules.	7	R, U,
CO2	Understand the basic bio-physiological pathways operating inside the plants at the molecular level.	7	U,An
CO3	Get basic understanding of the bio-molecules and their interactions which help in the development of the more potent plant pesticides and plant weedicides.	7	U,An,Ap, ,C





Estd. 1892

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**Course Title: Principles of Plant Breeding (minor)**

**Course Code: PBG- 513**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get basic knowledge about the importance of plant breeding.	5	R, U,An, Ap, C
CO2	Have brief knowledge on the commercial varieties, their adaptability and stability in the region	5	R,U, An, C
CO 3	Know the ideotype requirements in the particular parts of India.	5	R,U,An
CO 4	Acquaint themselves with the breeding methods of different varieties of crops.	5	U,Ap, C
CO 5	Know hybrid and transgressive breeding.	5	U,C
CO 6	Study inflorescence, fruit set, maturity, harvesting and quality improvement of different crops.	5	U, An,Ap
CO 7	Know breeding for physiological disorders, insect-pest and diseases of fruit crops.	5	U, Ap,C



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**Course Title: Statistical Methods for Research Workers**

**Course Code: STA-415**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the concept of probability theory, sampling techniques, standard error etc.	12	R, U, E, An, Ap
CO2	Apply correction and regression techniques.	12	R, U, E, An, Ap
CO3	Know the application of T-Test, chi-square and large sample tests	12	U, An, Ap,E

### SEMESTER-II

**Course Title: Sub Tropical and Temperate Fruit Production**

**Course Code: FSC-521**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Have basic knowledge about the importance and management of fruits grown in subtropical and temperate climate zones in India.	1,3	R, U, Ap
CO2	Identify commercial varieties of fruits of local , national and international importance being grown in various subtropical and temperate climate zones	1,2,3,5	U,Ap, An, E, C
CO3	Know the eco-physiological requirements for their cultivation	1, 3	U, An, E,
CO4	Acquaint themselves with the planting systems, canopy, nutrient and water management	3,4,5	U, Ap, C



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CO5	Understand the role of fertigation, bio-regulators, pollination and factors affecting fruit production	1,2,	U, Ap, An
CO6	Adopt various propagation methods and compatible rootstocks for the fruit plants	3,4,5	U, Ap
CO7	Understand inflorescence, fruit set, maturity, harvesting and quality improvement of fruits.	1,3	U, Ap
CO8	Identify physiological disorders, insect-pest and diseases of fruit crops	1,2,3,5	Ap, An, E, C
CO9	Apply post-harvest handling practices including grading, packaging, storage and ripening of fruit crops.	1, 3	U, An, E,
C010	Have knowledge on export potential, agricultural export zones and industrial support to fruit plants.	3,4,5	U, Ap, C

**Course Title: Breeding of Fruit Crops**

**Course Code: FSC-522**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Update their knowledge on recent trends in the field of breeding of tropical, subtropical and temperate fruit crops of India	1,5	Ap, E, C
CO2	Acquaint themselves with the plant genetic resources such as importance, selection of parental germplasm, recording of phenotypic variation and selection among progeny	5	Ap, C



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CO3	Understand blossom biology (flower and fertilization) in breeding programs	1,5	U ,An
CO4	Understand bio-technological interventions, achievements and crop improvement methods based on the introduction, selection, hybridization, mutation polyploidy and rootstock breeding in tropical, sub-tropical and temperate fruit plants.	3,4, 5	Ap, An, C

**Course Title: Post Harvest Technology of Fruit Crops**

**Course Code: FSC-523**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the importance, principles and methods of post-harvest management of horticultural crops	1,4	R, U
CO2	Judge the maturity indices, ripening, pre and post harvesting practices for marketing and transpiration loss of produce.	1,4,6	U,An ,E
CO3	Study the ripening physiology and biochemical changes occurring during the ripening, senescence, ethylene evolution and ethylene management along with the factors responsible for post-harvest loss and its control	1,4,6	R, U
CO4	Learn the storage methods along with preservation and value addition of horticultural produce	2,6	U, Ap, An
CO5	Learn the concept for processing and quality evaluation of the produce	2,6	Ap, An





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Course Title: Nursery Management of Horticultural Crops

Course Code: FSC-524

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the principles of plant propagation in context to different methods of cutting, budding, layering and grafting	1,4	R, U,C,Ap
CO2	Gain knowledge on seed dormancy and seed germination.	2,4,5	Ap, C
CO3	Study about the process of graft union and physiology of rootstocks used in propagation of plants	2,4,5	U,Ap, C
CO4	Acquaint themselves with containers media and mixtures	2,3	Ap, An
CO5	Know about various propagation structures used in propagation of plants.	2,3,4,5	Ap, An, C
CO6	get knowledge on nursery act, quarantine and certification	1	U,An
CO7	Practice different rootstock used for budding and grafting	2, 3,4,5	Ap, An, E,C
CO8	Assess the economics of raising fruit plant nursery and its maintenance	1,2,3,4	U,An, E,C



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**Course Title: Breeding for biotic and abiotic stress resistance (minor)**

**Course Code: PBG- 420**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge on breeding techniques for imparting insect and pest resistance to plants	5	R, U, Ap, C
CO2	Learn various techniques for making stress tolerant varieties of crops for different climatic conditions	5	U, An, Ap, C

**Course Title: Experiments in Biochemistry**

**Course Code: BCH-420**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the determination of sugars, starch, fatty acids and cholesterol.	12	R, U, An, Ap
CO2	Learn the determination of amino acids and proteins, vitamin and chlorophyll content	12	U, An, Ap



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**Course Title: Experimental Designs for Research Worker**

**Course Code: STA-425**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the need for designing experiments, different designs of experiments, their characteristics and basic principles.	13	R,U,Ap
CO2	Learn about the selection of experimental designs, mechanical errors in the field experiments and methods of reducing such errors; interpretation of data and presentation of research results efficiently.	13	U,Ap,An,E,C

### SEMESTER-III

**Course Title: Principles and Practices of Plant Propagation**

**Course Code: FSC-531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Define biological principles relevant to plant sexual and asexual reproduction through seed, cutting, budding, grafting and micro propagation techniques	1,4	R, U,C,Ap
CO2	Relate various seed and clonal propagation approaches used in fruit production.	2,4,5	U, Ap, An, E, C



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CO3	Describe environmental and edaphic factors for developmental and physiological stage on the regeneration of plants by sexual and asexual means	2,4,5	U,Ap,
CO4	Understand plant tissue culture practices used in the production including aseptic technique, preparation of culture media, criteria for choosing an explant and use of growth regulators in vitro.	2,3,5	Ap, An,E,C
CO5	Apply knowledge of propagation techniques to solve challenges in plant conservation, breeding and improvement of fruit plants.	2,3,4,5	U, Ap, An, C

**Course Title: Plant Growth Regulators in Fruit Crops**

**Course Code: FSC-532**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the physiological role of various PGRs in fruit plants	1,4	R, U,C,Ap
CO2	Understand various methods of application, methods of isolation and estimation along with mechanism of action of PGRs in fruit plants	2,4,5	U, Ap, An, E, C
CO3	Learn the role of PGRs in plant propagation, seed dormancy, apical dominance, rooting of cuttings, flower initiation, fruit set and development.	2,4,5	U,An,Ap,
CO4	Understand the role of PGRs in flower and fruit thinning, development of parthenocarpic fruits, fruit	2,3,5	Ap, An,E,C





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	drop and abscission, fruit ripening and quality improvement of fruits.		
CO5	Prepare various PGRs solution having different concentration	2,3,4,5	U, Ap, An, C
CO6	Learn the isolation and bioassay for different PGRs in fruit plants	2,3,4,5	U, Ap, An, C

**Course Title: Maintenance breeding and concepts of variety release and seed production**

**Course Code: BCH-430**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the development, maintenance and production of a crop variety	5	R, U, An
CO2	Produce quality seeds of cereals and millets, pulses, oilseeds, cotton and forages	5	U, R, An
CO3	Know the seed certification rules applicable at national and international levels.	5	U, An, Ap, C



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**Course Title: Fundamentals of nutritional biochemistry**

**Course Code: BCH-430**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the chemical pathways of different nutritional parameters	12	R, U, An
CO2	know the concepts of metabolism in proteins, carbohydrates and lipids	12	U,An

### SEMESTER-IV

**Course Title: Citriculture**

**Course Code: FSC-541**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Identify different citrus species and cultivars	1,4	R, U,C,Ap
CO2	Understand Ecological requirements of various citrus species	2,4,5	U, Ap, An, E
CO3	Practice propagation and rootstocks selection of different citrus species	2,4,5	U,An,Ap,
CO4	Understand the pruning, intercropping, weed control,	2,3,5	Ap, An,E,C



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	fertilization and irrigation methods of citrus.		
CO5	Identify physiological and pathological disorders of citrus and their control	2,3,4,5	U, Ap, An, C

**Course Title: Orchard Floor Management and Organic Agriculture**

**Course Code: FSC-542**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Assess soil quality and its management for orchard plantation	1,3,4,5	U, An, Ap
CO2	Get knowledge on the organic farming, different organic inputs and their role in organic agriculture	1,2,4,5	U, Ap, An, E, C
CO3	Get knowledge on EM technology, soil fertility, weed management and their impact	2,3,4,5	U,Ap,C
CO4	Develop understanding about the organic agriculture production systems and good agricultural practices (GAP).	2,3,5	U,An, Ap
CO5	Study the impact of organic farming on eco-system.	2,3,4,5	U,Ap, An,E



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### M.Sc. Ag. (PLANT PATHOLOGY) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1	To impart knowledge to the students on basic concepts, terminology of plant pathology, quarantine restriction in movements of agricultural products
PSO-2	To impart knowledge on the classification and identification of plant pathogens; history, importance, rule and regulation of quarantine.
PSO-3	To impart knowledge to the students about application of biological, cultural, chemical and biocontrol agents and about compatibility and integration in IDM
PSO-4	To impart knowledge on collection, identification and preservation of specimens of plant pathogenic fungi, bacteria nematodes etc.
PSO-5	To impart knowledge on history, importance and principles of plant pathology and understanding of insect pest management strategies and about new advancements in pest management in fields and in warehouses
PSO-6.	To impart knowledge about measuring diseases, spore dispersal and trapping of different plant diseases; weather recording, multiplication of inoculums of diseased samples and their reporting.
PSO-7	To impart knowledge on the principles, growth, reproduction, survival and dispersal of important plant pathogens and their symptomatology
PSO-8	To impart knowledge on different serological and molecular techniques for plant disease detection and seed certification
PSO-9	To impart knowledge about the formulation of different fungicides and plant protection appliances, formulation of fungicides, bactericides and nematicides used in different <i>in vitro</i> techniques
PSO-10	To impart knowledge on basic concepts and terminology of plant viral pathogens, nematodes and their symptomatology and different methods for testing vegetative propagules.
PSO-11	To impart knowledge to the students about different staining methods, biochemical and serological characterization of bacteria, plant DNA extraction and their purification, Agarose gel electrophoresis, Homogenization of leaves and subcellular fractionation by centrifugation
PSO-12	To have working knowledge on the use of statistical techniques to collect and analyze data and interpret and evaluate the results.
PSO-13	To provide information about how to collect material related to their research, data analysis, how to write thesis, use scientific language in thesis, and how to publish the research papers in different journals.





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### COURSE OUTCOMES

Semester: I

Course Title: Mycology

Course Code: PPL-511

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge of plant pathogen nomenclature and classification	1	R,U,An
CO2	Identify different groups of fungi	1,2	R,U,Ap,An,
CO3	Know the collection, identification and preservation of specimens of plant pathogenic fungi	3,4,6	R,U,Ap
CO4	Get knowledge on basic concepts and terminology of plant pathology	1,3,6	U,Ap,An,C

Course Title: Principles of Plant Pathology

Course Code: PPL-512

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn history and importance of plant pathology	2,5,7	R,U
CO2	Know the principles of survival and dispersal of important plant pathogens involved in the plant diseases	2,5,6	R,U,Ap
CO3	Know different serological and molecular techniques for plant disease detection	2,7,8	U,Ap,An
CO4	Study about biotic and abiotic causes of plant diseases and its management	2,4,5	U,An,Ap



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**Course Title: Integrated Disease Management**

**Course Code: PPL-513**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about the concept and tools of disease management	3,4,7,8	R,U
CO2	Get knowledge about the development of IDM and its adaptation in important crops like rice, wheat, cotton, sugarcane, chickpea, rapeseed mustard, pearl millet, vegetables and fruit crops	7,8	R,U,Ap
CO3	Learn the application of biological, cultural, chemical and biocontrol agents	3,4,7	U,Ap,An

**Course Title: Technical writing & communication skills**

**Course Code: TWC -514**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic components of definitions, descriptions, process explanations and other common forms of technical writing	13	R, U,An
CO2	Understand how to follow the stages of the writing process and apply them to technical and workplace writing tasks	13	U,An,Ap
CO3	Synthesize material collected from primary and secondary sources with their own ideas in research papers	13	U,An, Ap



Estd. 1892

# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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**Course Title: Biological control of Insect Pests****Course Code: ENT -531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about various biocontrol agents used to prevent the attack of pests to promote eco-friendly control methods.	3,9	U,Ap,An,E
CO2	Learn the mass multiplication techniques of biocontrol agents through hands-on training, which enables them to earn income from industrial production of biocontrol agents.	9	U,An,Ap,E,C
CO3	Check the field efficacy of various formulations of biocontrol agents.	3,9	Ap,An,E,C
CO4	Understand the trends and future possibilities of biological control and the role of biotechnology and semiochemicals in biological control.	3,9	U,An,Ap,E

**Course Title: Plant nematology****Course Code: NEM-410**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the importance of plant parasites and their classification	1,2	U,An
CO2	Know about the morphology and biology of important genera of nematodes	1,2	U,An
CO3	Know various methods to control, collect and extract nematodes	10	U,An,Ap
CO4	Know how to use nematodes in agriculture	1	U,An,Ap



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**Course Title: Statistical Methods for Research Workers**

**Course Code: STA-415**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the statistical concepts applied in agricultural research.	12,13	R,U,Ap
CO2	Impart knowledge of probability, frequency distributions, sampling techniques, mean, standard error, correlation and regression	12,13	R,U,Ap,An,E
CO3	Acquire skills in analysing statistical data efficiently using various statistical methods	12,13	R,U,Ap,An,E

### Semester: II

**Course Title: Plant Virology**

**Course Code: PPL-521**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	understand thorough knowledge on symptoms, transmission, assay of viruses and their physical properties	1,2	R,U
CO2	study about different serological tests, electron microscopy and molecular diagnostics techniques	1,2,5	R,U,An,
CO3	Diagnose the representative viral diseases and different principles of plant viral diseases.	1,5	Ap,An,E,C





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**Course Title: Plant Bacteriology****Course Code: PPL-522**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	get to know about basic concepts and terminology of plant	2,4	R,U
CO2	Learn about classification and identification of plant bacterial pathogens, symptomatology and disease management.	10,11	R,U,Ap
CO3	learn isolation, purification, identification and host inoculation of phytopathogenic bacteria	11	R,U,Ap,An
CO4	get acquainted different staining methods, biochemical and serological characterization of bacteria	11	R,U,Ap,An,E

**Course Title: Fungal Diseases of Plant****Course Code: PPL-523**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the classification and characterization of fungi.	2,6	R,U
CO2	know importance of sign and symptoms for detection of fungal diseases and their management	2,6,9	R,U,Ap
CO3	impart knowledge to students about important phytopathogenic genera and of fungi and their identification	2	U,Ap,An,E,



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### Course Title: Ecology of Plant Pathogens

Course Code: PPL-524

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study about different biocontrol agents and their Inoculum potential and density in relation to host	3,7	R,U,Ap
CO2	Understand about Dispersal, survival and dormancy of plant pathogens	7	U,Ap,E,C

### Course Title: Principles and procedures of certification

Course Code: PPL-524

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know rule and regulations of seed certifications	8,10	U,Ap,E,C
CO2	Know methods of seed testing	8	U,Ap,E,C
CO3	Understand role of seed health certification in national and international trade	10	U,Ap,E,C

### Course Title: Storage Entomology

Course Code: ENT- 542

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the history and basic concept of storage entomology. They will learn about post-harvest losses, their estimation and factors governing post-harvest losses	5,6	R,U
CO2	Get knowledge about different pests related to stored grains and agricultural products. They will also study the associations of stored grain insects with other micro-organisms..	5,6	R,U,Ap, An,E



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CO3	Know about different storage structures, ideal storage conditions and preventive as well as curative measures for the management of stored grain pests.	5,6	R,U,Ap, An
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**Course Title: Nematode disease of crops****Course Code: NEM-420**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Diagnose nematodes diseases and their damage in different crops	4,10	R,U,Ap,An
CO2	know nematode interaction with other organisms and crops	4, 10	R U Ap
CO3	Know importance of nematodes in horticultural crops	4 10	R,U

**Course Title: Experimental Designs for Research Worker****Course Code: STA-425**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the need for designing experiments. They will get knowledge about different designs, their characteristics and basic principles.	12,13	R,U,Ap
CO2	Learn about selection of experimental designs, mechanical errors in field experiments and methods of reducing such errors, interpretation of data and presentation of research results efficiently.	12,13	R,U,Ap,An,E, C



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### Semester: III

**Course Title: Epidemiology and Forecasting of Plant Diseases Course Code: PPL-531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	learn about survey and surveillance, vigilance and crop loss assessment models	3,7,9	R,U,Ap
CO2	impart knowledge to the students on basic concepts of disease epidemiology its history and importance in the disease development	3,7,9	R,U,,An,E,C
CO3	know students about principles and pre-requisites of disease forecasting, procedures of modeling disease growth and disease prediction	3,7,	Ap,An,E

**Course Title: Quarantine in Plant Protection**

**Course Code: PPL-532**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	get knowledge about importance of quarantine for domestic and international restrictions in the movement of agricultural produce including seeds and planting material	1,2	R,U,Ap,An
CO2	understand history of quarantine legislations, PQ Order 2003, Environmental Acts and APEDA	1,2	R,U,Ap
CO3	Students will get knowledge about Import and Export of bio-control agents	1,2	R,U,Ap,An, E





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**Course Title: Integrated Pest Management** **Course Code: ENT-532**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about origin, history, concept, philosophy and ecological principles of IPM.	1,3	R,U,Ap
CO2	Assess crop losses, economic thresholds and cost benefit ratios.	3,5	R,U,Ap,An ,E
CO3	Get acquainted with different sampling techniques and insect-pest population estimation methods.	13	R,U,Ap,An ,E
CO4	Learn about designing and implementation of IPM programmes for different crops and constraints in IPM implementation.	3	R,U,Ap,An ,E,C

### Semester: IV

**Course Title: Detection and Diagnosis of Plant Diseases** **Course Code: ENT-541**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	acquainted about detection and diagnosis of various plant pathogens, their isolation, preservation	7,11	R,U,Ap
CO2	students about various plant pathological lab techniques	7,11	R,U,Ap
CO3	study about pure culture techniques and use of selective media to isolate pathogens and use of hemocytometer, micrometer, centrifuge, pH meter, camera lucida	7,11	R,U,Ap



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CO 4	study about Principles, constriction and working of different microscopic techniques and staining methods	7,11	R,U,Ap
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**Course Title: Chemical in Plant Disease Management**

**Course Code: ENT-542**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	impart knowledge about history and development of agrochemicals, different terms and definitions, classification, advantages and disadvantages of chemicals	5,7	R,U,Ap,An
CO2	impart knowledge on various formulations, mode of actions, their applications, handling and storage	5,7	R,U,Ap
CO3	Detection of naturally occurring fungicide resistant mutants of pathogen and to study about different methods of application of chemicals	6	R,U,Ap,An,E



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### M.Sc. Ag. (SOIL SCIENCE & AGRICULTURAL CHEMISTRY) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Program Specific Outcomes (PSOs)

PSO-1	To acquaint the students with behavior of physical properties in relation to crop production, plant growth, morphology and growth parameters of different crops
PSO-2	Students will learn about methods of soil fertility evaluation and fertilizer recommendation.
PSO-3	To acquaint the students with concepts of soil chemistry and to familiarize students with modern developments in chemistry of soils in relation to using soils as a medium for plant growth.
PSO-4	Students will learn about structure of aluminosilicate minerals and genesis of clay minerals; soil genesis in terms of factors and processes of soil formation, and to enable students conduct soil survey and interpret soil survey reports in terms of land use planning
PSO-5	This programme also provides detailed knowledge regarding landform- soil relationship, major soil groups of India with special reference to respective states. Land capability and land irrigability classification.
PSO-6.	To teach students the basics of soil biology and biochemistry, including biogeochemical cycles, plant growth promoting rhizobacteria, microbial interactions in soil and other soil activities.
PSO-7	The course provides information about biotic factors in soil development, microbial toxins in the soil, preparation and preservation of organic manures, rural and urban composts and vermicomposting.
PSO-8	The programme provides knowledge on the history, distribution, identification and description of soil erosion problems in India, soil conservation planning in hilly, arid and semiarid regions, waterlogged and wet land.
PSO-9	Students will learn about farming systems; Concept and its role in sustainability of agriculture
PSO-10	To make the students aware of the problems of soil, water and air pollution associated with use of soils for crop production.
PSO-11	To familiarize the students with commonly used instruments – their working, preparations of common analytical reagents for qualitative and quantitative analysis of both soil as well as plant samples.
PSO-12	To provide information about area, distribution, origin and basic concepts of problematic soils, monitoring and management of salt- affected soils, salt tolerance of crops - mechanism and ratings.
PSO-13	To provide information about model, mathematical model, modeling processes and abstraction technique. Simulation models their verification, validation and calibration.



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<b>PSO-14</b>	The students would be exposed to concepts of statistical methods and statistical inference that would help them in understanding the importance of statistics. It would also help them study various experimental designs and transform the various inferences for agricultural experiments.
<b>PSO-15</b>	To provide knowledge about organic farming, sustainable farming and integrated farming system; recent updates in resource conservation. i.e. crop residue, water and soil, cropping systems and interaction between farm enterprises.
<b>PSO-16</b>	This programme provides information about how to collect material related to their research, how to write thesis, use scientific language in thesis, and how to publish their research paper in different journals
<b>COURSE OUTCOMES (COs)</b>	

**SEMESTER-I****Course Title: Soil Physics****Course Code: SSC-511**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about physical properties (viz., texture, structure, density of soil, soil temperature, soil air etc.) of different soils	1	R, U, Ap, C
CO2	Acquaint students with behavior of physical properties in relation to crop production, plant growth and Irrigation	1,3	U, Ap, C
CO3	Get familiar with soil structure genesis and measurements and evaluation for soil crusting and the effect of puddling on physical properties of soil	1,5	U, Ap, An, C
CO4	Learn about the soil water - retention, constants and energy state of soil water, soil-moisture characteristics and hysteresis.	1	U, An, Ap
CO5	Get information about hydrologic cycle, field water balance, soil-plant-atmosphere continuum and Soil aeration and temperature in relation to plant growth.	1	U, An, Ap

**Course Title: Soil Fertility and Fertilizer Use****Course Code: SSC-512**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn in detail about soil fertility and soil productivity, soil N - sources and N transformations, Nitrogenous fertilizers - their fate in soils and enhancing N use efficiency	2,3	R, U, Ap, C
CO2	Get information about soil P & K- forms, reactions in soils and factors affecting availability and the management of Phosphorus and Potassium fertilizers.	2,8	U, Ap, C





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CO3	Get knowledge about S, Ca and Mg - source, forms, fertilizers and their behavior in soils and management. Micronutrients, factors affecting their availability, sources and management.	3,7	U, Ap, An, C
CO4	Learn about methods of soil fertility evaluation and fertilizer recommendation.	2	U, An, Ap

**Course Title: Soil Chemistry****Course Code: SSC-513**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn in detail about chemical composition of earth's crust and soil, their chemical aspects, chemical reaction process occurring in soil, chemistry of problematic soils	3,8	R, U, Ap, C
CO2	Get detailed knowledge about Inorganic and organic colloids-surface charge characteristics and electrometric and sorption properties of soil colloid.	3	U, Ap, C
CO3	Learn about soil organic matter-fractionation, clay-organic interactions. Cations exchange-theories, adsorption isotherms, hysteresis in sorption-desorption of oxy-anions and anions.	3,9	U, Ap, An, C
CO4	Learn about experimental methods to study ion exchange phenomena and practical implications in plant nutrition. Chemistry of problematic soils and management aspects	2,10	U, An, Ap

**Course Title: Technical writing & communication skills****Course Code: TWC- 514**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic components of definitions, descriptions, process explanations and other common forms of technical writing	16	R, U,C
CO2	Understand and know how to follow the stages of the writing process and apply them to technical and workplace writing tasks	16	U,C
CO3	Synthesize and integrate material from primary and secondary sources with their own ideas in research papers	16	U, Ap,C



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**Course Title: Crop Ecology (Minor) Course Code: AGR-410**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand about ecology in relation to crop; Eco system, its components and energy flow- food chain and energy output relationships.	4,7	R, U, Ap, C
CO2	Learn about various farming systems of the world.	4,10	U, Ap, C
CO3	Learn about family, co-operative and collective farming, their occurrence, adaptation and weakness; Cropping systems, their characteristics and management.	4,9	U, Ap, An, C
CO4	Get information regarding Cropping patterns; farm selection, size of the farm and farm layout, cropping schemes and crop plans.	4,11	R, U, An, Ap
CO5	Get experimental knowledge regarding preparation of farm layout plans, different intensity crop rotations and cropping schemes.	4	U, Ap, An, C

**Course Title: Statistical Methods for Research Workers Course Code: STA-415**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge of probability, sampling techniques , standard error etc.	14	R, U, E, An, Ap
CO2	Application of Correction and regression techniques.	14	U, E, An, Ap
CO3	Application of T-Test, chi-square and large sample test	14	U, E, An, Ap

### SEMESTER-II

**Course Title: Soil Mineralogy, Genesis, Classification and Survey Course Code: SSC-521**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about fundamentals of crystallography, space lattice, isomorphism and polymorphism. Classification, structure, chemical composition and properties of clay minerals. Genesis and transformation of crystalline clay minerals. Clay minerals in Indian soils.	8	R, U, Ap, C
CO2	Get information regarding soil formation - factors, models, processes.	8,5	U, Ap, C
CO3	Learn about soil classification systems, soil survey, soil series, benchmark soils and soil correlations. Soil survey interpretations. Techniques for generation of soil maps.	4,8	U, Ap, An, C



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# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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CO4	Get detailed knowledge regarding landforms- soil relationship, major soil groups of India with special reference to respective states.	4,5	U, An, Ap
CO5	Get experimental knowledge in context to identification and quantification of minerals in soils.	4	U, Ap, An, C

**Course Title: Soil Biology and Biochemistry****Course Code: SSC-522**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about soil biota, soil microbial ecology, types of organisms, Soil microbial biomass, microbial interactions, un- culturable soil biota, Microbiology and biochemistry of root-soil interface.	6,7	R, U, Ap, C
CO2	Understand about soil enzymes, soil characteristics influencing growth and activity of micro flor, Microbial transformations of N, P, S, Fe and Mn in soil.	6,11	U, Ap, C
CO3	Get information about biotic factors in soil development. Microbial toxins in the soil. Preparation and preservation of organic manures, rural and urban composts and vermicomposting.	7,11	R, U, An, Ap
CO4	Get experimental knowledge regarding determination of soil microbial population, soil microbial biomass, and measurement of the important soil microbial processes such as ammonification, nitrification, N <sub>2</sub> fixation, S oxidation, P solubilization and mineralization of other micro nutrients.	7	U, Ap, An, C

**SEMESTER-III****Course Title: Soil Erosion and Conservation****Course Code: SSC-523**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand about identification and description of soil erosion problems in India.	8,12	R, U, Ap, C
CO2	Know about wind erosion and principles and practices of erosion control.	8	U, Ap, C
CO3	Learn about soil conservation planning in hilly, arid and semiarid regions, waterlogged and wet land. They will learn about land degradation and its impact on soil productivity.	12	U, Ap, An, C



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CO4	Get knowledge about watershed management, water harvesting, recycling, flood control, socio-economic aspects of watershed management, and case study in respect to monitoring and evaluation of watersheds and Remote Sensing.	8,12	U, An, Ap
CO5	Understand about erodibility indices, computation of kinetic energy of falling rain drops, computation of rainfall erosivity indices using rain gauge data, Measurement and estimation of runoff and soil loss. Visits to soil and water conservation works	8	U, Ap, An, C

**Course Title: Farm Cropping System (Minor)**

**Course Code: AGR-420**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about farming systems; concept and its role in sustainability of agriculture; resource management in relation to farm cropping systems.	9,15	R, U, Ap, C
CO2	Get knowledge on crop yield appraisals; plant interaction, criteria for assessing yield advantages.	9	U, Ap, C
CO3	Learn about evaluation and productivity of multiple cropping systems.	15	U, Ap, An, C
CO4	Get information regarding cropping systems with perennials, Comparison of chemical and organic farming.	9	R, U, An, Ap
CO5	Get a chance to visit farming system and agro-based industries and get experimental knowledge of farm lay out plan, cropping scheme; Estimation of crop yield, calculation of harvest index, land equitant ratio in mixed crops/ intercrops.	15	U, Ap, An, C





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**Course Title: Agricultural research and publication ethics Course Code: PGS-502**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the moral judgment and reactions	16	U, R and C
CO2	Identify the publication misconduct, scientific misconduct, complaints and appeals	16	U,R, An

**Course Title: Soil, Water and Air Pollution Course Code: SSC-531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get information about soil, water and air pollution problems associated with agriculture.	10	R, U, Ap, C
CO2	Learn about pollution of water resources, Sewage and industrial effluents - their composition and effect on soil, plant growth and human beings.	10,11	U, Ap, C
CO3	Learn about pesticides - their classification, behavior in soil and effect on soil micro- organisms.	10,12	U, Ap, An, C
CO4	Get information about emission of greenhouse gases. Remote sensing applications in monitoring and management of soil and water pollution to Safeguard food safety.	8,12	U, An, Ap
CO5	Study about sampling of sewage waters and sludge, industrial wastes, polluted soils and plants. Visit various industrial sites to study the impact of pollutants on soil and plants.	10	U, Ap, An, C

**Course Title: Analytical Techniques and Instrumental Methods (CourseCode: SSC-532)**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get information about atomic structure, Radioisotopes-properties and decay principles and Principles and use of radiation monitoring instruments.	10,12	R, U, Ap, C



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CO2	Learn about isotopic dilution techniques. Doses of radiation exposure, radiation safety aspects. Storage and handling of radioactive materials	10	U, Ap, C
CO3	Get information about principles of visible, ultraviolet and infrared spectrophotometer, inductively coupled plasma spectrometry.	10	U, Ap, An, C
CO4	learn about chromatographic techniques, mass spectrometry and X-ray diffractometry	10,12	R, U, An, Ap
CO5	Study about oxidation-reduction and complexometric titration, analyse soil and plant samples and plant materials by digesting plant material by wet and dry ashing and soil by wet digestion methods	10	U, Ap, An, C

**Course Title: Fertilizer Technology (Minor)****Course Code: SSC-430**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get information about fertilizer industry in India, raw materials, Manufacture of different types of fertilizers	3	R, U, Ap, C
CO2	Learn about granulation, segregation, caking, drying and cooling of fertilizers.	3	U, Ap, C
CO3	Get information about the complex, mixed, liquid, suspension and slow release fertilizers.	7	U, Ap, An, C
CO4	Learn about production of fertilizers containing secondary and micronutrients.	3	R, U, An, Ap

**Course Title: Fundamentals of Agro climatology (Minor)****Course Code: AGM-430**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study about surveys of the atmosphere; introduction to basic meteorological processes.	7,15	R, U, Ap, C



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CO2	Learn about atmospheric humidity and forms condensation; Evaporation and evapotranspiration; Winds, air masses and disturbance.	15	U, Ap, C
CO3	Get information about the influence of climate on plants, animals and pests; Meteorological droughts; indices in agro climatology.	7	U, Ap, An, C
CO4	Learn about agro climatic classifications and their application; field climate modification.	7	U, An, Ap
CO5	Study about meteorological instruments and their use in the measurement of agro climatic environment.	15	U, Ap, An, C

**Course Title: Physiology of growth and development Course Code: BOT-430**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know growth and physiological processes in plants	1	R, U, An, E, Ap, C
CO2	Use different growth substances in crop production	1	U, An, E, Ap, C
CO3	Use growth retardants in yield enhancement.	1	U, An, E, Ap, C

## SEMESTER-IV

**Course Title: Management of Problem Soils and Water Course Code: SSC-541**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get information about area, distribution, origin and basic concepts of problematic soils.	10	R, U, Ap, C
CO2	Learn about the management principles for sandy, clayey, red lateritic and dry land soils; Acid soils - nature, sources, management and effect on plant growth; Lime requirement of acid soils.	11,12	U, Ap, C
CO3	Learn about biological sickness of soils and its management, quality of irrigation water, management of brackish water and cropping pattern for utilizing poor quality ground waters	10	U, Ap, An, C
CO5	Understand the determination of cations [(Na <sup>+</sup> , K <sup>+</sup> , Ca <sup>++</sup> , and Mg <sup>++</sup> )] in ground water and soil samples. Determination of anions [(Cl <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup> , CO <sub>3</sub> <sup>2-</sup> and HCO <sub>3</sub> <sup>-</sup> )] in ground waters and soil samples. Lime and gypsum requirement of acid and sodic soil.	12	U, Ap, An, C



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Course Title: System Approaches in Soil and Crop Studies Course Code: SSC-542

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get information about system concepts, general system theory and thinking, dynamics, behavior and study of systems.	12	R, U, Ap, C
CO2	Get information about model, mathematical model, modeling concept, objective, processes and abstraction technique. Simulation models their verification, validation and calibration.	11,12	U, Ap, C
CO3	Learn about representation of continuous system and simulation, its design and analysis	12	U, Ap, An, C
CO4	Learn about the application of simulation models in understanding system behavior, optimizing system performance, evolution of policy options under different soil, water, and nutrient, climatic and cultural conditions.	10,12	U, An, Ap





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### **M.Sc. Ag. HORTICULTURE (VEGETABLE SCIENCE)** **Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)**

#### **PROGRAMME SPECIFIC OUTCOMES**

<b>PSO-1</b>	Basic knowledge of Vegetable Science and its various branches
<b>PSO-2</b>	Detailed knowledge of nursery growing and cultivation practices of vegetable crops will help the students to solve the field related problems in vegetable crops grown under field as well as protected conditions
<b>PSO-3</b>	To learn about the quality seed production (hybrid as well as varietal), seed certification, seed standards, seed act and law enforcement, plant quarantine and quality control
<b>PSO-4</b>	To acquaint the students with the history of vegetable breeding. origin, botany, taxonomy, cytogenetic, genetics, breeding objectives, breeding methods used in vegetables, resistance breeding for biotic and abiotic stress, quality improvement in vegetable crops
<b>PSO-5</b>	To get familiar with various biotechnological tools used in vegetable crop improvement
<b>PSO-6</b>	Detailed learning of different techniques and methods used in the vegetable production as well as vegetable breeding will improve the skills, decision making and research orientation of the students
<b>PSO-7</b>	To get the students acquainted with organic production of vegetables
<b>PSO-8</b>	Facilitating detailed study of post-harvest operation to increase yield and improvement of vegetable quality leading to successful marketing resulting in increasing the income of commercial vegetable growers
<b>PSO-9</b>	This programme will improve the communication skills of the students to deal with vegetable growers and researchers



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### COURSE OUTCOMES (COs)

#### SEMESTER-I

**Course Title:** Production Technology of Winter Season Vegetable Crops

**Course code:** VSC-511

Sr. no.	On completing the course. the students will be able to	PSOs addressed	Cognitive level
CO1	Learn about the Introduction, nutritional value, origin, botany and taxonomy of the vegetables grown in the winter season	1,2,4	R, U
CO2	Get the information about the important countries and states growing winter vegetables	1,2	R, An
CO3	Get knowledge about cultural practices of winter season vegetables, their post harvest management and plant protection measures	2,8	U, Ap
CO4	Learn about seed production of winter season vegetable crops	2, 3	U, Ap

**Course Title:** Breeding of Self Pollinated and Vegetatively Propagated Vegetable Crops

**Course code:** VSC-512

Sr. no.	On completing the course. the students will be able to	PSOs addressed	Cognitive level
CO1	Get knowledge about the history of vegetable breeding, origin, botany, taxonomy, cytogenetic, genetics, breeding objectives, breeding methods (introduction, selection, hybridization, mutation), resistance breeding for biotic and abiotic stress, quality improvement in self-pollinated crops and the concept of ideotype	4,5	R, U, Ap, E
CO2	Get information about molecular marker, marker assisted breeding and QTLs, biotechnology and their use in breeding in self-pollinated and vegetatively propagated vegetable crops	5,6	U, Ap, E
CO3	Get acquainted with the issues of patenting, PPV&FRA.	3,9	R, U, Ap



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CO4	Get information about present status of varietal/hybrid development in India	2,4	R, An, E
CO5	Learn about new approaches in breeding of self-pollinated	4,5,6	U, Ap, An, E

**Course Title:** Systematics of Vegetable Crops**Course code:** VSC-513

Sr. no.	On completing the course. the students will be able to	PSOs addressed	Cognitive level
CO1	Learn about the principles of classification, different methods of classification and salient features of international code of nomenclature of vegetable crops	1,4	R, U, Ap
CO2	Get acquainted with origin, history, evolution and distribution of vegetable crops, botanical description of families, genera and species covering various tropical, subtropical and temperate vegetables	4,9	U, Ap
CO3	Know about cytological level and descriptive keys for vegetables	4,6	An, Ap
CO4	Learn about importance of molecular markers in the evolution of vegetable crops, molecular markers as an aid in characterization and taxonomy of vegetable crops	5,6,9	An, Ap, E

**Course Title:** Technical writing & communication skills**Course Code:** TWC-514

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic components of definitions, descriptions, process explanations and other common forms of technical writing	6	R, U,
CO2	Understand how to follow the stages of the writing process and apply them to technical and workplace writing tasks	6	R, U
CO3	Synthesize material from primary and secondary sources with their own ideas in research papers	6	R, U, Ap



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**Course Title: Modern Concepts in Crop Production**      **Course Code: AGR-410**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand advanced concepts of crop growth and productivity in relation to climate change.	1,3	R, U, Ap, C
CO2	Gain knowledge on nano technology in agriculture	6	U, Ap, C
CO3	Acquire knowledge on modern concepts in tillage and farm mechanization.	1,6	U, Ap, An, C
CO4	Gain knowledge on the principles and components of organic farming and resource conservation technology.	2,3	U, An, Ap
CO5	Gain knowledge on ideal plant ideotypes and yield maximization	7	U, An, Ap

**Course Title: Statistical Methods for Research Workers**      **Course Code: STA-415**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge of probability, sampling techniques , standard error etc.	8	R, U, E, An, Ap
CO2	Apply correction and regression techniques.	8	R, U, E, An, Ap
CO3	Apply T-Test, chi-square and large sample tests	8	U, E, An, Ap

### SEMESTER-II

**Course Title:** Production Technology of Warm Season Vegetable Crops

**Course code:** VSC-521

Sr. no.	On completing the course, the students will be able to	PSOs addressed	Cognitive level
CO1	Get knowledge about Introduction, nutritional value, origin botany and taxonomy, important countries and states growing vegetables along with area	1,4	R, U
CO2	Learn about cultural practices, post-harvest management, plant protection measures of warm season vegetable crops	2,7	U, Ap





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CO3	Learn about seed production of warm season vegetable crops	3,9	U, Ap
CO4	Get acquainted with Polyhouse, net-house and low tunnel technology for offseason production of summer vegetables	2,6	U, An, Ap

**Course Title:** Breeding of Cross-pollinated Vegetable Crops

**Course code:** VSC-522

Sr. no.	On completing the course, the students will be able to	PSOs addressed	Cognitive level
CO1	Learn about the history of vegetable breeding, Origin, botany, taxonomy, cytogenetic, genetics, breeding objectives, breeding methods (introduction, selection, hybridization, mutation) and quality improvement, in cross pollinated crops	4,6,9	R, Ap
CO2	Get acquainted with molecular marker, marker assisted breeding and QTLs, biotechnology and their use in breeding cross pollinated vegetable crops	5,6	U, An, Ap
CO3	Get information on present status of varietal/hybrid development in India	1,2,4	U, An, Ap
CO4	Get familiar with new approaches in breeding of cross-pollinated vegetables	4,5,6	U, An, Ap, C

**Course Title:** Production Technology of Underexploited Vegetables Crops

**Course code:** VSC-523

Sr. no.	On completing the course, the students will be able to	PSOs addressed	Cognitive level
CO1	Get information about introduction, identification, botany and taxonomy of different underexploited vegetable crops	1,4	R, U, Ap



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CO2	Learn about the climatic & soil requirements and cultural practices followed in underexploited vegetable crops	2,9	U, Ap
CO3	Get knowledge about post-harvest management, plant protection measures and seed production of underexploited vegetable crops	2,3,8	U, An, Ap

**Course Title:** Commercial Vegetable production

**Course code:** VSC-524

Sr. no.	On completing the course, the students will be able to	PSOs addressed	Cognitive level
CO1	Get information about role of soil, climatic and agronomic factors in vegetable production	2,9	U, Ap
CO2	Get acquainted with the principles of cultivation including direct sowing, nursery management, transplanting, hardening of seedlings and vegetable forcing	2,6	R, U, Ap
CO3	Get knowledge about weeds and their control, crop rotation and intercropping in vegetable crops	1,2,9	U, Ap
CO4	Learn the export potentiality, post-harvest handling, processing, storage and marketing of vegetables	8,9	U, An, Ap

**Course Title:** Forcing Techniques in Vegetable Production

**Course code:** VST-524

Sr. no.	On completing the course, the students will be able to	PSOs addressed	Cognitive level
CO1	Learn about objectives, importance, scope and problems of protected cultivation	1,2	R, U
CO2	Get acquainted with nursery raising techniques, vegetable growing media Irrigation and fertigation technique used in vegetables, pest management in	2,6	U, An, Ap



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	greenhouse/glass house, crops and varieties suitable for protected cultivation		
CO3	Get information about environmental factors, sustainable land use systems, maximizing-land use efficiency in protected structures, soil sterilization techniques and hydroponics cultivation	1,2	U, Ap
CO4	Get knowledge about specific technology for raising tomato, sweet pepper, cucumber and high value crops in off season and their seed production of vegetables	2,6	U, Ap
CO5	Get acquainted with cladding material for protected structures use of mulches	1,2,6	U, An, Ap

**Course Title: Principles and Practices of Weed Management****Course Code: AGR-420**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge on weed biology and survey weeds in varied ecosystem.	4, 11	R, U, An, Ap
CO2	Identify the nature, type and economic uses of weeds in varied habitats.	1,4,11	R, U, An, Ap,
CO3	Gain knowledge on herbicide application techniques	11	U, An, Ap, C
CO4	Evaluate different methods of weed control	11	U, An, Ap, C
CO5	Formulate integrated weed management practices for different ecosystems	1,3,4	U, An, Ap, C

**Course Title: Experimental Designs for Research Workers****Course Code: STA-425**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about the designs, their principles, analysis of variance and interpretation of data.	8	R, U, An, E, Ap
CO2	Study various mechanical errors in field experiments, methods of reducing it and presentation of research results.	8	U, An, E Ap



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### SEMESTER-III

**Course Title:** Post-harvest Handling of Vegetable Crops

**Course code:** VSC-531

Sr. no.	On completing the course, the students will be able to	PSOs addressed	Cognitive level
CO1	Get knowledge about assessment of post-harvest losses, pre-harvest methods, practices effecting post-harvest shelf life and determination of maturity in different vegetable crops	2,8	R, U, Ap
CO2	Get acquainted with the mechanized harvesting of vegetables, pre cooling of vegetables using different techniques, post-harvest chemical and non-chemical treatments to enhance shelf life, sorting and grading for packaging	6,8	An, E, Ap
CO3	Get information about ripening of vegetables, packaging of vegetables including latest techniques like MAP, storage of vegetables including latest techniques like CA storage, food safety and quality, non-destructive methods of quality analysis	8,9	An, E, Ap
CO4	Get knowledge about quality of raw material for processing, transportation and destination handling, marketing, treatments before shipment and storage, fresh cut vegetables	6,8	U, An, Ap

**Course Title:** Protected Cultivation of Vegetable Crops

**Course code:** VSC-532

Sr. no.	On completing the course, the students will be able to	PSOs addressed	Cognitive level
CO1	Get acquainted with the importance, scope, principles, site selection, orientation, problems and remedies, classification and designs of protected cultivation of vegetable crops	1,2,6	R, U, Ap
CO2	Get detailed information about the effect of environmental factors, viz. temperature, light, CO2 and humidity, selection of varieties and hybrids, drip	2,6	U, An, Ap





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	irrigation and fertigation and role of plastic mulch under protected cultivation of vegetable crops		
CO3	Get acquaintance with nursery raising structures, Hi-tech nursery, nursery under portable plastic low tunnels	2,6,9	U, E, Ap
CO4	Get knowledge about use of protected structures for seed production	2,3	U, An, Ap
CO5	Get acquainted the students with technology for raising tomato, sweet pepper, cucumber and other high value vegetables crops in protected structures, training and staking in vegetable crops under protected structures	2,6,9	An, E, Ap
CO6	Learn about Hydroponics and Aeroponics	6,9	U, Ap

### SEMESTER-IV

**Course Title:** Seed Production Technology of Vegetable Crops

**Course code:** VSC-541

Sr. no.	On completing the course, the students will be able to	PSOs addressed	Cognitive level
CO1	get familiar with definition of seed and its quality; DUS test and scope of vegetable seed industry in India	3,9	R, U, Ap
CO2	get knowledge about agronomic principles and methods of seed production in important vegetable crops	2,3	U, An, E, Ap
CO3	use of growth regulators and chemicals in vegetable seed production; floral biology, pollination, breeding behaviour, seed development and maturation; methods of hybrid seed production	3,6	R, U, Ap
CO4	get acquainted with categories of seed; maintenance of nucleus, foundation and certified seed; seed certification, seed standards; seed act and law enforcement, plant quarantine and quality control	3,9	R, U, Ap
CO5	learn about physiological maturity, seed harvesting, extraction, curing, drying, grading, seed processing, seed coating and pelleting, packaging (containers/packets),	1,2,3	U, Ap



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	storage and cryopreservation of seeds, synthetic seed technology		
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**Course Title:** Organic Vegetable Production Technology

**Course code:** VSC-542

Sr. no.	On completing the course, the students will be able to	PSOs addressed	Cognitive level
CO1	get acquainted with importance, principles, perspective, concept and component of organic production of vegetable crops	1,7	R, U, Ap
CO2	get knowledge about managing soil fertility, pests and diseases and weed problems in organic farming system	7,9	U, An, E, Ap
CO3	get information about Indigenous methods of compost and biodynamics preparations etc	7	U, Ap
CO4	get information about processing and quality control, certification of organic products; organic production and export opportunity and challenges	6,7	U, An, E, Ap
CO5	learn about the cultural practices followed in organic production of vegetables crops	1,2,7	R, U, Ap



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### M.Sc. Biotechnology

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs):

<b>PSO-1</b>	To provide knowledge about the concepts related to biotechnology and related subjects.
<b>PSO-2</b>	To be aware of current research and have a working knowledge of genetic engineering, plant bio technology and agricultural biotechnology, as well as to present new bi technologies.
<b>PSO-3</b>	To understand the use of various bioinformatics tools to collect, store, and access data
<b>PSO-4</b>	To understand environmental issues and keeping up with bio ethics and clean gene technology
<b>PSO-5</b>	To use standard programme and algorithms to analyse data
<b>PSO-6</b>	To gain knowledge about scientific writing and ethics in the science.
<b>PSO-7</b>	To improve communication and presentation skills

#### COURSE OUTCOMES (COs)

Semester-I

Course Title: Cell Biology (Theory)

Course code: BT-MBT412

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Understand the structure and purpose of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles. The students will get familiarized with basic principles of working of Microscopy.	1,2,3,4,5	R,U
<b>CO-2</b>	Gain knowledge about the cellular components Underlying mitotic and meiotic cell division.	1,2,3,4,5	R,U
<b>CO-3</b>	Learn about the phases of cell cycle and its regulation.	1,2,5	R,U
<b>CO-4</b>	Acquire knowledge about the mechanism of signal transduction, modes of cell signaling and various pathways involved in cell signaling.	1,2,3,5	U
<b>CO-5</b>	Describe the mechanism of cellular communication, protein sorting and its transportation across organelles.	1,2,3,5	U



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Course Title: Cell Biology (Practical)

Course code: MBT412

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Differentiate between eukaryotic and prokaryotic cell structure.	1,2,3,5	R,U
CO-2	Understand the structure and function of various cell organelles.	1,2,3,4,5	R,U
CO-3	Get familiarized with different phases of mitosis and meiosis.	1,2,3,4,5	R,U
CO-4	Perform different types of staining techniques employed in cell biology.	1,2,3,4,5,7	R,U
CO-5	Learn about various instrumental methods used in cell biology such as centrifugation, chromatography and microscopy.	1,2,3,4,5,7	R,U

Course Title: Molecular Biology (Theory)

Course code: MBT413

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Structure of DNA, DNA as genetic material and complete process of replication, transposition and Recombination in prokaryotes and eukaryotes.	1,2,3,4,5	R,U
CO-2	Molecular Events of Transcription and processing of transcripts, RNA editing.	1,2,3,4,5	R,U,
CO-3	Understand the regulation of gene expression in prokaryotes using operon concept and ukaryotes.	1,2,3,4,5	R,U
CO-4	Molecular Events of Translation leading to protein synthesis and Post translational modification.	1,2,3,4,5	U





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Course Title: Molecular Biology (Practical)

Course code: MBT413

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn practically technique DNA isolation(bacterial and plant sample) and agarose gel electrophoresis	1,2,3,4,5	R,U,Ap
CO-2	Practice various technique in recombinant DNA technology like restriction digestion and Quantification of DNA.	1,2,3,4,5	R,U,Ap,An
CO-3	Get idea about transformation in bacterial cells and screening of transformants.	1,2,3,4,5	U,Ap,An
CO-4	Get hand-on training on performing Southern Blotting.	1,2,3,4,5	U,Ap,An

Course Title: Biochemistry (Theory)

Course code: MBT414

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Have a detailed understanding on the bio-molecules of life, their structure and function	1,2,3,5	R,U
CO-2	Become acquainted with the knowledge of structures , function, and interactions of proteins, nucleic acids ,carbohydrates and lipids	1,2,3,5	R,U
CO-3	Become aware of basic biosynthetic and catabolic pathways for Carbohydrate, Lipid, Amino Acids and Nucleotide metabolism.	1,2,5	U



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Course Title: Biochemistry (Practical)

Course code: MBT414

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Have knowledge regarding the preparation of various Buffers: Phosphate buffer and Tris buffer for conducting experiment.	1,2,3,4,5	R,U,Ap
CO-2	Develop skills of performing quantitation of sugars: Anthrone method and Bradford method.	1,2,3,4,5	R,U,Ap,An
CO-3	Possess the knowledge protein estimation by Lowry's method.	1,2,3,4,5	U,Ap,An
CO-4	Understand the process of saponification and acid value of fat, Iodine number of fat & Separation of amino acids by TLC.	1,2,3,4,5	U,Ap,An

Course Title: General Microbiology, Microbial Physiology & Biotechnology  
(Theory)

Course code: MBT415

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Have detailed insight on the principles, working and application of different Microscopes in microbiology.	1,2,3,4,5,7	R,U,Ap,An
CO-2	Distinguish between prokaryotic and eukaryotic cells based on morphological features and other key differences.	1,2,3,5	R,U,An
CO-3	Have knowledge about bacterial classification and concepts about bacterial replication.	1,2,3,5	U
CO-4	Understand Virus life cycle, prokaryotic cells and their growth curve patterns.	1,2,3,5	U



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### Course Title: General Microbiology, Microbial Physiology & Biotechnology (Practical) Course code: MBT415

Sr.No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Handle microscopes and be able to work on microorganisms.	1,2,3,4,5	R,U,Ap,An
CO-2	Perform serial dilutions of bacterial samples, Learn the techniques of obtaining pure Cultures in lab and practice sterilization techniques.	1,2,3,4,5	R,U,Ap,An,E,C
CO-3	Accomplish the testing of microbiological quality of potable water.	1,2,3,4,5	U,Ap,An,E
CO-4	Perform anti biotic sensitivity of bacterial strain using anti biotic discs.	1,2,3,4,5	U,Ap,An
CO-5	Distinguish E.coli. bacterial strains using staining techniques.	1,2,3,4,5	R,U,Ap,An



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Course Title: Environmental Biotechnology

Course code: MBT421

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about management of waste water environmental pollution, solid waste with Vermi composting.	1,2,5	R,U
CO-2	Learn about applications of Bio mass production, mechanisms of nitrogen fixation and Applications of Biofuels, Bioremediation.	1,2,5	R,U,Ap
CO-3	Determine the quality of portable water, perform BOD/COD, study techniques of vermi composting, Bioremediation and enrichment culture technique.	1,2,3,4,5	U,Ap
CO-4	Compare and use various types of bioremediation technologies to treat different types of pollutants.	1,2,3,4,5	U,Ap,An,E

Course Title: Environmental Biotechnology (Practical)

Course code: MBT421

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Practically learn waste management and remediation.	1,2,3,4,5	U,Ap,
CO-2	Learn about applications of Bio mass production, mechanisms of nitrogen fixation and Applications of Biofuels.	1,2,3,4	R,U,Ap
CO-3	Determine the quality of portable water, perform BOD/COD, study techniques of vermicomposting,	1,2,3,4,5	R,U,Ap,An

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<b>CO-4</b>	Compare and use various types of bioremediation technologies to treat different types of pollutants.	1,2,3,4,5	U,Ap,An,E,C
<b>CO-5</b>	Become perfectly ready for jobs of Environmental Bio technologists in Pollution Control Boards, Effluent Treatment Plants, Municipal Solid Waste disposal Plants etc.	1,2,3,4,5	U,Ap
<b>CO-6</b>	Become an entrepreneur in field of Environmental Pollution Control Consultancy, Bio-compost manufacturing or vermi-compost production.	1,2,3,4,5	U,Ap,An,E,C

### Course Title: Enzymology and Enzyme Technology (Theory)

Course code: MBT422

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Learn about international Classification and nomenclature along with concepts, mechanisms involved in catalysis and extraction, purification techniques of enzymes.	1,2,3,4,5	R,U,Ap,An
<b>CO-2</b>	Learn different mathematical models involved in enzymatic reaction kinetics along with different Types of inhibitors.	1,2,3,4	R,U,Ap,E
<b>CO-3</b>	Deeply understand the regulatory mechanisms including induction, repression, and covalent modification, along with different types of catalysis as well.	1,2,3,4	R,U
<b>CO-4</b>	Acquire apprehension about Membrane bound Enzymes, immobilization techniques and industrial applications.	1,2,3,4	U,Ap,E



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Course Title: Enzymology and Enzyme Technology (Practical)

Course code: MBT422

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about the extraction of enzyme from natural source along with its further purification in the laboratory by salt fractionation and dialysis techniques.	1,2,3,4,5	R,U,Ap
CO-2	Learn about the effect of proton or hydroxyl concentration on the enzymatic activity leading to the determination of pH optima of an enzyme.	1,2,3,4,5	R,U,Ap
CO-3	Laboratory outcome includes learning of effect of temperature on the enzymatic activity leading to determination temperature optima of a particular enzyme.	1,2,3,4,5	U,Ap
CO-4	Learn about the effect of increasing enzyme concentration on the rate of enzyme catalyzed reaction.	1,2,3,4,5	U,Ap,An
CO-5	Learn about the dependence of reaction rates of enzyme catalysed reaction on the substrate concentration and further estimation of Michalis constant $K_m$ and by estimating the maximum velocity of the reaction.	1,2,3,4,5	U,Ap,An
CO-6	Learn the technique to immobilise the enzyme for repeated use in reaction mixture.	1,2,3,4,5	U,Ap,An



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Course Title: Biophysical and Biochemical Techniques (Theory)

Course code: MBT423

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn the basic instrumentation, principle and procedure of various sophisticated instruments like electron microscope, fluorescence microscope, UV-VIS spectrophotometer, gas chromatography, NMR and ESR spectroscopy.	1,2,3,4,5	R,U,Ap
CO-2	Get theoretical knowledge of various instruments and their practical applications like Geiger-Muller counter, liquid scintillation Counter, autoradiography and X-ray crystallography	1,2,3,4,5	R,U
CO-3	Learn about centrifugation, electrophoresis, polymerase chain reaction and blotting techniques.	1,2,3,4,5	R,U
CO-4	Implement these techniques in biological research and in discovering new products/compounds.	1,2,3,4,5	U,C

Course Title: Bio physical and Biochemical Techniques (Practical)

Course code: MBT423

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Isolate and estimate DNA and protein from biological samples.	1,2,3,4,5	R,U,Ap
CO-2	Separate sample components using TLC, ion exchange, affinity and gel Permeation chromatography.	1,2,3,4,5	U,Ap,An
CO-3	Separate proteins using electrophoresis(Native and SDS-PAGE)	1,2,3,4,5	U,Ap,An



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### Course Title: Genetic Engineering (Theory)

Course code: MBT424

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Practically learn technique DNA isolation(bacterial and plant sample) and agarose gel electrophoresis	1,2,3,5	U,Ap
CO-2	Practice various technique in recombinant DNA technology like restriction digestion and Quantification of DNA.	1,2,3,5	U,Ap,An
CO-3	Get idea about transformation in bacterial cells and screening of transformants.	1,2,3,4,5	U,Ap,An
CO-4	Get hands-on training n performing Southern Blotting.	1,2,3,4,5	U,Ap,An

### Course Title: Genetic Engineering (Practical)

Course code: MBT424

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Gain hands on experience in gene isolation, cloning and amplification.	1,2,3,4,5	R,U,Ap
CO-2	Get expertise in the isolation of plasmids, cloning of gene, transformation into suitable bacteria for selection of recombinant clones and learn gene cloning in an expression vector.	1,2,3,4,5	R,U,Ap,C
CO-3	Conduct gene amplification experiments by PCR analysis and isolate RNA for cDNA synthesis.	1,2,3,4,5	U,Ap
CO-4	Get practical experience that would enable them to begin a career in biotech as well as pharmaceutical industry.	1,2,3,4,5	U,Ap,An,E,C

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Course Title: Computer Applications & Data Analysis (Theory)

Course code: MBT 425

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Understand the basic concept associated with C-Language and program designing	1,2,3,5	R,U
CO-2	Use various input and output functions, Operators and datatypes.	1,2,3,4,5	R,U,Ap
CO-3	Identify solution to a problem and apply control structures and user-defined functions for solving the problem.	1,2,3,4,5	R,U,Ap,An
CO-4	Understand how to start SPSS.	1,2,3,5	R,U
CO-5	Define a variety of statistical variables.	1,2,3,4,5	R,U,Ap
CO-6	Enter basic data into SPSS.	1,2,3,4	U,Ap,An
CO-7	Carry out a statistical analysis that can test hypotheses.	1,2,3,4	U,Ap,An,E

Course Title: Computer Applications & Data Analysis (Practical)

Course code: MBT425

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Use various input and output functions, operators and datatypes.	1,2,3,4,5	R,U,Ap,An,E
CO-2	Understand practically how to use SPSS.	1,3,5	R,U,Ap,An,E,C
CO-3	Understand the basic concept associated with C-Language and program designing	1,2,3,5	R,U,Ap,An
CO-4	Enter basic data into SPSS.	1,2,3,4	R,U,Ap,An,
CO-5	Carry out a statistical analysis.	1,2,3,4	R,U,Ap,An,E



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Course Title: Animal Tissue Culture & Animal Biotechnology (Theory)

Course code: MBT301

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Successfully maintain cultures of animal cells and established cell lines with good viability, minimal Contamination and appropriate documentation.	1,2,3,4	R,U,Ap,An,E
CO-2	Perform supportive or episodic tasks relevant to cell culture, including preparation and evaluation of media, cryopreservation and recovery, and assessment of cell growth/health.	1,2,3,4	R,U,Ap,An,E
CO-3	Study the establishment and maintenance of cell lines.	1,2,3,4	R,U,Ap,An
CO-4	Study the applications of cultured cell for large scale production of metabolites, transformation and in-vitro cell immobilization.	1,2,3,4	U,Ap,An,E



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(Semester-III)

Course Title: Animal Biotechnology (Practical)

Course code: MBT-301

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Focus on the practical aspects of cell culture, like design and layout of the laboratory and introduction to the instruments used in Animal Biotechnology lab.	1,2,3,4,5	R,U
CO-2	Get knowledge and hands on training on media preparation and sterilization.	1,2,3,4,5	R,U,Ap
CO-3	Understand Cryopreservation, revival of cells, maintenance and sub culturing cell lines.	1,2,3,4	R,U,Ap
CO-4	Get practical knowledge on how to determine viability count of cultured cells and determine cell doubling time	1,2,3,4	R,U



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Course Title: Plant Tissue Culture & Plant Biotechnology (Theory)

Coursecode: MBT302

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about important milestones in plant tissue culture and plant biotechnology.	1,2,3,4,5	R,U
CO-2	Understand the concepts and principles of plant tissue culture and plant biotechnology.	1,2,5	R,U
CO-3	Learn about different pathways of plant regeneration under in vitro conditions - organogenesis and somatic embryo genesis.	1,2,3,5	R,U
CO-4	Learn about techniques for establishing cell suspension culture, production of synthetic seeds and their applications.	1,2,3,4,5	R,U,Ap
CO-5	Learn about large scale production of secondary metabolites using different plant tissue culture techniques and bioreactors.	1,2,3,4	U,Ap,An
CO-6	Gain knowledge about Agro bacterium mediated plant transformation and genetic elements present on the Tiplasmid	1,2,3,4	U,Ap





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Course Title: Plant Tissue Culture & Plant Biotechnology (Practical)

Course code: MBT 302

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Prepare and sterilize the plant tissue culture medium	1,2,3	R,U,Ap
CO-2	Learn the effect of plant growth Hormones on cell division and cell proliferation.	1,2,5	R,U,Ap
CO-3	Know about different methods and steps involved in micro-propagation of plants.	1,2,3,4,5	R,U,Ap,An,
CO-4	Perform experiments related to callus induction, sub culturing and organogenesis from different explants.	1,2,3,4,5	U,Ap,An,E,C
CO-5	Acclimatize the tissue culture raised plantlets.	1,2,3,4,5	U,Ap,An,C



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Course Title: Immunology (Theory)

Course code: MBT303

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Acquire basic knowledge of different immunological components and processes at the cellular levels.	1,2,3,5	R,U,Ap
CO-2	Cultivate the apprehension regarding mechanisms of Generation of immune response and their different types	1,2,3,4	R,U,Ap
CO-3	Learn about the role of specialized lymphocytes, their action process along with diseases related with self defense mechanisms of body like allergic reaction and abnormality in antigen recognition.	1,2,3,4,5	R,U,Ap,An
CO-4	Realize about the direct involvement of medical science procedures involved in certain disease treatments as well as industrial aspect like mono clonal immunoglobulins generation and their utility	1,2,3,4,5	U,Ap,An,E



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Course Title: Immunology (Practical)

Course code: MBT303

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about staining techniques and Microscopy for the identification as well as morphological Characterization of blood cells.	1,2,3,7	R,U,Ap,An
CO-2	Understand Haematological studies using counting chamber for Erythrocyte and leukocyte count	1,2,3,4,5,7	U,Ap,An,E
CO-3	Understand Antigen-antibody interaction studies for blood Group testing and immunodiffusion.	1,2,3,4	U,Ap,An,E
CO-4	Understand Erythrocyte cross-links studies by lectin glycoproteins for carbohydrate determinants.	1,2,3,4,5	R,U,Ap,An,E
CO-5	Understand centrifugation technique for serum and plasma separation; Density gradient centrifugation for blood cell isolation and viability test.	1,2,3,4,7	U,Ap,An,E
CO-6	Understand Immunoblotting to identify target protein among unrelated proteins	1,2,3,4,	U,Ap,An,E



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(Semester-III)

Course Title: Bioprocess Engineering & Technology (Theory)

Course code: MBT304

Sr.No.	On completing the course, the students will be able	PSOs addressed	Cognitive levels
CO-1	Practically learn Bio reaction and Process engineering.	1,2,3,4	U,Ap,An
CO-2	Learn about applications of various types of bio reactors as are scaled-up in industry for industrial fermentations.	1,2,3,4	R,U,Ap,An
CO-3	Design up-stream, down-stream, economical, post production, processing and overall aspects of Fermentation technology. This aspect is desirable to join and work in bio process industries.	1,2,3,4,5	R,U,Ap,An,C
CO-4	Compare and use various types of bioprocess for different types of microbial processes.	1,2,3,4,5	R,U,Ap,An
CO-5	Become ready for jobs of Bioprocess engineer in distilleries, breweries, food processing plants, soft-drink bottling plants, milk processing industry etc.	1,2,3,4,5	U,Ap,An,E,C





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Course Title: Bioprocess Engineering & Technology (Practical)

Course code: MBT304

Sr.No.	On completing the course ,the students will be	PSOs addressed	Cognitive levels
CO-1	Learn to scale up of a Bio processes and various growth parameters,	1,2,3,4,5,7	R,U,Ap,An
CO-2	Learn about the design of batch sterilization process and other sterilization techniques	1,2,3,4,5,7	U,Ap,An
CO-3	Practically learn Bio reaction and process engineering aspects, aeration, agitation, mass flow, gas flow etc. for industrial bio reactors.	1,2,3,4,5,7	R,U,Ap,An,
CO-4	Learn about applications of various types of bioreactors as are scaled– up in industry for industrial fermentations.	1,2,3,4,5,7	R,U,Ap,An
CO-5	Design up-stream, down-stream, economical, postproduction, processing and overall aspects of fermentation technology. This aspect is desirable to work in various Bioprocess industries.ng,	1,2,3,4,5,7	U,Ap,An,C
CO-6	Compare and use various types of bioprocesss for different types of microbial processes.	1,2,3,4,5,7	U,Ap,An,E



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Course Title: Genomics and Proteomics

Course code: MBT401A

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Explain basic concepts of vectors, gene libraries and next generation sequencing including the differences between the conventional and modern methods;	1,2,3,4,5	R,U,Ap,An,E
CO-2	Develop technical skills for analysis and interpretation of data employing techniques like FISH, Microarray, SAGE and MPSS.	1,2,3,4,5	R,U,Ap,An,E
CO-3	Know about various methods of analysis proteome of a cell	1,2,3,4,5	U,An,
CO-4	Understand the importance of experimental design for genomics and proteomics and learn how to apply this knowledge in biomedical field.	1,2,3,4,5	U,Ap,An



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Course Title: Introduction to Bioinformatics

Course code: MBT401B

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about Genome sequencing Projects, various primary and secondary databases	1,2,3,4,5	R,U,Ap, An,E,
CO-2	Perform sequence alignment, multiple sequence alignment; Phylogenetic tree construction analysis.	1,2,3,4,5	R,U,Ap, An,E,C
CO-3	Have insights into sequence search tool algorithms and dynamic programming	1,2,3,4,5	U,Ap,An, E,C
CO-4	Understand about structural databases and the tools for protein structure prediction.	1,2,3,4,5	U,Ap,An, E,C



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Course Title: Medical Biotechnology

Course code: MBT402A

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about the role of genetically engineered stem cells in cancer treatment, clinical applications of tissue engineering.	1,2,3,4,5	R,U,Ap,An,E,
CO-2	Acquire knowledge on Immunotherapy, significance of mono clonal anti bodies, vaccine development and clinical applications of recombinant vaccines.	1,2,3,5	R,U,Ap,An,E,C
CO-3	Learn about various concepts about Gene therapy; Recombinant therapy and Clinical applications of recombinant technology.	1,2,3,5	U,Ap,An,E,
CO-4	Learn about biomarkers in early drug development, clinical development and in molecular diagnostics, methods of docking, concept of ADME metabolism and drug excretion, insilico drug designing and structure based drug designing.	1,2,3,4,5	U,Ap,An,E,C



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Course Title: Advances in Plant Biotechnology Medical Biotechnology  
Course code: MBT402B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about production of secondary metabolites using different techniques.	1,2,3,4	R,U,An
CO-2	Understand the concepts and principles of gene silencing techniques.	1,2,5	R,U,Ap,An
CO-3	Learn about hormonal regulation of growth and development in plants.	1,2,5	U,An
CO-4	Gain knowledge about Agrobacterium mediated genetic transformation and production of transgenic plants	1,2,3,4,5	U,Ap,An,C





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### Semester-IV

Course Title: Microbial Biotechnology

Course code: MBT402C

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn the wide range of the applications of Microbes.	1,2,3,4,5	R,U,An,E
CO-2	Understand microbes and their Products and get acquainted with the techniques to identify the useful microbes	1,2,3,4,5	R,U,Ap,An,E
CO-3	Study various aspects of fermentation technology and their application in the productions of various products of microbial origin	1,2,3,4,5	U,Ap,An
CO-4	Understand the recent application of microbes	1,2,3,4,5	U,Ap,C

Course Title: Intellectual Property Rights, Bioethics and Biosafety

Course code: MBT-403

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Get introduced to the concept of intellectual property rights and its different forms , Indian Patent law and patentable Subject matter.	1,2,3,4,5	R,U,Ap,An,E
CO-2	Learn about World Trade Organization, Patentability of Biotechnological invention, TRIPS agreement ,national and international regulatory mechanisms for genetically Modified organisms and Cartagena protocol	1,2,3,4,5	U,Ap,An,E
CO-3	Define the Bio-ethics, good laboratory and bio-safety practices, NGOs, public and private sectors for bio-safety and bio-ethics.	1,2,3,4,5	U,Ap,An,E,C



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### M.Sc. BOTANY

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1	Identify & classify the plants by using the key characters.
PSO-2	Preparation and examination of plant specimens using light microscopy.
PSO-3	Use pure culture and selective techniques to isolate fungi, plant pathogens, algae and identify them growing on media.
PSO-4	Qualitative and quantitative estimate of the number of floral components by using enumeration and suitable sampling techniques.
PSO-5	Documentation and report writing on experimental protocols, results and conclusions, study tours and field visits etc.

#### COURSE OUTCOMES (COs)

Semester: I

Course Title: Phycology

Course Code: BOTC511

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Comprehend the diversity of lower cryptogams <i>i.e.</i> Algae.	1,2	R,U,Ap,An,E,C
CO2	Collect and study of algae from different localities, identification up to generic level.	1,2,5	R,U,Ap,An
CO3	Recognize the morphology, anatomy, physiology, reproduction and lifecycle pattern.	1,3,4	R,U,Ap,An
CO4	Understand the phenomenon of algal blooms and bioluminescence.	1,4,5	R,U,Ap,An,E,C



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**Course Title:** Mycology and Plant Pathology

**Course Code:** BOTC512

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Comprehend the diversity of lower cryptogams <i>i.e.</i> Fungi.	1,2	R,U,Ap,An
CO2	Collect and study of fungi from different localities, Identification up to generic level.	1,3,4	R,U,Ap,An,E,C
CO3	Recognize morphology, anatomy, physiology, reproduction, lifecycle pattern and causative agent for different plant diseases.	1,3,4	R,U,Ap,An
CO4	Distinguish between the harmful and beneficial fungal genera.	1,2,5	R,U,Ap,An

**Course Title:** Genetics and Evolution

**Course Code:** BOTC513

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the karyotypic analysis, meiosis of complex translocation heterozygotes.	1,	R,U,Ap,An
CO2	Understand the meiotic behaviour of monosomy, trisomy in plants and its effect.	1,2	R,U,Ap,An,E,C
CO3	Understand the chromosomal behaviour in mutagen treated plants.	1,2,3,5	R,U,Ap,An
CO4	Understand the Chromatin organization, structural and numerical alterations in chromosomes	1,4,5	R,U,Ap,An,E,C



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**Course Title:** Plant Physiology

**Course Code:** BOTC514

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Make familiar with various physiological aspects involved in the plant development.	1,2	R,U,Ap,An
CO2	Understand the role of enzymes in it and mechanism of photosynthesis, respiration, nitrogen and lipid metabolism.	1,4,	R,U,Ap,An
CO3	Isolate starch, pectin and various nutritive products from the plants.	1,2,4	R,U,Ap,An,E,C
CO4	Analyze the qualitative and quantitative of plant contents <i>i.e.</i> biochemistry and mode/mechanism of synthesis.	1,4	R,U,Ap,An
CO5	Learn the skills and techniques related to plant physiology so that they can design their own experiments.	1,3,4	R,U,Ap,An,E,C

**Course Title:** Introduction to Computers and Basic Bioinformatics

**Course Code:** BOTC515

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the computer based techniques for plant studies.	1	R,U,Ap,An
CO2	Use the genetic engineering tools in crop improvement.	1,2	R,U,Ap,An,E,C
CO3	Use the Bioinformatics tool in biological data analysis.	1,3,4	R,U,Ap,An
CO4	Explain the methods used for characterizing and managing biological data.	1,2,3,4	R,U,Ap,An
CO5	Classify different types of biological databases.	1,4,5	R,U,Ap,An,E,C



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**Course Title:** Theoretical Biology

**Course Code:** BOTC516

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get familiar with linear, power, periodic, exponential and logarithmic functions.	1,2	R,U,Ap,An
CO2	Understand the concept of probability, permutations and combination.	1,3	R,U,Ap,An,E, ,C
CO3	Understand differentiation and integration.	1,2	R,U,Ap,An
CO4	Understand Statistical analysis model <i>i.e.</i> ANOVA, SE, SD, T-test, chi-square test.	1,2	R,U,Ap,An,E, ,C

**Course Title:** Introduction to Computers and Basic Bioinformatics

**Course Code:** BOT C515

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use word processors, spreadsheets, presentation software.	1	Ap
CO2	Understand and create a database using MS Access.	1	U
CO3	Describe the features and functions of the categories of application software.	1	An
CO4	Understand the dynamics of an office environment.	1	U
CO5	Demonstrate the ability to apply application software in an office environment.	1	An,Ap





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### Semester: II

**Course Title:** Bryology

**Course Code:** BOTC521

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the morphological, anatomical and developmental patterns in the bryophytes.	1,	R,U,Ap,An
CO2	Know the reproductive parts, their development and mechanism of reproduction and life cycle pattern.	1,2	R,U,Ap,An, E,C
CO3	Get familiar with economic values of the lower plants	1,2,5	R,U,Ap,An

**Course Title:** Diversity and Biology of Gymnosperms

**Course Code:** BOTC522

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the morphological, anatomical and developmental patterns in the Gymnosperms.	1,2	R,U,Ap,An
CO2	Know the reproductive parts their development and mechanism of reproduction and life cycle pattern.	1,3,4	R,U,Ap,An ,E,C
CO3	Know the evolutionary tendencies and organography in gymnosperms with particular reference to male and female sporophylls, cones, ovules, seeds and archegonia. Economic value <i>i.e.</i> timber, secondary metabolites, resins.	1,2,5	R,U,Ap,An ,



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**Course Title:** General Microbiology

**Course Code:** BOTC523

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic principles of microscopy, micrometry, staining, sterilization methods, culture media, pure culture methods.	1	R,U,Ap,An,C
CO2	Learn the classification of bacteria.	1,2	R,U,Ap,An,E,C
CO3	Understand the waste water treatment and ecological impact.	1,2	R,U,Ap,An,
CO4	Understand the concept of Biodegradative organisms, advantages of bioremediations, problem associated with bioremediation and methodology of bioremediation.	1,2,3	R,U,Ap,An,E
CO5	Learn the physical and chemical means for control of microorganisms.	1,3,4	R,U,Ap,An,E
CO6	Know the practical application and major groups of antimicrobial agents.	1,2,3,4	R,U,Ap,An,C
CO7	Learn the common bacterial, fungal and viral diseases.	1,2,4,5	R,U,Ap,An,E

**Course Title:** Cell Biology

**Course Code:** BOTC524

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the cell structures in relation to function of cells the fundamental unit of life, are concerned in this course along with molecules present in cells.	1	R,U,Ap,An,E
CO2	Apply the principles of cell biology in designing experiment, statistical analysis, and interpretation of results	1,2	R,U,Ap,An,C



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CO3	Operate and solve exercise using computation statistics software.	1,2,3,4	R,U,Ap,An,C
CO4	Get acquainted with basic approach in the research methodology.	1,2,3	R,U,Ap,An,E
CO5	Acquaint with laboratory techniques viz. microscopy to study mitosis and meiosis, barr body, cyclosis, mitotic and meiotic index, alterations in chromosomes.	1,3,4	R,U,Ap,An,C

**Course Title:** Pteridology

**Course Code:** BOTC525

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the morphological, anatomical and developmental patterns in the Pteridophytes.	1,2	R,U,Ap,An
CO2	Know about the reproductive parts their development and mechanism of reproduction and life cycle pattern.	1,2,3	R,U,Ap,An
CO3	Study the economic value of Pteridophytes	1,2,3,4	R,U,Ap,An
CO4	Understand the stellar evolution in Pteridophytes.	1,3,4	R,U,Ap,An
CO5	Understand the significance of Paleobotany and its applications.	1,2,3	R,U,Ap,An,E

**Course Title:** Ecological Modeling and Forest Ecology

**Course Code:** BOTC526

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Analyze various population growth curves, interaction between species, predator prey interactions.	1	R,U,Ap,An,E



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CO2	Study the Association analysis, Community classification and Species diversity.	1,2	R,U,Ap,An,C
CO3	Analyze the threat and suggest conservative measures.	1,2	R,U,Ap,An,E
CO4	Understand the environmental impact analysis, environmental law and policy.	1,2,3	R,U,Ap,An,C
CO5	Understand remote sensing, their methods and theories.	1,2,3	R,U,Ap,An,E

### Semester: III

**Course Title:** Plant Morphogenesis

**Course Code:** BOTC611

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the definition and terminology of morphogenesis.	1,2	R,U,Ap,An,C
CO2	Study the growth, co-relation and polarity.	1,2,3,4	R,U,Ap,An,E
CO3	Understand organic and inorganic symmetries, growth and differentiation (external and internal).	1,2,3,4	R,U,Ap,An,C
CO4	Learn the concept of Plant tissue culture, definition, application, totipotency, dedifferentiation and redifferentiation.	1,3,4,	R,U,Ap,An



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**Course Title:** Developmental Botany**Course Code:** BOTC612

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the ultrastructure and development of male and female gametophyte.	1,2	R,U,Ap,An
CO2	Understand the Pollination mechanisms and fertilization: Types and ultrastructure.	1,2	R,U,Ap,An,C
CO3	Study the polyembryony, apomixis and role of seed in growth and development of plants.	1,2,5	R,U,Ap,An
CO4	Understand the experimental and applied embryology: haploid production, nucellus culture, ovule and seed culture, ovary culture.	1,2,5	R,U,Ap,An

**Course Title:** Plant Molecular Biology**Course Code:** BOTC613

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the Central Dogma of Molecular Biology.	1	R,U,Ap,An
CO2	Study the Recombinant DNA Technology: Restriction Endonucleases, Cloning Vectors and cloning strategies.	1,2,5	R,U,Ap,An, C
CO3	Acquaint with laboratory techniques viz. Microscopy, SEM & TEM, Ultracentrifugation, fractionation,	1,2,5	R,U,Ap,An
CO4	Understand the Electrophoresis, PCR, GISH, FISH and Immunochemical techniques, DNA finger printing by RAPD and RFLP, spectrophotometry, sterile plating	1,2,5	R,U,Ap,An
CO5	Isolation of plant DNA and its quantification.	1,3,5	R,U,Ap,An
CO6	Explain the <i>Agrobacterium</i> mediated transformation of plants.	1,2,4,5	R,U,Ap,An, E





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**Course Title:** Plant Breeding and IPR

**Course Code:** BOTC614

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concepts and details of heredity and variation at molecular and cellular levels.	1	R,U,Ap,An,E
CO2	Know the utilization of wild plants in crop improvement, introduction and domestication as methods of plant breeding.	1,2,3	R,U,Ap,An,E
CO3	Isolate biochemical mutants following physical and chemical mutagenic treatments.	1,2	R,U,Ap,An,E
CO4	Isolate morphological mutants following physical and chemical mutagenic treatments.	1,2,3,4	R,U,Ap,An,E
CO5	Know the Intellectual Property Rights: Laws and conventions related to intellectual property rights.	1,4,5	R,U,Ap,An,E

**Course Title:** Plant Biochemistry

**Course Code:** BOTC615

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get familiar with various biochemical aspects involved in growth and development of plant and synthesis of plant secondary metabolites.	1	R,U,Ap,An,E
CO2	Study the introduction, history, nomenclature and classification on enzymes.	1,2	R,U,Ap,An,E
CO3	Understand the Enzyme kinetics, regulation and	1,2	R,U,Ap,An,E



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	activation.		
CO4	Study the carbohydrate metabolism overview and significance and secondary plants metabolites.	1,2,4	R,U,Ap,An,E
CO5	Understand the biosynthesis and oxidation of fatty acids, types and significance of lipids.	1,3,4,5	R,U,Ap,An,E

**Course Title:** Applied Botany

**Course Code:** BOTC616

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the food plants: History, nature of food plants and their economic importance.	1	R,U,Ap,An,E
CO2	Study about rubber plants of India and methods of extraction of raw rubber, raw resin and other products.	1,2	R,U,Ap,An,E
CO3	Study the physical characteristics of Indian woods, methods of seasoning and chemical treatment.	1,2,3	R,U,Ap,An,E
CO4	Know the important commercial woods of India.	1,3	R,U,Ap,An,E
CO5	Study the Fiber yielding plants, essential oil yielding plants of India, their use in perfume industry, fatty oil and waxes, tanning and dyeing materials, sources of natural dyes in India.	1,2,5	R,U,Ap,An,E
CO6	Know the opportunities for income and employment generation and will be able to develop the ability to think and create useful plant products.	1,5	R,U,Ap,An,E



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### Semester: IV

**Course Title:** Plant Anatomy

**Course Code:** BOTC621

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the primary structure and basic vasculature of shoot and root system of plants.	1,2	R,U,Ap,An
CO2	Study the types of nodes in dicots and monocots, formation of leaf and branch traces.	1	R,U,Ap,An
CO3	Understand the histology of Wood: Growth rings, types and ultrastructure of tracheids, vessels and wood rays, importance of density and weight in commercial utilization of woods.	1,4	R,U,Ap,An
CO4	Understand the floral, fruit and seed anatomy. Anatomy of leaf in relation to photosynthesis and transpiration.	1,3,5	R,U,Ap,An

**Course Title:** Structure and Metabolism of Plant Hormones

**Course Code:** BOTC622

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the general features of plant hormones, their analysis, and quantification.	1,2	R,U,Ap,An
CO2	Structure, physiological role and biosynthesis of auxins, gibberellins, cytokinins in higher plants.	1	R,U,Ap,An
CO3	Learn the discovery, structure, distribution and physiological roles of brassinosteroids, abscissic acid and ethylene.	1,2,5	R,U,Ap,An



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CO4	Learn the introduction, discovery, distribution and structure of jasmonates and other defense related compounds in plants.	1,2	R,U,Ap,An,E
CO5	Understand the mechanism of action and bioassays of plant hormones and their commercial use.	1,4,5	R,U,Ap,An,E

**Course Title:** Plant Tissue Culture and Biotechnology

**Course Code:** BOTC623

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the equipment's required in tissue culture lab and media preparation techniques for different plants.	1	R,U,Ap,An,E
CO2	Know the sterilization techniques for media as well as for explants.	1,2	R,U,Ap,An,E
CO3	Understand the explant Culture - anther culture, Pollen culture, micropropagation. embryo rescue technique.	1,2	R,U,Ap,An,E
CO4	Learn the somaclonal variation. <i>In vitro</i> mutation. Isolation of plant protoplasts and viability testing.	1,3	R,U,Ap,An,E
CO5	Understand the protoplast fusion techniques. Tissue culture of important horticultural, medicinal plants	1,4	R,U,Ap,An,E
CO6	Apply the basic knowledge of plant tissue culture in various fields for conservation, medicine, product development, disease resistance.	1,3,5	R,U,Ap,An,E



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**Course Title:** Analytical Techniques

**Course Code:** BOTC624

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the principles, types and applications of microscopy.	1	R,U,Ap,An,E
CO2	Role of fixation and staining in slide preparation.	1,2	R,U,Ap,An,E
CO3	Understand the principles, types and applications of chromatographic techniques.	1,2,3	R,U,Ap,An,E
CO4	Understand the role and types of spectroscopic techniques in chemical structure establishment in natural chemistry.	1,2	R,U,Ap,An,E
CO5	Learn the principles and techniques of biomolecules and plants <i>i.e.</i> DNA, proteins, lipids.	1,2,5	R,U,Ap,An,E

**Course Title:** Diversity and Biology of Angiosperms

**Course Code:** BOTC625

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the plant morphology.	1	R,U,Ap,An,E
CO2	Describe plant specimens.	1,2	R,U,Ap,An,E
CO3	Study at least 20 local available families of flowering plants.	1,3	R,U,Ap,An,E
CO4	Identify local available wild plants.	1,2,3	R,U,Ap,An,E
CO5	Learn the preparation of botanical keys at generic level by locating key characters.	1,3,4	R,U,Ap,An,E
CO6	Know various medicinal plant species.	1,2,3	R,U,Ap,An,E
CO7	Know the role of secondary metabolites.	1,2,3,5	R,U,Ap,An,E





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**Course Title:** Hazardous Chemicals

**Course Code:** BOTC724

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Identify and differentiate between hazardous/non-hazardous chemicals.	1	R,U,Ap,An,E
CO2	Learn the physical and toxic properties of hazardous chemicals.	1,3	R,U,Ap,An,E
CO3	Study the target organs of animals and combustible and explosive properties.	1,2	R,U,Ap,An,E
CO4	Study the details of some major hazardous chemical and their mechanism of action.	1,2,3,4	R,U,Ap,An,E
CO5	Study the structure, LD50 and health hazards of pesticides and herbicides.	1,2,5	R,U,Ap,An,E
CO6	Understand the procedures for safe and proper disposal of chemicals.	1,4,5	R,U,Ap,An,E



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### M. Sc. FASHION DESIGNING & MERCHANDISING

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

##### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1.	The students will have the basic foundation in designing and have the ability to visually represent it by illustrations, photographs, graphics and visual display of merchandise.
PSO-2.	The students will be able to convert their designs into garments using appropriate construction techniques.
PSO-3.	The students will have a strong foundation and understanding of the garment manufacturing process and procedures.
PSO-4.	Demonstrate event management, team work, leadership, entrepreneurial and business skills.
PSO-5.	Apply their updated knowledge of current trends of fashion in the creation of innovation design to produce garments to the modern textile industry.
PSO-6.	Exhibit the fashion portfolio sketching, dyeing and printing textile processing in the modern world.
PSO-7.	Express the basic concepts of designing, drafting methods of pattern making and its alteration with techniques for garments construction and skills on Photoshop & Corel draw.
PSO-8.	Demonstrate knowledge in fashion designing software such as rich fashion studio, rich piece pattern making CAD, photo shop and coral draw.
PSO-9.	Acquire advanced knowledge in a particular research area and acquire ability of focused writing following the research process by way of writing a dissertation.
PSO-10.	Explore employability as a fashion designer, either by becoming self-employed or working in fashion designing sectors
PSO-11.	Apply the theories and skill to solve real time problems in apparel design and work as a team and become accomplished successful designers, entrepreneurs on industry ready professionals.
PSO-12	Learn and understand about ancient and contemporary costumes of India.
PSO-13	Identify historical periods of clothing and describe how the themes of politics, morality, social issues, technology, culture and geography impact society and influence fashion development.



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<b>COURSE OUTCOMES (COs)</b>
<b>Semester-I</b>

**Course Title: Fashion Illustration**

**Course Code: MFD 411**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Draw fashion figures by understanding body proportions.	1,6	U,Ap,C,An,
CO2	Get brief knowledge about creating various textures using different techniques and mediums.	1,6	U,Ap,C, An,
CO3	Understand the rendering with different mediums as well as get brief knowledge about colour wheel and colour schemes.	1,6	U,C,Ap,An
CO4	Enhance their drawing skills and illustrate their ideas in different styles with detailing.	1,6	U,Ap,C,An,R
CO5	Develop approach towards ideation and confidence in presenting work creatively	1,6	U,Ap,C,An

**Course title: Product Development-Workshop**

**Course Code: MFD 412**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Predict the trend and design of garment.	2,3,5	U,Ap,C,An,E
CO2	Develop the basic theme board, mood board, colour band.	2,3,5,6	U,Ap,C,An
CO3	Collect the customer profile and fabric sourcing.	3,5	R,U,C,Ap,An
CO4	Illustrate the garment design with backdrops and prepare the spec sheet, construct the pattern and garment.	1,2,3,5	U,Ap,C,An

**Course title: Pattern Making and Grading**

**Course Code: MFD 413**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Use basic pattern making principles to create design variations.	2,3,5	R,U,Ap,C,An



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CO2	Apply the learned techniques of draping to develop a product.	3,5	U,Ap,C
CO3	Apply pattern making principles to create design variations and construct garments.	3,5,2	U,E,C,Ap,An
CO4	Understand the grading of sizes manually	3,5	U,Ap,C,E,An

### Course title : Computer Aided Fashion Designing Course Code: MFD 414

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Handle tools of Adobe Illustrator Photoshop to create fashion design illustration.	7,8	U,Ap,C,An,R
CO2	Gain knowledge about different themes required in the field of fashion.	3,7,8	U,Ap,C,An
CO3	Conceptualize their ideas and amalgamation of different accessories with the garments.	7,8	R,U,E,C,Ap,An
CO4	Develop approach towards ideations and confidence in presenting work creativity.	7,8	U,Ap,C,E,

### Course title : History of Indian Costumes Course Code: MFD 415

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Develop understanding about ancient and contemporary costumes of India.	12,13	U, R
CO2	Learn about fabrics, techniques and drapes of different eras which get them introduced to today's fashion industry in a more creative way.	12,13	U, R
CO3	Identify historical periods of clothing and describe how the themes of politics, morality, social issues, the economy, technology, culture and geography impact society and influence fashion development.	12,13	U, R
CO4	Understand and discuss the fabric, style, colour and fashion terminology used to identify characteristics of fashions of the past and present.	12,13	U, R
CO5	Compare contemporary designs manufactured in the apparel industry with their classic style counter parts of past centuries and predict or evaluate trends	12,13	U, R





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### Semester-II

#### Course title : Fashion Illustration

Course Code: MFD 421

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Draw fashion figures by understanding body proportions.	1,6	U,Ap,C,An
CO2	Get brief knowledge about anatomy of human body.	1,6	U,Ap,E,R,An
CO3	Learn detailing of trims, fasteners and different features of garment.	1,6	U,E,C,Ap,An

#### Course title : Product Development-Workshop

Course Code: MFD 422

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Predict the trend and design of garment.	2,3,5	U,Ap,C,An,R,E
CO2	Develop the basic theme board, mood board, colour board.	2,3,5,6	U,Ap,C,An
CO3	Collect the customer profile and fabric sourcing.	3,5	U,C,Ap,An
CO4	Illustrate the garment design with backdrops and prepare the spec sheet, construct the pattern and garment	1,2,3,5	U,Ap,C,An

#### Course title : Pattern Development and Draping

Course Code: MFD 423

Sr.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Develop the skills to use basic pattern making principles to create design variations.	2,3	U,Ap,C,An,R
CO2	Apply pattern making principles to construct garments	2,3,5	U,Ap,C,E,An
CO3	Explore the knowledge related to different fashion components and create variety of patterns regarding sleeves and collar	2,3,5	U,C,Ap,An





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### Course title : Computer Aided Fashion Designing Course Code: MFD 424

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Understand and apply common design patterns to incremental development.	7,8	U,Ap,C,An
CO2	Understand about pattern making digitally and about pattern software (JDPDS).	7,8	U,Ap,E,An,R
CO3	Work on patterns for grading as pattern marker for layout.	7,8	U,C,Ap,An

### Course title : Fashion Merchandising and Marketing Course Code- MFD 425

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Use basic buying management methods to meet the needs of a simulated retail Market.	1, 4,5	U,Ap,An,R,E
CO2	Evaluate relevant data in order to determine a suitable assortment of merchandise.	4,5	U,Ap,C,E,An
CO3	Work effectively and productively as a team member in order to negotiate and achieve a desired outcome.	4,5	U,E,C,Ap,An

### Course title : Traditional Indian Embroideries Course Code: MFD 426

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Differentiate between embroidery works of different states.	1,2,5	U,Ap,C,An
CO2	Use different technique in their collections.	1,2,5	U,Ap,C
CO3	Understand the problem, issues and other important conditions of craft men working on traditional textiles of different regions of India	1,2,5	U,E,C,Ap,An



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### Semester-III

Course title: Product Development-Workshop

Course Code: MFD 531

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Predict the trend and designs of garments.	2,3,5	U,Ap,C,An,R,E
CO2	Develop the basic theme board, mood board, colour board.	2,3,5,6	U,Ap,C,An
CO3	Collect the customer profile and fabric sourcing	3,5	U,C,Ap,An
CO4	Illustrate the garment design with backdrops, prepare the spec sheet, construct the patterns and garments	2,3,5	U,Ap,C,An

Course title : Advance Draping

Course Code: MFD 532

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Apply the learned techniques of draping to develop a product.	2,3	U,Ap,C,An
CO2	Apply the technique effectively for a desired fit in a garment	2,3	U,Ap,C,E,An
CO3	Develop patterns for different sizes through the grading process	2,3,5	U,E,C,Ap,An

Course title : Computer Aided Fashion Designing Course Code: MFD 533

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Illustrate the basic small designs as motifs.	1,7,8	U,Ap,C
CO2	Construct the garments for children using suitable Croquis.	7,8	U,Ap,C,An
CO3	Learn designing of women's garments with suitable texture	7,8	R,U,C,Ap,An
CO4	Learn different software's for designing.	7,8	Ap,C,E,An
CO5	Develop and conceptualize their designs and creations.	1,7,8	U,Ap,C,An



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### Course title : Surface Ornamentation Course Code: MFD 534

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Develop creative garments for home textiles, interior and other sectors of society.	1,2,3,5,6	U,Ap,C,An
CO2	Develop creative and sustainable fabrics.	1,2,5,6	U,Ap,C,An
CO3	Explore in terms of designing of different textile materials and techniques.	1,2,5,6	U,C,Ap,An

### Course title : Global Costumes Course Code: MFD 535

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Develop fashion garments inspired by different eras	3	U,Ap,An,R
CO2	Use their ideas of different styles globally	3	U,Ap,E,An
CO3	Make new ideas for their illustration as well as product development	1,2,3	U,E,C,Ap

### Course title : Indian Traditional Textiles -Seminar Course Code: MFD 536

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Classify the regional embroideries of India and identify specific embroidery styles of India on the basis of colours, motifs, layouts.	1,5,6	U,Ap,C,An,R
CO2	Identify the influencing factors for the development and evolution of a specific embroidered textile.	5,6	U,Ap,C,An
CO3	Study evolution of embroidered textiles over a period time	5,6	U,E,C,Ap,AN

### Course title : RESEARCH METHODOLOGY Course Code: MFD 537

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Conduct comprehensive research to solve different problems of society.	9	U,Ap,An,R



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CO2	Know the primary characteristics of quantitative research and qualitative research.	9	U,Ap,E,R
CO3	Become familiar with the steps involved in identifying and selecting a good theme to be used in a study or to develop line in fashion.	9	U,E,Ap,An

### Semester-IV

Course title: Portfolio Development

Course Code: MFD 541

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Prepare portfolio in digital as well as other modes of presentation.	1,4,6,5	U,Ap,C,An
CO2	Showcase their work and become able to discuss and explain their work professionally	1,4,6	U,Ap,C
CO3	Learn the world of fashion, where they can grab job opportunities by showcasing and explaining their talent through portfolio	1,4,6	U,E,C,Ap,An

Course title: Product Development- Workshop

Course Code: MFD 542

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Predict the trend and design of garment.	2,3,5	U,Ap,C,An,R,E
CO2	Develop the basic theme board, mood board, colour board.	2,3,5,6	U,Ap,C, An
CO3	Collect the customer profile and fabric sourcing.	3,5	U,C,Ap,An
CO4	Illustrate the garment design with backdrops, prepare the spec sheet, construct the pattern and garment	1,2, 3,5	U,Ap,C,An





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### Course title : Fashion Merchandising and Retailing

Course Code: MFD 543

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Help students comprehend the jobs of merchandiser, buyer and store manager.	10,11	U,Ap,An,R
CO2	Know about different kinds of marketing and merchandising technique	4,10,11	U,Ap,E,An
CO3	Understand various selling concept.	10,11	R,U,E,Ap,An
CO4	Develop knowledge about various national and international stores.	4,10,11	U,E,An

### Course title : Textile Chemistry

Course Code: MFD 544

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Understand the chemical structure of textile fibres and the effect of various chemical on them.	5,6	U,C,An,R,E
CO2	Explore different fabrics to explore different designs with dyeing techniques.	5,6	U,Ap,E,An
CO3	Learn about fabric analysis on the basis of thread count.	5,6	U,E,Ap,An
CO4	Understand the identification of fabrics ( woven, non-woven & knitted)	5,6	U,Ap,E,An

### Course title : Project Report/Design project

Course Code: MFD 546

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Take the opportunity to take an exciting and fascinating look into something one is passionate about. This helps them to make the writing process easier and smoother.	1,9	U,Ap,C,An,E,R
CO2	Learn to develop crucial skills	1,9	U,Ap,C,E,An





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CO3	boost employment	1,4,9	U,E,Ap
CO4	Develop organization, time- management and planning skills	1,9,4	U,E,Ap
CO5	Have ability to undertake research, critical thinking and excellent communication	1,9	U,E,Ap,An



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### M.SC. FOOD TECHNOLOGY

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

<b>PSO1:</b>	To disseminate knowledge of food technology and allied discipline among students which enable them to understand the emerging techniques and advanced methods of food processing and preservation.
<b>PSO2:</b>	To make students understand, evaluate and develop food products, their handling, processing and packaging.
<b>PSO3:</b>	Identification and analysis to solve problems for the development of products, processes, techniques to meet the demands of the society.
<b>PSO4:</b>	To enhance the ability of students in food processing industries to design and process food products as per the needs and specifications or can also emerge as an entrepreneur.

#### COURSE OUTCOMES (COs)

##### Semester-I

#### COURSE TITLE: PRINCIPLES OF FOOD PROCESSING & PRESERVATION COURSE CODE: MSFT51-101

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand principles of different techniques used in processing and preservation of foods.	1,2,4	R, U, An, E
CO2	Identify and select preservation methods appropriate for specific foods.	1,2	U, Ap, C
CO3	Learn the effects of preservation methods on the quality of food.	1,2,3	R, U, Ap
CO4	Learn about the recent food preservation methods.	1,2,3,4	An, Ap, C

#### COURSE TITLE: FOOD MICROBIOLOGY COURSE CODE: MSFT51-102

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Get knowledge on the importance of microbes of different categories and factors affecting microbial growth in food.	1,2,3,4	R, U, An
CO2	Recognize important microorganisms affecting food quality and safety.	1,2,3,4	R, Ap



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CO3	Identify methods of microorganism control to preserve food and make food consumption safe.	1,3	R, An, Ap
CO4	Get knowledge on food plant sanitation.	1,2,3,4	An, Ap

<b>COURSE TITLE: DAIRY TECHNOLOGY-I (Fluid Milk Processing)</b>			
<b>COURSE CODE: MSFT51-103</b>			
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
CO1	Know about composition of milk and important characteristics of milk constituents	1,2,	R, An
CO2	Study about the Legislation for the quality control of milk.	2,3,4	R, Ap, C
CO3	Learn about the adulterations of milk and its detection.	1,2, 3	R, An, Ap, C
CO4	Learn the processing of milk and working of a few dairy equipments.	1,2,3,4	An, Ap

<b>COURSE TITLE: TECHNOLOGY OF CEREAL PROCESSING</b>			
<b>COURSE CODE: MSFT51-104</b>			
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
CO1	Understand composition and structure of different cereals.	1,,4	R, U, An
CO2	Know about technology for cereal Milling & their products along with equipments.	1,2,3,4	U, Ap, C
CO3	Evaluate quality of wheat.	1,2, 3	R, An, Ap, C
CO4	Become aware of the role of different Bakery ingredients.	2,3	An, Ap

<b>COURSE TITLE: TECHNOLOGY OF FRUITS &amp; VEGETABLE PROCESSING</b>			
<b>COURSE CODE: MSFT51-105</b>			
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
CO1	Understand basic processes and changes in fruits and vegetables.	1,2,3	U, An, Ap
CO2	Know about different techniques used in processing and preservation of fruits and vegetables.	1,2	An, Ap, C
CO3	Become aware of different technologies and methods to reduce post-harvest losses in fresh produce	1,2, 3	R, An, Ap, C
CO4	Get knowledge on making commercial products like: Jams, Jellies, Marmalade etc.	1,2,3,4	An, Ap,C



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### Semester-II

#### COURSE TITLE: FOOD CHEMISTRY COURSE CODE: MSFT52-201

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about the chemistry of foods, role of each component and their interaction.	1,3,4	R, U, An, Ap
CO2	Understand the functional aspects of food components and their role in food processing.	1,2,3,4	U, An, Ap, C
CO3	Knowledge about various reactions involved in food.	1,2	An, Ap
CO4	Evaluate quality of fats and oils.	1,2,3,4	U,An, Ap,C

#### COURSE TITLE: DAIRY TECHNOLOGY-II (Milk Products Processing) COURSE CODE: MSFT52-202

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Have knowledge about classification and composition of various milk products.	1,2,3,4	R, U
CO2	Know about commercial making of various milk products and quality control involved.	1,2,3,4	U,An, Ap
CO3	Identify defects of butter and ice-creams and their possible causes and remedies.	3	An, Ap, C
CO4	Know about various miscellaneous dairy products.	1,2,3,4	U, Ap

#### COURSE TITLE: TECHNOLOGY OF LEGUMES AND OILSEEDS PROCESSING COURSE CODE: MSFT52-203

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the structure, composition and quality evaluation of various legumes and oilseeds.	1,2,3,4	R, U, An
CO2	Know the processing of pulses and oilseeds.	1,2,3,4	U, An, Ap, C
CO3	Become aware of the importance and processing of high protein products.	1,2,4	R, U, Ap
CO4	Assess the quality of fats and oils.	1,3,4	U, An, Ap, C





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<b>COURSE TITLE: TECHNOLOGY OF EGG &amp; POULTRY PROCESSING</b>			
<b>COURSE CODE: MSFT52-204</b>			
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
CO1	Know about egg structure, composition and nutritive value of egg and poultry.	1,3,4	R, U, An, Ap
CO2	Understand the egg preservation methods and assessment of egg quality.	1,2	U, An, Ap, C
CO3	Become aware of slaughtering and dressing of poultry and their waste utilization.	1,2,3	U, Ap, C
CO4	Make layout and design of poultry processing Industry.	2,3	U, An, Ap, C

<b>COURSE TITLE: FOOD ENGINEERING-I</b>			
<b>COURSE CODE: MSFT52-205</b>			
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
CO1	Know the basics of Food Engineering.	1,3,4	U, An, Ap
CO2	Know how to design a food plant and various systems involved	1,2	U, An, Ap, C
CO3	Understand principles of fluid flow, heat and mass transfer, steam, psychrometrics etc.	1,2,3,4	U, Ap, C
CO4	Perform Mathematical Calculations involved in food processing operations.	1,3,4	U, An, Ap, C

<b>COURSE TITLE: IN PLANT TRAINING</b>			
<b>COURSE CODE: MSFT52-206</b>			
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
CO1	Get a learning platform where they can enhance their employability skills.	1,3	U, Ap, C
CO2	Enhance practical knowledge regarding food technology.	2,3	U, An, Ap
CO3	Have self- confidence that helps them in understanding their job skill.	1,2,3	U, Ap, C
CO4	Become entrepreneurs and provide skill to others also	2,3,4	U, An, Ap, C





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### Semester-III

#### COURSE TITLE: FOOD PACKAGING TECHNOLOGY

#### COURSE CODE: MSFT61-301

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Get deep knowledge on different functions performed by packaging material.	1,2	U, Ap, C
CO2	Understand properties of packaging materials, their methods of testing and evaluation.	2,4	U, An, Ap
CO3	Get knowledge about packaging requirements for fresh and processed food.	2,3,4	U, Ap, C
CO4	Get knowledge about food packaging laws and regulations.	1,4	U, An, Ap, C

#### COURSE TITLE: FOOD ENGINEERING-II

#### COURSE CODE: MSFT61-302

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about the principles of Unit operation.	1,2	U, Ap, C
CO2	Understand principles of separation and size reduction processes in food.	1,3,4	U, An, Ap
CO3	Know about the fundamentals of food engineering and its process.	2,3,4	U, Ap, C
CO4	Do mathematical calculations related to food processing operations.	3,4	U, An, Ap, C

#### COURSE TITLE: TECHNOLOGY OF FISH & MEAT PROCESSING

#### COURSE CODE: MSFT61-303

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the structure, composition, and nutritional value of meat and fish.	1,3	U, Ap, C
CO2	Know about postmortem and biochemical changes in meat and fish.	1,4	U, An, Ap
CO3	Understand processing, preservation and quality control of meat and fish.	1,2,3	U, Ap, C
CO4	Become aware of manufacturing practices of meat based and fish based by products and their uses	3,4	U, An, Ap, C



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COURSE TITLE: APPLIED RESEARCH METHODOLOGY			
COURSE CODE: MSFT61-304			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Get knowledge regarding the principles of research design and its methodologies.	1,2,3	U, Ap, C
CO2	Write synopsis, thesis and analyse data.	1,3,4	U, An, Ap, C
CO3	Write review of literature, formulating a research problem, articulate hypothesis.	1,3,4	U, Ap, C
CO4	Understand basics and applications of statistical softwares.	3,4	U, An, Ap, C

COURSE TITLE: MASTER'S SEMINAR			
COURSE CODE: MSFT61-305			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Develop scientific aptitude	1,3	U, Ap, C
CO2	Build confidence for delivering lectures	1,2,3	U, Ap, C
CO3	Improve their presentation skills	2,3	U, Ap, C
CO4	Improve their writing skills	1,3	U, Ap, C

### Semester-IV

COURSE TITLE: FOOD QUALITY ASSURANCE & MANAGEMENT			
COURSE CODE: MSFT62-401			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Learn about various quality attributes of foods and various aspects of food safety.	1,2	U, An, Ap
CO2	Understand involvement of food agency for implementing various food laws in India.	3,4	U, An, Ap, C
CO3	Understand the concept of quality control and assurance, risk assessments, GMPs etc. in food sector.	1,2,3,4	U, Ap, C
CO4	Know the importance of sensory evaluation and quality control in food	3,4	U, An, Ap, C



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**COURSE TITLE: INDUSTRIAL MICROBIOLOGY & FERMENTED FOODS**  
**COURSE CODE: MSFT62-402**

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about fermentor, its parts and instrumentation involved	1,2	R, U, Ap, C
CO2	Understand processing methods of down streams and extraction of products.	1,2,4	U, An, Ap, C
CO3	Know about the technical aspects involved in the production of various fermented products.	1,2,4	U, Ap, C
CO4	Correlate relevance of fermentation with food technology.	1,3,4	U, Ap, C

**COURSE TITLE: ADVANCES IN FOOD NUTRITION**  
**COURSE CODE: MSFT62-403**

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Make relationship between food, nutrition and health.	1,2,3	R, U, Ap, C
CO2	Understand various metabolic processes involved while consuming food	1,2	U, Ap, C
CO3	Know about concept of balanced and healthy diets for various age groups.	1,4	U, An, Ap, C
CO4	Use food as medicine.	1,3,4	U, Ap, C

**COURSE TITLE: APPLICATION OF ENZYMES IN FOOD INDUSTRY**  
**COURSE CODE: MSFT62-404**

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the role of various enzymes used in food technology and their working mechanisms.	1,2,3	R, U, Ap
CO2	Understand factors affecting enzyme activity.	1	U, An, Ap
CO3	Understand the significance of different enzymes used in baking industry at commercial level.	1,4	An, Ap, C
CO4	Use enzymes for quality enhancement of food	1,3,4	U, An, Ap, C



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<b>COURSE TITLE: M. Sc. Dissertation</b>			
<b>COURSE CODE: MSFT62-405</b>			
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
CO1	Write synopsis for research topic.	1,3	U, Ap, C
CO2	Develop research and project writing skills	2,3	U, Ap, C
CO3	Understand the techniques of data collection and analysis	1,2,3	U, Ap, C
CO4	Write dissertation	1,2	U, Ap, C





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## Khalsa College Amritsar

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### M.Sc. Zoology

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Programme Specific Outcomes (PSOs)

PSO-1.	Students enrolled in M.Sc. Zoology will study and acquire complete knowledge of disciplinary as well as allied biological sciences
PSO-2.	Students are able to correctly use biological instrumentation and proper laboratory techniques.
PSO-3.	Students will be able to identify the relationship or synchronization between structure and function at all levels: molecular, cellular and organismal.
PSO-4.	Students will also be able to describe economic, ecological and medical significance of various animals.
PSO-5.	Students will be able to explain how organisms function at the level of the gene, genome, cell, tissue, organ and organ system.

#### COURSE OUTCOMES (COs)

##### Semester-I

Course Title: Functional Organization of Animals - I

Course Code: ZooC-501

S. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Understand the anatomical aspects of different animals	1,2,3,4	U, Ap, An, E
CO-2.	Have a better understanding of human body	1,2,3,4	U, Ap, An, E
CO-3.	Have an insight on the internal systems and their functions	1,2,3,4	U, Ap, An, E
CO-4.	Understand the physiological aspects of various organ systems	1,2,3,4	U, Ap, An, E
CO-5.	Have a comprehensive knowledge about the evolutionary trends among different animal groups.	1,2,3,4	U, Ap, An, E





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### Course Title: Animal Ecology

Course Code: ZooC-502

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about the relationship between biotic and abiotic world.	1,3,4	R, U, An, E
CO-2	Learn about different habits and habitat of animal & plants	1,3,4	R,U, An, E
CO-3	Learn about adaptations for different environments.	1,3,4	R, U, An, E
CO-4	Gain knowledge about coloration, crypsis, mimicry and protection from predators.	1,3,4,5	R, U, Ap, An, E
CO-5	Gain knowledge about various types of pollution viz. air, water and land pollution.	1,3,4	R, U, Ap, An, E

### Course Title: Cell Biology

Course Code: ZooC-503

S. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Understand the cell theory and cell principle.	1,2,3,4	R, U, Ap, An, E
CO-2.	Understand various properties of cell like cell size, shape, number, life span and death	1,2,3,4	U, Ap, An, E
CO-3.	Differentiate between prokaryotic and eukaryotic cell.	1,2,3,4	U, An, E
CO-4.	Know the structure of Mycoplasma, Bacteria, Cyanobacteria and importance of their study.	1,2,3,4	R, U, Ap, An, E
CO-5.	Study the theories of evolution of eukaryotic cell from prokaryotic cell.	1,2,3,4	R, U, Ap, An, E
CO-6	Develop understanding about composition and properties of cell membrane including various lipoprotein models.	1,2,3,4	R, U, Ap, An, E
CO-7	Study the structure and functions of the cell organelles like Golgi complex, Endoplasmic reticulum, Mitochondrion, Ribosomes, Peroxisomes and glyoxysomes.	1,2,3,4	U, Ap, An, E
CO-8	Develop understanding about various cell surface modifications: Glycocalyx, Microvilli and Caveolae.	1,2,3,4	U, Ap, An, E
CO-9	Become familiarized with various cytoplasmic inclusions in the cytoplasm: Glycogen, Starch, lipids, metabolic crystals.	1,2,3,4	U, Ap, An, E



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CO-10	Study the cytoskeleton including microtubules, actin, myosin, intermediate filaments and their role in muscle contraction.	1,2,3,4	U, Ap, An, E
CO-11	Understand the phases of cell cycle including Mitosis and Meiosis.	1,2,3,4	U, Ap, An, E

### Course Title: COMPUTER FUNDAMENTALS & DATA PROCESSING

#### Course Code: ZooC-504

S. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Use word processors, spreadsheets, presentation software.	1,2	Ap
CO-2.	Describe the features and functions of the categories of application software.	1,2	An,E
CO-3.	Understand the dynamics of an office environment.	1,2	U
CO-4.	Demonstrate the ability to apply application software in an office environment.	1,2	An

### Course Title: Practical-I (Functional Organization of Animals-I)

#### Course Code: ZooC-551

S. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Understand various systems like digestive, nervous and muscular system	1,2,3,4	U, Ap, An, E
CO-2.	Compare and contrast the systems of invertebrates and vertebrates	1,2,3,4	U, Ap, An, E
CO-3.	Have an insight on the internal systems and their functions	1,2,3,4	U, Ap, An, E
CO-4.	Have a better understanding about histological characteristics of different organs	1,2,3,4	U, Ap, An, E
CO-5.	Understand comparative systems like respiratory and cardiovascular systems	1,2,3,4	U, Ap, An, E

### Course Title: Practical-II (Ecology & Cell Biology)

#### Course Code: ZooC-552

S. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Estimate the population size of insect population using sweep net method.	1,2,3,4	R, U, Ap, An, E
CO-2.	Acquire practical understanding towards collection methods of Protozoans, Nematodes, Soil arthropods	1,2,3,4	R, U, Ap, An, E



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CO-3.	Perform combined population studies using quadrates.	1,2,3,4	R, U, Ap, An, E
CO-4.	Perform experiments to determine diversity indices/ richness using Simpson, Shannon-Wiener methods.	1,2,3,4	R, U, Ap, An, E
CO-5.	Study intra-population distribution and Poison distribution, construction of life table and survivorship curves from given data.	1,2,3,4	R, U, Ap, An, E
CO-6	Get familiarized with basic principle and working of various types of microscopies including compound, phase contrast and electron microscope	1,2,3,4	R, U, Ap, An, E
CO-7	Develop understanding about the use and care of Light compound microscope and Lens aberrations.	1,2,3,4	R, U, Ap, An, E
CO-8	Study different cell types including prokaryote cells: Lactobacillus, E. coli. Blue green algae and Eukaryote cells: Testicular material (for studies of spermatogenesis).	1,2,3,4	U, Ap, An, E
CO-9	Get demonstrations regarding microtomy: Introduction of the instrument - its use and care along with the preparation of permanent slides: Principles and procedures - Section cutting of tissues and staining of tissues with Haematoxylin/Eosin method.	1,2,3,4	U, Ap, An, E
CO-10	Study various tissues (gut region, liver, lung, spleen, kidney, pancreas, testis, ovary, tongue, skin etc.) using permanent slides & cell organelles through electron micrographs.	1,2,3,4	U, Ap, An, E
CO-11	Perform various cytochemical techniques: carbohydrates, nucleic acids, proteins, lipids and enzymes.	1,2,3,4	U, Ap, An, E

## Semester-II

**Course Title: Functional Organization of Animals - II**

**Course Code: ZooC-601**

S. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1.	Have an insight of the internal systems and their functions	1,2,3,4	U, Ap, An, E
CO-2.	Have a better understanding of our body	1,2,3,4	U, Ap, An, E
CO-3.	Understand various anatomical aspects of different animals	1,2,3,4	U, Ap, An, E



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CO-4.	Understand the physiological aspects of various organ systems	1,2,3,4	U, Ap, An, E
CO-5.	Have knowledge about the evolution among different invertebrates and vertebrates	1,2,3,4	U, Ap, An, E
CO-6.	Have an insight on the internal systems and their functions	1,2,3,4	U, Ap, An, E

**Course Title: Applied Zoology-I (Invertebrates)**

**Course Code: ZooC-602**

S. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1.	Be familiar with the economically important arthropod species and their significance	1,2,3,4	R, U, Ap, An, E
CO-2.	Gain knowledge of farming of insects for increasing food production	1,2,3,4	R, U, Ap, An, E
CO-3.	Understand importance of insects as pollinators and bio-control agents	1,2,3,4	R, U, Ap, An, E
CO-4.	Utilize modern methods and economic aspects of apiculture, sericulture and lac culture	1,2,3,4	R, U, Ap, An, E
CO-5.	Identify different species and casts of honeybees and species of silkworm.	1,2,3,4	R, U, Ap, An, E
CO-6.	Explain the tools and techniques used in apiculture, sericulture, moriculture and lac culture	1,2,3,4	R, U, Ap, An, E
CO-7.	Identify different species and casts of honeybees and species of silkworm.	1,2,3,4	R, U, Ap, An, E
CO-8.	Observe culture techniques, farm management and hatchery operations of prawn and pearl culture	1,2,3,4	R, U, Ap, An, E
CO-9.	Analyze harvesting and marketing strategies of prawn and pearl culture	1,2,3,4	R, U, Ap, An, E
CO-10.	Understand the significance of vermiculture and vermicomposting at domestic and commercial level.	1,2,3,4	R, U, Ap, An, E
CO-11.	Identify economically important protozoans, helminthes and echinoderms	1,2,3,4	R, U, Ap, An, E

**Course Title: Evolution**

**Course Code: ZooC-603**

Sr. No.	Course Outcome	PSOs addressed	Cognitive levels
CO1	Know about population genetics, human evolution, various concepts about origin of species, extinctions, phylogenetic tree making	1,2,3,4,5	R, U, Ap, An, E, C





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CO2	Have knowledge of fitness, the measure for selection and how it can be measured empirically	1,2,3,4	R,U, Ap, An, E, C
CO3	Counter arguments against evolution, critically evaluate popularized writings which take up evolutionary topic or use evolutionary argumentation.	1,3,4,5	R, U, An, E
CO4	Better distinguish between scientific and unscientific arguments	1,2,3,4,5	R, U, An, E
CO5	See evolutionary biology as a powerful set of tool for approaching current changes in biodiversity and addressing future challenges.	1,3,4	R, U, Ap, An, E

**Course Title: Practical-II (Functional Organization of Animals-II)**

**Course Code: ZooC-651**

S. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1.	Have a better understanding of histological characteristics of different organs like skin	1,2,3,4	U, Ap, An, E
CO-2.	Compare and contrast the systems of invertebrates	1,2,3,4	U, Ap, An, E
CO-3.	Have an understanding of insect morphology and wings	1,2,3,4	U, Ap, An, E
CO-4.	Understand various systems like nervous system	1,2,3,4	U, Ap, An, E
CO-5.	Understand comparative antennary and wing modifications of insects	1,2,3,4	U, Ap, An, E

**Course Title: Practical IV (Evolution and Applied Zoology-I) Course Code: ZooC-652**

S. No.	COURSE OUTCOMES	PSOs addressed	Cognitive levels
CO-1.	Use regression, correlation and variance analysis for gene frequency	1,2,3,4	R, U, An, E
CO-2.	Understand Hardy-Weinberg law and its application phenomena of natural selection in a population	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Compare vertebrates skeleton to understand evolutionary trends	1,2,3,4,5	R, U, An, E
CO-4.	Understand phylogenetic tree and polyphyletic origin of characters	1,2,3,4	R, U, Ap, An, E
CO-5.	Map geographic distribution of animals	1,2,3,4	R, U, An, E





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CO-6.	Compare and contrast homology and analogy	1,2,3,4,5	R, U, An, E
CO-7.	Observe various tools, crafts and gears used in Apiary, Fishery, Sericulture and Pest control	1,2,3,4	R, U, An, E
CO-8.	Analyze the physic-chemical characteristics of honey and vermicompost	1,2,3,4,5	R,U, Ap, An, E
CO-9.	Identify various qualities of lac	1,2,3,4,5	R, U, An, E
CO-10.	Visit apiary, vermicomposting unit, sericulture unit and prawn farm and learn to prepare reports	1,2,3,4,5	R, U, An, E

### Semester-III

**Course Title: Research Techniques**

**Course Code: ZooC-701**

Sr. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1	Develop an understanding regarding centrifugation and chromatographic techniques	1,2,3,4	R, U, An, Ap,E
CO-2	Understand each and every aspect of spectroscopy	1,2,3,4	R,U, Ap, An, E
CO-3	Develop an insight into electrophoretic techniques related to carbohydrates and proteins	1,2,3,4,5	R, U, An, Ap, E,C
CO-4	Develop an understanding about radio isotopic techniques and scintillation counters	1,2,3,4,5	R, U, Ap, An, E
CO-5	Develop an understanding regarding chromatographic techniques	1,2,3,4,5	R, U, An, E, C

**Course Title: Developmental Biology**

**Course Code: ZooC-702**

S. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1.	Learn the concepts of developmental biology	1,2,3,4	R, U, Ap, An, E
CO-2.	Prepare the flow chart of gametogenesis process.	1,2,3,4	R, U, Ap, An, E



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CO-3.	Understand the process of differentiation of eggs and sperms before fertilization	1,2,3,4	R, U, Ap, An, E
CO-4.	Get knowledge of assisted reproductive technologies like IVF and ET	1,2,3,4	R, U, Ap, An, E
CO-5.	Understand and appreciate the genetic mechanisms development	1,2,3,4	R, U, Ap, An, E
CO-6.	Understand the role of model organisms	1,2,3,4	R, U, Ap, An, E
CO-7.	Understand the causes of infertility and their preventive measures	1,2,3,4	R, U, Ap, An, E
CO-8.	Understand the significance of regeneration and metamorphosis	1,2,3,4	R, U, Ap, An, E
CO-9.	Understand the events that lead up to and comprise the process of fertilization	1,2,3,4	R, U, Ap, An, E
CO-10.	Know about the macro-, meso- and micromeres which form into specific cells in the embryo	1,2,3,4	R, U, Ap, An, E
CO-11.	Find scope to do research in different developmental processes of animals	1,2,3,4	R, U, Ap, An, E
CO-12.	Explain the theories of preformation and concepts like growth, differentiation and reproduction	1,2,3,4	R, U, Ap, An, E
CO-13.	Describe the key events in early and systematic embryological development	1,2,3,4	R, U, Ap, An, E
CO-14.	Understand early embryonic development of invertebrates and vertebrates	1,2,3,4	R, U, Ap, An, E
CO-15.	Know the inducer and inductor role in embryogenesis	1,2,3,4	R, U, Ap, An, E
CO-16.	Get knowledge about metamorphosis and the process of regeneration.	1,2,3,4	R, U, Ap, An, E
CO-17.	Explain the concept of mesoderm induction and pattern formation with examples.	1,2,3,4	R, U, Ap, An, E

**Course Title: Biochemistry**

**Course Code: ZooC-703**

S. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1.	Understand the scope of biochemistry in the field of medicine, nutrition and agriculture	1,2,3,4	R, U, An, E
CO-2.	Understand the causes and cure of diseases and effect of nutritional deficiencies	1,2,3,4,5	R,U, Ap, An, E



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CO-3.	Enhance the scope of career in research laboratories	1,2,3,4,5	R, U, An, E
CO-4.	Understand how biochemistry covers genes, their inheritance and expression	1,2,3,4	R, U, Ap, An, E

**Course Title: Applied Zoology-II (Vertebrates)**

**Course Code: ZooC-704**

S. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1.	Understand the concepts of fisheries, fishing tools, site selection, preparation and management of fish culture ponds	1,2,3,4	R, U, Ap, An, E
CO-2.	Study aqua culture systems, induced breeding techniques and post harvesting techniques	1,2,3,4	R, U, Ap, An, E
CO-3.	Develop knowledge of farming of aquatic organisms for increasing food production and animals beneficial to human	1,2,3,4	R, U, Ap, An, E
CO-4.	Observe culture techniques and farm management of piggery, poultry, fur, leather, wool and milk producing animals	1,2,3,4	R, U, Ap, An, E
CO-5.	Analyse harvesting and marketing strategies for fur, leather and wool industry	1,2,3,4	R, U, Ap, An, E
CO-6.	Understand the technique of fish preservation and water quality monitoring techniques	1,2,3,4	R, U, Ap, An, E
CO-7.	Get knowledge about various livestock specifically the farm animals	1,2,3,4	R, U, Ap, An, E
CO-8.	Have expertise of the housing system, feeding requirements, feeding habits and use of low-cost feed technology for better economic returns from various animals farms	1,2,3,4	R, U, Ap, An, E
CO-9.	Know the importance and contribution of livestock in the state and national economy	1,2,3,4	R, U, Ap, An, E
CO-10.	Understand the use of animals in vaccine production and pharmaceutical industry	1,2,3,4	R, U, Ap, An, E



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### Course Title: Practical-V (Research Tech. & App. Zoo.)

Course Code: ZooC-751

Sr. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1	Develop a practical approach regarding centrifugation and chromatographic techniques	1,2,3,4	R, U, An, Ap,E
CO-2	Understand how to use spectrophotometers, rotors and centrifuges	1,2,3,4	R,U, Ap, An, E
CO-3	Learn the preparation of agarose and SDS-PAGE Gels	1,2,3,4,5	R, U, An, Ap, E,C
CO-4	Learn practical preparation of standard curves of BSA and their application in spectroscopic techniques	1,2,3,4,5	R, U, Ap, An, E
CO-5	Perform physic-chemical analysis of milk, different qualities of leather and wool	1,2,3,4,5	R, U, An, E, C
CO-6	Students visit to poultry/ piggery/ diary/ rabbit/ sheep/ fish farm/ leather/ wool industry	1,2,3,4,5	R, U, Ap, An, E

### Course Title: Developmental Biology and Biochemistry

Course Code: ZooC-752

S. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1.	Get hands on training about biochemical reaction taking place inside the cell	1,2,3,4	R, U, An, E
CO-2.	Do quantitative analysis of proteins, carbohydrate, fats etc.	1,2,3,4,5	R,U, An, E
CO-3.	Develop scope in pharmaceutical and research laboratories	1,2,3,4,5	R, U, An, E
CO-4.	Gain In-depth comparative knowledge of spermatogenesis and oogenesis	1,2,3,4	R, U, Ap, An, E
CO-5.	Study larval forms throughout the animal kingdom	1,2,3,4	R, U, An, E
CO-6.	Get hands on training and understanding of various developmental stages of chick and frog	1,2,3,4,5	R, U, An, E
CO-7.	Compare and contrast spermatogenesis and oogenesis	1,2,3,4	R, U, An, E





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CO-8.	Identify the developmental stages of chick embryo, cell structures and phases of cell division	1,2,3,4,5	R,U, Ap, An, E
CO-9.	Estimate sugar and protein by suitable biochemical method, and isolate protein from biological source.	1,2,3,4,5	R, U, An, E
CO-10.	Prepare acid and base solutions of desired strength and buffers	1,2,3,4,5	R, U, An, E

### Semester-IV

**Course Title: Animal Behavior & Wildlife Conservation Course Code: ZooC-801**

Sr. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1	Develop an understanding regarding different behavioral patterns, communication and memory.	1,3,4,5	R, U, An, Ap,E
CO-2	Explain genetic, environmental, hormonal and neural controls of animal behaviour	1,2,3,4,5	R,U, Ap, An, E
CO-3	Develop an insight into various social behaviors in insects and primates	1,2,3,4,5	R, U, An, Ap, E,C
CO-4	To develop an understanding on a variety of reproductive behaviors and their evolution	1,2,3,4,5	R, U, Ap, An, E
CO-5	Study faunal diversity and the implementation of conservation measures to save diversity	1,2,3,4,5	R, U, An, E, C
CO-6	Understand the importance of wildlife and conservation for protected areas	1,3,4,5	R, U, Ap, An, E
CO-7	Learn the causes of depletion of wildlife and conservation ethics	1,3,4,5	R, U, An, E, C
CO-8	Understand wildlife legislation, its amendments and implementation	1,3,4,5	R, U, An, E





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**Course Title: Animal Genetics and Biotechnology**

**Course Code: ZooC-802**

S. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1.	Acquire a broad understanding of Genetics including the physical and chemical basis of heredity	1,2,3,4	R, U, An, E
CO-2.	Understand the basic organization and chemical composition of prokaryotic and eukaryotic genomes	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Understand about genetic phenomenon like linkage, crossing over and chromosomal mapping	1,2,3,4,5	R, U, An, E
CO-4.	Understand the types and classification of mutations and mutagens along with their underlying mechanism	1,2,3,4	R, U, Ap, An, E
CO-5.	Understand the basic aspects of flow of genetic information from DNA to Protein, gene expression and regulation mechanisms among prokaryotes and eukaryotes	1,2,3,4	R, U, An, E
CO-6.	Be able to distinguish between maternal effect, sex-linked, and extra nuclear modes of inheritance	1,2,3,4,5	R, U, An, E
CO-7.	Study the organization and expression of bacteriophage genome; structure and infection cycles of eukaryotic viruses with special focus on animal virus and cancers	1,2,3,4	R, U, An, E
CO-8.	Have a better understanding of bacterial genetics and means of genetic recombination	1,2,3,4,5	R,U, Ap, An, E
CO-9.	Understand the role of genetic technologies in industry related to pharmaceuticals, biotechnology, and diagnostic clinics	1,2,3,4,5	R, U, An, E

**Course Title: Immunology**

**Course Code: ZooC-803**

S. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1.	Get opportunity to know about the immune system & Processes of organisms.	1,2,3,4	R, U, An, E
CO-2.	Study techniques to cure immunological diseases.	1,2,3,4,5	R,U, Ap, E
CO-3.	Guide common people to have better health.	1,2,3,4,5	R, U, An, E
CO-4.	Understand the importance of the role of immunology in the diseases like Corona pandemic and they can also guide people about how to prevent Corona and not to bother about rumors related to Corona as well as the use of life saving Vaccines.	1,2,3,4	R, U, Ap, An, E



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CO-5.	Get opportunity of Job as Advisor, Teacher, Researcher, Technicians in the academics as well as in research and pharmaceutical institutes.	1,2,3,4	R, U, An, E
CO-6.	Become volunteers to assist the professionals and to guide the people to mitigate the pandemic.	1,2,3,4,5	R, U, An, E

**Course Title: Biosystematics**

**Course Code: ZooC-804**

S. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1.	Illustrate the methodologies used in systematics		
CO-2.	Understand various theories relevant to biosystematics	1,2,3,4	R, U, Ap, An, E
CO-3.	Acquire thorough knowledge of principles and practices of biosystematics	1,2,3,4	R, U, Ap, An, E
CO-4.	Understand diversity and inter-relationships of animals, principles, methods of biological classification and diversity in kingdom Animalia	1,2,3,4	R, U, Ap, An, E
CO-5.	Develop a holistic appreciation on the phylogeny and adaptations in animals and various taxonomic procedures and molecular phylogenetics	1,2,3,4	R, U, Ap, An, E
CO-6.	Understand the taxonomic procedures to identify a species, explain the importance of taxonomic keys and taxonomic characters	1,2,3,4	R, U, Ap, An, E
CO-7.	Acquire the skills of nomenclature of species and sub species.	1,2,3,4	R, U, Ap, An, E
CO-8.	Apply the International rules of Nomenclature to give scientific names to animals which are found during research and understand the principles of zoological classification and nomenclature	1,2,3,4	R, U, Ap, An, E
CO-9.	Understand the gradual development and evolutionary history of different kinds of living organisms from earlier forms over several generations	1,2,3,4	R, U, Ap, An, E
CO-10.	Differentiate between Species, subspecies, sibling species race and deme.	1,2,3,4	R, U, Ap, An, E
CO-11.	Justify the inclusion of a given organism in a given phylum.	1,2,3,4	R, U, Ap, An, E



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### Course Title: Practical-VII (Behaviour and Wildlife)

Course Code: ZooC-851

Sr. No.	Course Outcomes	PSOs addressed	Cognitive levels
CO-1	Study different behavioral patterns using photographs	1,2,3,4	R, U, An, Ap,E
CO-2	Study the influence of temperature on development and population build up in Tribolium	1,2,3,4	R,U, Ap, An, E
CO-3	Investigate the locomotive, explorative and habituation behaviour in earthworm	1,2,3,4,5	R, U, An, Ap, E,C
CO-4	Study geotaxis, humidity preference and photo taxis in various experimental animals	1,2,3,4,5	R, U, Ap, An, E
CO-5	Study latent and operant learning in rat	1,2,3,4,5	R, U, An, E, C
CO-6	Study the chemosensory responses in drosophila	1,2,3,4,5	R, U, Ap, An, E
CO-7	Understand how to record their body rhythms	1,2,3,4,5	R, U, An, E, C

### Course title: Practical-VIII (Genetics and Biosystematics)

Course Code: ZooC-852

Sr. No.	Course Outcome	PSOs addressed	Cognitive levels
CO-1.	Identify museum specimen/pictures of minor phyla, Invertebrates, Protochordates and Vertebrates	1,2,3,4	R, U, An, E
CO-2.	Classify animals on the basis of their relation to other animals by bodystructure external characters	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Understand the use of various kinds of keys to identify and classify animals	1,2,3,4,5	R, U, An, E
CO-4.	Understand the use of various equipment for collection of animals.	1,2,3,4	R, U, Ap, An, E
CO-5.	Have in-depth knowledge of museology- placement and arrangement of animals depicting their classification and interrelationships. Categorize animals according to the phylogeny.	1,2,3,4	R, U, An, E
CO-6.	Have hands-on training of preservation techniques	1,2,3,4,5	R, U, An, E
CO-7.	Be well equipped to become very competent in research or teaching fields after completion of this course	1,2,3,4	R, U, An, E
CO-8.	Collect and preserve animal samples using common methods, compare the methods of collection and preservation of insects	1,2,3,4,5	R,U, Ap, An, E
CO-9.	Write scientific report of field/ institutional visit.	1,2,3,4,5	R, U, An, E



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CO-10.	Prepare temporary slides of various cells to demonstrate the cell morphology and cell division, giant chromosome and pedigree analysis chart.	1,2,3,4,5	R, U, An, E
CO-11.	Determine the gene distance and order, genotype and phenotypic ratios and allelic frequencies from the given data.	1,2,3,4	R, U, An, E





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### M. Sc. MATHEMATICS (UNDER THE HONS. SCHEME)

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Programme Specific Outcomes (PSOs)

<b>PSO-1</b>	Understand the nature of abstract mathematics and explore the concepts in various fields.
<b>PSO-2</b>	Comprehend and write effective reports and design documentation related to mathematical research and literature, make effective presentations.
<b>PSO-3</b>	To make them expertise in using ICT tools in solving problems in mathematics.
<b>PSO-4</b>	Inculcate mathematical reasoning and assimilate complex mathematical ideas and arguments.
<b>PSO-5</b>	Communicate mathematical ideas with clarity and coherence, both written and verbally.

#### COURSE OUTCOMES (Cos)

##### Semester-I

**COURSE TITLE: REAL ANALYSIS-I**

**COURSE CODE: MHMH-411**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Introduce students to the fundamentals of mathematical analysis and reading and writing mathematical proofs.	1,4,	R, U, Ap, E
CO2	Correlate Calculus with real analysis by finding infinite sums and evaluating limits to understanding the concept of continuity and uniform continuity one is doing real analysis.	4,5	Ap, An, E
CO3	Understand the concept of cardinality of a set, open sets, closed sets, compact sets and connected sets, complete spaces, continuity and uniform continuity in a metric space.	1, 4	R, U, Ap
CO4	Realizes how these notions are generalized from real line to metric spaces.	1, 4	An, E,C





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### COURSE TITLE: MODERN ALGEBRA

### COURSE CODE: MHMH-412

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Recognize the foundation required for more advanced studies in Algebra.	1, 4	R, U,
CO2	Use group theory in modern physics which is based on symmetry principles.	1,4,5	Ap, An, E
CO3	Apply group theory such that the existence of several particles can be predicted before they are experimentally observed.	1, 4	U, Ap, An
CO4	Apply group theory in chemistry such as the symmetry of a molecule provides students with the information of energy levels of the orbital, the orbital symmetries, bond order.	1, 4,5	Ap, An, E

### COURSE TITLE: APPLIED LINEAR ALGEBRA

### COURSE CODE: MHMH-413

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Deepen their understanding of Linear Algebra.	1	U,An, E,C
CO2	Become familiar with the concepts of linear independence, basis, span, linear maps, the properties of linear transformations and orthogonal decomposition of inner product spaces.	1, 4	R, U, Ap
CO3	Have a good knowledge of inner product spaces, and will be able to define and use the adjoint of a linear map on a finite-dimensional inner product space.	1,4,5	U, An, E
CO4	Construct the matrix of a bilinear form and to find index, rank and signature of a bilinear form.	4,5	An, E, C
CO5	Determine a linear operator is normal, unitary and orthogonal projection and to construct the spectral decomposition of normal and self-adjoint operators.	1, 2, 3	Ap, An, E



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### COURSE TITLE: NUMBER THEORY

COURSE CODE: MHMH-414

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Form the bridge between pure mathematics and applied mathematics.	1, 2, 4	U, An, C
CO2	Apply Number Theory in mathematics as well in practical applications such as security system like in banking securities, coding theory, barcodes and memory management systems.	1,4,5	R, U, Ap
CO3	Understand the various types of numbers and their properties.	1, 5	R, U, An
CO4	Use various arithmetic functions and the concept of congruences to solve various arithmetic problems.	2, 4	Ap, C, E
CO5	Analyze the study of integers and integer-valued functions.	1, 4	An, E, C

### COURSE TITLE: COMPLEX ANALYSIS

COURSE CODE: MHMH-415

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the properties of analytic functions.	1	R, U, Ap, C
CO2	Understand the concept of poles, singularities, residues, contour integration and conformal mappings and their applications.	1, 4	Ap, An, E

### COURSE TITLE: DIFFERENTIAL EQUATIONS

COURSE CODE: MHMH-416

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to express laws of nature with the help of differential equations.	1, 2	Ap, An, E, C
CO2	Know how to model the world in terms of differential equations, and how to solve those equations and interpret the solutions.	1,4	U, An, Ap
CO3	Focus on the equations and techniques most useful in science and engineering.	2,4	Ap, E,C



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CO4	Understand properties of solutions of differential equations which is fundamental to much of contemporary science and engineering.	1, 2	U, Ap, An
CO5	Learn to formulate, classify and transform first order partial differential equation into canonical forms.	1,4,5	U, Ap, An, E, C

### Semester-II

**COURSE TITLE: REAL ANALYSIS II**

**COURSE CODE: MHMH-421**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the behavior of sequences and series of functions.	1,2	R, U, An
CO2	Familiar with the Riemann Stieltje's integral which is generalization of the Riemann integral.	1, 2	An, E, C
CO3	Analyzes the applications of Power series in the field of engineering i.e in spectrum analysis, radio, audio, and light applications.	1, 4	An, Ap, E
CO4	Understand Riemann Stieltjesintegrability of a bounded function and prove a selection of theorems concerning integration.	1,4	U, An, Ap, C
CO5	Recognize the difference between pointwise and uniform convergence of sequence and series of functions, Equicontinuous families of functions, Arzela Ascoli's theorem and Weierstrass Approximation Theorem.	1, 2	R, U, Ap, An

**COURSE TITLE: ADVANCED ALGEBRA**

**COURSE CODE: MHMH- 422**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use ring theory in wide areas of current research in mathematics, computer science and mathematical/theoretical physics.	1, 2, 4	U, Ap, An



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CO2	Introduce themselves with the concepts and develop working knowledge on simple ring and ring homomorphism.	2, 4	R, U, Ap
CO3	Know the structure of rings, their representations, modules, special classes of rings (group rings, division rings, and universal enveloping algebras).	1, 5	U, Ap, An
CO4	Deal with developments of commutative ring theory, which is a major area of modern mathematics.	2, 4	An, Ap, C
CO5	Appreciate the significance of unique factorization in rings and integral domains.	1, 4	An, E, C

**COURSE TITLE: PROBABILITY THEORY COURSE CODE: MHMH- 423**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquaint with the foundation of probabilistic and statistical analysis ,mostly used in engineering and science like disease modeling, climate prediction networks etc.	1, 2,4	U, An, C
CO2	Take informed decisions about a population by examining only a small random sample of the members of that population.	1, 4	An, E, C
CO3	Quantify the uncertainty and assess the accuracy of our inference about the population.	2,4	Ap, An, E
CO4	Have good understanding of exploratory data analysis. Learner will be able to write a short-report describing a simple statistical data set.	1, 4,5	R, U, Ap
CO5	Become informed consumer of statistical information provided in newspaper, magazine and journals.	1, 2	U, Ap, An,





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### COURSE TITLE: CLASSICAL MECHANICS AND CALCULUS OF VARIATIONS COURSE CODE: MHMH- 424

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply the classical mechanics approach to solve a mechanical problems	1, 2	Ap, An
CO2	Understand the concept of functional and determine stationary paths of a functional to deduce the differential equation for stationary paths.	1, 2	U, An, Ap
CO3	Describe and understand the motion of a mechanical system using Lagrange Hamilton formalism.	2, 4	R, U, E
CO4	Recognize the degrees of freedom and understand the concept of generalized coordinates.	1, 2	R, U, Ap
CO5	Apply the concepts of classical mechanics in Geology, engineering, and many other inter-disciplinary areas.	2,4,5	Ap, An, E, C

### COURSE TITLE: DIFFERENTIAL GEOMETRY COURSE CODE: MHMH- 425

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get familiar with curvature and torsion of space curves, the relation of tangent planes, principle normals and binormals.	1,4	An, E, C
CO2	Know the intrinsic and non-intrinsic properties of surfaces and geodesics, tensors analysis and its applications.	1, 2	R, U, Ap

### COURSE TITLE: MATHEMATICAL METHODS COURSE CODE: MHMH- 426

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Prepare themselves with mathematical tools and techniques that are required in advanced courses offered in the applied mathematics and engineering problems.	2, 4	An, E, C





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CO2	Apply concept of mathematical methods in diverse areas of science and technology such as electric analysis, communication engineering and solution of partial differential operation.	1, 2	Ap, U, An
CO3	Learn to solve the Integral equations which are encountered in various problems including radiative transfer, and the oscillation of a string, membrane, or axle.	1,5	R, E, C
CO4	Understand the concept of Laplace and Fourier Transforms and enable them to apply these for solving simultaneous, linear and partial differential equations.	1, 2, 4	U, R, Ap, An
CO5	Interpret the concept of Volterra and Fredholm integral equations and find solutions of these equations using various methods.	2,4	An, E, C

### Semester-III

**COURSE TITLE: MEASURE THEORY**

**COURSE CODE: MHMH- 531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use concepts of mathematical analysis to determine the sizes of sets.	1, 4	C, Ap
CO2	Know about natural extension of Riemann integral which allows for better understanding of the fundamental relations between differentiation and integration.	1, 2, 3	U, R
CO3	Apply Lebesgue integration in many areas, including Functional Analysis, Harmonic Analysis and Probability Theory.	3,4	R, Ap, U
CO4	Acquire the knowledge of Lebesgue measurable sets, measurable functions and Lebesgue integral.	2,3, 4	R,U, Ap
CO5	Extend the concept of outer measure in an abstract space.	1,2 , 3, 4	U, E



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### COURSE TITLE: FUNCTIONAL ANALYSIS-I

COURSE CODE: MHMH- 532

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the main concepts and fundamental methods of functional analysis to treat various concrete problems based on Banach spaces.	1, 3	U, R
CO2	Study the certain classes of functions defined in functional spaces.	3, 4	C, An
CO3	Learn the various examples of banach spaces.	1,3, 4	U, R
CO4	Verify the requirements of a norm and completeness with respect to a norm.	2,3	An, E
CO5	Compute the spectrum of operators and classify the set into sub-classes.	2, 3	C, An

### COURSE TITLE: STATISTICAL INFERENCE

COURSE CODE: MHMH- 533

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Solve the problems based on estimation and to test the efficiency of various estimators.	1,3	U, R, Ap
CO2	Handle the practical problems using hypothesis testing.	2,4	C, An, Ap
CO3	Solve the practical problems using t-test, F-test, Z-test, chi-square test for various types of data.	1,3	U, R

### COURSE TITLE: MECHANICS

COURSE CODE: MHMH- 534

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	To apply Kepler laws in satellite motion.	2	Ap
CO2	To apply knowledge of work energy principle to solve problems related to statics and dynamic equilibrium.	1	Ap, An
CO3	To solve problems in two-dimensional rigid bodies using various energy and momentum laws.	5	E



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### COURSE TITLE: DISCRETE MATHEMATICS COURSE CODE: MHMH- 535

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Formulate problems and solve recurrence relations.	5	C
CO2	Model and solve real world problems using graphs and trees.	2	E,C
CO3	Simplify Boolean Expressions	5	An

### COURSE TITLE: APPLIED STATISTICS COURSE CODE: MHMH -536 (A)

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Analyze the trends using various methods such as graphic method and method of curve fitting.	1	An
CO2	Construct index numbers with the help of Laspeyre's method, Paasche's method, Bowley's method, Fisher's method.	2	C
CO3	Learn the methods of obtaining vital Statistics.	4	R,U
CO4	Apply the knowledge of applied statistics to measure the mortality rate	5	Ap
CO5	Calculate the total fertility rate and general fertility rate with the help of applied statistics.	5	An, E

### COURSE TITLE: PROJECT COURSE CODE: MHMH -536 (B)

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop presentation skills in the students.	2	An
CO2	Inculcate discussion abilities, flexibility of thought and effective time management in students	1, 4	C
CO3	Get eligible for admission in Ph.D programmes and other higher studies in national and international universities	2, 4	U
CO4	Acquaint themselves with research oriented work.	2	E
CO5	Enhance the knowledge of pure mathematics.	5	C
CO6	Experience to face a panel in logical way.	4	E



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### Semester-IV

**COURSE TITLE: TOPOLOGY**

**COURSE CODE: MHMH- 5412**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the properties of a geometric object that are preserved under continuous deformations, such as stretching, twisting, crumpling and bending.	1,3	U, R
CO2	Discuss the shape of molecules in chemistry by analysis of the topology of a related graph.	2,4	C, An
CO3	Understand the mathematical tools that are useful to applied mathematicians and to theoretical physicists.	1,3	U, R, Ap
CO4	Apply the knowledge of topology in computers especially in network science.	1,3,4	R, Ap
CO5	Understand the various topological spaces and their properties, separation axioms, Tietz extension theorem and Tychonoff theorem.	1,2,3	U, An, Ap

**COURSE TITLE: FUNCTIONAL ANALYSIS-II COURSE CODE: MHMH- 542**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the main concepts and fundamental methods of functional analysis to enable a student to treat various concrete problems based on Hilbert spaces.	1, 4	C, U, E
CO2	Study functional spaces which play vital role in study of existence and uniqueness of solutions of differential equations, boundary value problems, optimization techniques etc.	1,2,3	U, R, An, E
CO3	Distinguish between Banach spaces and Hilbert spaces.	2,3,4	An, E
CO4	Classify operators into self-adjoint, unitary and normal operators.	1,3	U, An, E
CO5	Represent a bounded linear functional in terms of inner product.	3,4	U, Ap





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### COURSE TITLE: FIELD EXTENSION AND GALOIS THEORY

#### COURSE CODE: MHMH- 543

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Deal with the problems based on finite and infinite fields.	1, 2	C, U, R
CO2	Detect the simple field, splitting field, perfect field etc.	1,2,3	C, U
CO3	Have an idea of splitting field of a given polynomial	1,2,3,4	U, R, E

### COURSE TITLE: OPERATIONS RESEARCH-II COURSE CODE: MHMH- 544

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the Operations Research for the purpose of making better decisions.	1, 4	U, R, Ap
CO2	Learn about management and administration of socio-cultural behavior and economic factors that exist as bottleneck to effective implementation.	1,2,3	U, R
CO3	Analyze complex real life problems typically with the goal of improving or optimizing performance.	2,3,4	An, C
CO4	Develop more effective approaches to programming by using different queuing models,generalized models, power supply model etc., customer's preference relating to the size,colour packaging .	1,3	C, Ap, E
CO5	determine the size of the stock to meet the future demand by applying inventory control methods,replacement problems	3,4	An, U, E

### COURSE TITLE: SAMPLING THEORY COURSE CODE: MHMH- 545

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the fundamental concepts of population and sample.	1	U





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CO2	Understand the principles of sample survey and the steps involved in selecting a sample.	2, 5	U, An
CO3	Compare Simple Random Sampling and Stratified Sampling	5	E
CO4	Practical applications of proportional and optimal allocation	4	C
CO5	Understand properties of unbiased estimators of population mean and variance	1	Ap, U

**COURSE TITLE: SPECIAL FUNCTIONS**

**COURSE CODE: MHMH- 546**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain the various mathematical methods.	5	U, Ap, C
CO2	To solve the various mathematical problems beyond the syllabus	4	Ap, An, E



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### M.Sc. PHYSICS (UNDER THE HONOURS SCHEME)

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

##### Programme Specific Outcomes (PSOs)

<b>PSO-1</b>	To train students in such a way that they can objectively carry out investigations, scientific and/or otherwise, without being biased or without having any preconceived notions.
<b>PSO-2</b>	As technology exploits the rules of Physics, students properly trained in Physics can be good researchers in the field of technology too.
<b>PSO-3</b>	To understand the basic concepts of physics particularly concepts in classical mechanics, quantum mechanics, electrodynamics and electronics to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws.
<b>PSO-4</b>	To apply advanced theoretical and/or experimental methods, including the use of numerical methods and simulations.
<b>PSO-5</b>	To get some research oriented experience by doing theoretical and experimental projects in the last semester under the supervision of faculty.
<b>PSO-6</b>	Students may get opportunities in higher education, research organizations, radiology and radiation oncology. Students can start their career in BARC, DRDO, IPR, ONGC etc.



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### COURSE OUTCOMES (COs)

#### Semester-I

Course Title: Electronics

Course Code: MHP-411

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use techniques for analysing analogue and digital electronic circuits	2,3,4,5	U, Ap, An, E,C
CO2	Formulate the concepts of operational amplifier and learn about basic operational amplifier characteristics, OPAMP parameters, applications as inverter, integrator, differentiator etc	1,3,4,5,6	R, U, Ap, An,C
CO3	Identify the major properties, types and applications of MOSFET, MESFET, UJT, SCR and Multivibrators.	1,3,5,6	U, Ap, E
CO4	Learn digital electronics basics using logic gates and working of major digital devices like flip flops, CMOS, CCD etc	1,2,3,4,5	U, Ap, An, C
CO5	Learn about Karnaugh maps, Flip Flops and counters in detail.	1,3,4,5,6	U, Ap, An, E, C

Course Title: Mathematical Physics

Course Code: MHP-412

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Expand a function in a Fourier series. They will also be aware of the integral transforms and be able to use this to solve mathematical problems relevant to the physical sciences.	1,3,5,6	U, Ap, An, E



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CO2	Learn about Gradient, Divergence and Curl in orthogonal.	2,3,5,6	R, U, Ap, E
CO3	Solve ordinary second order differential equations which are important in the physical sciences.	1,2,3,5	U, Ap, An, E
CO4	Have a good grasp of the basic elements of complex analysis, including the important integral theorems. They will be able to determine the residues of a complex function and use the residue theorem to compute certain types of integrals.	1,2,3,4,5	R, U, Ap, An, E
CO5	Expand functions in Taylor's Series & Laurent Series.	1,3,5,6	U, Ap, An, E

Course Title: Classical Mechanics

Course Code: MHP-413

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic concepts of constraint and advanced problems involving the dynamic motion.	1,2,3,4,5	U,An,Ap,E
CO2	Explain the Newton's laws of motion, differential equations have developed in terms of Lagrangian with different examples.	1,2,3,4	R,U,E,C
CO3	Analyse the central force problems by equations of motion and different Kepler Laws.	1,2,3,4,5	U,An,Ap,E
CO4	Understand the concept of rigid body by Euler equations of motion and conservation laws on basis of symmetries of classical physics.	1,2,3,4,5	An,E,C
CO5	Explain the concepts of Canonical transformations, Hamilton equations, Poisson brackets in a comprehensive way.	1,2,3,4,5,6	U,E,C,Ap



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**Course Title:** Computational Techniques

**Course Code:** MHP-414

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basics of computers, their applications in solving common and scientific problems, scientific word processing and graphical analysis.	1,2,3,4,5,6	U,R,E,C,Ap
CO2	Learn the basic terms like constants, variables, structures, arrays etc. used in Fortran programming language and will learn its application in Numerical analysis.	1,2,3,4,5	U,E,Ap
CO3	Demonstrate the Newton's formula for forward and backward interpolation, divided differences, Newton's general and Lagrange's interpolation formula through Fortran programming.	1,2,3,4,5	U,R,E,C,Ap,An
CO4	Solve numerical integration and differentiation with the help of different methods like Simpson, Weddle and Trape rules, Monte- Carlo Method, Euler's method, Modified Euler's method, Runge-Kutta Method etc. These concepts are used in solving the problems in various research fields.	1,2,3,4,5,6	U,R,E,C,Ap,An
CO5	Find roots of equation with the help of Bisection Method, Regula-Falsi Method, Newton-Raphson method, Bairstow method etc.	1,2,3,4,5,6	U,R,E,C,Ap,An





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**Course Title:** Electronics Lab**Course Code:** MHP-415

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the characteristics of diodes and transistors, design simple circuits and mini projects, know the benefits of feedback in amplifier and can use op amps as scalar, summer, differentiator and integrator. Study, compare and classify oscillators and multivibrators as free running, monostable and bistable.	1,2,3,4,5,6	U,An,Ap,E,C
CO2	Examine the basic structure of logic gates and use them in half adder and full adder.	2,3,4,5	R,U,Ap,E
CO3	Perform simple addition, subtraction, multiplication, division, and logic operations, such as OR and AND. The memory stores the program's instructions and data. The control unit fetches data and instructions from memory	1,2,3,4,5,6	U,An,Ap,E,C
CO4	Learn to convert the digital signal to analog signal using DA convertor.	3,4,5,6	U,Ap,E,An

**Course Title:** Computer Lab**Course Code:** MHP-416

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Write programs in FORTRAN to solve numerical analysis programme.	1,2,3,4,5,6	U,R,E,C,Ap,An
CO2	Write the Newton's formula for forward and backward interpolation, divided differences,	1,2,3,4,5	U,R,E,C,Ap,An



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	Newton's general and Lagrange's interpolation formula through FORTRAN programming.		
CO3	Apply Fortran programming to analyze the numerical integration and differentiation with the help of different methods like Simpson, Trap rules, Monte-Carlo Method, Euler's method, Modified Euler's method, Runge-Kutta Method etc. These concepts are used in solving the problems in various research fields.	1,2,3,4,5,6	U,R,E,C,Ap,An
CO4	Find roots of equation with the help of Bisection Method, Regula-Falsi Method, Newton-Raphson method, Bairstow method etc and develop ability to write programmes in Fortran.	1,2,3,4,5	U,R,E,C,Ap,An

### Semester-II

Course Title: Quantum Mechanics-I

Course Code: MHP-421

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain the basic formulation of Quantum mechanics developed by Dirac.	2,3,4	R,U,Ap,An
CO2	Understand quantum dynamics of states using time evolution operator.	1,2,3	R,U,Ap,An
CO3	Understand the quantum mechanical analysis of few one dimensional potential systems.	2,3,4	U,Ap,An
CO4	Understand the quantum mechanical analysis of few three dimensional potential systems.	2,3,4	U,Ap,An,E



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CO5	Understand and use the concept of addition of angular momenta and evaluation of ClebschGordan coefficients.	2,3,4	R,U,Ap
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**Course Title:** Electrodynamics-I**Course Code:** MHP-422

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand basics of Electrostatic and Magnetostatics.	1,2,3,4,5	U, Ap, An, E
CO2	Apply the principles of electrostatics to the solutions of problems relating to electric field and electric potential, boundary conditions and electric energy density.	1,2,3,5,6	R, U, Ap, An, E
CO3	Understand conservation laws for a system of charged particles and electromagnetic field.	1,2,3,4,5	U, Ap, An, E
CO4	Describe Maxwell equations and its physical consequences.	1,2,3,4,6	R, U, Ap, E
CO5	Describe the nature of electromagnetic wave and its propagation through different media and interfaces.	1,2,3,4,5,6	U, Ap, An, E

**Course Title:** Condensed Matter Physics-I**Course Code:** MHP-423

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basics of Magnetic properties of solids and able to explain diamagnetism, paramagnetic susceptibility and ferromagnetism on the basis of classical & quantum theory.	1,2,3,4,5	U, An, E



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CO2	Learn about the Superconductivity, properties of superconductors, Meissner effect, BCS Theory etc.	1,3,4,5,6	U, Ap, An, E, C
CO3	Understand about the different types of defects in solids.	1,2,3,4,5,6	R, U, Ap, E
CO4	Understand about the Lattice Vibrations and Phonons theory in crystals	1,2,3,5	U, Ap, An

**Course Title:** Atomic and Molecular Spectroscopy

**Course Code:** MHP-424

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic information about atomic spectra of one and two valence electrons, interaction energies involving L-S and J-J interactions and selection rules governing transitions.	1,2,4	R,U, An, ,C
CO2	Understand the effect of magnetic field on spectral lines and broadening of lines.	1,3,4,5	R,U,Ap,An
CO3	Explain the applications of molecular spectra pertaining to rotational and vibrational motion of different types of molecules	1,2,4,5,6	U, Ap, An, C
CO4	Understand the Raman and electronic spectroscopy of diatomic molecules.	1,2,3,5	U, Ap, An,C
CO5	Understand about intensity of spectral lines and the Frank-Condon principle.	1,2,3,4,5,6	U, Ap, An,C

**Course Title:** Condensed Matter Lab-I

**Course Code:** MHP-425

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Determine Hall coefficient by Hall Effect.	1,2,3,4,5,6	U, Ap, An, E,C



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CO2	Understand the dielectric constant of liquids.	1,2,3,4,5,6	U, Ap, An, E
CO3	Study the spectral characteristics of a photovoltaic cell.	1,2,3,4,5,6	U, Ap, An, E,C
CO4	Calculate the band gap of a semiconductor using p-n junction diode.	1,2,3,4,5,6	U, Ap, An, E
CO5	Find out the magnetic susceptibility of a material using Quink's method	1,2,3,4,5,6	U, Ap, An, E

**Course Title:** Spectroscopy Lab

**Course Code:** MHP-426

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get basic information about confirmation of existence of Bohr energy levels atom by Frank Hertz Experiment	1,2,4	R, U, E
CO2	Understand how a deviation spectrometer helps to find unknown wavelengths of light using Constant deviation spectrometer	1,3,4,5	R,U, Ap, An
CO3	Explain the wavelength determination with the help of Michelson and Feby-Perot interferometer.	1,2,4,5,6	U, Ap, An, C
CO4	Understand how Zeeman pattern appear when source is placed in external magnetic field.	1,2,3,5	U, Ap, An,C
CO5	Get an idea about wavelength determination of the source with the help of diffraction experiment.	1,2,3,4,5,6	U, Ap, An,C





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### Semester-III

Course: Quantum Mechanics-II

Course Code: MHP-531

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	understand the concepts of advance quantum mechanics like perturbation theory, scattering theory, relativistic quantum mechanics, quantum theory of identical particles etc.	1,2,3,4,5,6	R, U, Ap, An, E
CO2	Realize various phenomenon in terms of quantum mechanics and develop ability to apply different quantum formulations and concept to understand various phenomenon in nature.	1,2,3,4,5,6	R, U, Ap, An, E
CO3	Understand WKB method, bound states of potential wells and use of scattering theory for various kind of problems.	1,2,3,4,5,6	R, U, Ap, An, E
CO4	Understand the importance of relativistic quantum mechanics.	1,2,3,4,5,6	U, Ap, An, E
CO5	Develop numerical ability for quantum theory.	1,2,3,4,5,6	U, Ap, An, E

Course: Electrodynamics-II

Course Code: MHP-532

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Derive expression of various fields, energy flow and attenuation in wave guides and resonant cavities.	1,2,3,4	U,Ap,An
CO2	Understand formulation of electrodynamics using four tensors.	1,2,3,4	U,Ap,An
CO3	Derive various electric and magnetic fields from localized oscillating sources.	1,2,3,4,5	U,Ap,An



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CO4	Derive velocity dependant potentials and the power loss using Larmor power formula.	1,2,3,4,5	U,Ap,An
CO5	Understand terms related to radiation reaction, radiation damping and angular distribution of radiation.	1,2,3,4,5	U,Ap,An

**Course Title:** Condensed Matter Physics II

**Course Code:** MHP-533

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain the concepts of lattice specific heat and elastic constants of solids.	1,2,4,5	R, U, Ap
CO2	Understand about the Physics of Semiconductors materials & theirs different properties.	1,3,4,5	R, U, Ap, An
CO3	Learn about the conductivity of Metals and Luminescence of materials.	1,2,3,4,5	U, Ap, E, C
CO4	Understand the Dielectrics and Ferro Electrics	1,2,3,5	U, Ap, An

**Course Title:** Nuclear Physics

**Course Code:** MHP-534

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of Nuclear two body problem by considering a deuteron, basic concepts underlying nuclear forces and exchange nature of nuclear forces.	1,4,5,6	U,R,Ap, An
CO2	Easily understand the concept underlying liquid drop model, shell model, collective model, Nilsson model and Bohr- Wheeler theory of nuclear fission.	1,3,4,6	U, R, Ap, E
CO3	Study nuclear decays and detailed understanding of Fermi theory of beta decay, gamma decay, multipole radiations and selection rules.	1,2,5,6	U, R, Ap, An,



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CO4	Let the student know about Nuclear reaction cross section, types of reactions, Q value and conservation laws governing nuclear reactions.	3,4,5,6	U, Ap, An,
CO5	Easily understand direct and compound nuclear reactions, partial wave analysis of nuclear reaction cross section and Breit- wigner one level dispersion.	1,3,4,5,6	U, Ap, An, E,C

**Course Title:** Condensed Matter Lab II**Course Code:** MHP-535

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn and determine Stefan's constant using Boltzmann's Law.	1,3,4,5	U, Ap, An, E, C
CO2	Determine the energy loss in transformer and ferrite cores using B-H curve.	1,3,4,5	U, Ap, An, E
CO3	Study the Curie temperature of ferrites.	1,3,4,5	U, Ap, An, E
CO4	Determine the energy loss in transformer and ferrite cores using B-H curve.	1,3,4,5	U, Ap, An, E
CO5	Study the depletion capacitance and its variation with reverse bias in a p-n junction	1,3,4,5	U, Ap, An, E

**Course Title:** Nuclear Lab**Course Code:** MHP-536

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn how a Geiger Muller counter works and how to find its operating voltage.	1,2,4,5	U, Ap, An, E
CO2	Learn about experimental confirmation of statistical fluctuation of radioactive decay while doing experiment with Geiger Muller counter.	1,2,4,5,6	U, Ap, An, E



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CO3	Understand the concept of dead time, source strength and window thickness determination with the help of Geiger Muller counter.	1,2,3,5,6	U, Ap, An
CO4	Understand the concept of Scintillation counter and how does it works to find energy of unknown source.	1,2,3,4,5	U, Ap, An, E,C
CO5	Understand the concept of absorption of radiation in matter with the help of Geiger Muller counter.	1,2,4,5	U, Ap, An, E

### Semester-IV

Course Title: Particle Physics

Course Code: MHP541

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the fundamental particles of nature and their different inherent properties related to physics.	1,2,3,4,5	U,An,Ap,E
CO2	Explain the concept of conservation laws of quantum physics and different discrete and continuous symmetries.	2,3,4,5,	R,U,An,Ap,E
CO3	Explain the special theories of Weak interactions and CPT theorem	1,2,3,4,5	R,U,Ap,C
CO4	Explain the four fundamental forces of nature and their unification have understandable by latest development of grand unification theory.	1,2,3,4,5,6	R,U,Ap,E,C
CO5	Know about an overview of current development of particle physics including Goldstone theorem and Higgs mechanism including all the mediators.	1,2,3,4,5	U,An,Ap,E



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**Course Title:** Statistical Physics

**Course Code:** MHP-542

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Define and discuss the concepts of statistical physics, microstate and macro state of a system, apply the principles of statistical mechanics to classical ideal gas and phase space.	1,2,3,4	R,U,Ap,E
CO2	Define and discuss the concepts and roles of entropy and free energy from the view point of statistical mechanics.	1,2,3,4,5	U,Ap,E
CO3	Understand the concept of ensemble and statistics of various ensembles. Will also study different examples in a micro canonical, canonical and grand canonical ensemble.	1,2,3,4,5	U,An,Ap,E
CO4	Understand the fundamental difference between classical and quantum statistical mechanics. They can also very easily understand the significance of Boltzmann formula in classical and quantum statistical mechanics.	1,2,3,4,5	U,An,Ap,E
CO5	Understand the concepts and thermodynamics of ideal fermi gas, Bose Einstein condensation, photon, phonon, electron gas in metals, Pauli's paramagnetism and statistical equilibrium of white dwarf.	1,2,3,4,5	U,An,Ap,E





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**Course Title:** Physics of materials

**Course Code:** MHP-544

Course Learning Outcomes	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Students will be able to have knowledge about the vacuum techniques, vacuum pumps and pressure gauges.	1,2,3,4	U, An
CO2	Students will be able to learn the thin film deposition techniques and their thickness measurement methods.	2,3,4,5	R, U, An
CO3	Identify the characteristics of polymers, melting and glass transitions.	1,3,5	R, U, Ap, E
CO4	Learn the characteristics and applications of ceramics liquid crystals etc	1,2,3,4,5	U, Ap, An,E
CO5	Learn about synthesis of Nano phase materials and various characterization tools.	1,3,4,5,6	Ap, An, E, C

**Course Title:** Radiation Physics

**Course Code:** MPH-545

Sr. No.	On completing the course, the student will be able to:	PSOs addressed	Cognitive levels
CO1	Understand radioactive decay, production and types of ionizing radiation and the interactions of ionizing radiation with matter.	1,2,3,4,5,6	R, U, Ap, An, E
CO2	Understand the use of devices and protocols for the accurate measurement of ionizing radiation and calibration of clinical equipment.	1,2,3,4,5,6	R, U, Ap, An, E
CO3	Understand the role of the physicist in radiation medicine and protection.	1,2,3,4,5,6	R, U, Ap, An, E
CO4	Understand dosimetry and various types of dosimeters.	1,2,3,4,5,6	U, Ap, An, E
CO5	Understand the need of shielding and important shielding materials.	1,2,3,4,5,6	U, Ap, An, E



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**Course Title:** Reactor Physics

**Course Code:** MHP-546

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain basic reactor science, critically examine reactor types to identify their advantages and disadvantages.	1,2,3,4,5,6	U,E,,An,Ap
CO2	Understand the technical status of various reactors with special reference of Indian reactors	2,3,4,5,6	R,E,C ,Ap
CO3	Critically review the issues affecting the economy of nuclear power	3,4,5,6	U,R,E,C,Ap
CO4	Evaluate reactor safety measurements.	1,2,3,4	An,Ap,E

**Course Title:** Plasma Physics

**Course Code:** MHP-547

Course Learning Outcomes	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about basics of Plasmas: Occurrence of plasma in nature, definition of plasma, concept of temperature, Debye shielding and plasma parameter.	2,6	R, U
CO2	Have knowledge about single particle motion in uniform E and B, non-uniform magnetic field, grid B and curvature drifts, invariance of magnetic moment and magnetic mirror. Simple application of plasmas.	2,3,4, 5, 6	R, U, Ap, E
CO3	Learn about Plasma Waves in which they study Plasma oscillations electron plasma waves, ion waves, electrostatic electron and ion oscillations perpendicular to magnetic field upper hybrid waves, lower hybrid waves, ion cyclotron waves.	2,3,4, 5, 6	R, U, Ap, E
CO4	Learn about different equations like Fokker Plank equation, integral expression for collision zeroth	2,3,4, 5, 6	R, U, Ap, E



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	and first order moments, the single equation relaxation model for collision. They also understand the application of kinetic theory to electron plasma waves, the physics of Landau damping, elementary magnetic and inertial fusion concepts and solve the related problems.		
CO5	Learn about Non-linear Plasma theories in which they study Non-linear Electrostatic Waves, KdV Equations, Non-linear Schrodinger Equation, Solitons, Shocks, Non-linear Landau Damping, Microscopic instabilities, Inverse Landau damping, ion acoustic wave instability, Absolute and convective instabilities and solve the related problems.	2,3,4, 5, 6	R, U, Ap, E,

**Course Title:** Geophysics

**Course Code:** MHP-548

Course Learning Outcomes	On completion of the course, the students will be able to	POs/PSOs addressed	Cognitive levels
CO1	Get knowledge about the origin of earth, shape, mass and density of earth.	1,2,3,4	R,U, Ap, An
CO2	Study seismic waves, their types, pressure and elastic parameters with depth.	1,2,3,4	R, U, Ap, An, C
CO3	Differentiate between geochronological and geodynamics effects of earth.	1,2,3,4	U, An, C
CO4	Learn about the Brown reaction series, Uranium occurrence in India especially with the help of radiometers and emanometers.	1,2,3,4	R, U, Ap, An, C
CO5	Learn about the gamma spectrometric analysis of decay of radioactive rocks and other induced activities.	1,2,3,4	U, An, E, C



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**Course Title:** Nanotechnology

**Course Code:** MHP-549

Course Learning Outcomes	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study different methods for synthesis of nano materials which include Top down and Bottom up approaches.	1,2,3,4,5	U, An
CO2	Learn the characterization of nano structures. Methodologies such as Electron Microscopy, Scanning Probe Microscopy, Photo luminescence spectroscopy, IR and Raman spectroscopy, X – Ray diffraction methods etc are studied.	2,3,4,5	R, U, An
CO3	Study carbon nanotubes and other carbon based materials, their method of fabrication and applications	3,5,6	R, U, Ap, E
CO4	Understand Semiconductor nanoparticles based applications in sensors memes, LED's etc.	4,5	U, Ap, An,E
CO5	Pursue higher education or apply the acquired knowledge in solving industrial problems.	4,5,6	Ap, An, E, C

**Course Title:** Project

**Course Code:** MHP-543

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Complete a Guided Research Project.	1,2,3,4,5,6	U,E,C,An,Ap
CO2	Learn Conceptual understanding and scientific reasoning skills like applying scientific reasoning skills.	1,2,3,4,5,6	U,E,C,An,Ap
CO3	Develop rigorous quantitative understanding of core physical theories.	1,2,3,4,5,6	U,E,C,An,Ap
CO4	Give formal and informal scientific presentations to various audiences, including peers.	1,2,3,4,5,6	U,E,C,An,Ap
CO5	Communicate clearly and concisely in writing.	1,2,3,4,5,6	U,E,An,Ap



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**Course Title:** Advanced Practical

**Course Code:** MHP-560

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Determine the resistivity of highly resistive sample using two probe.	2,4	R,U,Ap,An
CO2	Calculate the Fermi energy of copper.	1,2	R,U,Ap,An
CO3	Determine the Thomson, Pelter and Seebeck coefficient using thermocouple.	2,4	U,Ap,An
CO4	Determine the permittivity of free space using parallel plate capacitor.	2,4	U,Ap,An,E
CO5	Study the variation of dielectric constant of a given sample.	2,4	R,U,Ap





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### M. Sc. MATHEMATICS

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Programme Specific Outcomes (PSOs)

PSO-1	Understand the nature of abstract mathematics and explore the concepts in various fields.
PSO-2	Inculcate mathematical reasoning and assimilate complex mathematical ideas and arguments.
PSO-3	Communicate mathematical ideas with clarity and coherence, both written and verbally.
PSO-4	Undertaking original research on a particular topic.
PSO-5	To impart computer knowledge to enable them to calculate various mathematical concepts.

#### COURSE OUTCOMES (COs)

##### Semester-I

COURSE TITLE: REAL ANALYSIS-I

COURSE CODE: MHM-411

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand fundamentals of mathematical analysis and reading and writing mathematical proofs.	1, 2,4	R, U, Ap, E
CO2	Correlate Calculus with real analysis by finding infinite sums and evaluating limits to understanding the concept of continuity and uniform continuity one is doing real analysis.	2,4	Ap, An, E
CO3	Understand the concept of cardinality of a set, open sets, closed sets, compact sets and connected sets, complete spaces, continuity and uniform continuity in a metric space.	1, 3, 4	R, U, Ap
CO4	Realize how these notions are generalized from real line to metric spaces.	1, 2	An, E,C



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**COURSE TITLE: ALGEBRA I****COURSE CODE: MHM-412**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Recognize the foundation required for more advanced studies in Algebra.	1, 2, 4	R, U,
CO2	Use group theory in modern physics which is based on symmetry principles.	2, 3	Ap, An, E
CO3	Apply group theory such that the existence of several particles can be predicted before they are experimentally observed.	1, 3	U, Ap, An
CO4	Apply group theory in chemistry such as the symmetry of a molecule provides students with the information of energy levels of the orbital, the orbital symmetries bond order.	2, 3, 4	Ap, An, E
CO5	Develop the reasoning, logic and calculative ability in mathematics.	1, 3, 4	An, E, C

**COURSE TITLE: APPLIED LINEAR ALGEBRA****COURSE CODE: MHM-413**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Deepen their understanding of Linear Algebra.	1, 3	U,An, E,C
CO2	Become familiar with the concepts of linear independence, basis, span, linear maps, the properties of linear transformations and orthogonal decomposition of inner product spaces.	3, 4	R, U, Ap
CO3	Have a good knowledge of inner product spaces, and will be able to define and use the adjoint of a linear map on a finite-dimensional inner product space.	1,2, 3	U, An, E
CO4	Construct the matrix of a bilinear form and to find index, rank and signature of a bilinear form.	3,4	An, E, C
CO5	Determine a linear operator is normal, unitary and orthogonal projection and to construct the spectral decomposition of normal and self-adjoint operators.	1, 2, 3	Ap, An, E



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### COURSE TITLE: NUMBER THEORY

COURSE CODE: MHM-414

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Form the bridge between pure mathematics and applied mathematics.	1, 2, 4	U, An, C
CO2	Apply Number Theory in mathematics as well in practical applications such as security system like in banking securities, coding theory, barcodes and memory management systems.	2, 3	R, U, Ap
CO3	Understand the various types of numbers and their properties.	1, 3	R, U, An
CO4	Use various arithmetic functions and the concept of congruences to solve various arithmetic problems.	2, 3, 4	Ap, C, E
CO5	Analyze the study of integers and integer-valued functions.	1, 3, 4	An, E, C

### COURSE TITLE: COMPLEX ANALYSIS

COURSE CODE: MHM-415

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the properties of analytic functions.	1, 3	R, U, Ap, C
CO2	Understand the concept of poles, singularities, residues, contour integration and conformal mappings and their applications.	1, 3, 4	Ap, An, E

### COURSE TITLE: DIFFERENTIAL EQUATIONS

COURSE CODE: MHM-416

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to express laws of nature with the help of differential equations.	1, 2, 3	Ap, An, E, C



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CO2	Know how to model the world in terms of differential equations, and how to solve those equations and interpret the solutions.	1, 3	U, An, Ap
CO3	Focus on the equations and techniques most useful in science and engineering.	3	Ap, E,C
CO4	Understand that the properties of solutions of differential equations is fundamental to much of contemporary science and engineering.	1, 2,	U, Ap, An
CO5	Learn to formulate, classify and transform first order partial differential equation into canonical forms.	1, 3	U, Ap, An, E, C

**SEMESTER-II**

**COURSE TITLE: REAL ANALYSIS II**

**COURSE CODE: MHM-421**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the behavior of sequences and series of functions.	2, 3	R, U, An
CO2	Get familiar with the Riemann Stieltje's integral which generalization of the Riemann integral is.	1, 2, 3	An, E, C
CO3	Analyze the applications of Power series in the field of engineering i.e in spectrum analysis, radio, audio, and light applications.	1, 2, 3	An, Ap, E
CO4	Understand Riemann Stieltjes integrability of a bounded function and prove a selection of theorems concerning integration.	1, 3	U, An, Ap, C
CO5	Recognize the difference between pointwise and uniform convergence of sequence and series of functions, Equicontinuous families of functions, Arzela Ascoli's theorem and Weierstrass Approximation Theorem.	1, 2	R, U, Ap, An





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**COURSE TITLE: ALGEBRA II**

**COURSE CODE: MHM- 422**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use ring theory in wide areas of current research in mathematics, computer science and mathematical/theoretical physics.	1, 2, 4	U, Ap, An
CO2	Introduce themselves with the concepts and develop working knowledge on simple ring and ring homomorphism.	2, 3	R, U, Ap
CO3	Know the structure of rings, their representations, modules, special classes of rings (group rings, division rings, and universal enveloping algebras).	1, 3	U, Ap, An
CO4	Deal with developments of commutative ring theory, which is a major area of modern mathematics.	2, 3, 4	An, Ap, C
CO5	Appreciate the significance of unique factorization in rings and integral domains.	1, 3, 4	An, E, C

**COURSE TITLE: PROBABILITY THEORY**

**COURSE CODE: MHM- 423**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquaint with the foundation of probabilistic and statistical analysis ,mostly used in engineering and science like disease modeling, climate prediction networks etc.	1, 2,4	U, An, C
CO2	Take informed decisions about a population by examining only a small random sample of the members of that population.	1	E
CO3	Quantify the uncertainty and assess the accuracy of our inference about the population.	3	An
CO4	Have good understanding of exploratory data analysis. Learner will be able to write a short-report describing a simple statistical data set.	1	U, C
CO5	Become informed consumer of statistical information provided in newspaper, magazine and journals.	3	An, E





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### COURSE TITLE: CLASSICAL MECHANICS AND CALCULUS OF VARIATIONS

#### COURSE CODE: MHM- 424

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply the classical mechanics approach to solve a mechanical problems.	1, 2, 3	Ap, An
CO2	Understand the concept of functional and determine stationary paths of a functional to deduce the differential equation for stationary paths.	1, 2, 3	U, An, Ap
CO3	Describe and understand the motion of a mechanical system using Lagrange Hamilton formalism.	2, 3, 4	R, U, E
CO4	Recognize the degrees of freedom and understand the concept of generalized coordinates.	1, 2, 3	R, U, Ap
CO5	Apply the concepts of classical mechanics in Geology, engineering, and many other inter-disciplinary areas.	2, 3	Ap, An, E, C

### COURSE TITLE: DIFFERENTIAL GEOMETRY

#### COURSE CODE: MHM- 425

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Become familiar with curvature and torsion of space curves, the relation of tangent planes, principle normals and binormals.	1, 3, 4	An, E, C
CO2	Know the intrinsic and non-intrinsic properties of surfaces and geodesics, tensors analysis and its applications.	1, 2	R, U, Ap

### COURSE TITLE: MATHEMATICAL METHODS

#### COURSE CODE: MHM- 426

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Prepare themselves with mathematical tools and techniques that are required in advanced courses offered in the applied mathematics and engineering problems.	2,3,4	An, E, C



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CO2	Apply concept of mathematical methods in diverse areas of science and technology such as electric analysis, communication engineering and solution of partial differential operation.	1, 2, 3	Ap, U, An
CO3	Learn to solve the Integral equations which are encountered in various problems including radiative transfer, and the oscillation of a string, membrane, or axle.	1, 3	R, E, C
CO4	Understand the concept of Laplace and Fourier Transforms and enable them to apply these for solving simultaneous, linear and partial differential equations.	1, 3, 4	U, R, Ap, An
CO5	Interpret the concept of Volterra and Fredholm integral equations and find solutions of these equations using various methods.	2,3,4	An, E, C

**SEMESTER-III**

**COURSE TITLE: MEASURE THEORY**

**COURSE CODE: MHM- 531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use concepts of mathematical analysis to determine the sizes of sets.	1, 4	C, Ap
CO2	Know about natural extension of Riemann integral which allows for better understanding of the fundamental relations between differentiation and integration.	1, 2, 3	U, R
CO3	Apply Lebesgue integration in many areas, including Functional Analysis, Harmonic Analysis and Probability Theory.	3,4	R, Ap, U
CO4	Acquire the knowledge of Lebesgue measurable sets, measurable functions and Lebesgue integral.	2,3, 4	R,U, Ap
CO5	Extend the concept of outer measure in an abstract space.	1,2 , 3, 4	U, E



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### COURSE TITLE: FUNCTIONAL ANALYSIS-I

COURSE CODE: MHM- 532

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the main concepts and fundamental methods of functional analysis to treat various concrete problems based on Banach spaces.	1, 3	U, R
CO2	Study the certain classes of functions defined in functional spaces.	3, 4	C, An
CO3	Learn the various examples of Banach spaces.	1,3, 4	U, R
CO4	Verify the requirements of a norm and completeness with respect to a norm.	2,3	An, E
CO5	Compute the spectrum of operators and classify the set into sub-classes.	2, 3	C, An

### COURSE TITLE: STATISTICAL INFERENCE

COURSE CODE: MHM- 533

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Solve the problems based on estimation and to test the efficiency of various estimators.	1,3	U, R, Ap
CO2	Handle the practical problems using hypothesis testing.	2,4	C, An, Ap
CO3	Solve the practical problems using t-test, F-test, Z-test, chi-square test for various types of data.	4	Ap, An

### COURSE TITLE: OPERATIONS RESEARCH-I

COURSE CODE: MHM- 534

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand special situations such as redundancy, infeasibility, unboundedness and alternate optimal solutions in linear programming problems.	1, 4	U, R
CO2	Acquire quantitative, analytical tools to support decision making in the optimization of economic processes.	1, 2, 3	R, C, E



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CO3	Develop the functional mathematical relationship that describe decision variables, objective function, constraints of the problem and non-negativity conditions.	3,4	U, R, An
CO4	decide optimum allocation of various limited resources to arrive at the optimum decision by using various techniques like assignment, transportation problems etc.	2,3, 4	An, Ap, E
CO5	Extend their knowledge of basic optimization techniques to do interesting research work on these types of optimization techniques.	1,2 , 3, 4	R, Ap, E

**COURSE TITLE: DISCRETE MATHEMATICS-I**

**COURSE CODE: MHM- 535**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply laws of set theory, recurrence relations, grammar and language, logic and propositional calculus in various fields of computer science, electronic engineering and medical sciences.	1, 3	U, R, Ap
CO2	Learn Grammar as an algebraic system that describes the process by which instances of a language can be constructed.	3, 4	U, R
CO3	Understand mathematical structure for accepting or rejecting strings (words) in a language.	1,3, 4	U, E
CO4	Explore and apply the basic method in subsequent courses in the design and analysis algorithms, computability theory and software engineering.	2,3	C, An, Ap
CO5	Apply the concepts of discrete mathematics in analyzing, designing and simplifying electronic devices including digital computer, dial telephone, switching system and different kind of control devices.	2, 3	C, An, Ap, E

**COURSE TITLE: INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY**

**COURSE CODE: CS-MHM -531**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquire the computer terminology	5	U,R





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CO2	Gain insight of working of input and output devices.	5	Ap, An
CO3	Develop skills of working with MS-Word, MS-PowerPoint, MS-excel.	5	Ap, An,U
CO4	Possess the knowledge of importance of operating system in computer.	5	Ap
CO5	Understand the concept of storing of data in memory and its types.	5	Ap, An

**Course Title: Introduction to Computers and Information Technology**

**Course Code: CS-MHM-531**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Acquire the computer terminology	1,2	R,U
CO2	Gain insight of working of input and output devices.	1,2	R,U
CO3	Develop skills of working with MS-Word, MS-PowerPoint, MS-excel.	1,2	U
CO4	Possess the knowledge of importance of operating system in computer.	1,2	U
CO5	Understand the concept of storing of data in memory and its types.	1,2	U

### SEMESTER-IV

**COURSE TITLE: TOPOLOGY**

**COURSE CODE: MHM- 541**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the properties of a geometric object that are preserved under continuous deformations, such as stretching, twisting, crumpling and bending.	1,3	U, R





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CO2	Discuss the shape of molecules in chemistry by analysis of the topology of a related graph.	2,4	C, An
CO3	Understand the mathematical tools that are useful to applied mathematicians and to theoretical physicists.	1,3	U, R, Ap
CO4	Apply the knowledge of topology in computers especially in network science.	1,3,4	R, Ap
CO5	Understand the various topological spaces and their properties, separation axioms, Tietz extension theorem and Tychonoff theorem.	1,2,3	U, An, Ap

**COURSE TITLE: FUNCTIONAL ANALYSIS-II**

**COURSE CODE: MHM- 542**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the main concepts and fundamental methods of functional analysis to enable a student to treat various concrete problems based on Hilbert spaces.	1, 4	C, U, E
CO2	Study functional spaces which play vital role in study of existence and uniqueness of solutions of differential equations, boundary value problems, optimization techniques etc.	1,2,3	U, R, An, E
CO3	Distinguish between Banach spaces and Hilbert spaces.	2,3,4	An, E
CO4	Classify operators into self-adjoint, unitary and normal operators.	1,3	U, An, E
CO5	Represent a bounded linear functional in terms of inner product.	3,4	U, Ap

**COURSE TITLE: FIELD EXTENSION AND GALOIS THEORY**

**COURSE CODE: MHM- 543**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Deal with the problems based on finite and infinite fields.	1, 2	C, U, R
CO2	Detect the simple field, splitting field, perfect field etc.	1,2,3	C, U
CO3	Have an idea of splitting field of a given.	1,2,3,4	U, R, E



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### COURSE TITLE: OPERATIONS RESEARCH-II COURSE CODE: MHM- 544

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the Operations Research for the purpose of making better decisions.	1, 4	U, R, Ap
CO2	Learn about management and administration of socio-cultural behavior and economic factors that exist as bottleneck to effective implementation.	1,2,3	U, R
CO3	Analyze complex real life problems typically with the goal of improving or optimizing performance.	2,3,4	An, C
CO4	Develop more effective approaches to programming by using different queuing models, generalized models, power supply model etc., customer's preference relating to the size, colour packaging .	1,3	C, Ap, E
CO5	determine the size of the stock to meet the future demand by applying inventory control methods, replacement problems	3,4	An, U, E

### COURSE TITLE: DISCRETE MATHEMATICS-II COURSE CODE: MHM- 545

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about Graph theory, the mathematics of network is one of the most important branches of discrete mathematics which is most useful for traveling salesman problems etc.	1,3	U, R
CO2	Learn to apply the trees and graphs in finding the travelling routes.	1,2,3	Ap, C
CO3	Solve practical problems using inclusion-exclusion principle and Pigeon hole principle.	1,2,4	U, R



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### COURSE TITLE: PROGRAMMING IN C COURSE CODE: CS-MHM-541

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use the fundamentals of C programming in trivial problem solving	5	U, R
CO2	Identify solution to a problem and apply control structures and user defined functions for solving the problem	5	Ap
CO3	Demonstrate the use of Strings and string handling functions	5	An, Ap
CO4	work with arrays of complex objects.	5	Ap, C,E
CO5	Apply skill of identifying appropriate programming constructs for problem solving.	5	U, C



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### M.Sc. PHYSICS

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

##### Programme Specific Outcomes (PSOs)

PSO-1	To train students in such a way that they can objectively carry out investigations, scientific and/or otherwise, without being biased or without having any preconceived notions.
PSO-2	As technology exploits the rules of Physics, students properly trained in Physics can be good researchers in the field of technology too.
PSO-3	To understand the basic concepts of physics particularly concepts in classical mechanics, quantum mechanics, electrodynamics and electronics to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws.
PSO-4	To apply advanced theoretical and/or experimental methods, including the use of numerical methods and simulations.
PSO-5	To get some research oriented experience by doing theoretical and experimental projects in the last semester under the supervision of faculty.
PSO-6	Students may get opportunities in higher education, research organizations, radiology and radiation oncology. Students can start their career in BARC, DRDO, IPR, ONGC etc.

##### COURSE OUTCOMES (COs)

##### Semester-I

Course Title: Electronics

Course Code: Phy-411

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use techniques for analyzing analogue and digital electronic circuits	2,3,4,5	U, Ap, An, E,C



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CO2	Formulate the concepts of operational amplifier and learn about basic operational amplifier characteristics, OP-AMP parameters, applications as inverter, integrator, differentiator etc	1,3,4,5,6	R, U, Ap, An,C
CO3	Identify the major properties, types and applications of MOSFET, MESFET, UJT, SCR and Multivibrators.	1,3,5,6	U, Ap, E
CO4	Learn digital electronics basics using logic gates and working of major digital devices like flip flops, CMOS, CCD etc	1,2,3,4,5	U, Ap, An, C
CO5	Learn about Karnaugh maps, Flip Flops and counters in detail.	1,3,4,5,6	U, Ap, An, E, C

**Course Title:** Mathematical Physics

**Course Code:** PHY-412

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Expand a function in a Fourier series. They will also be aware of the integral transforms and be able to use this to solve mathematical problems relevant to the physical sciences.	1,3,5,6	U, Ap, An, E
CO2	Learn about Gradient, Divergence and Curl in orthogonal.	2,3,5,6	R, U, Ap, E
CO3	Solve ordinary second order differential equations which are important in the physical sciences.	1,2,3,5	U, Ap, An, E
CO4	Have a good grasp of the basic elements of complex analysis, including the important	1,2,3,4,5	R, U, Ap, An, E





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	integral theorems. They will be able to determine the residues of a complex function and use the residue theorem to compute certain types of integrals.		
CO5	Expand functions in Taylor's Series & Laurent Series.	1,3,5,6	U, Ap, An, E

**Course Title:** Classical Mechanics

**Course Code:** MHP-413

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic concepts of constraint and advanced problems involving the dynamic motion.	1,2,3,4,5	U,An,Ap,E
CO2	Explain the Newton's laws of motion, differential equations have developed in terms of Lagrangian with different examples.	1,2,3,4	R,U,E,C
CO3	Analyse the central force problems by equations of motion and different Kepler Laws.	1,2,3,4,5	U,An,Ap,E
CO4	Understand the concept of rigid body by Euler equations of motion and conservation laws on basis of symmetries of classical physics.	1,2,3,4,5	An,E,C
CO5	Explain the concepts of Canonical transformations, Hamilton equations, Poisson brackets in a comprehensive way.	1,2,3,4,5,6	U,E,C,Ap



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**Course Title:** Computational Techniques

**Course Code:** MHP-414

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basics of computers, their applications in solving common and scientific problems, scientific word processing and graphical analysis.	1,2,3,4,5,6	U,R,E,C,Ap
CO2	Learn the basic terms like constants, variables, structures, arrays etc. used in Fortran programming language and will learn its application in Numerical analysis.	1,2,3,4,5	U,E,Ap
CO3	Demonstrate the Newton's formula for forward and backward interpolation, divided differences, Newton's general and Lagrange's interpolation formula through Fortran programming.	1,2,3,4,5	U,R,E,C,Ap,An
CO4	Solve numerical integration and differentiation with the help of different methods like Simpson, Weddle and Trape rules, Monte- Carlo Method, Euler's method, Modified Euler's method, Runge-Kutta Method etc. These concepts are used in solving the problems in various research fields.	1,2,3,4,5,6	U,R,E,C,Ap,An
CO5	Find roots of equation with the help of Bisection Method, Regula-Falsi Method, Newton-Raphson method, Bairstow method etc.	1,2,3,4,5,6	U,R,E,C,Ap,An



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**Course Title:** Electronics Lab

**Course Code:** Phy-415

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the characteristics of diodes and transistors, design simple circuits and mini projects, know the benefits of feedback in amplifier and can use op amps as scalar, summer, differentiator and integrator. Study, compare and classify oscillators and multivibrators as free running, monostable and bistable.	1,2,3,4,5,6	U,An,Ap,E,C
CO2	Examine the basic structure of logic gates and use them in half adder and full adder.	2,3,4,5	R,U,Ap,E
CO3	Perform simple addition, subtraction, multiplication, division, and logic operations, such as OR and AND. The memory stores the program's instructions and data. The control unit fetches data and instructions from memory	1,2,3,4,5,6	U,An,Ap,E,C
CO4	Learn to convert the digital signal to analog signal using DA convertor.	3,4,5,6	U,Ap,E,An

**Course Title:** Computer Lab

**Course Code:** MHP-416

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Write programs in FORTRAN to solve numerical analysis programme.	1,2,3,4,5,6	U,R,E,C,Ap,An



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CO2	Write the Newton's formula for forward and backward interpolation, divided differences, Newton's general and Lagrange's interpolation formula through FORTRAN programming.	1,2,3,4,5	U,R,E,C,Ap,An
CO3	Apply Fortran programming to analyze the numerical integration and differentiation with the help of different methods like Simpson, Trap rules, Monte- Carlo Method, Euler's method, Modified Euler's method, Runge-Kutta Method etc. These concepts are used in solving the problems in various research fields.	1,2,3,4,5,6	U,R,E,C,Ap,An
CO4	Find roots of equation with the help of Bisection Method, Regula-Falsi Method, Newton-Raphson method, Bairstow method etc and develop ability to write programmes in Fortran.	1,2,3,4,5	U,R,E,C,Ap,An

### Semester: II

**Course Title:** Quantum Mechanics-I

**Course Code:** PHY-421

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain the basic formulation of Quantum mechanics developed by Dirac.	2,3,4	R,U,Ap,An
CO2	Understand quantum dynamics of states using time evolution operator.	1,2,3	R,U,Ap,An
CO3	Understand the quantum mechanical analysis of few one dimensional potential systems.	2,3,4	U,Ap,An
CO4	Understand the quantum mechanical analysis of few three dimensional potential systems.	2,3,4	U,Ap,An,E



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CO5	Understand and use the concept of addition of angular momenta and evaluation of Clebsch Gordan coefficients.	2,3,4	R,U,Ap
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**Course Title:** Electrodynamics-I

**Course Code:** PHY-422

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand basics of Electrostatic and Magnetostatics.	1,2,3,4,5	U, Ap, An, E
CO2	Apply the principles of electrostatics to the solutions of problems relating to electric field and electric potential, boundary conditions and electric energy density.	1,2,3,5,6	R, U, Ap, An, E
CO3	Understand conservation laws for a system of charged particles and electromagnetic field.	1,2,3,4,5	U, Ap, An, E
CO4	Describe Maxwell equations and its physical consequences.	1,2,3,4,6	R, U, Ap, E
CO5	Describe the nature of electromagnetic wave and its propagation through different media and interfaces.	1,2,3,4,5,6	U, Ap, An, E

**Course Title:** Condensed Matter Physics-I

**Course Code:** PHY-423

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basics of Magnetic properties of solids and able to explain diamagnetism, paramagnetic susceptibility and ferromagnetism on the basis of classical & quantum theory.	1,2,3,4,5	U, An, E





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CO2	Learn about the Superconductivity, properties of superconductors, Meissner effect, BCS Theory etc.	1,3,4,5,6	U, Ap, An, E, C
CO3	Understand about the different types of defects in solids.	1,2,3,4,5,6	R, U, Ap, E
CO4	Understand about the Lattice Vibrations and Phonons theory in crystals	1,2,3,5	U, Ap, An

**Course Title:** Atomic and Molecular Spectroscopy

**Course Code:** PHY-424

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic information about atomic spectra of one and two valance electrons, interaction energies involving L-S and J-J interactions and selection rules governing transitions.	1,2,4	R,U, An, ,C
CO2	Understand the effect of magnetic field on spectral lines and broadening of lines.	1,3,4,5	R,U,Ap,An
CO3	Explain the applications of molecular spectra pertaining to rotational and vibrational motion of different types of molecules	1,2,4,5,6	U, Ap, An, C
CO4	Understand the Raman and electronic spectroscopy of diatomic molecules.	1,2,3,5	U, Ap, An,C
CO5	Understand about intensity of spectral lines and the Frank-Condon principle.	1,2,3,4,5,6	U, Ap, An,C



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**Course Title:** Condensed Matter Lab-I

**Course Code:** PHY-425

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Determine Hall coefficient by Hall Effect.	1,2,3,4,5,6	U, Ap, An, E,C
CO2	Understand the dielectric constant of liquids.	1,2,3,4,5,6	U, Ap, An, E
CO3	Study the spectral characteristics of a photovoltaic cell.	1,2,3,4,5,6	U, Ap, An, E,C
CO4	Calculate the band gap of a semiconductor using p-n junction diode.	1,2,3,4,5,6	U, Ap, An, E
CO5	Find out the magnetic susceptibility of a material using Quink's method	1,2,3,4,5,6	U, Ap, An, E

**Course Title:** Spectroscopy Lab

**Course Code:** PHY-426

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get basic information about confirmation of existence of Bohr energy levels atom by Frank Hertz Experiment	1,2,4	R, U, E
CO2	Understand how a deviation spectrometer helps to find unknown wavelengths of light using Constant deviation spectrometer	1,3,4,5	R,U, Ap, An
CO3	Explain the wavelength determination with the help of Michelson and Feby-Perot interferometer.	1,2,4,5,6	U, Ap, An, C
CO4	Understand how Zeeman pattern appear when source is placed in external magnetic field.	1,2,3,5	U, Ap, An,C
CO5	Get an idea about wavelength determination of the source with the help of diffraction experiment.	1,2,3,4,5,6	U, Ap, An,C



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### Semester: III

Course: Quantum Mechanics-II

Course Code: PHY-531

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	understand the concepts of advance quantum mechanics like perturbation theory, scattering theory, relativistic quantum mechanics, quantum theory of identical particles etc.	1,2,3,4,5,6	R, U, Ap, An, E
CO2	Realize various phenomenon in terms of quantum mechanics and develop ability to apply different quantum formulations and concept to understand various phenomenon in nature.	1,2,3,4,5,6	R, U, Ap, An, E
CO3	Understand WKB method, bound states of potential wells and use of scattering theory for various kind of problems.	1,2,3,4,5,6	R, U, Ap, An, E
CO4	Understand the importance of relativistic quantum mechanics.	1,2,3,4,5,6	U, Ap, An, E
CO5	Develop numerical ability for quantum theory.	1,2,3,4,5,6	U, Ap, An, E

Course: Electrodynamics-II

Course Code: PHY-532

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Derive expression of various fields, energy flow and attenuation in wave guides and resonant cavities.	1,2,3,4	U,Ap,An
CO2	Understand formulation of electrodynamics using four tensors.	1,2,3,4	U,Ap,An



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CO3	Derive various electric and magnetic fields from localized oscillating sources.	1,2,3,4,5	U,Ap,An
CO4	Derive velocity dependant potentials and the power loss using Larmor power formula.	1,2,3,4,5	U,Ap,An
CO5	Understand terms related to radiation reaction, radiation damping and angular distribution of radiation.	1,2,3,4,5	U,Ap,An

**Course Title:** Condensed Matter Physics II

**Course Code:** PHY-533

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain the concepts of lattice specific heat and elastic constants of solids.	1,2,4,5	R, U, Ap
CO2	Understand about the Physics of Semiconductors materials & their different properties.	1,3,4,5	R, U, Ap, An
CO3	Learn about the conductivity of Metals and Luminescence of materials.	1,2,3,4,5	U, Ap, E, C
CO4	Understand the Dielectrics and Ferro Electrics	1,2,3,5	U, Ap, An

**Course Title:** Nuclear Physics

**Course Code:** PHY-534

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of Nuclear two body problem by considering a deuteron, basic concepts underlying nuclear forces and exchange nature of nuclear forces.	1,4,5,6	U,R,Ap, An



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CO2	Easily understand the concept underlying liquid drop model, shell model, collective model, Nilsson model and Bohr- Wheeler theory of nuclear fission.	1,3,4,6	U, R, Ap, E
CO3	Study nuclear decays and detailed understanding of Fermi theory of beta decay, gamma decay, multipole radiations and selection rules.	1,2,5,6	U, R, Ap, An,
CO4	Let the student know about Nuclear reaction cross section, types of reactions, Q value and conservation laws governing nuclear reactions.	3,4,5,6	U, Ap, An,
CO5	Easily understand direct and compound nuclear reactions, partial wave analysis of nuclear reaction cross section and Breit- wigner one level dispersion.	1,3,4,5,6	U, Ap, An, E,C

**Course Title:** Condensed Matter Lab II**Course Code:** PHY-535

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn and determine Stefan's constant using Boltzmann's Law.	1,3,4,5	U, Ap, An, E, C
CO2	Determine the energy loss in transformer and ferrite cores using B-H curve.	1,3,4,5	U, Ap, An, E
CO3	Study the Curie temperature of ferrites.	1,3,4,5	U, Ap, An, E
CO4	Determine the energy loss in transformer and ferrite cores using B-H curve.	1,3,4,5	U, Ap, An, E
CO5	Study the depletion capacitance and its variation with reverse bias in a p-n junction	1,3,4,5	U, Ap, An, E





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**Course Title:** Nuclear Lab

**Course Code:** PHY-536

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn how a Geiger Muller counter works and how to find its operating voltage.	1,2,4,5	U, Ap, An, E
CO2	Learn about experimental confirmation of statistical fluctuation of radioactive decay while doing experiment with Geiger Muller counter.	1,2,4,5,6	U, Ap, An, E
CO3	Understand the concept of dead time, source strength and window thickness determination with the help of Geiger Muller counter.	1,2,3,5,6	U, Ap, An
CO4	Understand the concept of Scintillation counter and how does it works to find energy of unknown source.	1,2,3,4,5	U, Ap, An, E,C
CO5	Understand the concept of absorption of radiation in matter with the help of Geiger Muller counter.	1,2,4,5	U, Ap, An, E

### Semester: IV

**Course Title:** Particle Physics

**Course Code:** PHY-541

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the fundamental particles of nature and their different inherent properties related to physics.	1,2,3,4,5	U,An,Ap,E
CO2	Explain the concept of conservation laws of quantum physics and different discrete and continuous symmetries.	2,3,4,5,	R,U,An,Ap,E



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CO3	Explain the special theories of Weak interactions and CPT theorem	1,2,3,4,5	R,U,Ap,C
CO4	Explain the four fundamental forces of nature and their unification have understandable by latest development of grand unification theory.	1,2,3,4,5,6	R,U,Ap,E,C
CO5	Know about an overview of current development of particle physics including Goldstone theorem and Higgs mechanism including all the mediators.	1,2,3,4,5	U,An,Ap,E

Course Title: Statistical Physics

Course Code: PHY-542

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Define and discuss the concepts of statistical physics, microstate and macro state of a system, apply the principles of statistical mechanics to classical ideal gas and phase space.	1,2,3,4	R,U,Ap,E
CO2	Define and discuss the concepts and roles of entropy and free energy from the view point of statistical mechanics.	1,2,3,4,5	U,Ap,E
CO3	Understand the concept of ensemble and statistics of various ensembles. Will also study different examples in a micro canonical, canonical and grand canonical ensemble.	1,2,3,4,5	U,An,Ap,E
CO4	Understand the fundamental difference between classical and quantum statistical mechanics. They can also very easily understand the	1,2,3,4,5	U,An,Ap,E



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	significance of Boltzmann formula in classical and quantum statistical mechanics.		
CO5	Understand the concepts and thermodynamics of ideal fermi gas, Bose Einstein condensation, photon, phonon, electron gas in metals, Pauli's paramagnetism and statistical equilibrium of white dwarf.	1,2,3,4,5	U,An,Ap,E

**Course Title:** Seminar & Assignment

**Course Code:** Phy-543

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop rigorous quantitative understanding of core physical theories.	1,2,3,4,5,6	U,E,C,An,Ap
CO2	Get organized knowledge of the major branches of physics.	1,2,3,4,5,6	R,U, An,Ap
CO3	Give formal and informal scientific presentations to various audiences, including peers.	1,2,3,4,5,6	U,E,C,An,Ap
CO4	Communicate clearly and concisely in writing.	1,2,3,4,5,6	E,C,An,Ap
CO5	Apply scientific reasoning skills	1,2,3,4,5,6	U,E,C,An,Ap

**Course Title:** Physics of materials

**Course Code:** Phy-544

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Students will be able to have knowledge about the vacuum techniques, vacuum pumps and pressure gauges.	1,2,3,4	U, An
CO2	Students will be able to learn the thin film deposition techniques and their thickness measurement methods.	2,3,4,5	R, U, An



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CO3	Identify the characteristics of polymers, melting and glass transitions.	1,3,5	R, U, Ap, E
CO4	Learn the characteristics and applications of ceramics liquid crystals etc	1,2,3,4,5	U, Ap, An,E
CO5	Learn about synthesis of nanopahse materials and various characterization tools.	1,3,4,5,6	Ap, An, E, C

**Course Title:** Radiation Physics

**Course Code:** PHY-545

Sr. No.	On completing the course, the student will be able to:	PSOs addressed	Cognitive levels
CO1	Understand radioactive decay, production and types of ionizing radiation and the interactions of ionizing radiation with matter.	1,2,3,4,5,6	R, U, Ap, An, E
CO2	Understand the use of devices and protocols for the accurate measurement of ionizing radiation and calibration of clinical equipment.	1,2,3,4,5,6	R, U, Ap, An, E
CO3	Understand the role of the physicist in radiation medicine and protection.	1,2,3,4,5,6	R, U, Ap, An, E
CO4	Understand dosimetry and various types of dosimeters.	1,2,3,4,5,6	U, Ap, An, E
CO5	Understand the need of shielding and important shielding materials.	1,2,3,4,5,6	U, Ap, An, E

**Course Title:** Reactor Physics

**Course Code:** PHY-546

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain basic reactor science, critically examine reactor types to identify their advantages and disadvantages.	1,2,3,4,5,6	U,E,,An,Ap



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CO2	Understand the technical status of various reactors with special reference of Indian reactors	2,3,4,5,6	R,E,C ,Ap
CO3	Critically review the issues affecting the economy of nuclear power	3,4,5,6	U,R,E,C,Ap
CO4	Evaluate reactor safety measurements.	1,2,3,4	An,Ap,E

**Course Title:** Plasma Physics

**Course Code:** PHY-547

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about basics of Plasmas: Occurrence of plasma in nature, definition of plasma, concept of temperature, Debye shielding and plasma parameter.	2,6	R, U
CO2	Have knowledge about single particle motion in uniform E and B, non-uniform magnetic field, grid B and curvature drifts, invariance of magnetic moment and magnetic mirror. Simple application of plasmas.	2,3,4, 5, 6	R, U, Ap, E
CO3	Learn about Plasma Waves in which they study Plasma oscillations electron plasma waves, ion waves, electrostatic electron and ion oscillations perpendicular to magnetic field upper hybrid waves, lower hybrid waves, ion cyclotron waves.	2,3,4, 5, 6	R, U, Ap, E
CO4	Learn about different equations like Fokker Plank equation, integral expression for collision zeroth and first order moments, the single equation relaxation model for collision. They also understand the application of kinetic theory to electron plasma waves, the physics of Landau damping, elementary magnetic and inertial fusion concepts and solve the related problems.	2,3,4, 5, 6	R, U, Ap, E





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CO5	Learn about Non-linear Plasma theories in which they study Non-linear Electrostatic Waves, KdV Equations, Non-linear Schrodinger Equation, Solitons, Shocks, Non-linear Landou Damping, Microscopic instabilities, Inverse Landau damping, ion acoustic wave instability, Absolute and convective instabilities and solve the related problems.	2,3,4, 5, 6	R, U, Ap, E,
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**Course Title:** Geophysics

**Course Code:** PHY-548

Sr.No.	On completion of the course, the students will be able to	POs/PSOs addressed	Cognitive levels
CO1	Get knowledge about the origin of earth, shape, mass and density of earth.	1,2,3,4	R,U, Ap, An
CO2	Study seismic waves, their types, pressure and elastic parameters with depth.	1,2,3,4	R, U, Ap, An, C
CO3	Differentiate between geochronological and geodynamics effects of earth.	1,2,3,4	U, An, C
CO4	Learn about the Brown reaction series, Uranium occurrence in India especially with the help of radiometers and emanometers.	1,2,3,4	R, U, Ap, An, C
CO5	Learn about the gamma spectrometric analysis of decay of radioactive rocks and other induced activities.	1,2,3,4	U, An, E, C

**Course Title:** Nanotechnology

**Course Code:** Phy-549

Sr.No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study different methods for synthesis of nano materials which include Top down and Bottom up approaches.	1,2,3,4,5	U, An
CO2	Learn the characterization of nano structures. Methodologies such as Electron Microscopy, Scanning Probe Microscopy, Photo luminescence spectroscopy, IR and Raman	2,3,4,5	R, U, An



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	spectroscopy, X – Ray diffraction methods etc are studied.		
CO3	Study carbon nanotubes and other carbon based materials, their method of fabrication and applications	3,5,6	R, U, Ap, E
CO4	Understand Semiconductor nanoparticles based applications in sensors memes, LED's etc.	4,5	U, Ap, An,E
CO5	Pursue higher education or apply the acquired knowledge in solving industrial problems.	4,5,6	Ap, An, E, C



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### Master of Physiotherapy (Cardiopulmonary)

### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1	Interpretation of different invasive and noninvasive diagnostic investigation to make proper assessment in various respiratory, cardiovascular dysfunctions.
PSO-2	Develops the skills to execute different Physiotherapy techniques used in treatment of cardiovascular dysfunctions.
PSO-3	Demonstrate abilities to select strategies for cure, care & prevention; adopt restorative & rehabilitative measures for maximum possible functional independence of a patient at home, workplace & in community.
PSO-4	Able to execute the effective Physiotherapeutic measures with appropriate clinical reasoning to improve cardiovascular function.
PSO-5	Able to design & execute effective tailored cardiopulmonary cardiovascular, rehabilitation programme.
PSO-6	Able to execute the principle of care of patients at the Intensive care area.
PSO-7	Acquire, assess, apply and integrate new knowledge, learn to adapt to changing circumstances and ensure that patients receive the highest level of professional care.
PSO-8	Establish the foundations for lifelong learning and continuing professional development through attendance in various seminars, CMEs and conferences.
PSO-9	Manage time and prioritize tasks, and work autonomously when necessary and appropriate, demonstrate clinical decision making ability and provide appropriate patient care.
PSO-10	Function effectively as a mentor and teacher contributing to the appraisal, assessment and review of colleagues, providing effective feedback, and taking advantage of opportunities to develop these skills.
PSO-11	Analyze the roles and expertise of health care professionals and social workers in the context of working and functioning as a multidisciplinary team for the delivery of safe and high-quality care.
PSO-12	Critically appraise the results of relevant qualitative and quantitative studies as reported in scientific literature and outline the ethical issues involved in clinical research.
PSO-13	Write accurate, legible and complete clinical records, use computers and other information systems for data storage, retrieval, prepare health promotion material for patients, research and education.



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COURSE OUTCOMES (COs)			
Semester-I			
<b>Course Title: Research Methodology &amp; Biostatistics</b>		<b>Course Code: MPT-01</b>	
Sr.No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the importance of research in the relative field.	12,13	R, U, An
CO2	Understand the basic concepts and methods of research.	12,13	R, U, An
CO3	Interpret differences in data distributions via visual displays	12,13	R, U, An, Ap, E
CO4	Calculate standard normal scores and resulting probabilities	12,13	U, An, Ap, E,C
CO5	Calculate and interpret confidence intervals for population means and proportions	12,13	U, An, Ap, E,C
CO6	Interpret and explain a p-value.	12,13	U, An, Ap, E,C
<b>Course Title: Basic Medical Sciences</b>		<b>Course Code: MPC-01</b>	
Sr.No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Develop ability to critically evaluate research literature in the area of anatomy, functional applied anatomy, and apply this information to understand the mechanisms operating in cardiopulmonary conditions resulting from injury or disease.	1,2,3	R, U, An, Ap, E
CO2	Understand the importance of, and development of, good written and presentation skills to aid group learning.	13	R, U, An
CO3	Get sound knowledge of the anatomy of the cardiopulmonary system in the body.	1,2,3,7	R, U, An
CO4	Get advanced understanding of the relationship between structure and function of the cardiopulmonary system of the healthy and diseased subjects.	1,2,3,7	R, U, An
CO5	Develop ability to analyze mechanisms underlying selected cardiopulmonary condition resulting from injury or disease processes.	1,2,3,4,5,7	R, U, An
CO6	Understand the anatomy / applied anatomy basis for clinical testing cardiopulmonary structures.	1,2,3,4	R, U, An



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<b>Course Title: Physical and Functional Evaluation in Cardiopulmonary Disorders</b>			
<b>Course Code: MPC-02</b>			
<b>Sr.No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO1</b>	Know about how to assess cardiopulmonary conditions	1,2	R, U, An
<b>CO2</b>	Have complete knowledge about various assessment tools	1,2	R, U, An
<b>CO3</b>	Understand various diagnostic techniques involved in cardiopulmonary assessment	1,2,3	U, An
<b>CO4</b>	Be well equipped with cardiopulmonary assessment and diagnose a condition successfully.	1,2,3	U, An, Ap





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An Autonomous College affiliated to G.N.D.U., Amritsar

UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

☎ (O) : +91-183-2258097

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e-mail : khalsacollegeamritsar@yahoo.com

Web : www.khalsacollege.edu.in

◆ A HERITAGE INSTITUTION AND COLLEGE WITH POTENTIAL FOR EXCELLENCE - Status conferred by UGC ◆

◆ NAAC REACCREDITED "A" GRADE (CGPA) ◆ STAR STATUS CONFERRED BY DBT, NEW DELHI ◆ AN ISO CERTIFIED COLLEGE ◆

Course Title: Clinicals /Journal Club – I		Course Code: MPC-03	
Sr.No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Become fully equipped with handling patients practically, make provisional diagnosis and plan a physiotherapy treatment protocol.	1,2,3,4,5	R, U, An, Ap, E, C
CO2	Learn skills about how to present case studies, scientific papers and journals in front of experts in the field.	1,2,3,4,5	R, U, An, Ap, E, C
CO3	Leave their valuable work done in their postings in hospitals and leave subject matter for new entrants as they work as mentors for their juniors.	1,2,3,4,5	U, An, Ap, E, C
Semester: II			
Course Title: Skill Enhancing Studies		Course Code: MPT-02	
Sr.No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know how a healthcare system works.	6,7,8,9,10,11	R, U, An
CO2	Know management skills and principles to work in healthcare set up	6,7,8,9,10,11	R, U, An, Ap, E
CO3	Have complete understanding of financial and risk management and marketing strategies in healthcare set up.	6,7,8,9,10,11	R, U, An, Ap, E, C
CO4	Have complete knowledge about history and development, professional conduct and standards of practicing in physiotherapy.	6,7,8,9,10,11	U, An, Ap, E, C
CO5	Know about codes of ethics, social and mental policies, professional liability and obligations, legal responsibility and medico-legal action to work efficiently as a physiotherapist.	12	U, An, Ap, E, C
CO6	Be well equipped with knowledge regarding education technology ,its programming and its evaluations along with teaching its theories, tools and skills that increase scope in teaching profession for them.	12,13	U, An, Ap
Course Title: Exercise Physiology and Nutrition		Course Code:MPT-03	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Have complete understanding of exercise physiology and how to interpret it in making treatment protocols for their patients.	1,2	R, U, An
CO2	Know about adverse effects of exercise regulation and will know how to treat it.	1,2,4	R, U, An, Ap



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<b>CO3</b>	Become trained as professionals to understand stages of exercise training and how to implement it.	1,2,4,5	U, An, Ap, E
<b>CO4</b>	Have complete knowledge of how exercise impacts cardiovascular system and how body reacts through its endocrinological processes.	1,2	U, An, Ap, E

**Course Title: Medical and Surgical Aspects of Cardiopulmonary Conditions**

**Course Code: MPC-04**

Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO1</b>	Understand cardiopulmonary disorders briefly and main surgical procedures performed for its management	1,2	R, U, An
<b>CO2</b>	Access all the cardiopulmonary conditions and have knowledge of surgical procedures performed on them also know when, why and how physiotherapy interventions are applied in the concerned scenario.	1,2,4,5	R, U, An, Ap, E, C

**Course Title: Clinicals/Journal Club – II**

**Course Code: MPC-05**

Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO1</b>	Become fully equipped with handling patients practically and make a provisional diagnosis and plan a physiotherapy treatment protocol.	3,4,5	R, U, An, Ap, E, C
<b>CO2</b>	Gain skills about how to present case studies, scientific papers and journals in front of experts in the field.	7,8,9,10	R, U, An, Ap, E, C
<b>CO3</b>	Leave their valuable work done in their postings to hospitals and leave subject matter for new entrants as they work as mentors for their juniors.	13	U, An, Ap, E, C

**Semester: III**

**Course Title: Cardiopulmonary Physiotherapy**

**Course Code: MPC-06**

Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO1</b>	Plan an appropriate treatment regimen based on their knowledge of the subject.	1,2,4,5	R, U, An, Ap
<b>CO2</b>	Get expertise in various special techniques/ approaches like Chest PNF, Breathing Exercises, autogenic drainage, ACBT, Therapeutic body positioning.	1,2,4,5	An, Ap, E, C



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<b>Course Title: Preventive Cardiology</b>		<b>Course Code: MPC-07</b>	
<b>Sr.No</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO1</b>	Get advanced knowledge of preventive cardiology that will facilitate decision-making.	1,2,4,5	R, U, An
<b>CO2</b>	Gain expertise in cardiorespiratory assessment and disability evaluation.	1,2,3,4	U, An, Ap, E, C
<b>Course Title: Dissertation-I</b>		<b>Course Code: MPC-08</b>	
<b>Sr.No</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO1</b>	Conduct research independently	12	R, U, An, Ap, E, C
<b>CO2</b>	Demonstrate a commitment to disseminate knowledge through publications and presentations	12,13	R, U, An, Ap, E, C
<b>CO3</b>	Understand the methods of data collection and analysis of collected data using suitable statistical tests	12	U, An, Ap, E, C



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Course Title: Practical		Course Code: MPC-09	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Apply the principles of research and evidence based practice in clinical interactions with patients/clients	11,12	R, U, An, Ap, E, C
CO2	Do self assessment of personal and professional strengths and weaknesses	10,11,12	R, U, An, Ap
CO3	Plan and execute activities to serve the profession and community	1,2,3,4,5	U, An, Ap, E, C

Course Title: Clinicals/Journal Club – III		Course Code:MPC-10	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Become fully equipped with handling patients practically, make a provisional diagnosis and plan a physiotherapy treatment protocol.	1,2,3,4,5	R, U, An, Ap, E, C
CO2	Have skills how to present case studies, scientific papers and journals in front of experts in the field.	1,2,,3,4,5,8	R, U, An, Ap, E, C
CO3	Leave their valuable work done in their postings to hospitals and leave subject matter for new entrants as they work as mentors for their juniors.	12,13	U, An, Ap, E, C

Semester: IV			
Course Title: Cardiac and Pulmonary Rehabilitation		Course Code:MPC-11	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Get expertise in the community health and function in the general set up.	1,2,3	R, U, An, Ap, E, C
CO2	Attain ability as a mandatory member of the team of the health professionals	10	R, U, An, Ap, E, C
CO3	Do patient assessment and treatment planning, including integration and interpretation of patient problems and effective goal setting.	1,2,3,4,5	U, An
CO4	Understand physiotherapeutic intervention that is based on a sound base of evidence and sensitive to service delivery models and the culture of both the patient and the organization.	1,2,3,4,5,7	U, An, Ap, E, C





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Course Title: Modalities and Interventions in ICU		Course Code: MPC-12	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Apply effectively different physiotherapy technique for rehabilitation of cardiac and pulmonary conditions in ICU	6	R, U, An, Ap, E, C
CO2	Understand the importance of critical care rehabilitation	6	R, U, An, Ap, E, C
Course Title: Dissertation-II		Course Code: MPC-13	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Develop ability to conduct research independently	12	R, U, An, Ap, E, C
CO2	Demonstrate a commitment to dissemination of knowledge through publications and presentations	12,13	R, U, An, Ap, E, C
CO3	Understand the methods of data collection and analysis of collected data using suitable statistical tests	12	U, An, Ap, E, C
CO4	Study new correlation between any variables or may find a suitable advance therapeutic intervention for different conditions	12	U, An, Ap, E, C

Course Title: Practical		Course Code: MPC-14	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Apply the principles of research and evidence based practice in clinical interactions with patients/clients	11,12	R, U, An, Ap, E, C
CO2	Do self assessment of personal and professional strengths and weaknesses	10,11,12	R, U, An, Ap
CO3	Plan and execute activities to serve the profession and community	1,2,3,4,5	U, An, Ap, E, C





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Course Title: Clinicals/Journal Club – IV		Course Code:MPC-15	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Become fully equipped with handling patients practically in viewpoint of approaching them and make a provisional diagnosis and plan a physiotherapy treatment protocol.	1,2,3,4,5	R, U, An, Ap, E, C
CO2	Get skills about how to present case studies, scientific papers and journals in front of experts in the field.	1,2,,3,4,5,8	U, An, Ap, E, C
CO3	Leave their valuable work done in their postings to hospitals and leave subject matter for new entrants as they work as mentors for their juniors.	12,13	U, An, Ap, E, C



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### Master of Physiotherapy (Orthopaedics)

### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1	To interpret different invasive and noninvasive diagnostic investigation to make proper assessment in various respiratory and musculoskeletal dysfunctions.
PSO-2	To develop the skills to execute different Physiotherapy techniques used in treatment of musculoskeletal dysfunctions.
PSO-3	To demonstrate abilities to select strategies for cure, care & prevention; adopt restorative & rehabilitative measures for maximum possible functional independence of a patient at home, workplace & in community.
PSO-4	To develop ability to execute the effective Physiotherapeutic measures with appropriate clinical reasoning to improve musculoskeletal function.
PSO-5	To develop ability to design and execute effective tailored cardiopulmonary musculoskeletal rehabilitation programme.
PSO-6	To develop ability to execute the principle of care of patients at the Intensive care area.
PSO-7	To acquire, assess, apply and integrate new knowledge, learn to adapt to changing circumstances and ensure that patients receive the highest level of professional care.
PSO-8	To establish the foundations for lifelong learning and continuing professional development through attendance in various seminars, CMEs and conferences.
PSO-9	To manage time and prioritize tasks, and work autonomously when necessary and appropriate, demonstrate clinical decision making ability and provide appropriate patient care.
PSO-10	To function effectively as a mentor and teacher contributing to the appraisal, assessment and review of colleagues, providing effective feedback, and taking advantage of opportunities to develop these skills.
PSO-11	To analyze the roles and expertise of health care professionals and social workers in the context of working and functioning as a multidisciplinary team for the delivery of safe and high-quality care.
PSO-12	To critically appraise the results of relevant qualitative and quantitative studies as reported in scientific literature and outline the ethical issues involved in clinical research.
PSO-13	To write accurate, legible and complete clinical records, use computers and other information systems for data storage, retrieval, prepare health promotion material for patients, research and education.



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COURSE OUTCOMES (COs)			
Semester: I			
Course Title: Research Methodology & Biostatistics			Course Code: MPT-01
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the importance of research in the relative field.	12,13	R, U, An
CO2	Understand the basic concepts and methods of research.	12,13	R, U, An
CO3	Interpret differences in data distributions via visual displays	12,13	U, An, Ap, E
CO4	Calculate standard normal scores and resulting probabilities	12,13	U, An, Ap, E,C
CO5	Calculate and interpret confidence intervals for population means and proportions	12,13	U, An, Ap, E,C
CO6	Interpret and explain a p-value.	12,13	U, An, Ap, E,C
Course Title: Basic Medical Sciences			Course Code:MPO-01
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Develop ability to critically evaluate research literature in the area of anatomy, functional applied anatomy and apply this information for understanding the mechanisms operating in orthopedic conditions resulting from injury or disease.	1,2,3	R, U, An, Ap, E,C
CO2	Have sound knowledge of the anatomy of the musculoskeletal system in the body.	1,2,3,7	U, An
CO3	Get advanced understanding of the relationship between structure and function of the musculoskeletal system of the healthy and diseased subjects.	1,2,3,7	U, An
CO4	Develop ability to analyze mechanisms underlying selected orthopedic conditions resulting from injury or disease.	1,2,3,4,5,7	U, An, Ap, E
CO5	Get advanced understanding on the anatomy/applied anatomy basis for clinical testing musculoskeletal structures.	1,2,3,4	U, An, Ap, E, C



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<b>Course Title: Physical and Functional Evaluation in Musculoskeletal Disorders</b>			
<b>Course Code: MPO-02</b>			
<b>Sr.No</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO1</b>	Know about how to assess musculoskeletal conditions	1,2,3,4,5	R, U, An
<b>CO2</b>	Have complete knowledge about various assessment tools	1,2	R, U, An
<b>CO3</b>	Have knowledge on the assessment done in various areas like sports and geriatrics	1,2	R, U, An
<b>CO4</b>	Understand various diagnostic techniques involved in musculoskeletal assessment	1,2,3	R, U, An
<b>CO5</b>	Become well equipped with musculoskeletal assessment and learn to diagnose the condition successfully.	1,2,3,4,5	U, An, Ap, E
<b>Course Title: Clinicals/Journal Club – I</b>			
<b>Course Code:MPO-03</b>			
<b>Sr.No</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO1</b>	Become fully equipped with handling patients practically and make provisional diagnosis and plan a physiotherapy treatment protocol.	1,2,3,4,5	R, U, An, Ap, E, C
<b>CO2</b>	Have skills about how to present case studies, scientific papers in journals and in front of experts in the field.	8	U, An, Ap, E, C
<b>CO3</b>	Leave their valuable work done during their postings in hospitals and record their experiences in writing to guide their juniors.	9,10	U, An, Ap, E, C
<b>Semester: II</b>			
<b>Course Title: Skill Enhancing Studies</b>			
<b>Course Code:MPT-02</b>			
<b>Sr.No</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO1</b>	Know about how a healthcare system works.	6,7,8,9,10,11	R, U, An
<b>CO2</b>	Know management skills and principles to work in healthcare set up	6,7,8,9,10,11	U, An, Ap, E
<b>CO3</b>	Have understanding of financial and risk management and marketing strategies in healthcare set up.	6,7,8,9,10,11	U, An, Ap, E, C





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<b>CO4</b>	Have complete knowledge about professional conduct and standards of practicing in physiotherapy.	6,7,8,9,10,11	U, An, Ap, E, C
<b>CO5</b>	Know about code of ethics, social and mental policies, professional liability and obligations, legal responsibility and medico-legal action required for working efficiently as a physiotherapist.	12	U, An, Ap, E, C
<b>CO6</b>	Be well equipped with knowledge regarding education technology, its programming and evaluations along with its theories, tools and skills that will enhance their scope in teaching profession.	12,13	U, An, Ap

**Course Title: Exercise Physiology and Nutrition**

**Course Code:MPT-03**

Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO1</b>	Have complete understanding of exercise physiology and how to interpret it in making treatment protocols for their patients.	1,2	R, U, An
<b>CO2</b>	Know about adverse effects of exercise regulation and its treatment .	1,2,4	R, U, An, Ap
<b>CO3</b>	Get trained as professional to understand stages of exercise training and how to implement it.	1,2,4,5	U, An, Ap, E
<b>CO4</b>	Have complete knowledge on how exercise affects cardiovascular system and how body reacts through its endocrinological processes.	1,2	U, An, Ap, E

**Course Title: Medical and Surgical Aspects of Orthopaedic Conditions**

**Course Code:MPO-04**

Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO1</b>	Understand orthopaedic disorders briefly and main surgical procedures performed for its management	1,2	R, U, An
<b>CO2</b>	Access all the orthopaedic conditions and have knowledge of surgical procedures performed on patients and also understand about when, why and how physiotherapy interventions are applied in the concerned scenario.	1,2,3,4,5	U, An, Ap, E, C





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Course Title: Clinicals/Journal Club – II		Course Code:MPO-05	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Become fully equipped with handling patients practically and make provisional diagnosis and plan a physiotherapy treatment protocol	1,2,3,4,5	R, U, An, Ap, E, C
CO2	Learn skills about how to present case studies, scientific papers in journals and in front of experts in the field.	1,2,3,4,5	R, U, An, Ap, E, C
CO3	Leave their valuable work done during their postings in hospitals by recording their experiences, which will be of great help to their juniors.	1,2,3,4,5	U, An, Ap, E, C

### Semester: III

Course Title: Physiotherapy Management in Orthopaedic Conditions Course Code:MPO-06

Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Have the basic biomechanical and patho-mechanical knowledge about the common musculoskeletal conditions and drug management in orthopedics.	1,2	R, U, An, Ap, E
CO2	Become proficient to assess different kind of musculoskeletal conditions in physiotherapy.	1,2,3,4,5	U, An

Course Title: General Orthopedic Physiotherapy		Course Code:MPO-07	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Demonstrate an understanding about the principles of different schools of therapy.	1,2,3,4,5	R, U, An,
CO2	Know physiotherapeutic management of common musculoskeletal conditions.	2,3	U, An, Ap, E, C



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# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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Course Title: Dissertation-I		Course Code: MPO-08	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Develop ability to conduct research independently	12	R, U, An, Ap, E, C
CO2	Demonstrate commitment to disseminate knowledge through publications and presentations	12,13	U, An, Ap, E, C
CO3	Understand the method of data collection and analysis of collected data using suitable statistical tests	12	U, An, Ap, E, C
Course Title: Practical		Course Code: MPO-09	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Apply the principles of research and evidence based practice in clinical interactions with patients/clients	11,12	R, U, An, Ap, E, C
CO2	Do self-assessment of their personal and professional strengths and weaknesses	10,11,12	R, U, An, Ap
CO3	Plan and execute activities to serve their profession and community	1,2,3,4,5	U, An, Ap, E, C
Course Title: Clinicals/Journal Club – III		Course Code: MPO-10	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Be fully equipped with handling patients practically and make a provisional diagnosis and plan a physiotherapy treatment protocol	1,2,3,4,5	R, U, An, Ap, E, C
CO2	Have skills to present case studies, scientific papers in journals and in front of experts in the field.	1,2,,3,4,5,8	R, U, An, Ap, E
CO3	Leave their valuable experiences which they gain during their postings in hospitals for the guidance to their juniors.	12,13	U, An, Ap, E



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### Semester: IV

Course Title: Bioengineering and Rehabilitation Principles

Course Code: MPO-11

Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the concept of rehabilitation; role of different team members and agencies and legal aspects in disabilities	1,2,3,4,5	R, U, An, Ap
CO2	Understand the uses and fitting of orthosis and prosthesis-region wise	1,2,3,4,5	U, An, Ap
CO3	Plan and execute various rehab protocols	3,4,5	An, Ap, E
CO4	Understand the professional ethics required for physiotherapist	12	U, An



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Course Title: Approaches in Musculoskeletal Physiotherapy		Course Code: MPO-12	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand various recent approaches in physiotherapy like Butler mobilization of nerves, cyriax, maitland, kalterborne, mckenzie etc.	1,2,3,4,5,7	R, U, An, Ap, E, C
CO2	Understand and perform recent soft tissue mobilization techniques.	5,7	R, U, An, Ap
CO3	Understand anthropometry and its various techniques.	1,2	U, An, Ap, E, C
Course Title: Dissertation-II		Course Code: MPO-13	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Develop ability to conduct research independently	12	R, U, An, Ap, E, C
CO2	Demonstrate a commitment to disseminate knowledge through publications and presentations	12,13	R, U, An, Ap, E, C
CO3	Understand the methods of data collection and analysis of collected data using suitable statistical tests	12	U, An, Ap, E, C
CO4	Find correlation between variables to find suitable advance therapeutic intervention for different conditions	12	U, An, Ap, E, C



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Course Title: Practical		Course Code:MPO-14	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Apply the principles of research and evidence based practice in clinical interactions with patients	11,12	R, U, An, Ap, E, C
CO2	Do self assessment of their personal and professional strengths and weaknesses	10,11,12	U, An, Ap
CO3	Plan and execute activities to serve the profession and community	1,2,3,4,5	U, An, Ap, E, C
Course Title: Clinicals/Journal Club – IV		Course Code:MPO-15	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Be fully equipped with handling patients practically in viewpoint of approaching them and make a provisional diagnosis and plan a physiotherapy treatment protocol.	1,2,3,4,5	R, U, An, Ap, E, C
CO2	Develop skills to present case studies, scientific papers and journals in front of experts in the field.	1,2,,3,4,5,8	U, An, Ap, E, C
CO3	Leave their valuable work done in their postings to hospitals and leave subject matter for new entrants as they work as mentors for their juniors.	12,13	U, An, Ap, E, C





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### M.A JOURNALISM & MASS COMMUNICATION

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Programme Specific Outcomes

PSO1	To get in depth knowledge about the communication and media and various laws governing media
PSO2	To have knowledge about the development of communication, media management, current affairs and also about the communication research.
PSO3	To develop skills of mass communication and photography.
PSO4	To get information about international communication and human rights.
PSO5	To prepare the student for film studies and research techniques by enabling them to write term paper and dissertation.
PSO6	To develop understanding about intercultural communication.



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COURSE OUTCOMES (COs)			
Semester-I			
<b>Course Title:</b> Introduction To Communication		<b>Course Code:</b> MAJMC1101	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand various media system theories	1	R,U,Ap,An,E
CO-2	Understand the concepts of communication in detail	1,2,3,4	R,U,Ap,An
CO-3	Understand communication models	1,4	U,Ap,An,E
CO-4	Understand barriers in communication	1,3	U,Ap,An,E
<b>Course Title:</b> History of Print Media in India		<b>Course Code:</b> MAJMC1102	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand history of print media	1	R,U,An,E
CO-2	Know about the birth of Indian language press.	1	R,U,An,E
CO-3	Understand historical development of important newspaper and magazines	1	U,An,E
CO-4	Understand importance of various newspapers in detail.	1	U,An,E
<b>Course Title:</b> Reporting and Editing		<b>Course Code:</b> MAJMC1103	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand the concepts of news in detail.	1	R,U,Ap,An,E,C
CO-2	Understand the concept of features and types of features in detail.	1	U,Ap,An,E,C
CO-3	Understand the layout and makeup for newspaper in detail.	1	U,Ap,An,E,C

<b>Course Title:</b> Media Laws and Ethics		<b>Course Code:</b> MAJMC1104	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand various press laws prevailing in India.	1,3,4	R,U,Ap,An,C
CO-2	Understand ethics of media and various problems associated with it	1,4	U,Ap,An,C



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Course Title: Advertising		Course Code: MAJMC1105	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand the concept of consumer behaviour and various factors affecting consumer behaviour.	1,2,4	R,U,Ap,An,E
CO-2	Get knowledge about apex bodies in advertising.	1,2,4	R,U,Ap,An,E
CO-3	Understand advertising and its related concepts.	1,2,4	R,U,Ap,An,E,C
CO-4	Understand advertisement agency management in detail.	1,2,4	U,Ap,An,E
Course Title: Advertising Practical		Course Code: MAJMC1106	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand consumer behaviour and various factors influencing it.	1,2,4	R,U,Ap,An,E
CO-2	Understand apex bodies in advertising.	1,2,4	R,U,Ap,An,E
CO-3	Understand advertising and its related concepts.	1,2,4	R,U,Ap,An,E,C
CO-4	Get practical knowledge about advertisement agency management.	1,2,4	R,U,Ap,An,E
Semester-II			
Course Title: Development Communication		Course Code: MAJMC1207	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Know about the communication development at various levels in the society.	2,3,4,6	R,U,Ap,An,E
CO-2	Understand the gap between the developed and developing societies by studying their social, economic and political developments.	2,3,4,6	R,U,An,E
CO-3	Learn about different types of development communication which influence the development of rural area people in terms of their communication and development in the society.	2,3,4,6	R,U,Ap,An,E
Course Title: Media Management		Course Code: MAJMC1208	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Know about various media activities which are used in managing media with its principles.	1,2	U,Ap,An,E,C



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C)-2	Know about different patterns and structures of media agencies and the problems faced by the media organizations.	1,2	U,Ap,An,E,
CO-3	Know about the actual meaning of advertising and public relations and the marketing strategies used to achieve the results.	1,2	U,Ap,An,E,C
<b>Course Title:</b> Current Affairs		<b>Course Code:</b> MAJMC1209	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Stay in touch with what's happening around the world.	2	R,U,Ap,An,E,C
CO-2	Develop newspaper reading habits	2	U,Ap,An,E,C
CO-3	Generate awareness among themselves.	2	U,Ap,An,E,C
CO-4	Stay connected to the current events happenings around the world	2	U,Ap,An,E,C
<b>Course Title:</b> Communication Research I		<b>Course Code:</b> MAJMC1210	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the different types of human communication from one person communication to a wide group communication.	1,2,3,4,5,6	R,U,Ap,An,E
CO-2	Understand various research methods which are related to the human communication and learn about the evaluation of human communication.	1,2,3,4,5,6	R,U,Ap,An,E,C
CO-3	Understand various approaches related to the study of communication and develop, use and evaluate writing methods related to communication	1,2,3,4,5,6	U,Ap,An,E
<b>Course Title:</b> Radio and Television Programming		<b>Course Code:</b> MAJMC1211	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Know about the invention of radio and television with their proper history in detail.	1,2	R,U,An,E
CO-2	Understand different types of cameras, their movements and angles which help them in making good quality videos and photo production. They also get knowledge about the	3	R,U,Ap,An,E





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	need of lighting and various other elements related to television programming.		
CO-3	Learn about the radio elements which involve radio interviews, radio writings etc.	1,2	U,Ap,An,E
<b>Course Title:</b> Radio and Television Programming		<b>Course Code:</b> MAJMC1212	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Learn about types of Jack, Microphones, Sound and audio recorders.	1,2	R,U,Ap,An,E,C
CO-2	Get knowledge regarding good presentation.	1,2,3,4,6	U,Ap,An,E,C
CO-3	Learn how to write for radio and TV, Storyboards, scripts and screenplay.	1,2	U,Ap,An,E,C
<b>Semester: III</b>			
<b>Course Title:</b> Mass Communication Research-II		<b>Course Code:</b> MAJMC2301	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand mass communication research techniques	1,2,3,4,6	U,Ap,An,E,C
CO-2	Understand the theoretical, conceptual and operational framework of research.	1,3,5	U,Ap,An,E,C
CO-3	Understand various steps of research like literature review, methods of data collection, analysis and interpretation of results etc.	5	U,Ap,An,E,C
<b>Course Title:</b> New Media Technology		<b>Course Code:</b> MAJMC2302	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Know about different new communication technologies used in new media along with their concepts and scope for future.	1,2	U,Ap,An,E,C
CO-2	Know the difference between knowledge gathered from online sources and political communication.	1,2	U,Ap,An,E,C
CO-3	Get knowledge about the cyber journalism or online media, the pros and cons of cybercrimes and the cyber laws.	1,2	U,Ap,An,E,C





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<b>Course Title: Public Relation and Corporate Communication Course Code: MAJMC2303</b>			
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Know about the meaning and concept of public relations, its scope and various P R techniques.	1,2	R,U,Ap,An,E,C
CO-2	Learn about the basic P R tools and the techniques which must be used in achieving good results in various sectors like P R in industry, centre and state.	1,2	U,Ap,An,E,C
CO-3	Get introduced to SWOT Analysis of media.	2	U,Ap,An,E
<b>Course Title: Science Journalism Course Code: MAJMC2304</b>			
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Know about the science journalism, its pros and cons for the society and its technology.	1,2	U,Ap,An,E
CO-2	Learn how to write science stories and know about various career opportunities in the field of science journalism i.e. as science journalist	1,2	U,Ap,An,E,C
CO-3	Know about various fields involved in the science journalism which may include agriculture journalism, weather journalism etc.	1,2,3,4,5	U,Ap,An,E,C
<b>Course Title: Photography Course Code: MAJMC2305</b>			
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand about camera, its various components, and different types of shots, angles and movements.	1,2,3	R,U,Ap,An,E
CO-2	Know the difference between depth of field and depth of focus.	3,5,6	R,U,Ap,An,E,C
CO-3	Gain knowledge about different types of cameras and the requirement for good photography	2,4, 3	U,Ap,An,E,C
<b>Course Title: Photography Lab Course Code: MAJMC2306</b>			
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Learn practically the difference between depth of field and depth of focus.	3,6	R,U,Ap,An,E,C



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CO-2	Gain practical knowledge about different types of cameras and the requirements to become good photographer.	3,4,5	R,U,Ap,An,E,C
<b>Semester-IV</b>			
<b>Course Title:</b> International Communication		<b>Course Code:</b> MAJMC2407	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand various dimensions of global communication	1,3, 4	U,Ap,An,E
CO-2	Understand various news agencies and their organizational structures	4	U,Ap,An,E
CO-3	Understand effects of globalization on media systems	1,2,4	U,Ap,An,E
CO-4	Understand UNESCO's efforts in the removal of imbalances in news.	4	U,Ap,An,E,
<b>Course Title:</b> Human Rights		<b>Course Code:</b> MAJMC2408	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the concepts of human rights.	4	U,Ap,An,E
CO-2	Understand human rights and environmental issues.	4	U,Ap,An,E
CO-3	Understand various commissions of human rights in detail.	4	U,Ap,An,E
<b>Course Title:</b> Film Studies		<b>Course Code:</b> MAJMC2409	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand film studies and C's of cinematography.	5	U,Ap,An,E
CO-2	Understand history of world cinema in detail	5	U,Ap,An,E,
CO-3	Understand history of Indian cinema in detail	5	U,Ap,An,E
<b>Course Title:</b> Intercultural Communication		<b>Course Code:</b> MAJMC2410	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the concept of communication eastern culture.	6	U,Ap,An,E
CO-2	Understand barriers in inter-cultural communication.	6	U,Ap,An,E



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CO-3	Understand the use of communication in folk media.	6	U,Ap,An,E,C
<b>Course Title:</b> Dissertation		<b>Course Code:</b> MAJMC2411	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Develop research skills	5	U,Ap,An,E,C
CO-2	Develop problem solving skills.	5	U,Ap,An,E,C
CO-3	Practically apply various research techniques	5	U,Ap,An,E,C
<b>Course Title:</b> Film Studies Lab		<b>Course Code:</b> MAJMC2412	
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Learn about film making.	5	U,Ap,An,E,C
CO-2	Make various documentaries	5	U,Ap,An,E,C
CO-3	Review various films.	5	U,Ap,An,E,C



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### POST GRADUATE DIPLOMA IN GARMENT CONSTRUCTION & FASHION DESIGNING

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1	The students will have the basic foundation in designing and have the ability to visually represent it by illustrations, photographs, graphics and visual display of merchandise
PSO-2	The students will be able to convert their designs into a garment using appropriate construction techniques.
PSO-3	The student will have a strong foundation and understanding of the garment manufacturing process and procedures.
PSO-4	Identify employability as a fashion designer either self-employed or work in fashion designing sectors
PSO-5	Express the basic concepts of designing, drafting, methods of pattern making and its alteration with techniques for garment construction and skills on Photoshop and Corel Draw
PSO-6	Express the basic concepts of designing, drafting, methods of pattern making and its alteration with techniques for garment construction and skills on Photoshop and Corel Draw.
PSO-7	Apply the theories and skills to solve real time problems in apparel design and work as a team in an organization and become accomplished successful designers, entrepreneurs or industry ready professionals.
PSO-8	Demonstrate knowledge in fashion designing software such as rich peace fashion studio, rich peace pattern making CAD, Photoshop and Corel Draw

#### COURSE OUTCOMES (COs)

Semester: I			
Course title: PATTERN MAKING		Course Code: PGFD 111	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Gain proficiency in pattern making for garments. Students will use basic pattern making principles to create design variations.	5,6,2	U,Ap,An





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CO2	Gain ability to use pattern making for creating garments designs. Students will be able to develop patterns by using the acquired knowledge of patternmaking	5,6,2	U,Ap,C
CO3	Develop the skills that will help students to use basic patternmaking principles to create design variations	5,6,2	U,C,Ap,An
CO4	Apply patternmaking principles to create design variations and construct garments	5,6,2	U,Ap,C
CO5	Create design for different styles of Garments, explore the knowledge related to different fashion components students and create variety of patterns regard to sleeve and collars.	5,6,2	U,C,Ap,An

Course title : FASHION ILLUSTRATION		Course Code: PGFD 112	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Find the human body in proportions relevant to fashion illustration	1	U,Ap,C,An,R
CO2	Select the apparel using color harmony and types of charts	1	U,Ap,C,E,An,R
CO3	Illustrate the apparel design for elements of designs.	1	R,U,E,C,Ap

Course title : GARMENT DESIGNING		Course Code: PGFD 113	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Impart knowledge about various fashion details and designing various outfits	1,2,3	U,Ap,C,An
CO2	Gain knowledge about various illustration techniques	1	U,Ap,C,
CO3	Conceptualize their ideas and amalgamation of different accessories with the garments	1	U,C,Ap





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Course title : GARMENT CONSTRUCTION		Course Code: PGFD 114	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Impart knowledge about various construction techniques	2,3,6	U,Ap,C,An
CO2	Gain the understanding regarding different garment components and their construction	2,3,6	U,Ap,C,
CO3	Get equipped with the knowledge and confidence to respond creatively to a design brief within the women's wear market.	2,3,7	U,C,Ap,An

Course title : FASHION CONCEPTS		Course Code: PGFD 115	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Develop an understanding about Fashion, Fashion terminologies and Fashion forecasting	07	U, An,R
CO2	Learn about factors affecting fashion.	07	U,E,R,An
CO3	Understand about the role of social and psychological aspects	04,07	R,U,E,An

## SEMESTER-II

Course title : WORKSHOP: SURFACE ORNAMENTATION		Course Code: PGFD 116	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	know about different embellishments	1,2	U,Ap,C,
CO2	know about different types of embroideries	1,2	U,Ap,C,
CO3	Impart students with knowledge of various stitches and embroideries	1,2	U,C,Ap
CO4	know about various traditional printing methods	1,2	U,Ap,C



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Course title : CAD IN FASHION		Course Code: PGFD 117	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the fashion design concepts on computer.	5,6,8	U,Ap,C,An
CO2	Gain knowledge about different themes required in the field of fashion.	5,6,7,8	U,Ap,C,An
CO3	Make designs digitally in Coral Draw and Adobe Photoshop	5,6,8	U,C,Ap
CO4	Develop and conceptualize their designs and creations	3,5,6,8	U,C,Ap

Course title : PATTERN MAKING		Course Code: PGFD 121	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Gain proficiency in pattern making for garments Students will use basic pattern making principles to create design variations.	5,6,2	U,Ap,An
CO2	Gain ability to use pattern making for creating garments designs. Students will be able to develop patterns by using the acquired knowledge of patternmaking	5,6,2	U,Ap,C,
CO3	Develop the skills that will help them to use basic patternmaking principles to create design variations	2,5,6	U,C,Ap,An
CO4	Apply patternmaking principles to create design variations and construct garments.	2,5,6	U,Ap,C
CO5	Create design for different styles of Garments, explore the knowledge related to different fashion components students and create variety of patterns regard to sleeve and collars.	2,5,6	U,Ap,C,An

Course title : FASHION ILLUSTRATION		Course Code: PGFD 122	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels



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CO1	Find the human body in proportions relevant to fashion illustration	1	U,Ap,C,An,R
CO2	Select the apparel using color harmony and types of charts	1	U,Ap,C,E,An,R
CO3	Illustrate the apparel design for elements of designs.	1	R,U,E,C,Ap

<b>Course title : GARMENT DESIGNING</b>		<b>Course Code: PGFD 123</b>	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Impart knowledge about various fashion details and designing various outfits	1,2,3	U,Ap,C,An
CO2	Gain knowledge about various illustration techniques	1	U,Ap,C
CO3	Conceptualize their ideas and amalgamation of different accessories with the garments	1	U,C,Ap

<b>Course title : GARMENT CONSTRUCTION</b>		<b>Course Code: PGFD 124</b>	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Impart knowledge about various construction techniques	2,3,6	U,Ap,C,An
CO2	Gain the understanding regarding different garment components and their construction	2,3,6	U,Ap,C
CO3	Get equipped with the knowledge and confidence to respond creatively to a design brief within the women's wear market.	2,3,7	U,C,Ap,An

<b>Course title : FUNDAMENTALS OF TEXTILE</b>		<b>Course Code: PGFD 125</b>	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Learn an intelligent appraisal of standards and brands of merchandise	2,3,7	U,Ap,C,An,R
CO2	Develop the ability to distinguish quality in fabrics.	2,3,7	U,Ap,E,



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CO3	Study why certain fabrics are more durable and therefore more serviceable for specific purpose.	2,3,7	U,E,Ap,An
CO4	Get idea about how to buy and what to buy.	3,7	U,E,C,Ap
CO5	Explain why certain fabrics make cool wearing apparel	3,4,7	U,Ap,C,An

Course title : SURFACE ORNAMENTATION		Course Code: PGFD 126	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about different embellishments	1,2	U,Ap,C
CO2	Help students know about different types of embroideries	1,2	U,Ap,C
CO3	Impart students with knowledge of various stitches and embroideries	1,2	U,C,Ap
CO4	Help students to know about various traditional printing methods	2	U,C,Ap,An
CO5	Help impart knowledge about methods of various traditional textiles	1	U,Ap,C

Course title: CAD IN FASHION		Course Code: PGFD 127	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the fashion design concepts on computer.	5,6,8	U,Ap,C,An
CO2	Gain knowledge about different themes required in the field of fashion.	5,6,7,8	U,Ap,C,An
CO3	Make designs digitally in Coral Draw and Adobe Photoshop	5,6,8	U,C,Ap
CO4	Develop and conceptualize their designs and creations	3,5,6,8	U,C,Ap
CO5	Understand the fashion design concepts on computer.	5,6,8	U,Ap,C,An





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### P.G. DIPLOMA IN COMPUTER APPLICATIONS

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

##### PROGRAMME SPECIFIC OUTCOMES (PSOs)

<b>PSO-1</b>	To understand and comprehend advanced level of programming, databases, networks concept and management, Web Designing & Uses of Internet and data analysis.
<b>PSO-2</b>	To demonstrate competence in using computer science concepts and computational tools for simulation and digital transformation.
<b>PSO-3</b>	To develop ability to effectively apply the information technology concepts to analyze, design and develop cost effective solutions to the societal problems.
<b>PSO-4</b>	To provide user friendly and need based mobile, web or cloud based solutions to the society.

##### COURSE OUTCOMES (COs)

###### Semester: I

Course Title: PC COMPUTING-I (MS Office) 2003

Course Code: PDCA-411

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use word processors, spreadsheets and presentation software.	1,2,3,4	R,U,Ap,An
CO2	Understand and create a database using MS Access.	1,2,4	R,U,Ap,C
CO3	Describe the features and functions of the categories of application software.	1,2	U,Ap,E
CO4	Understand the dynamics of an office environment.	1,3	U,An,Ap
CO5	Demonstrate the ability to apply application software in an office environment.	2	U,Ap





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Course Title :PC Computing-II (Professional DTP)		Course Code: PDCA-412	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Get essential information on CorelDraw Graphics Suite.	1,3	R,U
CO2	Become comfortable with the CorelDraw work area, tools, boards, and fundamental methods and understand the strategies of making and controlling vector (plan) articles, shapes and variety fill.	1,2,5	R,U, Ap
CO3	Work with imaginative text for the making logos, marks and any other one-page print plan material.	3	Ap,C
CO4	Work on Corel Draw, Vector Graphics, Colour Palette and Pasteboard.	1	Ap,C

Course Title :Fundamentals of Computer & Operating Systems		Course Code: PDCA-413	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Get knowledge about the usage of computers and their importance as essential components in business, education and society.	1,3	R,U
CO2	Understand the concept of peripheral devices and memory.	1,2,3	R,U
CO3	Get introduced to the basic concepts of Operating System, its functions and services.	1,2,3	U,Ap,C
CO4	Understand various features and application of window vista.	1,2,3,4	U
CO5	Learn about the fundamentals of UNIX operating system and its various commands.	1	U



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<b>Course Title :Database Management System through Oracle-10g &amp; System Analysis &amp; Design</b>			
			<b>Course Code: PDCA-414</b>
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Illustrate the basic elements of a relational database management system	1	R,U,Ap,C
CO2	Develop skill to solve the data models for applicable problems	1,2,3	U,An,E
CO3	Develop ability to convert ER diagrams into RDBMS data.	2,3	U,Ap,E
CO4	Make database connectivity in programming language	3	U,C

<b>Semester: II</b>			
<b>Course Title: Network Concepts and Management (Hardware, Software, Setting In Course Linux/Unix/NT Environment)</b>			<b>Course Code: PDCA-421</b>
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Become familiar with the concept of Network hardware and software requirements.	1,2	R,U
CO2	Understand the working of different protocols at different layers of OSI and TCP/IP models.	1,3	R,U,Ap
CO3	Learn the concepts of different networking devices like router, hub, and switch.	1	R,U
CO4	Understand the concept of IP address and its various classes.	1	U,An
CO5	Compare and understand the different networking operating systems like Windows NT, UNIX and Linux.	1,4	U,An



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Course Title: Programming in C		Course Code: PDCA-422	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Figure out the basics of C programming.	1	R,U,Ap
CO2	Get information on programming which will assist them with making programs and applications in C.	1,2	R,U
CO3	Learn the essential programming builds, which can undoubtedly help them in switching over to any other language in future.	3,4	U,Ap
CO4	Develop basic understanding of computers, the concept of algorithms and algorithmic thinking.	3,4	U,Ap
CO5	Develop the ability to analyse a problem and develop an algorithm to solve it.	1,2,3,4	An

Course Title: Introduction to Scripting Languages, Web Designing & Uses of Internet		Course Code: PDCA-423	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the HTML tags.	1,2	R,U
CO2	Learn how to write, test and debug web pages using HTML	2,3	R,U
CO3	Become familiar with graphics.	1,3	R,U,Ap
CO4	Develop ability to create and edit web pages using Front Page.	3	C
CO5	Understand different types of internet connectivity and protocols related to internet	1,2	U



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Course Title: Programming in Visual Basic with Active X		Course Code: PDCA-424	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Design, formulate, and construct applications with visual basic	1,2,3	Ap,An,C
CO2	Understand the integrated development environment (IDE)	1	U,An
CO3	Distinguish between the types of event driven programming.	1,3	U,An
CO4	Write program code using event driven programming	3	Ap,C



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### POST GRADUATE DIPLOMA IN FINANCIAL SERVICES (PGDFS) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

<b>PSO-1</b>	This programme enables the students to develop skills required to act as financial analyst or consultant having thorough knowledge of financial analysis, risk management, portfolio theory and insurance sector.
<b>PSO-2</b>	To handle work in different domains of financial sector like banking and insurance.
<b>PSO-3</b>	To develop ability to invest money in difference sources of finance and investment avenues and provide in depth understanding of different avenues of financial system viz. capital markets, banking, insurance, mutual funds & other related services.
<b>PSO-4</b>	To develop learning about all regulatory norms, acts, policies formulated and implemented regarding financial sector.
<b>PSO-5</b>	To equip the students with skills required to operate in competitive environment in the service sector.

#### COURSE OUTCOMES (COs)

##### Semester: I

Course Title: FINANCIAL SERVICES – I

Course Code : PGDFS-101

Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquaint themselves about financial service market and its constituents. They would assess growth of financial services and the problems faced by financial services in India.	1,2	R, U
CO2	Acquire knowledge about various financial	1,2,3	R, An, E





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	services and the concepts like merchant banking, Leasing, Hire Purchase and Housing finance services.		
CO3	Comprehend the concepts and marketing of Mutual Funds, credit cards, housing finance, personal loans and factoring services.	1,3,5	U, Ap, An,C
CO4	Understand Mechanism of Securitization of Debt, Dematerialization process and various SEBI guidelines about it.	3,4	Ap, E

Course Title: FINANCIAL INSTITUTIONS		Course Code: PGDFS-102	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the role of financial institutions in Indian financial system.	1, 5	R,U
CO2	Acquaint themselves with RBI and its working.	2,3	R,U
CO3	Know about various development banks and non-banking financial institutions.	1,2,3	U, Ap, E
CO4	Understand the concepts of commercial banking and NBFC's and credit rating agencies.	3,4	An, E

Course Title: Financial Sector Regulations –I		Course Code: PGDFS-103	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the meaning, functions, powers and regulatory frame work of SEBI.	3, 4, 5	R, U, E
CO2	Overview Securities Contract (Regulation) Act, 1956, provisions Under BSCC Act, Depository Act and Foreign Exchange Management Act.	3, 4	An, Ap
CO3	Understand norms, provisions, working and regulatory framework of NBFC.	2,4	An, E

Course Title: FINANCIAL AND COST ACCOUNTING		Course Code : PGDFS-104	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Overview the concept and Conventions	1,2	R, An



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	of Financial Accounting.		
CO2	Prepare the financial statements for Banking and Insurance Companies.	2,3	U, Ap, An
CO3	Understand various costs on the basis of element, behaviour and functions. It helps in ascertaining the basic concepts of Cost determination and preparation of Cost Sheet.	1,5	E, C
CO4	Understand various techniques of costing like Budgetary control, Standard costing and Marginal costing and Break-even-Analysis.	1,2,3	An, Ap, E

Course Title: FINANCIAL MARKETS		Course Code: PGDFS-105	
Sr. No.	On the completion of the course Students will be able to:	SOs Addressed	Cognitive Levels
CO1	Understand the whole Financial System of India.	1,2,4	R, U
CO2	Understand the concepts of Capital Market and Money Market and their respective sub-markets.	2,3	Ap, An, E
CO3	Apprehend the various derivative instruments and gain knowledge about Debt market, Equity market and Commodity market in Indian financial system.	3,5	Ap, An, E

Semester II			
Course Title: FINANCIAL SECTOR REGULATIONS –II		Course Code: PGDFS-201	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the regulations and norms undertaken by authorities towards banking sector.	1, 2, 4	R, U, E
CO2	Learn about various new acts and policies of government.	3, 4	U, An, E
CO3	Understand the provisions of Basel Norms and working of banks.	2,4	U, An



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CO4	Become aware of the importance of KYC norms.	4,5	Ap, An
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Course Title: FINANCIAL SERVICES –II		Course Code: PGDFS-202	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Get well equipped with the concepts and functional aspects of various types of services like venture capital, financing, factoring available in our country.	1,2	R, U
CO-2	Acquire the skills necessary to participate in managing a financial services company. They come to know about the concepts and role of NBFCs, depository system etc.	1, 2, 5	An, Ap, E, C
CO-3	Know about financial products, services and strategies offered by different financial services institutions.	2,3,4	An, Ap, E
CO-4	Get knowledge about financial services industries namely insurance, banking securities, real estate and their financial banking.	2,3,5	An, E

Course Title: FINANCIAL MANAGEMENT		Course Code:203	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Get prepared for managing financial issues in undertaking business, the sources and uses of funds, the benefits, risks and costs associated with different types of resources and financing.	1,2,3	R, U, E
CO-2	Enhance their ability to deal with short-term dealing and also longer-term dealing, which involve major capital investment decisions.	3,4	An, Ap, C
CO-3	Get knowledge on the allocation and management of financial resources, the concept of time value of money and various sources of investments	2,3	An, E, C
CO-4	Learn the concepts like working capital management, capital structure, capital budgeting and cost of capital.	3, 5	U, An, E



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<b>Course Title: INFORMATION TECHNOLOGY IN FINANCIAL SERVICES</b>			
<b>Course Code: PGDFS-204</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the electronic methods of undertaking business to arrive at appropriate solutions	3,5	U, Ap, An,
CO-2	Acquire knowledge on the computing requirements for the technology solutions in business applications.	2,3,5	Ap, E, An
CO-3	Develop an understanding on basics of computer and how internet can help in the growth of the business	4,5	U, E, An
CO-4	Learn about accounting software for managing the accounts of business	3, 5	E, C

<b>Course Title: MANAGEMENT OF BANKING AND INSURANCE SERVICES</b>			
<b>Course Code: PGDFS-205</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the basic concepts of banking and the functions of banking.	1, 2	R, U
CO-2	Describe fundamental regulatory norms and services provided by the banking sector.	2,4	U
CO-3	Understand the basic concepts of insurance, its function types and its relevance in economic sector.	2,3	An, E, C
CO-4	Understand various policies offered, risks faced by insurance companies and the insurance product cost and pricing.	2,3,5	Ap, An, E





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## COURSE OUTCOMES (COs) FOR UG PROGRAMMES

**The Course Outcomes (COs) are mapped to the revised Bloom's Taxonomy using the following abbreviations:**

**R- Remembering**

**U – Understanding**

**Ap- Applying**

**An- Analyzing**

**E- Evaluating**

**C- Creating**





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### **BACHELOR OF ARTS (B.A.)**

#### **Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)**

#### **Department of Computer Science**

##### **Program Specific Outcomes (PSOs)**

**PSO-1.** Computer Science students become capable to explore a wide range of computational and mathematical jobs in the creative industries, business, finance, education, medicine, and science.

**PSO-2.** This course offers a broad-based intellectual engagement with computing both in theory and practice, enhances technical competence, problem solving and communication skills. Social and ethical contexts of the discipline of computing are well integrated into the curriculum.

**PSO-3.** Enables students to demonstrate advanced skills in the effective analysis design and realization of business system utilizing contemporary information technology.

**PSO-4.** Students become proficient in computer programming like C, C++ and Python which enable them to apply standard software engineering process and strategies in software project development using open source programming environment to deliver a quality product for business success.



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COURSE OUTCOMES (COs)			
Semester-I			
<b>Course Title: Computer Fundamental &amp; Information Technology</b>			
<b>Course Code: CSC-111</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Get knowledge about the fundamental concepts of computers.	1,2	R,U,Ap,An,E
CO2	Familiarise themselves with the operating systems, peripheral devices, networking and internet.	1,3	U,Ap
CO3	Identify the hardware and software concepts, input and output units components of a computer system.	1,2,3	R,U,Ap,C
CO4	Understand different communication medias.	1,2,3	R,U,Ap,C
CO5	Learn about Information systems, system development life cycle, tools and its applications	1,2	U,Ap,C
Semester: III			
<b>Course Title: COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS</b>			
<b>Course Code: CSC-231</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Demonstrate understanding on common numerical methods and how they are used to obtain approximate solutions	1,2	U,Ap
CO2	Apply various numerical methods to find out solution of algebraic and transcendental non-linear equations and also solve system of linear equations numerically using direct and iterative methods.	1, 2,3	U, An, Ap



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Semester: II			
Course Title: Programming Using C		Course Code: CSC-121	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use the fundamentals of C programming in trivial problem solving	1,2,3	U
CO2	Identify solution to a problem and apply control structures and user defined functions for solving the problem	1,2 ,4	Ap,U,An, E
CO3	Demonstrate the use of strings and string handling functions	1,2	Ap,An,E, C
CO4	Work with arrays of complex objects.	1,2	An, Ap, E
CO5	Develop skill to identify appropriate programming constructs for problem solving.	1,2,4	Ap, An, E, C
CO3	Understand the methods to construct interpolating polynomials and finite difference concepts (forward, backward, divided, and central difference) for prediction and also use integration to find area under curve.	1,3	Ap, An, C
CO4	Learn fundamental concepts of statistical and optimization methods.	1,2,3	U, An, Ap, C

Semester: IV			
Course Title: Data Structures & Programming Language Using C++		Course Code: CSC-241	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Learn the basic types of data structures, their implementation and application.	1,2	U



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CO2	Use linear and non-linear data structure like stacks, queues, linked list etc.	1,3,4	R, U, An, Ap
CO3	Implement various searching and sorting algorithms	1,2,3	Ap, An, E, C
CO4	Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.	1,2,3	U, An, Ap, E, C
CO5	Develop programming skills which is required for solving problems.	1,2,3,4	U, An, Ap

### Semester: V

**Course Title: Database Management System & Oracle**

**Course Code: CSC-351**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain ability to handle large volumes of structured, semi-structured, and unstructured data using database technologies.	1,2	U, E
CO2	Appreciate the need for DB approach and understand the components and roles of DBMS.	1, 2	R, U, An, Ap
CO3	Apply DB system development life cycle to business problems.	1,3	An, E, C
CO4	Implement a set of relations in the chosen DBMS.	1,2,4	An, Ap, E, C
CO5	Understand the development and administration using MySQL and know about how to read and write files.	2,3	U, An, Ap



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Semester: VI			
Course Title: Programming using Python			
Course Code: CSC-361			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Get knowledge on one of the latest and powerful programming languages – Python.	1,2,4	U, E
CO2	Understand about how to read and write files.	1,2	R, U, An, Ap
CO3	Get broader view on the concept of Object-Oriented Programming (OOP) applied in Python.	2,4	U, An, E, C
CO4	Understand how to connect Python programs to a database.	1,2,4	An, Ap, E, C
CO5	Identify Python object types.	1,2,3,4	U, An, Ap





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### Department of Economics

#### Program Specific Outcomes (PSOs)

PSO1: To understand the basic terms, concepts and principles of economics.

PSO2: To learn basic statistical and mathematical techniques, which are used in economic analysis.

PSO3: To understand various macroeconomic theories like consumption, investment, banking, money, international trade, economic development and public finance.

PSO4: To gain knowledge on the concepts and basic theories related to consumer behaviour, producer behaviour and market structure

PSO5: To learn about various problems of Indian economy and latest developments in the economy during post globalization era

COURSE OUTCOMES (COs)			
Semester-I			
Course Title: Micro Economics			
S.No	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO- 1	Learn about various definitions of economics and the basic concepts related to economics	1,4	U,R
CO- 2	Gain knowledge about consumer behaviour	1,4	U,R
CO- 3	Understand the theory of production , costs and revenue	1,3,4	U, Ap
CO- 4	Learn about various market forms, their features and equilibrium	3,4	U, Ap, An
CO- 5	Understand theories of distribution	1,3	U,Ap,E

Semester II			
Course Title: Macro Economics			
S.No	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO- 1	Understand and evaluate different theories of income and employment determination	1,2,3	U,R, E
CO- 2	Learn about consumption and investment functions	2,3	U,R, E



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CO- 3	Understand the role and functions of money	1,3,4	U,R
CO- 4	Understand the problem of inflation, its causes, effects and solutions in an economy	1,4,5	U, An
CO- 5	Get an overview on fiscal and monetary policy	2,3,4	U, An, E

Semester: III			
Course Title: Indian Economy			
Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Understand about various sectors of the Indian economy	1,5	U, An, E,C
CO-2	Analyze various issues related to Indian agriculture sector	1,4,5	U, Ap, An, E
CO-3	Get an in-depth understanding about Indian Industrial sector, its growth, problems and policies	1,3,5	U, Ap, An, E
CO-4	Get an overview on foreign trade of India	1,3,4,5	U, An, E
CO-5	Gain knowledge about various problems of Indian economy, Indian tax structure and economic planning	1,3,5	U, Ap, An, E

Semester: IV			
Course Title: International Economics and Public Finance			
Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Gain knowledge about theories of International Trade	1,2,3,4	U, Ap, An, E
CO-2	Understand the concept and structure of balance of payments; disequilibrium causes and measures through which disequilibrium can be corrected	1,3,4,5	U, An, E
CO-3	Understand how the exchange rate is determined	1,2,3,4	U, An, E
CO-4	Understand the basic aspects of public finance like taxes, public revenue, public expenditure, public debt etc.	1,3,5	U, An, E,C
CO-5	Learn about commercial policy	1,3,4,5	U, An, E
Semester V			



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Course Title: Economics of Development			
S.No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Understand the meaning, measurement and the determinants of Economic Development.	1,3	R, U, An
CO- 2	Understand the characteristics of underdeveloped countries and the concept of dualism	1,3	U, An
CO- 3	Analyze various growth models and strategies of economic development.	1,3	U, An, E
CO- 4	Understand the concept of capital formation and choice of technique	1,3	U, An, E
CO- 5	Understand the need, objectives, strategies and problems of economic planning	1,3	U, An, E

### Semester VI

Course Title: Quantitative Methods for Economists

S.No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Learn about the concepts of sets, relations , functions and continuity, Derivatives, Matrices and their economic applications	1,2	R,U,Ap
CO- 2	Understand different measures of central tendency	1,2	R,U,Ap
CO- 3	Understand different measures of dispersion	1,2	U,Ap
CO- 4	Understand the concepts and measurement of skewness, kurtosis, correlation and regression	1,2	U, Ap
CO- 5	Understand the concepts of Interpolation & extrapolation and the calculation of Index numbers	1,2	U, Ap



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## Department of Fine Arts

### Programme specific Outcomes (PSOs)

PSO-1. To polish the talent of students.

PSO -2. To get knowledge on the theory of Art, which includes Pre- Historic to Modern age. It enables Students to be aware of what has happened in the field of Art.

PSO -3. To understand the practical aspect of drawing and painting.

PSO -4. To get introduced to the commercial aspects of Fine Arts.

PSO -5. To gain knowledge on entrepreneurship in the field of Art.

### COURSE OUTCOMES (Cos)

#### Semester-I

Course Title: History of Indian Painting (T)

Course Code: BFAA-1109

S.NO	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Acquire basic knowledge on painting and sculptures.	1,2	R,U, Ap, C
CO-2	Know from where the history of Art started in our country.	2	R, U, An, E
CO-3	Focus on the basic principles and techniques of Art.	2,3	U,E
CO-4	Use innovative approaches to generate ideas with in boarder socio-cultural perspectives.	2	U, An ,E
CO-5	Understand the function of visual art period covered in the course.	2,5	U, An



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**Course Title: Still Life (P)**

**Course Code: BFAB-1109**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Learn the basics of drawing and colour application.	1	U, Ap, C
CO-2	Get the basic knowledge of composition	1,3	U, Ap, C
CO-3	Understand the elements of art practically while studying the objects in front.	3	U, Ap, E, C
CO-4	Develop and strengthen the natural level of drawing ability.	3,4	U, Ap, An, E, C

**Course Title: Letter Writing (P)**

**Course Code: BFAC-1109**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Get knowledge on basic calligraphy.	1	Ap, An, C
CO-2	Learn each and every alphabet of different languages	1,3	U, Ap, C
CO-3	Understand the techniques and treatments of drawing	3,4	U, Ap, C
CO-4	Get one or more media to complete the technical and formal challenges pertinent to a body of original work.	4,5	U, Ap, An, E, C

### Semester-II

**Course Title: History of Indian Sculptural (T)**

**Course Code: BFAC-1209**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Get basic knowledge up to the advanced level of sculptures of India	1,2	U, Ap, C





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CO-2	Gain knowledge about the development process in the field sculpture in different style in India	2	R, U, C
CO-3	Know the different mediums and techniques in which sculptures have been done.	2,5	U, Ap, An, C
CO-4	Examine the development of the sculpture in the particular period.	2,5	R, U, Ap, An, C
CO-5	Analyse cultural and historical context in which works of art are made.	2.4	U, Ap, An

**Course Title: Still Life Study (P)**

**Course Code: BFAB-1209**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Understand the basics of drawing and colour application.	1	U, Ap, C
CO-2	Get basic knowledge on composition	1,3	U, Ap, C
CO-3	Understand the elements of art practically while studying the objects in front.	3	U, Ap, E, C
CO-4	Practice the still life art which strengthens their natural level of drawing ability.	3,4	U, Ap, E, C
CO-5	Develop the Artistic view.	4,5	U, C

**Course Title: Head Study (P)**

**Course Code: BFAC-1209**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Get basic understanding on portraiture.	1	U, C
CO-2	Become aware of the initial stage of portrait in monochrome	1,3	U, Ap, C
CO-3	Enhance their creative power.	1	U, Ap, E, C
CO-4	Create and implement the concepts and basic principles of head study.	1,3,5	U, Ap, C



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### Semester-III

**Course Title: History of Indian Sculpture (T)**

**Course Code: BFAA-2309**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Study Indian sculptures instructs which would help them to know the truths of the Hinduism, Buddhism and Jainism.	2	R, U, E
CO-2	Study the imagined shapes of Gods	2	R, U, An
CO-3	Develop techniques to improve their talents and creativity through sculpture.	2,3	U, C
CO-4	Develop their observational skills.	1,2	U, C
CO-5	Learn about past history, mythology and its importance in today's life.	2,5	U, An, E, C

**Course Title: Design 2D/3D (P)**

**Course Code: BFAB-2309**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Execute 2D as well as 3D designs.	3	U, Ap, C
CO-2	Learn to quickly modify the design.	3,4	U, Ap, An, C
CO-3	Know about design efficiency which would provide them to excel in various market projects	4,5	U, Ap, C
CO-4	Study techniques which would help them in their professional lines.	4,5	U, Ap, E, C
CO-5	Tackle with geometrical elements of height, width and depth while doing their project in class.	3,4,5	Ap, An, E, C



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**Course Title: Head Study (P)**

**Course Code: BFAC-1109**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Get basic understanding of portraiture.	1	U, C
CO-2	Become aware of the initial stage of portrait in monochrome.	1,3	U, Ap, C
CO-3	Enhance their creative power.	1,5	U, Ap, E, C
CO-4	Create and implement the concepts and basic principles of head study.	1,3,5	U, Ap, C

### Semester-IV

**Course Title: History of Indian miniature Paintings (T)**

**Course Code: BFAA-2409**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Study the history of Indian Miniature painting which is the best example of handmade forms of visual arts in India.	1,2	R, U, E
CO-2	Study history which provides means to understand about the kings and their glorious deeds through miniature paintings and their relationship with our present.	2	R, U, An, E
CO-3	Learn about how products of art were used to promote religious activities.	2,4	U, An, E
CO-4	Study paintings which tell the elegance, rich colors and attention to detail.	2,3	U, An, C
CO-5	Study global, national and local relationship between society and art.	2,4,5	U, Ap, An, E, C



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### Course Title: Head Study (P)

Course Code: BFAB-2409

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Do detailed study of human head and learn movement, balance, proportion, weight etc.	1,3	U, Ap, C
CO-2	Strengthen their focus and strategic thinking.	3,5	U, Ap, C
CO-3	Enhance their creative power.	1	U, Ap, An, C
CO-4	Enhance the visualization power and develop perception and ideas.	3,4	U, Ap, C
CO-5	Develop Fine Motor skills and improve hand-eye coordination.	4,5	U, Ap, E, C

### Course Title: Poster/Book Cover (P)

Course Code: BFAC-2409

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Do Poster study which is used as tools to display important information.	1,5	U, Ap, C
CO-2	Use poster/book cover as visual aid that support oral communication of information.	1,4,5	U, Ap, C
CO-3	Enhance creative thinking by making poster.	3,4,5	U, Ap, An, C
CO-4	Create a perfusion aspect i.e. the basis of advertisement and promotion	3,4	U, Ap, C
CO-5	Understand how to design a book cover according to the content	4,5	U, Ap, An, C



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### Semester-V

**Course Title: History of Modern Movement in Europe (T)**

**Course Code: BFAA-3509**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Study modern movements which help them in studying changes in art and society due to industrial revolution till the French revolution in Europe.	1,2	U, An
CO-2	Study through available sources in the department like magazines, books, photographs and video's, the history of modern movements in Europe	2,4	U, AP, E
CO-3	Study how the history provides means by which we can understand our human past and its relationship with our present.	2,4,5	U, E, C
CO-4	Learn the rich past history which help them in understanding where do they stand today.	2,5	U, E
CO-5	Learn about past societies, systems, ideologies, government, culture and technologies and how they were built, operated and changed.	2,4,5	U, An, E

**Course Title: Landscape (P)**

**Course Code: BFAB-3509**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Study the development and formation of landscape in the open air which enables them to capture space in front of them on canvas.	1,3	U, Ap, C





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CO-2	Learn the depiction of natural scenery such as mountains, valleys, trees, rivers, forests etc. while learning the elements of art arranged in coherent composition.	3,4	U, Ap, C
CO-3	Represent or replicate the nature's beauty on their canvas.	3,4	U, Ap, C
CO-4	Learn various aesthetic elements like light, colour, texture etc. to learn landscape	3,5	U, Ap, C
CO-5	Have knowledge of perspective	3,4,5	U, Ap, C

**Course Title: Full Life Drawing (P)**

**Course Code: BFAC-3509**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Understand the shapes and depth, light and shadow in living model.	1,3	U, Ap, C
CO-2	Create live painting full of character.	1,3	U, Ap, C
CO-3	Learn the techniques of foreshortenings.	3	U, Ap, E, C
CO-4	Learn about the human figure and the movement of different body parts together as one whole unit.	3,5	U, Ap, E, C
CO-5	Improve their hand-eye coordination and observational skills	3,4,5	U, Ap, An, E, C

### Semester-VI

**Course Title: History of Indian Painting (Modern Period) (T)**

**Course Code: BFAA-3609**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels



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CO-1	Study the History of Indian Paintings during modern period which allows them to study the personal expressions of artist.	2	R, U, An
CO-2	Understand about the self-expressions and the creativity of the modern period artists which help them to build confidence as well as sense of individual identity	2,4	R, U, An, E
CO-3	Understand the theory which deals with the modern art traced to the mid-19 <sup>th</sup> century rejection of academic tradition in subject matter style by certain artists and critics.	2,5	R, U, An, E
CO-4	Study the impact of art on society	2,5	U, Ap,
CO-5	Develop the sense of creativity, innovation, critical thinking, communication, motivation and self-confidence	2,4,5	U, Ap, E,

**Course Title: Landscape Painting (P)**

**Course Code: BFAB-3609**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Learn how to capture space in front of them on canvas through the development and formation of landscape teaching in the open air	1,3	U, Ap, C
CO-2	Learn the depiction of natural scenery such as mountains, valleys, trees, rivers, forests etc. while learning the elements of art arranged in coherent composition	3,4	U, Ap, C
CO-3	Represent or replicate the nature's beauty on their canvas.	3,4	U, Ap, C
CO-4	Understand various aesthetic elements like light, colour, texture etc. to learn landscape.	3,5	U, Ap, C
CO-5	Gain knowledge on perspective	3,4,5	U, Ap, C



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**Course Title: Full Life Drawing (P)**

**Course Code: BFAC-3609**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Study Full Life Drawing which will help them to understand the shapes and depth, light and shadow in living model.	1,3	U, Ap, C
CO-2	Create live painting full of character	1,3	U, Ap, C
CO-3	Learn the techniques of foreshortenings.	3	U, Ap, E, C
CO-4	Learn about the human figure and the movement of different body parts together as one whole unit.	3,5	U, Ap, E, C
CO-5	Improve hand-eye coordination and observational skills	3,4,5	U, Ap, An, E, C



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## Department of Geography Programme specific Outcomes (PSOs)

PSO1. To explore the fundamental concepts of the atmosphere, oceans and earth's surface.

PSO 2. To familiarize the students with the basic map making and reading techniques.

PSO 3. To make students understand various aspects of regional development and planning.

PSO 4. To give students general view about the importance of men and environment relationship.

PSO 5. To make students aware about the physiographic divisions and economic resources of India.

PSO 6. To gain theoretical and practical knowledge about what, where and why in geography through field survey.

PSO 7. To motivate students to understand the disaster risk and to take actions appropriately against such risk with their own will.

### COURSE OUTCOMES (COs)

#### Semester-I

**Course Title:** Physical Geography-I Geomorphology

**Course code:** BGEO-1119

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Understand the landforms in a systematic way	6	U, R, Ap, An
CO2	Gain knowledge on the influence of various types of the rocks on the development and evolution of the landforms	1,6	U, Ap, An
CO3	Study landforms and the related processes from the traditional concept to the contemporary development in geography	6	U, An, E

**Course Title:** Cartography-I

**Course code:** BGEO-1119



Estd. 1892

# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Develop skills of map making and its importance	2	U, Ap, An, C
CO2	Develop observation skills	2	U, Ap, C
CO3	Learn basic themes of map making	2	U, Ap, An, C

### Semester-II

**Course Title:** Physical Geography-I Climatology & Oceanography

**Course code:** BGEO-1219

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Understand the nature and scope of climatology	1	U, R, Ap, An, E
CO2	Acquire knowledge about the concepts of climatology	1	U, R, Ap, An, E
CO3	Study interaction between the earth's atmosphere and the earth's surface and how does atmospheric moisture work	1,6	U, Ap, An, E
CO4	Analyse physical and chemical properties of sea water bottom relief and distribution of oceanic resources	1,6	U, An, E

**Course Title:** Cartography-II

**Course cod:** BGEOP-1219

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Understand the symbols of weather map	2	U, Ap, An, C
CO2	Understand the conventional symbols	2	U, Ap, An, C
CO3	Gain in depth knowledge on directions	2	U, Ap, An, C

### Semester-III

**Course Title:** Geography of resources and environment: World patterns

**Course code-** 2319





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Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Understand the importance of resources and environment	3,4,6	U, R, Ap, An, E
CO2	Understand how man induced changes in environment	3,4,6	U, Ap, An, E

**Course Title:** Cartography

**Course code:** BGEOP-2319

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Learn the skill of drawing map	2	U, R, Ap, An, E, C
CO2	Learn the interpretation of topographic maps	2	U, R, Ap, An, E, C
CO3	Understand the cartographic symbols	2	U, Ap, An, E, C

### Semester-IV

**Course Title:** Geography of Punjab

**Course code:** BGEO-2419

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Understand the geographical background and natural resources	3,4,6	U, R, An, E
CO2	Understand the irrigation and agricultural development in Punjab	3,4,6	U, An, E
CO3	Evaluate the transportation and population distribution of Punjab	3,4,6	U, An, E

**Course Title:** Cartography

**Course code:** BGEOP-2419

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Learn the skill of drawing map	2	R, U, Ap, An, E, C



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CO2	Learn the interpretation of topographic maps	2	R,U, Ap, An, E, C
CO3	Understand the cartographic symbols	2	U, R, Ap, An, E, C
CO4	Get introduced to Remote sensing and GIS	2	U,An

### Semester-V

**Course Title:** World Geography

**Course code:** BGEO-3519

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Understand the location, physiography, drainage and vegetation of the world	3,4,5	U, R, Ap, An, E
CO2	Understand the human resources development and distribution	3,4,5	U, R, Ap, An, E
CO3	Evaluate the natural resources and industries and their importance	3,4,5	U, R, Ap, An, E

**Course Title:** Map projection

**Course code:** BGEO-3519

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Develop the skill to draw projections	2	U, Ap, An, E, C
CO2	Understand the shape and size of the earth	2	U, Ap, An, E, C
CO3	Understand the concept of longitude and latitude	2	U, Ap, An, E, C

### Semester-VI

**Course Title:** Geography of India



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**Course code: BGEO-3619**

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Understand the geographical background and natural resources	3,4,5	U, R, An, E
CO2	Understand the irrigation and agricultural development in India	3,4,5	U, R, An, E
CO3	Evaluate the transportation and population distribution in India	3,4,5	U, R, An, E

**Course Title: Field work**

**Course code: BGEO-3619**

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Acquire knowledge on different types of map projections	2,6	R,U, Ap, An, E, C
CO2	Acquire understanding about socio-economic and cultural dimensions of the population through physical land Surveys	2,6	R,U, An, E, C
CO3	Understand the application of knowledge in the reality	2,6	R,U, Ap, An, E, C



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### Department of English

#### Programme Specific Outcomes (PSOs)

PSO1. To build up proficiency in English Language

PSO 2. To understand the basic and advanced grammar of English

PSO 3. To develop critical and analytical skills within students

PSO 4. To build up knowledge in the usage of English language, its structures, pronunciation and other features of connected speech, better equipping students to pursue higher degrees or jobs in corporate/management sector or any other area

PSO 5. To provide knowledge on multifarious opportunities in the field of this programme

PSO 6. To acquire the knowledge on latest technology related with communication skills

PSO 7. To display better skills of speaking and writing in the language

PSO 8. To enhance their knowledge on the usage of various linguistic structures at the level of speech and writing and develop better language proficiency and fluency

#### COURSE OUTCOMES (Cos)

##### Semester-I

Course Title: **Elective English**

Course Code: BEEN-1106

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
1.	Develop interest in reading and appreciation of literature.	1,2,3,5	U,Ap
2.	Become familiar with socio-political and cultural issues related to prescribed text.	4,5,6	U,Ap,An
3.	Acquire pronunciation skills in English.	2	U,Ap
4.	Become creative writer in media / journalism.	2,3,4,5	Ap

##### Semester-II

Course Title: Elective English

Course Code: BEEN-1206

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
1.	Develop interpretative skills.	1,2,4,5,6	U,An



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2.	Acquire knowledge about the basic concepts of Literary writings.	1,5,6	U,An,E
3.	Learn to situate literary works in their larger cultural contexts.	5,6	U,An
4.	Prepare for higher studies in literature	1,2,3,4,5,6	U,Ap
5.	Find jobs in teaching literature after acquiring the degree.	1,2,3,5,6	Ap

### Semester-III

Course Title: **Elective English**

Course Code: BEEN-2306

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
1.	Acquire an understanding about sustained allegory and the basic tenets of Marxism, Capitalism and their social implications	1,5,6	U,An
2.	Understand various figures of speech and literary devices in the poetry of different poets prescribed	2,3,4,5	U,Ap,An,
3.	Understand various literary terms and their significance	1,4,5,6	U,Ap,An
4.	Enhance their reading and analyzing power of texts through guided reading	1,2,3,4,5,6	U,Ap,An

### Semester-IV

Course Title: **Elective English**

Course Code: BEEN-2406

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
1.	Acquire an understanding of various international issues in an I.T. savvy world.	4,5,6	U,Ap,An
2.	Have a glimpse of different cultures of the world by reading stories from Commonwealth countries.	1,4,5,6	U,An
3.	Sensitize themselves on current issues faced by humanity globally.	1,4,5,6	U,Ap,An
4.	Enhance their reading and analyzing power of texts through guided reading	1,2,3,4,5,6	U,Ap,An





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## Semester-V

Course Title: **Elective English**

Course Code: BEEN-3506

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
1.	Facilitate the understanding of American, African, Indian Canadian and Multicultural sensibilities by getting introduced to the literary works representing them.	1,4,5,6	U,Ap,An
2.	Get introduced to the background study of English Literature.	1,2,5,6	U,An
3.	Demonstrate the effective use of literary theory.	1,4,5,6	U,An
4.	Enhance their reading and analyzing skills of texts through guided reading	2,3,4	U,Ap,An

## Semester-VI

Course Title: **Elective English**

Course Code: BEEN-3606

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
1.	Understand American, African, Indian Canadian and multicultural sensibilities by getting introduced to the literary works representing them.	1,4,5,6	U,Ap,An
2.	Get knowledge about the background study of English Literature.	1,2,4,5,6	U,Ap,An
3.	Demonstrate the effective use of literary theory.	1,4,5,6	U,An
4.	Enhance their reading and analyzing power of texts through guided reading	2,3,4,5,6	U,Ap,An



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### Department of Hindi

#### Programme Specific Outcomes (PSOs)

- PSO1.** To provide knowledge about social values, culture, society and contemporary concerns which help in sensitizing the student regarding society, polity and fellow beings.
- PSO2.** To develop the linguistic skills which help in better communication (written and verbal) and also the skills for drafting, creative writing and reporting etc.
- PSO3.** To groom the talent, skills and knowledge to make the students capable of appearing in various entrance exams for government and corporate jobs.
- PSO4.** To enable the students to get jobs or to become self-employed as draftsman, journalist, media anchor, tourist guide etc.
- PSO5.** To understand the evolution of Hindi as a language and its literature which further help in research oriented higher study in Hindi language and literature.

#### COURSE OUTCOMES (Cos)

##### Semester-I

Course Title: Hindi Elective

Course Code: BHEI: 1107

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
CO1.	Get knowledge on Hindi Prose	1, 2,5	R, U, C
CO2.	Develop functional skills in Hindi	1, 2,5	U, C

##### Semester-II

Course Title: Hindi Elective

Course Code: BHEI: 1207

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
CO1.	Get knowledge on modern Hindi poetry	1,2,3,5	U, Ap, C
CO2.	Develop grammatical skills in Hindi	1,2,3,5	U, Ap, C

##### Semester-III

Course Title: Hindi Elective

Course Code: BHEI: 2307



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Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
CO1.	Get knowledge of Hindi novel and drama	1,5	U, R,An, E
CO2.	Develop practical linguistic skills in Hindi	1,5	U, R,An, E

### Semester-IV

Course Title: Hindi Elective

Course Code: BHEI: 2407

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
CO1.	Have knowledge on medieval Hindi poetry and ancient and medieval history of Hindi literature.	1,3,5	U, Ap, An
CO2.	Develop skill in administrative Hindi vocabulary.	1,3,5	U, Ap, An

### Semester-V

Course Title: Hindi Elective

Course Code: BHEI: 3507

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
CO1.	Get knowledge on memoir and Travelogue in Hindi and about the development of modern history of Hindi.	1,3,5	Ap, U, R, E
CO2.	Develop communication skills in administrative Hindi.	1,3,5	U, Ap, An

### Semester-VI

Course Title: Hindi Elective

Course Code: BHEI: 3607

Sr. No.	On completing the course, the students will be able to	PSOs Addressed	Cognitive Levels
CO1.	Get knowledge on Hindi poetry particularly the poetic drama.	1,2,3,4,5	U, E, Ap, C
CO2.	Develop creative writing skills in Hindi	1,2,3,4,5	U, E, Ap, C



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### Department Of History

#### Programme Specific Outcomes (PSOs)

PSO-1 To learn about the whole story of the man as well as his progress in civilization and culture from the dim past to the present age.

PSO-2 To understand the political, social, economic and religious system of the present better as they all had their roots in the past.

PSO-3 To gain ability to build a critical and evaluative approach to understand different events and changes of the past and their impact on present and future.

PSO-4 To get knowledge about the rich heritage and culture of India's past.

PSO-5 Study of history helps to have moral and environmental education and also develops a feeling of nationalism and patriotism in the hearts of the pupils.

COURSE OUTCOMES (Cos)			
Semester-I			
Course Title- HISTORY OF INDIA UPTO A.D. 1000			
Course Code: BHIS-1110			
Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO- 1	Study about the different sources to construct the Ancient Indian History.	1,2,3,4	R,U,An,E
CO- 2	Understand the social, economic, religious and political life of people of Indus Valley Civilization and Vedic-Aryans.	1,2,3,4	R,U,An,E
CO- 3	Learn the origin, teachings and impact of Jainism and Buddhism.	1,2,3,4	R,U,An,E
CO-4	Study about the polity, economy and society of Ancient Indian dynasties.	1,2,3,4	U,E
CO- 5	Understand the richness of art and architecture, literature and philosophy, science and technology of Ancient India.	1,2,3,4	U,An,E



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Semester-II			
Course Title- HISTORY OF INDIA (A.D. 1000–1707)			
Course Code- BHIS-1210			
Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Learn about the Polity, Economy and Society during Medieval India.	1,2,3,4	R,U,An,E
CO-2	Study about the emergence, growth and decline of various dynasties.	1,2,3,4	R,U,E
CO-3	Study about the emergence of composite culture in India.	1,2,3,4	R,U,E
CO-4	Learn about the rise of Hindu dynasties: Vijay Nagar and Marathas during the rule of the Turks and the Mughals.	1,2,3,4	U,An,E
CO-5	Understand the legacy of the Sultanate and the Mughal period in India.	1,2,3,4	U,E
Semester-III			
Course Title- HISTORY OF INDIA (A.D. 1707-1947)			
Course Code- BHIS-2310			
Sr. No	On Completing the Course, the Students will be able to :	PSOs addressed	Cognitive Levels
CO-1	Understand the different strategies of the British to establish and expand their rule in India.	1,2,3,4,5	R,U,An,E
CO-2	Analyze various administrative, social and economic changes brought by them in India	1,2,3,4,5	R,U,E
CO-3	Study about the role of Gandhi Ji in National Movement in India.	1,2,3,4,5	U,An,E
CO-4	Learn about the impact of revolutionaries in the freedom movement of India.	1,2,3,4,5	U,E





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<b>CO-5</b>	Study about the rise of communal politics and partition of India in 1947.	1,2,3,4,5	U,An,E
<b>Semester-IV</b>			
<b>Course Title- HISTORY OF THE PUNJAB (A.D. 1469-1799)</b>			
<b>Course Code- BHIS-2410</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Analyze the prevalent political, social and religious conditions in which the Sikhism originated and developed in Punjab.	1,2,3,4,5	R,U,AN,E
<b>CO-2</b>	Study about the critical analysis of the various categories of the sources of the history of Punjab.	1,2,3,4,5	U,E
<b>CO-3</b>	Learn the teachings and the philosophy of the Sikhism.	1,2,3,4,5	R,U,An,E
<b>CO-4</b>	Understand the consolidation and expansion of the Sikh Panth.	1,2,3,4,5	U,An,E
<b>CO-5</b>	Study about the political struggle of the Sikhs under Banda Bahadur and the Sikh Misl.	1,2,3,4,5	U,An,E
<b>Semester-V</b>			
<b>Course Title- HISTORY OF THE WORLD (A.D. 1500-1956)</b>			
<b>Course Code- BHIS-3510</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Study about various events of the Western world such as renaissance, reformation and enlightenment which brought awakening in the world.	1,2,3,4	R,U,E
<b>CO-2</b>	Understand and explain the basic concepts of liberty, equality and fraternity.	1,2,3,4	R,U,An,E



Estd. 1892

# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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<b>CO-3</b>	Understand the concepts of individualism, humanism, liberalism, nationalism, socialism and Marxism.	1,2,3,4	U,An,E
<b>CO-4</b>	Analyze World wars I & II and their effects.	1,2,3,4	U,An,E
<b>CO-5</b>	Study about the role of UNO in political social and economic spheres.	1,2,3,4	U,E
<b>Semester VI</b>			
<b>Course Title- HISTORY OF THE PUNJAB (A.D. 1799-1966)</b>			
<b>Course Code- BHIS-3610</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Study about the political condition of Punjab on the eve of the accession of Ranjit Singh to power.	1,2,3,4	R,U,An,E
<b>CO-2</b>	Learn the administrative structure and policies of the Lahore Darbar.	1,2,3,4	R,U,An
<b>CO-3</b>	Understand the strategies and policies of the British to annex the Punjab in their Empire.	1,2,3,4,5	U,An,E
<b>CO-4</b>	Study the role of Punjab in the freedom struggle of India.	1,2,3,4,5	R,U,E
<b>CO-5</b>	Study about the creation of the Punjabi Suba in 1966.	1,2,3,4	R,U,E



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### Department of Mathematics

#### Programme Specific Outcomes (PSOs)

**PSO-1.** To understand the fundamental concepts of physics, chemistry & mathematics and develop ideas based on them.

**PSO-2.** To possess knowledge on the topics of pure physics, chemistry & mathematics, empowering students to pursue higher studies at reputed academic institutions.

**PSO-3.** To demonstrate problem-solving skills, innovative thinking and creativity.

**PSO-4.** To motivate students towards research in physics, chemistry & mathematics and related fields.

**PSO-5.** To become eligible to serve in DRDO, defense, public sector and private Sector.

Course Outcome

### COURSE OUTCOMES (Cos)

#### Semester-I

Course Title: Algebra

Course Code: MAT-111A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Solve problems based on matrices, vector spaces, eigen values and eigen vectors,	2	R,U
CO2	Recognize consistency and inconsistency of linear equations.	3	R, U, An
CO3	Understand the relation between roots and coefficients.	3	U, An

Course Title: Calculus and Trigonometry

Course Code: MAT-111B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Get themselves acquainted with the concepts of limits, functions, derivatives, integrals, and infinite series.	1	R, U, Ap
CO2	Associate differential equations with the Mathematical modeling.	2,3	U, An
CO3	Solve multifarious differential equation that relates functions with its derivatives.	3	An, E, Ap
CO4	Know about concavity and convexity of the functions, Asymptotes and multiple points of a curve.	2	R, U, C
CO5	Have knowledge about applications in fields of engineering, physics, economics, and biology	1,4	Ap, U, C, E

### Semester-II

Course Title: Calculus and Differential equations

Course Code: MAT-121A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquaint themselves with the limits, functions, derivatives, integrals, and infinite series.	1,2	An, E, C
CO2	Associate differential equations with the Mathematical modeling.	3	Ap, An
CO3	Solve multifarious differential equation that relates functions with its derivatives.	3	U, Ap, E
CO4	Know about concavity and convexity of the functions, Asymptotes and multiple points of a curve.	2	U, An
CO5	Have knowledge about applications in fields of engineering, physics, economics, and biology.	1,4	U, Ap, E

Course Title: Calculus

Course Code: MAT-121B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Apply Calculus to various fields such as computer graphics, physical sciences, economics and engineering.	1,4	Ap, E, C
CO2	Use Calculus in oceanography to calculate the height of tides in oceans.	4,5	An, Ap, E
CO3	Understand concept of partial derivatives which are used in fields such as computer graphics, physical sciences, vector calculus and engineering.	1,4	U, C
CO4	Learn about evaluating double and triple integrals of functions of several variables and apply them in evaluating area and volume of solids.	2,3	U, Ap
CO5	Understand the concepts of Jacobians, maxima and minima of functions of two variables, envelopes and evolutes.	3	U,Ap

### Semester-III

Course Title: Analysis

Course Code:MAT-231A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the behavior of real numbers, sequences and series of real numbers.	3	U, An
CO2	Test the convergence of sequences and series of various types, the convergence of improper integrals.	1,3	An, Ap
CO3	Apply the concept of Riemann integrability, the use of beta and gamma functions in solving various problems of calculus.	3,4	Ap, C

Course Title: Analytical Geometry

Course Code:MAT-231B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand and apply the concepts of geometry in the daily life.	1,4	U, Ap
CO2	Analyze the applications of geometry in different fields such as art, robotics, Computer, and video games.	1,2	An, E





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CO3	Realize the important role of Analytical Geometry in architecture and also in the construction of stairs by making use of angles.	4,5	E, C
CO4	Comprehend the concepts of change of origin, rotation of axes and invariants for second degree equations in two and three dimensions.	3	U, Ap
CO5	Know about the properties of conics (parabola, ellipse, hyperbola and sphere).	3	U

### Semester-IV

Course Title: Statics and Vector Calculus

Course Code:MAT-241A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the study of system of forces in equilibrium and differentiation and integration of vector functions.	3	U, R, An
CO2	Define the resolution and composition of a number of forces, parallel forces and couples, moments of forces and couples about a point and a line.	2,3	R, U, E
CO3	Understand the theory behind the friction and centre of gravity.	1,3	E, C
CO4	Understand the definition of directional derivative and gradient and illustrate geometric meanings with the aid of sketches.	1,2	U, Ap
CO5	Apply the concept of a vector integration in a plane and in space.	4	Ap,An

Course Title: Solid Geometry

Course Code:MAT-241B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of 3-D Euclidean geometry.	1,4	R, U
CO2	Generalize the concepts and ideas of plane geometry.	1,4	E, C
CO3	Understand the basic geometric views of shape, size, length, angle, volume, surface area, rotation, translation, location etc. associated with any figure.	2	U, Ap



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CO4	Learn about the applications of solid geometry in 3-D modelling, Architectural designing, 3-D Computer graphics.	1,2	U, Ap
CO5	Understand the concepts and properties of solids like cone, right circular cone, cylinder, right circular cylinder and sphere.	3	U, Ap

### Semester-V

Course Title: Dynamics

Course Code:MAT-351A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Handle the problems based on rectilinear motion.	3	C, E
CO2	Use Newton's laws of motion in numerical problems.	2,3	Ap, E
CO3	Deal with the problems based on variable acceleration.	1,3	Ap, An
CO4	Use concepts of work, power and energy to solve practical problems.	3	E, C

Course Title: Number Theory

Course Code:MAT-351B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about some discoveries related to properties of prime numbers.	1,2	An, E, C
CO2	Interpret the concept of divisibility and fundamental theorem of Arithmetic.	2,3	R, U
CO3	Have knowledge about applications such as security system like in banking securities, coding theory, barcodes and memory management systems.	4,5	Ap, An



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CO4	Understand various types of numbers and their properties, various arithmetic functions.	3	U, E
CO5	Understand concept of G.C.D. and L.C.M. of numbers and the relation of linear Diophantine equations and congruences will help to solve various arithmetic problems.	3,4	U, Ap

### Semester-VI

Course Title: Linear Algebra Course Code:MAT-361A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Handle the problems based on vector spaces, subspaces, basis and dimensions.	3	E, C
CO2	Check the linear independence of vectors.	3	R, U
CO3	Form the linear combination of vectors.	1	An, Ap, C
CO4	Find the matrix corresponding to a linear transformation and vice versa.	3	Ap, E

Course Title: Numerical Analysis Course Code:MAT-361B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the use of Numerical analysis in detecting errors in numerical calculations.	1,2	E, C
CO2	Solve linear and non-linear equations, numerical differentiation, integration and differential equations.	3	Ap, An, E
CO3	Have knowledge of algorithms that use numerical approximation for the problems of mathematical analysis.	2,3	R, U, Ap
CO4	Apply numerical analysis in the fields of engineering, physical sciences, life sciences, social sciences, medicine, business and arts.	1,4,5	Ap, An, E, C
CO5	Analyze and evaluate the accuracy of common numerical methods.	1, 3	An, E



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## Statistics

### Programme Specific Outcomes (PSOs)

- PSO-1.** To enable students to acquire core knowledge on the basic concepts of statistics which include the concepts of probability theory, probability distributions, distribution theory, statistical inference, survey sampling, designs of experiments and applied statistics.
- PSO-2.** Practical exercises done enable the students to analyse and interpret data and also to draw valid conclusions. This will be helpful to handle real time applications.
- PSO-3.** To apply the concepts of statistics, probability distribution and its related concepts to real life problems.
- PSO-4.** To understand the applications of statistical concepts in other disciplines such as mathematics, physics, economics, etc.
- PSO-5.** To get a platform for pursuing higher studies in statistics .

COURSE OUTCOMES (Cos)			
Semester-I			

**COURSE TITLE: STATISTICAL METHODS-I      COURSE CODE: STA-111A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to solve statistical problems using various measure of central tendency.	1	R ,U,Ap
CO2	Collect the data and present it diagrammatically.	4	U,Ap, An, E
CO3	Use Statistics in research for proper characterization, summarization, presentation and interpretation of the result of research.	2, 3	U, Ap, An
CO4	Apply the statistical methods in various fields such as finance, marketing, accounting and business.	4	Ap, An, C

**COURSE TITLE: PROBABILITY THEORY      COURSE CODE: STA-111B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Use statistics in engineering and science like disease modeling, climate prediction networks etc.	3,4	U,Ap, An
CO2	Quantify the uncertainty and assess the accuracy of our inference about the population.	2	U,An, E
CO3	Have good understanding of exploratory data analysis.	4	U
CO4	Learn the concept of random variable, expected value and moment generating function of random variable.	3	U

**COURSE TITLE: Practical based on PAPER: Statistical methods-I**

**COURSE CODE: STA-111P**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn practically to solve statistical problems using various measure of central tendency.	1	U, Ap
CO2	Collect the data and present it diagrammatically.	2,3	U, An
CO3	Use statistics in research for proper characterization, summarization, presentation and interpretation of the results of research.	3, 1	Ap
CO4	Apply the statistical methods in various fields such as finance, marketing, accounting and business.	1,5	Ap, C

### SEMESTER-II

**COURSE TITLE: STATISTICAL METHODS-II**

**COURSE CODE: STA-121A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Learn to establish linear association between two variables by using Correlation technique.	3	U, R, C
CO2	Find the best fit for a set of data points with the help of method of least square.	2,4	An, E
CO3	Use regression to predict the behavior of dependent variable.	3	U, R, Ap
CO4	Use method of association and contingency table to find the independence of the attributes.	3	U, Ap, E
CO5	Use statistical methods for future predictions in different fields like business analysis, artificial intelligence, financial analysis, fraud detection, share market and pharmaceutical sector and other industries.	4,5	Ap, E

### COURSE TITLE: PROBABILITY DISTRIBUTIONS COURSE CODE: STA-121B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Differentiate between discrete and continuous distributions.	2	C, An
CO2	Know about distributions to study the behavior of two random variables.	1,3	U, An
CO3	Study the discrete distributions such as Bernoulli, Binomial, Poisson etc.	3,4	U, An
CO4	Learn about continuous distributions such as exponential, normal, uniform etc.	3	U, Ap

### COURSE TITLE: PROBABILITY DISTRIBUTIONS COURSE CODE: STA-121P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Estimate the best fit for a set of data points with the help of method of least square.	1, 3	U, An, Ap, C
CO2	Use regression to predict the behavior of dependent variable	2	U, Ap
CO3	Differentiate between discrete and continuous distributions.	3	U, An



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CO4	Know about distributions to study the behavior of two random variables.	4	U, Ap
CO5	Study the discrete distributions such as Bernoulli, Binomial, Poisson etc.	3	An, Ap

### Sem-III

**COURSE TITLE: Advanced probability-I**

**COURSE CODE: STA-231A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the moments of Bivariate probability distributions	3	C, An
CO2	Learn distributions to study the joint behavior of two random variables	1	R,U
CO3	Learn to compute expectation, covariance and correlation coefficients	2,3	U, An,Ap
CO4	Learn the applications of Cauchy Schwartz Inequality and Chebyshev's inequality	2,3	U,An, Ap

**COURSE TITLE: Statistical Inference-I**

**COURSE CODE: STA-231B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand different methods of finding point estimators for unknown population parameters, their advantages and disadvantages.	1,3	U, An
CO2	Learn desirable properties of point estimators based on which estimators can be compared	2,4	U,An
CO3	Apply the general methods of constructing interval estimators (Confidence Intervals) for unknown population parameters	3	U, An,Ap
CO4	Develop/construct the statistical tests to test hypothesis regarding unknown population	3	U, Ap,C



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	parameters (Using Neyman-Pearson Lemma and Likelihood Ratio tests).		
CO5	Learn to construct good estimators based on unbiasedness, consistency, efficiency and sufficiency.	1	U,An, Ap, C

**COURSE TITLE: Practical Based on Statistical inference-I**

**COURSE CODE: STA-231P**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the practical applications of estimation theory and hypothesis testing pertaining to all discussed methods.	2,3	U,Ap An
CO2	Draw inferences about the unknown population parameters based on random samples	2,4	U
CO3	Validate the estimation/ inference about the population using hypothesis testing.	3	U, Ap,E
CO4	Solve exercises on method of estimators, types of error, critical region, significance level etc..	2, 4	U, Ap

**Sem\_IV**

**COURSE TITLE: Advanced probability-II**

**COURSE CODE: STA-241A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of sampling distributions and their applications in statistical inference	1	U, An
CO2	Learn the applications of t and F distribution	2	U,An,Ap
CO3	Develop clear understanding of Central Limit Theorem and its applications.	4	U, An,E
CO4	Analyze categorical data by using Chi square techniques.	3	U,An, Ap
CO5	Understand the laws of convergence and their inter relations	3	U,An



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### COURSE TITLE: Statistical inference–II COURSE CODE: STA-241B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Have a clear understanding of when to apply various tests of hypothesis about population parameters using sample statistics and draw appropriate conclusion.	2,3	U, An,Ap
CO2	Compare the two univariate normal distributions through their mean and variance.	4	U,An
CO3	Apply Z test to check the significance of correlation coefficient and single proportion	3,4	U, An,Ap
CO4	Learn the applications of chi square test such as goodness of fit and independence of attributes	2,4	U,An, Ap
CO5	Use t-test for checking the significance of single population and double population.	1,3	An, Ap

### COURSE TITLE: Practical Based on Statistical inference–II

### COURSE CODE: STA-241P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the practical applications of large and small sample tests.	2,4	U, An,Ap
CO2	Draw inferences about the unknown population parameters based on various tests.	3,4	U, An,Ap
CO3	Validate the significance of hypothesis using various tests.	4	U, Ap,C
CO4	Solve exercises on Z transformation.	2	U,R, Ap
CO5	Practice the question based on application of Chi square test.	2,3	An, Ap, E





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### Department of Music

#### Program Specific Outcomes (PSOs)

- PSO-1. To understand the basic terminology of Indian music
- PSO-2. To be able to give a practical demonstration of ragas
- PSO-3. To learn how to write the practical composition according to the notation system
- PSO-4. To learn about the music in the Vedic period and also the works of music scholars of the past.
- PSO-5. To understand the studies about the gharanas of Indian music

#### COURSE OUTCOMES (Cos)

##### Semester-I

Course Title: Theory and Practical (Music Vocal)

Course Code: BMUV-1117

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Get basic knowledge of Swar Naad saptak jati	1	R,U,C
CO-2	Know about great musicians and scholars of Indian music	4	R, U, An, C
CO-3	Get brief knowledge of ragas as well as practical knowledge of Indian music.	2	U,An,Ap,,E
CO-4	Know about rhythm and the introduction of string instrument in theory and practical form.	3	U, Ap, An ,C

##### Semester- II

Course Title: Theory and Practical (Music Vocal)

Course Code: BMUV-1217

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Get knowledge about great musicians who dedicated their whole life for music.	4	R,U,An,
CO-2	know about various raga of Indian music	3	U,Ap,,C





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### Semester -III

**Course Title: Theory and Practical (Music Vocal)**

**Course Code: BMUV-2317**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Sing vilambit and Drut khayal	3	R,U,C
CO-2	Learn the musical techniques	2	R,U, Ap,E,
CO-3	Learn about vocal culture techniques with major and minor notes	3	U, Ap,E, C

### Semester- IV

**Course Title: Theory and Practical (Music Vocal)**

**Course Code: BMUV-2417**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Understand about sargam geet, lakhshan geet which help students to get established in practical fields.	1	R,U,An,
CO-2	Understand tala and rhythm structure and gain knowledge about the ancient raga and yoga	2,3	U,Ap, C

### Semester-V

**Course Title: Theory and Practical (Music Vocal)**

**Course Code: BMUV-3517**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Get knowledge on different style of singing.	4	R,U, Ap, C
CO-2	Explain the structure of talas and ragas.	3	R,U, Ap, C
CO-3	Get knowledge on Gurmat sangeet and its various style of singing	1,4	R,U,An,C



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### Semester-VI

**Course Title: Theory and Practical (Music Vocal)**

**Course Code: BMUV-3617**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Know about basic technique dhrupad and dhammar.	1,3,4	R,U, C
CO-2	Understand about Hindustani classical music in practical form.	4,5	U, Ap,An, C



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### Music Instrumental

#### Program Specific OutcomeS (PSOs)

- PSO-1. To understand the basic terminology of Indian music
- PSO-2. To enable students to give a practical demonstration of ragas
- PSO-3. To learn how to write the practical composition according to the notation system
- PSO-4. To learn about the music in the Vedic period and to study the works of music scholars of the past.
- PSO-5. To gain knowledge about the gharanas of Indian music

#### COURSE OUTCOMES (Cos)

##### Semester-I

Course Title: Theory and Practical (Music Instrumental)

Course Code: BMUI-1118

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Learn to improvise raga and ability to play gatt.	3	R, U, Ap,E,C
CO-2	Have great command over instruments.	2	R, U, An,C

##### Semester-II

Course Title: Theory and Practical (Music Instrumental)

Course Code: BMUI-1218

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Gain theoretical knowledge of instrumental music	4	U, Ap,Ap, C
CO-2	Learn to play different instruments	1	U, Ap, An, C



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### Semester III

**Course Title: Theory and Practical (Music Instrumental)**

**Course Code: BMUI-2318**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Get knowledge to understand the life and contribution of great musicians.	4	U,An, C

### Semester-IV

**Course Title: Theory and Practical (Music Instrumental)**

**Course Code: BMUI-2418**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Gain skill to play instruments	2	R, U, E
CO-2	Get basic knowledge on the terminology of music	1	R, U, C

### Semester-V

**Course Title: Theory and Practical (Music Instrumental)**

**Course Code: BMUI-3518**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Learn to play raga and instruments.	3	R,U, C
CO-2	Understand the time theory of music.	1	U, Ap, C

### Semester-VI

**Course Title: Theory and Practical (Music Instrumental)**

**Course Code: BMUI-3618**

S.NO	On completing the course, the students will be able to:	PSOS addressed	Cognitive levels
CO-1	Learn to play string instruments	3	R,U, C
CO-2	Gain knowledge on raga and tala	1	R,U, Ap, C



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### Department of Physical Education

#### Programme specific outcomes (PSOs)

- PSO1. To gain knowledge regarding general fitness.  
 PSO2. To become aware of development of sports in India.  
 PSO3. To get knowledge of major international sports events.  
 PSO4. To become aware of various organs of body and their function.  
 PSO5. To know about basic requirements of dietary components to maintain good health.  
 PSO6. To know various psychological disorders and technique to avoid them.  
 PSO7. To become aware of political issues in sports in India.  
 PSO8. To get knowledge of renowned sports personalities.  
 PSO9. To learn various yogic exercises and recreational activities for better living.  
 PSO10. To understand various body movements through muscle contraction and the effects of exercise on various body parts.  
 PSO11. To get knowledge of various sports training methods and motivation techniques.  
 PSO12. To study the causes, preventions and cure of sports injuries (sprain, contusion, dislocation and fractures).  
 PSO13. To understand the concept of intramural and extramural.

#### COURSE OUTCOMES (COs)

##### Semester-I

Course Title: Physical education

Course code- BPED-1115

Sr. No.	On completing the course student will be able to:	PSOs addressed	Cognitive levels
CO1	Become aware of general fitness.	1,6	U, An, E
CO2	Learn about the concept of kinesthetic perception	5	R, U, Ap, An
CO3	Understand education and its importance	3	U, Ap, An, E
CO4	Understand about how sports develop in India	2	R, An, Ap, U
CO5	Gain knowledge regarding different international sports events	3	U, Ap, An, E





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### Semester-II

Course Title: Physical education

Course Code - BPED-1215

Sr. No.	On completing the course students will be able to:	PSOs addressed	Cognitive levels
CO1	Get information about their body and its functions.	4	U, An, E,C
CO2	Become aware about basic food ingredients necessary for body.	5	U, Ap, An, E
CO3	Become aware about basic health needs and hygienic conditions.	1,6	An, Ap, U

### Semester-III

Course Title: Physical education

Course Code - BPED-2315

Sr. No.	On completing the course students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of learning and motivation.	11	U, An, E
CO2	Know various psychological disorders and technique to avoid them	6	R, U, Ap, An
CO3	Know the relationship between Sports and politics	7	U, Ap, An, E
CO4	Get knowledge about renowned sports personalities	8	An, Ap, U

### Semester-IV

Course Title: Physical education

Course Code - BPED-2415

Sr. No.	On completing the course students will be able to:	PSOs addressed	Cognitive levels
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CO1	Get knowledge about various stages of growth and development	5,6	R, An, Ap, U
CO2	Learn Yoga, both cultural and meditative asans.	9	R, U, Ap, An
CO3	Study Sports Injuries	12	U, Ap, An, E
CO4	Get knowledge regarding respiratory circulatory and nervous system	10	U, An, E

### Semester-V

Course Title: Physical education

Course Code - BPED-3515

Sr. No.	On completing the course students will be able to:	PSOs addressed	Cognitive levels
CO1	Become aware about how to relieve stress through recreation	9,10,12	U, An, E, C
CO2	Know various body movements through muscle contraction	10	R, An, Ap, U
CO3	Understand the concept of postural deformities and its remedial measures	10,12	U, Ap, An
CO4	Get knowledge on basics of sports training components	11	U, Ap, An, E

### Semester-VI

Course Title: Physical education

Course Code - BPED-3615

Sr. No.	On completing the course students will be able to :	PSOs addressed	Cognitive levels
CO1	Study the regular exercise effect on body	9,10	R, An, Ap, U
CO2	Understand the concept of sports training	11	U, An, Ap
CO3	Become aware about nutrition and different dietary manipulations	5	U, Ap, An,



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## Department of Political Science and Public Administration

### Programme Specific Outcomes (PSOs)

PSO -1 To apprise the students with the political systems of India and the world and analyze their political problems and issues.

PSO-2 To enable the students to understand and evaluate various national and global political issues.

PSO-3 To develop comprehensive understanding of the subject by teaching political concepts, political theory, Indian politics, comparative politics and international politics.

PSO-4 To get theoretical knowledge and develop empirical thinking about political ideas.

PSO-5 To enable the students to understand and follow the changes in political behavior, public opinion and political culture.

PSO-6 To help the students in preparing for various competitive examinations and to make them capable for pursuing higher education

### Course Outcomes

COURSE OUTCOMES (Cos)			
Semester-I			
Course Title- Political Concepts Course			
Course Code-BPOL-1113			
Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Understand the basic ideas of political science.	3,4	U, An
CO-2	Acquire knowledge about political concepts and political theory.	3,4	U, An, Ap
CO-3	Make distinction between basic political concepts like state and government.	4,5	U, An, E
CO-4	Learn the basics of the discipline such as democracy, rights, liberty, equality and justice etc.	3,4,5,6	U, An
CO-5	Understand new political concepts like political system, political culture and political socialization.	3,4,5,6	U, An, E
Semester-II			



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<b>Course Title- Political Theory And Ideologies</b>			
<b>Course Code- BPOL-1213</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the nature, scope and significance of political theory.	3	U, An
CO-2	Understand political theories in the light of two contending political ideologies of Liberalism and Marxism.	3,4,6	U, An, Ap
CO-3	Get Acquainted with different political ideas in political theory.	3,4,2	U, An
CO-4	Understand various traditional and modern theories of Political Science.	3,4	U, An
CO-5	Explain the concept of Democracy (Liberal, Elitist and Marxist perspective) and Sovereignty (Monistic and Pluralistic perspective)- its types and related theories	3,4,6	U, An, E
<b>Semester-III</b>			
<b>Course Title- Indian Constitution</b>			
<b>Course Code- BPOL-2313</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Learn about the nature and making of the Indian Constitution.	1,2,3,5	U, An, R
CO-2	Understand the philosophy of the Indian Constitution.	1,2,3,4	U, An
CO-3	Learn about the Indian Constitution with a focus on its evolution and examines the essence of the Preamble.	1,3,6	U, An
CO-4	Get awareness about Fundamental Rights, Duties of the Indian citizens and significance of Directive Principles of State Policy.	1,3,6	U, An, Ap, E
CO-5	Analyze the working of important political institutions of the Indian state.	1,2,4	U, An
<b>Semester-IV</b>			
<b>Course Title- Indian Political System</b>			<b>Course</b>
<b>Code- BPOL-2413</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Evaluate the Indian party system– its development, ideologies, policy programmes and support base of the dominant national and regional political parties.	1,2,6	U, An





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CO-2	Understand the electoral process in India with a focus on the role of Election Commission and determinants of Political Behavior and Political Participation.	1,2,4,5	U, An, E
CO-3	Investigate the challenges to Indian democracy like caste, religion, and regionalism.	1,2,3	U, An, E
CO-4	Acquire understanding about the role of economic liberalization in Indian Politics.	1,2,6	U, An, E
CO-5	Understand the basic principles of Indian foreign policy.	1,2,4,6	U, An

### Semester-V

Course Title- Comparative Political Systems (UK & USA)

Course Code- BPOL-3513

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Understand the forms and working of the political systems of UK and USA.	1,2,3,5,6	R, U, An
CO-2	Analyze the working of political parties, pressure groups etc.	1,2,4,5	An, Ap, E
CO-3	Acquire information about different constitutions of the world.	1,3,6	U, Ap
CO-4	Make a comparative study of the constitution of UK and USA.	1,3,4	U, An
CO-5	Find employment opportunities in the subject.	6	U, C

### Semester-VI

Course Title- International Politics: Theory And Practice

Course Code- BPOL-3613

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Understand the structures and working of international political institutions.	1,2,3,4,6	U, An, E
CO-2	Understand the power dynamism among the states.	2,3,4	U, E
CO-3	Have awareness about the global concerns like terrorism, climate change etc.	1,2,3,6	An, E, C
CO-4	Learn about global cooperation and conflicts.	1,2,6	U, An, Ap
CO-5	Look for employment opportunities in the subject.	6	U, C





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### Public Administration Programme Specific Outcomes(PSOs)

- PSO-1 To understand the basic principles and working of Public Administration.  
PSO-2 To make the students aware about the actual working of Public administration along with theoretical underpinnings and practices.  
PSO-3 To understand the concepts of administrative responsibility, accountability, efficiency, integrity and team work in government and non-governmental organizations.  
PSO-4 To understand different aspects of public policy, human resource management, public budgeting and finance  
PSO-5 To get awareness about the powers and working of local self-government in India.  
PSO-6 To foster understanding about the development administration in India and analyzing the major issues involved in development process.  
PSO-7 To enable the students to grasp knowledge about personnel and financial administration in India and the major issues involved in financial and personnel administration.  
PSO-8 To help students in preparing for Civil Services Career

### COURSE OUTCOMES (Cos)

#### Semester-I

Course Title- Principles of Public Administration

Course Code- BPUB-1114

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Understand the nature and scope of the Public Administration.	1,2,3,7	U
CO-2	Be familiar with the approaches, concepts and principles of Public Administration.	1,2,3,6	U, An, Ap
CO-3	Develop an understanding of the Administrative Behaviour.	1,2,3	U, E
CO-4	Get acquainted with the working of state administrative machinery.	1,2,3,6,7	U, An
CO-5	Upgrade their knowledge about the working of Public administration as a stabilizing force in society	2,4	U, Ap

#### Semester-II

Course Title- Indian Administration

Course Code- BPUB-1214

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
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CO-1	Have an insight into the historical evolution of the Indian Administration.	3,4,5	R, U, E
CO-2	Understand the forms and substance of Indian Administration.	4,6,7	U, An
CO-3	Get acquainted with the functioning of Indian Administration at various levels.	3,4,5,6	U, Ap
CO-4	Have awareness about the administrative machinery working at local, regional and national level.	5,7,8	U, An, C
CO-5	Learn about burning issues in Indian Administration.	1,2,3,8	An, E, C

### Semester III

**Course Title- Personnel Administration**  
**Code- BPUB-2314**

**Course**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Understand the thrust of the subject that trained manpower is always an asset for any organization.	1,4,6	U, E
CO-2	Widen their knowledge about central and state civil services.	3,4,7	U, Ap
CO-3	Develop holistic view point about the administrative concepts like recruitment, training, conduct, discipline etc.	3,4,7,8	U, Ap
CO-4	Develop understanding about the employer-employee relationships and their impact on the working of administrative organizations.	2,3,7	U, An, Ap, E
CO-5	Learn about the constitutional machinery that works as a watch dog for checking corruption.	1,2,3	U, An, Ap, E

### Semester IV

**Course Title- Financial Administration**  
**Code- BPUB-2414**

**Course**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Get knowledge about the meaning and significance of Financial Administration.	6,7	U, An
CO-2	Understand the union-state financial relations in the light of constitutional framework	1,7,8	U, An, E
CO-3	Understand the budgetary process including the legislative control over public finance.	1,3,7	U, An, E



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CO-4	Learn about Finance Commission and its working as a tool for redressing states' financial grievances.	1,7	U, An
CO-5	Understand about the composition and working of Union Ministry of Finance and Department of Finance in Punjab.	2,7,8	U, An, E
<b>Semester V</b>			
<b>Course Title- Local Government (With Special Reference To Punjab)</b>			
<b>Course Code- B PUB-3514</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the meaning and nature of local government.	2,5	U, R
CO-2	Identify the objectives and functions of local government.	2,5,6	U, An
CO-3	Learn about the working of local self-government in India.	2,5	U, An, Ap
CO-4	Get information about the organizational structure of the Department of Local Government in Punjab.	5	U, An, Ap
CO-5	Analyze the challenges faced by institutions of local government in India.	2,5,6	U, An
<b>Semester VI</b>			
<b>Course Title- Development Administration (With Special Reference To India)</b>			
<b>Course Code- B PUB-3614</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the nature and importance of the development administration in the developing nations including India.	4,6	U, R, An
CO-2	Enhance their understanding of India's economic model and its rationale for socio-economic development.	4,6	U, An, E
CO-3	Acquire knowledge about the planning machinery that work at national, regional and local level in India.	4,5,6	U, An, Ap
CO-4	Get acquainted with the role and growth of public sector in India.	4,6,8	U, An, E
CO-5	Learn about the various welfare measures for SCs, STs, OBC, women and Children.	2,4,5,6,8	U, An, Ap, E



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### Department of Psychology

#### Programme Specific Outcomes (PSOs):

PSO1: To understand the fundamentals of Psychology to build strong base to explore careers in Psychology and allied fields. Students will be able to apply different psychological concepts in everyday life

PSO2: To be able to develop an understanding of the concept of individual differences with the goal to promote self-reflection and understanding of self and others.

PSO3: To get idea about the biological basis of behavior and the influence of behavior, cognition and environment on bodily system.

PSO4: To be able to apply the theoretical knowledge in practical situations related to motivation and emotions.

PSO5: To get an expertise of designing and conducting experiments in laboratory conditions particularly related to sensation and perception. Students will be able to look into the role of sensory modalities in influencing human behavior with the help of psychophysical methods.

PSO6: To understand etiology and the diagnosis and treatment of psychological problems.

PSO7: To gain expertise in analytical and counselling skills which will further help in providing remedies to prevent and resolve psychological issues.

PSO8: To get expertise to provide mental health services in schools, nursing homes, old-age homes, de-addiction centres, rehabilitation centres etc.

PSO9: To be able to use descriptive and inferential statistics in order to understand the results of psychological research in a better manner.

COURSE OUTCOMES (Cos)			
Semester-I			

**Course Title:** Basic Psychological Processes-I

**Course Code:** BPSY-1111

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Understand the historical roots and methods of Psychology to know the dynamics of human thoughts, feelings and behaviors.	1	U, AN
CO2	Apply theories of learning and intelligence to modify illogical thoughts and behaviors into logical ones.	1	Un, Ap, An





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CO3	Know individual differences by assessing them on various psychological tools and questionnaires.	2	An, E
CO4	Administer, analyze and interpret results from various psychological tools.	1, 2	Un, Ap, An, C
CO5	Apply the knowledge of various assessment procedures related to intelligence and learning.	1, 2	Un, Ap, An, C
CO6	Build a rapport with subjects to perform practical effectively.	1, 2	Un, Ap, An, C

### Semester: II

**Course Title:** Basic Psychological Processes-II

**Course Code:** BPSY-1211

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Identify the role of neurophysiology in determining human behaviors.	3	R, Un, Ap, An
CO2	Know different theories of motivation, emotion and personality in order to get better view of human beings.	4	Un, Ap
CO3	Apply descriptive statistics on the scores of psychological tools.	8	R, Un, An
CO4	To measure motivation, personality and memory of individuals by using psychological apparatus and questionnaires.	4	Ap, An, C
CO5	Assess the personality of others by using psychometric and projective techniques.	4	Ap, An, C

### Semester: III

**Course Title:** Experimental Psychology-I

**Course Code:** BPSY-2311

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Develop experimental expertise and understand the significance of designing and conducting experiments.	5	Un, Ap, An, E, C





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CO2	Understand the concepts of sensation and perception with the help of experiments.	5	Un, Ap, An, E, C
CO3	Know the distribution of population on various psychological processes with the help of normal probability curve.	5	Un, Ap, An
CO4	Measure attention, perception and learning ability of individuals by using psychological apparatus and questionnaires.	5	Ap, An, C
CO5	Analyze the results of practical quantitatively as well as qualitatively.	5	Ap, An, C

**Semester: IV**

**Course Title:** Experimental Psychology-II

**Course Code:** BPSY-2411

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Understand psychophysical methods to uncover the concepts of sensation and perception deeply.	5	U, Ap, An
CO2	Uncover the role of various cognitive processes in determining human behavior.	5	U, Ap, An
CO3	Understand how different mental processes are related to each other with the help of statistical techniques	5, 9	U, Ap, An
CO4	Assess absolute and differential thresholds of subjects with the help of different psychophysical methods.	5	U, Ap, An
CO5	Understand the practical application of the principles of classical as well as modern psychophysics.	5	U, Ap, An

**Semester: V**

**Course Title:** Abnormal Psychology-I

**Course Code:** BPSY-3511



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Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Uncover major issues and scientific principles underlying abnormal human behavior.	6	U, An
CO2	Acquire psychosocial, biological and socio-cultural perspectives of abnormal behavior.	6, 7	Un, Ap, An
CO3	Gain knowledge about the general psychological problems	6	U, Ap
CO4	Analyze and interpret the deviations in personality, adjustment and attitude of people practically from normally distributed population	6, 9	U, Ap, An
CO5	Help students in choosing careers by identifying specific interests with the help of questionnaires.	8, 9	U, Ap, E

**Semester: VI**

**Course Title:** Abnormal Psychology-II

**Course Code:** BPSY-3611

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Describe the diagnostic criteria, symptoms, etiology, treatment and prognosis of major mental disorders by discussing case studies.	6, 7	U, An, E
CO2	Gain expertise in applying psychological tools to diagnose various psychological problems.	7, 8	U, Ap, An
CO3	Get an insight into the skills required by a psychologist to treat various psychological problems.	7, 8	U, Ap, An
CO4	Assess the level of anxiety, depression and frustration among people with the help of psychological questionnaires.	7, 9	U, Ap, An, E
CO5	Deal with the psychological issues of human beings in an effective manner.	6, 7, 8	U, Ap, An, C



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### Department of Punjabi

#### Program Specific Outcomes (PSOs)

PSO1. Students gain knowledge about various forms of literature (medieval and modern) which create ability to do textual and practical analysis

PSO2. Gain knowledge about the social, cultural, historical and political aspects of literature.

PSO3. Gain knowledge about the history, origin and development, limitations and possibilities of various genres of Punjabi literature.

PSO4. Gain knowledge about the nuances of Punjabi language and linguistics.

COURSE OUTCOMES (COs)			
Semester-I			
Course Title :	Elective Punjabi	Course Code	BPBI-1103
SR. NO	On Completing the Course the Students will be able to	PSOs Addressed	Cognitive Levels.
CO1	Gain knowledge of the various genres of Punjabi literature.	1,2,3	R,U,C
CO2	Gain literary knowledge.	1,2,3	R,U,C
CO3	Increase their capability of textual and practical studies.	1,2,3	R,U,C
CO4	Increase the knowledge and skills of Punjabi language.	4	U
Semester-II			
Course Title :	Elective Punjabi	Course Code	BPBI-1203
SR. NO	On Completing the Course the Students will be able to	PSOs Addressed	Cognitive Levels.
CO1	Understand historical development achievement of modern Punjabi literature	1,2,3	R,U
CO2	Increase knowledge with the understanding of thematic and theatrical aspects of One Act Play.	1,2,3	R,U,C



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CO3	Gain knowledge of language with the study of linguistic resolution	4	R,U
<b>Semester-III</b>			
<b>Course Title :</b>	<b>Elective Punjabi</b>	<b>Course Code</b>	<b>BPBI-2303</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels.</b>
CO1	Acquire knowledge from rich medieval ideology	1,2,3	R,U
CO2	Improve their critical thinking ability through the resolutions of literary Criticism	1,3	R,U,AN
CO3	Increase their knowledge with the understanding of modern Punjabi stories.	1,2,3	R,U,C
<b>Semester-IV</b>			
<b>Course Title :</b>	<b>Elective Punjabi</b>	<b>Course Code</b>	<b>BPBI-2403</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels.</b>
CO1	Get inspired by the rich tradition of Punjabi literature.	1,2,3	R,U
CO2	Understand the nature of Punjabi culture.	2	R,U,AN
CO3	Enhance their knowledge by knowing the historical development of Punjabi language and script.	4	R,U
<b>Semester-V</b>			
<b>Course Title :</b>	<b>Elective Punjabi</b>	<b>Course Code</b>	<b>BPBI-3503</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels.</b>
CO1	Understand the biographies of world famous persons.	1,2	R,U,AN,C
CO2	Improve their knowledge of traditional Punjabi kaav-roop.	1	R,U
CO3	Increase their knowledge about historical, social and political	1,2	U



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	aspects of society with the help of literature.		
<b>Semester-VI</b>			
<b>Course Title :</b>	<b>Elective Punjabi</b>	<b>Course Code</b>	<b>BPBI-3603</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels.</b>
CO1	Understand the various genres of literature.	1,2,3	R,U,C
CO2	Increase possibilities of Literary Creations.	1,2,3	R,U,AN,C
CO3	Enhance their knowledge about historical development of Punjabi language and script.	4	R,U





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### Department of Sociology

#### Programme Specific Outcomes (PSOs)

**PSO1.** Sociology is an academic discipline that is vital to be studied in our rapidly progressing and changing world.

**PSO2.** Sociology helps understand various human and social perspectives in which individual lives are defined and shaped.

**PSO3.** Sociology plays a major role in raising awareness about the nature of livelihoods of marginalized communities.

**PSO4.** It studies the role of social institutions (home, school, church) in the development of individuals.

#### COURSE OUTCOMES (COs)

##### Semester-I

**Course Title:** Fundamentals of Sociology-I

**Course Code:** BSOC 1108

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Get acquainted with the subject and its usage in various fields	4	U, Ap, An
CO2	Become familiar with the basic concepts of sociology like community, society, association and institution	4	U, Ap, An
CO3	Become familiar with the interrelationship of sociology with other social sciences	1	U, Ap, An
CO4	Get the basic understanding of the social structure of the society	4	U, Ap, An
CO5	Know about the various agencies which help in understanding the process of socialization	2	U, Ap, An



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### Semester: II

**Course Title:** Fundamentals of Sociology-II

**Course Code:** BSOC-1208

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Understand the social and cultural construction of society	1,4	U, Ap, An
CO2	Get knowledge about various social processes which help to run the society	4	U, Ap, An
CO3	Have knowledge about various social agencies which help to run society into conformity	4	U, Ap, An
CO4	Become aware about the concept of deviant behaviour and various forces that make people deviant	2	U, Ap, An

### Semester: III

**Course Title:** Society in India

**Course Code:** BSOC-2308

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Get knowledge about diversities prevailing in India	1	U, Ap, An
CO2	Learn about the division of society on the basis of caste and class and their relation with politics	3,4	U, Ap, An
CO3	Come to know about social institutions like family, marriage and kinship along with their comparison in northern and southern regions	4	U, Ap, An
CO4	Know about various social issues like regionalism and communalism	1,2	U, Ap, An



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**Semester: IV**

**Course Title:** Social Change in India

**Course Code:** BSOC-2408

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Learn about various forces that bring change in the society	1,2	U, R, Ap, An
CO2	Become familiar with various dimensions of social change and related processes	1,2	U, Ap, An
CO3	Get acquainted with the outcomes of social change	1,2	U, Ap, An

**Semester: V**

**Course Title:** Social thought

**Course Code:** BSOC-3508

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Learn an integrated approach to understand theoretical aspect of the sociology	2	U, R, Ap, An, E
CO2	Receive knowledge about various classical social thinkers and various forces that enforce them to develop different concepts of sociology	2	U, Ap, An, E
CO3	Come to know about different types of theories regarding society	2	U, Ap, An, E

**Semester: VI**

**Course Title:** Scientific Research and Scientific Methods

**Course Code:** BSOC-3608

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive Levels
CO1	Develop research aptitude	1,3	U, R, Ap, An, E
CO2	Become familiar with different methods of social research	1,3	U, Ap, An, E
CO3	Learn about various research designs	1,3	U, Ap, An, E
CO4	Learn about various tools of data collection, methods of analysis and report writing	1,3	U, Ap, An, E



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### Department of Religious Studies

#### Programme Specific Outcomes (PSOs)

PSO1. To understand the origin of religion, the historical development of religion, various aspects of religion, philosophy and ethics and the relation of religion with other subjects and their social importance. Along with this, the student will be able to understand the importance and role of religion for establishing human values and peace at the global level.

PSO2. To understand the beliefs, scriptures, deities and sects of Hinduism and their beliefs within India's oldest Vedic religion. Along with this, students get comprehensive information about the major scriptures of the Indian religious traditions and the main religious doctrines of Jainism and Buddhism.

PSO3. To acquire comprehensive information about the major religions of the Semitic religious tradition in the World, Judaism, Christianity, Islam and the Zoroasterism. Get an overview of world religions because of this, the student is able to understand and respect the beliefs & practices and also establish mutual brotherhood.

PSO4. To understand the medieval devotional movement of India, its major saints/devotees and the Sufi movement. Students derive inspiration and enthusiasm for the creation of a good society by understanding the achievements of religious reform movements in the medieval and modern times and the multifaceted contribution of these movements in religious/societal reform.

PSO5. To gain an understanding of the philosophical and religious beliefs of Sikhism and their positive impact on Sikhism and society. Apart from this, the students get multi-faceted information about Guru Granth Sahib and Bani and get guidance from Bani to lead a true life.

PSO6. To get knowledge about the lives of the Ten Gurus, their role in the spread of Sikhism, the development of Sikh principles and institutions, which inspire students to adopt good conduct and virtues.

COURSE OUTCOMES (COs)			
Semester-I			
Course Title: Dharam, Adi Dharam Ate Dharam Sambhandi Adhunik Mudhe (Religion, Primitive Religion and Modern Religious issues)			
Course Code: BARS-114			
Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Understand the origin, development, definition and primitive forms of Religion.	1	R, U, An, E





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<b>CO-2</b>	Learn about the philosophy, ethics and their equality and differences.	1	R, U, Ap, An, E
<b>CO-3</b>	Get introduced to the key role of religious tradition to eradicate Natural disaster and religious beliefs as well	1	R, U, An, E
<b>CO-4</b>	Get knowledge about religious beliefs (concept and characteristics) rituals about birth, religious-entity, marriage and funeral also. They will also be able to understand about religious festivals and their importance in society	1	U, Ap, An, E
<b>CO-5</b>	Understand the challenges of modernization for religion, relation between religion and society, it's role in world peace and co-existence	1	U, Ap, An, E

## Semester-II

**Course Title: Pramukh Bharti Dharam (Major Indian Religions)**

**Course Code: BARS-214**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
<b>CO-1</b>	Get introduced to Vedic religion – Introduction of Arian, Arian religion-Vedas, Bali, Yagya and Vedic Gods.	2	R, U, An, E
<b>CO-2</b>	Get knowledge about The Vaishnavism, Shaivism, Shakatism, The Bhagwat Gita, The Mahabharata and The Ramayana – their introduction and basic principles	2,	U, An, E, Ap
<b>CO-3</b>	Get introduced to Jain religion, the life and teaching of the Bhagwan Mahavira. They will be able to understand the Jainism's Sects and texts.	2	R, U, An, E
<b>CO-4</b>	Get introduced to the Budhism, life and teaching of Mahatma Budha and basic principles of Budhism, text and sects of Budh Dharma	2	U, An, E

## Semester-III

**Course Title: Saami Dharam (The Semitic Religion)**

**Course Code: BARS - 314**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
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CO-1	Get introduced to the tradition of Semitic Religions; Judaism, life and teachings of Moses and about Judaism's Scripture (old testament)	3	R, U, An, E
CO-2	Get introduced to Christianity-Life and teachings of the Jesus Christ, origin and development of Church and new Testaments	3	U, An, E
CO-3	Understand about Islamic Religion, life and teachings of Prophet Mohammad, five pillars of Islam and the holy Quran.	3	U, An, E
CO-4	Learn about Zoroasterism, life and teachings of Prophet Jartust, religious texts of Zoroasterism - Ahuramazda, Aharman and Jenda Avesta.	3	U, An, E

### Semester-IV

**Course Title: Madhkaalin Ate Adhunik Dharmik Lehran (The Modern and Medieval Religious Movements)**

**Course Code: BARS - 414**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Get introduced to the religious movements of medieval and modern period; origin and development of the Bhakti movement and their major Saints – Namdev, Kabir and Ravidas.	3,4	R, U, Ap, An, E
CO-2	Learn about the historical background, origin and development of Sufism; principles and sects e. g. Chishti and the life and teachings of Baba Farid	3,4	U, Ap, An, E
CO-3	Learn about major religious promoters of medieval Bhakti Movement – Chitanaya, Mahaprabhu, Shankra Deva and Mira Bai	3, 4	U, Ap, An, E
CO-4	Understand major religious movements of 19 <sup>th</sup> century – Rama Krishna Mission, Brahma Samaj and Aria Samaj	3,4	U, Ap, An, E

### Semester-V

**Course Title- Sikh Darshan (The Sikh Philosophy)**

**Course Code- BARS - 514**



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Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Get introduced to Sikh Philosophy – The Akaal Purakh, Origin of Universe and Living soul	1,6	R, U, Ap, An, E
CO-2	Learn about the concept of Hukam (Divine Order), Simran and Seva	1,6	R, U, Ap, An, E
CO-3	Get information about Sri Guru Granth Sahib, editing and completion of Guru Granth Sahib	1,6	R, U, An, E
CO-4	Understand major Banis of Guru Granth Sahib – The japuji, Saloks of Sri Guru Angad Dev and Baramah Majh	1,6	R, U, Ap, An, E

**Semester-VI**

**Course Title: Sikh Dharam Ate Sansthavan (Sikh Religion and Its Institutions)**

**Course Code – BARS-614**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Get knowledge about Life and teachings of Guru Nanak Dev and Socio-Religious and Political circumferences of Guru Nanak's time. In addition they will learn about development of Sikhism from Guru Angad Dev to Guru Arjan Dev	5,6	R, U, An, E
CO-2	Study the development of Sikh religion from Guru Hargobind Singh to Guru Gobind Singh	5,6	R, U, Ap, An, E
CO-3	Study basic institutions of Sikh religion-Gurudwara, Sangat (Congregation) and Pangat. Manji System, Masand system and Dasvandh	5,6	U, Ap, An, E
CO-4	Get introduced to major Sikh movements – Namdhari movement, Singh Sabha movement and Gurudwara Reform movements	5,6	U An, E



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### B.A. (HONS.) ENGLISH

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Programme Specific Outcome (PSOs)

PSO-1	To generate an ability to understand various literary genres and texts in English literature.
PSO-2	To develop critical and analytical skills within the students.
PSO-3	To build up their proficiency in English language which enhances their chance to pursue the careers in various other sectors.
PSO-4	To create skills for enhancement of employment in the field of education.
PSO-5	To make students empathetic towards society and self.
PSO-6	To develop a comparative awareness about literature from the west and the east.
PSO-7	To understand the history of Britain and other countries.
PSO-8	To understand the basic and advanced grammar of English and grasp basic linguistics skills

#### COURSE OUTCOMES (COs)

##### Semester-I

Course Title: Renaissance Poetry

Course Code: BHEN-1101

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Acquire knowledge regarding the language shift in Elizabethan and Neo-classical period.	2,4,6,7,9	R,U,Ap,An,E,C
2.	Understand that literature is an expression of human values and sensitivity.	5,7,8,9	U,Ap,An,E,C
3.	Understand the concepts of Renaissance, Reformation and the role of poetic language in the political shift.	1,2,3,6,7,8,9	U,Ap,An,E,C



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4.	Enhance the skills like writing, comprehension, interpretation, paraphrasing and vocabulary.	2,3,4,9	U,Ap,An,E,C
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**Course Title: Structure of English: The English Sound System**

**Course Code: BHEN-1102**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Make phonological analysis.	2,4,9	R,U,Ap,E,C
2.	Understand the regional and international varieties of English.	2,4,9	R,U,An,E,C
3.	Understand the social background of the speakers.	2,4,9	U,Ap,E
4.	Become intelligible at national and international levels.	1,2,4,9	U,An,E

**Course Title: Short story**

**Course Code: BHEN-1103**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Know new words and language and develop early literacy skills.	1,2,9	R,U,Ap,An,E,C
2.	Spark imagination and stimulate curiosity	1,2,3	U,Ap,An,E,C
3.	Describe the major events, experiences and feelings of a character.	1,2,5	U,Ap,An,E,C
4.	Improve knowledge and awareness.	1,2,3,4,5,6,7,8	U,Ap,An,E,C
5.	Build vocabulary and strengthen brain.	3,4,9	U,Ap,An,E,C





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Course Title: **English Prose from Bacon to Swift**

Course Code: BHEN-1104

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Acquaint themselves with the major features of English prose from Elizabethan to the Neoclassical Age	1,3,5,6,7,8,9	U,An,E
2.	Comprehend the themes, styles and language in the essays of Francis Bacon, Jonathan Swift and Joseph Addison	1,2,3,5,6,9	R,U,An,E,C
3.	Relate the prescribed works to their social, historical and cultural contexts in order to gain a richer understanding of both text as well as context	1,2,4,7,8,9	U,An,E
4.	Make inferences based on comprehension of a prose text	1,2,3,7,8,9	U,An,E,C

Course Title: **History of English Literature (450- 1400)**

Course Code: BHEN-1105

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Develop knowledge of and appreciation for the origin of English literature and its growth through various genres over a given period of time from the Anglo-Saxon to Anglo Norman period of English literary history.	1,7,8	R,U,An,E
2.	Understand the manner in which particular ideologies, movements and worldviews about life, politics, religion and the world at large have found expression in different writers through various techniques, concepts, devices etc. from the Anglo Saxon to Anglo Norman period.	1,2,5,7,8	U,E
3.	Acquire knowledge about the works, and thematic as well as stylistic concerns of the	1,2,3,5,7,8	U,An





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	prominent poets and prose writers of the Old English to Middle English Period.		
4.	Become capable to relate various literary texts to their historical, socio-cultural, political and economic contexts and understand their temporal as well as universal significance.	7,8	U,Ap
5.	Become aware about the moral and ethical bourgeoning in the tribal people and their love for democratic, chivalric, and life of justice and responsibility towards their people and the expression and celebration of the same qualities through their literature.	1,2,3,5,8	U,Ap

Course Title: **History of England (1066-1660)**

Course Code: BHEN-1106

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Understand the political, economic and Social History of England	7	R,UAn,C
2.	Get familiarized with the main events, conflicts, inventions and rich history of Great Britain.	8	R,U,Ap,E
3.	Understand the importance of various events of each century so that they can relate it with their texts of the times.	7,8	U,An,E
4.	Relate events with characters, plots of the texts	5,7,8	U,An,E

## Semester: II

Course Title: **Neoclassical Poetry**

Course Code: BHEN-1201

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
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1.	Acquire knowledge regarding the language shift in Elizabethan and Neo-classical period.	1,2,3,4,6,7,8,9	R,U,Ap,An,E,C
2.	Understand that literature is an expression of human values and sensitivity.	5	U,Ap,An,E,C
3.	Understand the concepts of Renaissance, Reformation and the role of poetic language in the political shift.	1,2,3,4,6,8,9	U,Ap,An,E,C
4.	Enhance the skills like writing, comprehension, interpretation, paraphrasing and vocabulary.	2,3,4,9	U,Ap,An,E,C

Course Title: **Structure of English: English Grammar**

Course Code: BHEN-1202

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Make phonological analysis.	2,4,9	R,U,Ap,E,C
2.	Understand the regional and international types of English.	2,4,9	R,U,An,E,C
3.	Understand the social background of the speakers.	2,4,9	U,Ap,E
4.	Become intelligible at national and international levels.	1,2,4,9	U,An,E

Course Title: **One-Act Play**

Course Code: BHEN-1203

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Develop as creative, effective and independent person.	1,2,4,5	R,U,Ap,An,E,C



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2.	Build confidence and concentration.	1,2,3,4,6	R,U,Ap,An,E,C
3.	Develop language and communication skills.	1,3,4,5	U,Ap,An,E,C
4.	Develop emotional intelligence.	1,2,3,4,5	U,Ap,An,E,C
5.	Get training in the practical aspects of communication	2,3,4,5	U,Ap,An,E,C

Course Title: **Nineteenth Century English Prose**

Course Code: BHEN-1204

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Get acquainted with the major features of nineteenth century English prose	1,3,5,6,7,8,9	U,An,E
2.	Comprehend and appreciate the prose style of nineteenth century English writers like Charles Lamb, William Hazlitt and G.K. Chesterton	1,2,3,5,6,9	U,An,E
3.	Draw a comparative analysis of the themes and traditions of language in the works of Charles Lamb, William Hazlitt and G.K. Chesterton	1,2,4,7,8,9	U,An,E,C
4.	Relate the prescribed works to their social, cultural and historical contexts and gain a richer understanding of both text and context	1,2,3,7,8,9	U,An,E,C

Course Title: **History of English Literature (1400-1625)**

Course Code: BHEN-1205

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
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1.	Develop knowledge of English literature through various genres during Renaissance period.	1,7,8	R,U
2.	Become capable to relate various literary texts studies to their historical, socio-cultural, political and economic contexts and understand their temporal as well as universal significance.	1,2,5,7,8	U,Ap
3.	Become aware about the moral and ethical qualities of the renaissance period when the period took the first step from the dark and middle ages towards the brighter times in the future. It is the time connected with various literary and scientific conceptions of the world and the students understand the importance of the necessary components needed for change and a better future and also learn the lesson of cultural and religious tolerance if a society or nation is to make progress.	1,2,3,5,7,8	U,Ap,An
4.	Understand the manner in which particular ideologies, movements and worldviews about life, politics, religion and the world at large have found expression in different writers through various techniques, concepts, devices etc. during the Renaissance Period.	1,5,8,9	R,U,Ap
5.	Acquire knowledge about the general characteristics, works and thematic as well as stylistic concerns of the prominent dramatists, poets, prose, and fiction writers of the Renaissance Period.	1,2,3,8	R,U,Ap

Course Title: **History of England (1660-1950)**

Course Code: BHEN-1206

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Understand the political, economic and Social History of England	7	R,U,An
2.	Become familiar with the main events, conflicts, inventions and rich history of Great Britain.	8	R,U,Ap,E
3.	Understand the importance of various events of each century so that they can relate it with their texts of the times.	7,8	U,An,E
4.	Relate events with characters, plots of the texts	5,7,8	U,An,E





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### Semester: III

Course Title: **Elements of Novel-I**

Course Code: BHEN-2301

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Become familiarized with American and British historical background	1,2,7,8	U,An,E
2.	Learn the importance of persistence and role of fate in life through prescribed novels	2,5	An
3.	Critically analyse the works of Hardy and Hemingway	2,6,8	U,E
4.	Develop an appreciation of language and analyse its connotations	2,3,9	U,Ap,An
5.	Analyse and learn about various stylistic devices used in the prescribed novels	2,4,9	U,An

Course Title: **Elizabethan Drama**

Course Code: BHEN-2302

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Acquire the spirit of team work.	2,3,4,8,9	U,Ap,E
2.	Develop tolerance & empathy	2,3,4,8,9	U,E,
3.	Come out with their talent as script writer and actors.	2,3,4,8,9	U,An,E,C

Course Title: **Romantic Poetry**

Course Code: BHEN-2303

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Know the difference between classicism and romanticism and acknowledge the gradual development of English poetry.	1,2,3,4,6,7,8,9	R,U,Ap,An,E,C
2.	Understand the concepts of nature, mankind and environment in a better way.	5,6,7,8	U,Ap,An,E,C





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3.	Acquire knowledge regarding a transitional shift from agrarian to industrial economy.	5,7,8	U,Ap,An,E,C
4.	Get familiarized with the different writing styles of different writers.	2,3,9	U,Ap,An,E,C

Course Title: **Indian Fiction in English**

Course Code: **BHEN-2304**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Build community in a classroom.	1,2,5,6,8	E,C
2.	Deal with the real situation in life through the study of various characters and plots	1,2,5,6,8	U,An,E
3.	Enhance their critical thinking, independent judgement, inter-cultural sensitivity and regional, national and global perspectives.	1,2,5,6,7,8	U,An,E
4.	Improve vocabulary, decoding skills by increasing their stamina and fluency of language.	3,4,9	U,E,C

Course Title: **History of English Literature (1625-1750)**

Course Code: **BHEN-2305**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Become capable to relate various literary texts studied to their historical, socio-cultural, political and economic contexts and understand their temporal as well as universal significance.	1,7,8	R,U,E
2.	Become aware about the moral and ethical qualities of the renaissance period when the period took the first step from the dark and middle ages towards the brighter times in the future. It is the time connected with various literary and scientific conceptions of the world and the students understand the importance of the necessary components needed for change and a better future.	2,5,7,8	R,U,Ap,E



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3.	Acquire the skills to get employment in teaching, publication, translation, public relations, historical guidance and content writing departments.	1,5,7,8	U,Ap,An
4.	Have a working knowledge of the plays by modern Indian English writers and changes in the dramatic trends	1,2,5,7	U,Ap

**Course Title: American Fiction and Prose**

**Course Code: BHEN-2306**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Have a better understanding of the major American writers like Edgar Allan Poe, Henry James and R. W. Emerson and their contribution to American Fiction and Prose	1,3,4,7,8,9	U,An,E
2.	Comprehend and appreciate the theme, style and language in the works of the prescribed authors	2,3,5,7,8	U,An,E
3.	Critically analyse the works of the prescribed writers	1,2,4,7,8	R,U,An,E
4.	Make inferences based on comprehension of the prescribed texts	1,2,4,7,9	U,Ap,An,E

**Semester: IV**

**Course Title: Elements of Novel-II**

**Course Code: BHEN-2401**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Get acquainted with 19th and 20th century British socio-cultural background	1,2,3,5,6,8	U,E
2.	Know the social and cultural milieu of England and its impact on the novels under study	7,8	U,An,E,C
3.	Comprehend, appreciate and critically analyse the prescribed novels of Charles Dickens and Graham Greene	2,3,6,7,8	U,An



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4.	Analyse and learn the various stylistic devices used by the novelists	3,4,9	U,Ap,An
5.	Develop an appreciation of language and analyse its connotations	2,4,9	U,Ap,An

**Course Title: English Drama: Jacobean Period to 19<sup>th</sup> century**

**Course Code: BHEN-2402**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Acquire Knowledge of 16 <sup>th</sup> and 17 <sup>th</sup> century British Literature which helps them to sense the gradual development of drama during this period.	1,2,3,5,6,7,8,9	R,U,An
2.	Inculcate the knowledge of aestheticism in life.	1,2,3,6,,8,9	U,An
3.	Acknowledge the concepts related to criticism, culture and politics.	1,2,3,6,8,9	U,An,E
4.	Pave the way to theatre, films and other practical arts to sustain employability in contemporary era.	1,2,4,6,7,8,9	U,An,E,C

**Course Title: Victorian Poetry**

**Course Code: BHEN-2403**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Know the difference between classicism and romanticism and acknowledge the gradual development of English poetry.	1,2,6,7,8	R,U,Ap,An,E,C
2.	Understand the concepts of nature, mankind and environment in a better way.	4,5,6,7	R,U,Ap,An,E,C
3.	Acquire knowledge regarding a transitional shift from agrarian to industrial economy.	2,4,5,6,8	R,U,Ap,An,E,C



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4.	Get familiarized with the different writing styles of different writers.	2,3,4,9	R,U,Ap,An,E,C
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**Course Title: Indian Poetry and Drama**

**Course Code: BHEN-2404**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Have a working knowledge of Indian English poetry as a literary genre	1,2,8,9	U,An,E,C
2.	Identify, analyse and describe the characteristics of various poetic forms	1,2,4,6,9	R,U,An,E,C
3.	Share ideas related to the poetic and dramatic works in Indian English literature, during class and group activities	1,2,4,6,9	U,An,E,C
4.	Have a working knowledge of the plays by modern Indian English writers and changes in the dramatic trends	1,2,3,6,7,8,9	R,U,An,E,C

**Course Title: History of English Literature (1750-1850)**

**Course Code: BHEN-2405**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Acquire the skills to get employment in teaching, publication, translation, public relations, historical guidance and content writing departments.	1,2,3,4,7,8	U,Ap,An,E,C
2.	Become capable to relate various literary texts studied to their historical, socio-cultural, political and economic contexts and understand their temporal as well as universal significance.	5,7,8	R,U,Ap,E,C
3.	Become aware about the moral and ethical bourgeoning in the tribal people and their love for democratic, chivalric, and life of justice and responsibility towards their people and the expression and celebration of the same qualities through their literature.	1,2,5,7,8	R,U,Ap,An





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4.	Acquire knowledge about the works, and thematic as well as stylistic concerns of the prominent poets and prose writers	1,2,5,7	R,U,Ap,E,C
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**Course Title: American Poetry and Drama**

**Course Code: BHEN-2406**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Understand the historical and political background of America from Colonialism to Modern times	1,2,6,7,8	U,An,E
2.	Understand the influence of American culture	1,2,6,7	U,An,E
3.	Have an ability to read and understand various literary genres	1,2,7,8	U,An,E
4.	Display a critical aptitude and reflexive thinking to systematically analyse the prescribed texts	1,2,7,8	R,U,An,E

**Semester: V**

**Course Title: Modern English Poetry**

**Course Code: BHEN-3501**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Analyze various elements of poetry such as diction, tone, style, figures of speech, symbolism, etc.	1,2,5,7,8	U,An,E
2.	Identify a variety of forms and genres of poetry from diverse cultures and historic periods such as sonnets, ballads, dramatic monologue, free verse, etc.	1,2,5,7,8	U,An,E
3.	Interpret poems from phonological semantical and structural perspectives for understanding the meaning, beauty and rhythm.	1,2,4,5,7,9	R,U,An,E
4.	Understand lives of people including their emotions, psycho and cultural background.	1,2,5,6,7,8	U,An,E

**Course Title: Modern English Drama**

**Course Code: BHEN-3502**





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Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Understand the themes and styles of Global Drama.	1,2,5,6,7,8	R,U,Ap,An,E,C
2.	Enhance their Multicultural sensibilities by understanding the concepts of multiculturalism and modernism.	1,2,3,5,6,7,8	R,U,Ap,An,E,C
3.	Understand the concepts of theatre, stage, films and other practical arts to sustain employability in contemporary era.	1,2,3,5,6,7,8	R,U,Ap,An,E,C
4.	Acquire knowledge of different social, political and literary movements across the globe.	1,2,5,6,7,8	R,U,Ap,An,E,C

**Course Title: Modern Novel**

**Course Code: BHEN-3503**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Get acquainted with the diversity of Modern novel, its techniques, approach and thematic concerns	5,6	R,U,Ap,E
2.	Understand the idea of totalitarian state and its impact on human life through 1984	1,2	R,U,Ap,An
3.	Understand the concept of absurd works	4,5	U,An,E
4.	Comparatively analyse the prescribed texts	3	U,An,E

**Course Title: English Literary Criticism**

**Course Code: BHEN-3504**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Acquire knowledge of the basics of Literary Approaches Theory and Criticism.	2,5,7,8	R,U,Ap,E,C



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2.	Obtain knowledge of the various social and intellectual movements and their impact on literature.	2,3,5,7,8	R,Ap,An,E,C
3.	Impart the techniques of close readings of the literary texts.	1,2,5,7,8	U,Ap,An,E,C
4.	Analyze, interpret, explicate and evaluate literary texts.	2,5,7,8	U,Ap,An,E,C
5.	Acquire knowledge of practical and applied criticism.	2,3,5,7,8	U,Ap,An,E,C

**Course Title: World Classics in Translation**

**Course Code: BHEN-3505**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Learn features of World Literature	1,2,3,5,6,8,	U,Ap,An
2.	Get familiarized with Universal problems	1,2,,3,5	U,An
3.	Learn comparison between Indian Literature and World Literature and World issues such as Gender, Social ethics, etc.	1,2,4,6,8	U,Ap,An,E
4.	Prepare for higher studies in literature in abroad	1,9	Ap
5.	Find job in teaching literature worldwide.	3,4	Ap

**Course Title: History of English Literature (1850-1900)**

**Course Code: BHEN-3506**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Acquire knowledge about the growth of English literature through various genres during Victorian period.	1,7,8	R,U
2.	Understand the manner in which particular ideologies, movements and worldviews about life, politics, religion and the world at large have found expression in different writers through various techniques, concepts,	1,2,5,7,8	R,U,Ap



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	devices etc. during the Victorian Period.		
3.	Acquire knowledge about the general characteristics, works and thematic as well as stylistic concerns of the prominent poets, prose, and fiction writers of the Victorian Period.	1,7,8	R,U,Ap
4.	Acquire knowledge to relate various literary texts studied to their historical, socio-cultural, political and economic contexts and understand their temporal as well as universal significance.	1,7,8	U,An

**Course Title: Twentieth Century Indian Literature**

**Course Code: BHEN-3507**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Get acquainted with a working knowledge of Indian English short stories as a literary genre	1,2,3	R,U,Ap,An
2.	Identify, analyse and describe the characteristics of various narrative forms	5,6,8	R,U,Ap,An
3.	Share ideas related to the narrative and dramatic works in Indian English literature, during class and group activities	2,3,4	U,Ap,An
4.	Get a working knowledge of the plays by modern Indian English writers and changes in the dramatic trends	6,8,9	U,Ap,An

**Semester: VI**

**Course Title: Post-War English Poetry**

**Course Code: BHEN-3601**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
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1.	Get acquainted with the major trends of Post-War Poetry	1,2,3	U,Ap,E
2.	Appreciate and analyse the poems in the larger socio-political and religious context of the time	2,5,8	U,Ap,E
3.	Understand the nature of the relationships of human beings to other beings in relation to the prescribed poems	5,8,9	U,An,E
4.	Analyse various elements of poetry such as diction, tone, form, imagery, figures of speech, literary devices, theme etc. in the poetry of Stephen Spender, Sylvia Plath and Ted Hughes	1,2,3,9	U,An,E

**Course Title: European Drama**

**Course Code: BHEN-3602**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Acquire knowledge of the themes and styles of Global Drama.	1,2,5,6,7,8	R,U,Ap,An,E,C
2.	Enhance multicultural sensibilities by understanding the concepts of multiculturalism and modernism.	1,2,3,5,6,7,8	R,U,Ap,An,E,C
3.	Understand the concepts of theatre, stage, films and other practical arts to sustain employability in contemporary era.	1,2,3,4,5,6,7,8	U,Ap,An,E,C
4.	Acquire deeper knowledge of different social, political and literary movements across the globe.	1,2,5,6,7,8	U,Ap,An,E,C

**Course Title: Introduction to Lit. Criticism**

**Course Code: BHEN-3603**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
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1.	Acquire knowledge on the basics of Literary Approaches, Theory and Criticism.	1,2,5,7,8	R,U,Ap,An,E,C
2.	Acquire knowledge on the various social and intellectual movements and their impact on literature.	1,2,5,6,7,8	R,U,Ap,An,E,C
3.	Understand the techniques of close readings of the literary texts.	1,2,5,7,8	U,Ap,An,E,C
4.	Analyze, interpret, explicate and evaluate literary texts.	1,2,3,5,6,7,8	U,Ap,An,E,C
5.	Get knowledge on practical and applied criticism.	1,2,5,8	U,Ap,An,E,C

**Course Title: Indian Literature in Translation**

**Course Code: BHEN-3604**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Learn the values of spiritual refinement in human life.	1,2,3,4,9	U,Ap,An
2.	Understand the need of wiping out social evils to dream of a healthy society.	5,6	Ap,An
3.	Understand the Indian culture reflected in Literature.	1,5,8	An,E
4.	Understand the socio-cultural aspect of Indian society	6,8	U,An,E

**Course Title: Diasporic Literature**

**Course Code: BHEN-3605**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Get acquainted with the diversity of Diasporic novel, its techniques, approach and thematic concerns.	1,2,6	R,U,Ap,E
2.	Understand the terms like Hybridity, Alienation, Cultural Identity and Ethnicity	5,6	U,Ap,E
3.	Understand the concept of Diaspora	1,2	U,Ap,An
4.	Comparatively analyse the prescribed texts	6,7	U,Ap,E

**Course Title: Partition Literature**

**Course Code: BHEN-3606**

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Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Realise plurality of human experiences.	1,2,5,6,8	U,E
2.	Get an in depth knowledge into the issues of class, gender, religion, ostracization, and the meaning of existence.	1,2,5,6,7,8	U,An,E
3.	Learn about the most abrupt, unplanned and tragic transfer of population, that human history has ever known.	1,2,5,6,7	U,Ap,E

**Course Title: History of English Literature (1900-present) Course Code: BHEN-3607**

Sr. No.	The completion of this course enables students to:	PSOs Addressed	Cognitive Levels
1.	Acquire knowledge of and appreciation for the growth of English literature through various genres from Modern to Contemporary period.	1,7,8	R,U
2.	Understand the manner in which particular ideologies, movements and worldviews about life, politics, religion and the world at large have found expression in different writers through various techniques, concepts, devices etc. from Modern to Contemporary Period.	1,2,5,7,8	R,U,Ap
3.	Acquire knowledge on the general characteristics, works and thematic as well as stylistic concerns of the prominent dramatists, poets, prose, and fiction writers from Modern to Contemporary Period.	1,7,8	R,U,Ap
4.	Acquire knowledge to relate various literary texts studied to their historical, socio-cultural, political and economic contexts and understand their temporal as well as universal significance.	1,7,8	R,U,An
5.	Acquire skills to get employment in teaching, publication, translation, public relations, historical guidance and content writing departments.	2,3,4,5	R,U,Ap,C



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### B.A. SOCIAL SCIENCES

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

##### Programme Specific Outcomes (PSOs)

<b>PSO-1</b>	This programme covers all the major subjects related to Social Sciences.
<b>PSO-2</b>	The Foundation Courses and ID courses of the program help students to understand the basic concepts in various subjects.
<b>PSO-3</b>	Honor subjects provide thorough knowledge of a particular subject of student's choice.
<b>PSO-4</b>	To develop the communicative skills of the students, the program offers various opportunities to develop soft skills of the students like Presentations, Group Discussions, Debates and Quiz etc.
<b>PSO-5</b>	To inculcate the research aptitude in a Social Science student the program offers project work for students.

##### COURSE OUTCOMES (COs)

###### Semester-I

**Course Title: Political Concepts (Major-I)**

**Course Code: BSS-101**

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
<b>CO-1</b>	Familiarize themselves with the basic ideas of political science.	1,4	R,U
<b>CO-2</b>	Become aware about the concepts of political theory.	1,4	R,U,E
<b>CO-3</b>	Have knowledge of various political concepts and its interplay.	1,4,5	U,Ap,E
<b>CO-4</b>	Widen their understanding about rights, liberty, equality and fraternity.	1,4,5	U,Ap,E

**Course Title: Basic Concepts of Political Science (Minor-I)**

**Course Code: BSS-102**

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
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CO-1	Understand the basic concepts of political science	1,4	R,U
CO-2	Acknowledge the concepts of political theory.	1,4	R,U,E
CO-3	Have knowledge about political postulates.	1,4,5	U,Ap,E
CO-4	To get knowledge about rights, duties, liberty etc.	1,4,5	U,Ap,E
<b>Course Title: Principles of Public Administration (Major-I)</b>			
<b>Course Code: BSS-103</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Have a deep look at the meaning and working of Administration.	1,4	R,U,Ap,E
CO-2	Familiarize themselves them with the models, concepts and principles of public Administration.	1,4	U,Ap, An
CO-3	Widen their knowledge about the insights on various Administrative Machinery.	1,4,5	U, An, E
CO-4	Equip themselves to know the dynamics of administrative behavior.	1,5	U, An, E
CO-5	Discuss various checks and balances over the working of administration.	1,4	U, An, E
<b>Course Title: Basic Concepts of Public Administration (Minor-I)</b>			
<b>Course Code: BSS-104</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Acknowledge the meaning and working of administration.	1,4	R,U,Ap,E
CO-2	Familiarize themselves with the models, concepts and principles of public administration.	1,4	U,Ap, An
CO-3	Gain knowledge about the insights of various Administrative Machinery.	1,4,5	U, An, E
CO-4	Understand the dynamics of administrative behavior.	1,5	U, An, E
CO-5	Discuss various checks and balances over the working of Administration.	1,4	U, An, E
<b>Course Title: Micro Economics (Major-I)</b>			
<b>Course Code: BSS-105</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>



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CO-1	Know the basic fundamentals of Micro Economics and their uses.	1,4	R,U,Ap
CO-2	Know about how the tools of Micro Economics can be applied in real-life situations. Moreover, students understand about various forms of markets (Perfect Competition, Monopoly and Monopolist Competition), their imperfections and market failures.	1,4	U,Ap, An, E
<b>Course Title - History of India up to A.D. 1000 (Major-I)</b>			
<b>Course Code- BSS-107</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the genesis of history writing in different countries as well as in India.	1,4	R,U,E
CO-2	Know about sources of ancient India, Civilizations like Indus and Aryan, Mauryan, Gupta, Kushana and Vardhana Empire and political and religious changes upto 1000 AD	1,4	U,An,E
<b>Course Title - Fundamentals of Sociology-I (Major-I)</b>			
<b>Course Code- BSS-109</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Study the basic concepts of sociology and learn to think critically about various social issues and problems that confront our society.	1,4,5	R,U,E,
CO-2	Understand the social interaction and relationships, social structure, social change, the significance of diversity and human variation.	1,4,5	U,E,
CO-3	Comprehend the meaning, definition and subject matter of sociology, explain the nature and importance of sociology, describe the origin and development of sociology.	1,4	U,E,
<b>Course Title - Elective English (Major-I &amp; II)</b>			
<b>Course Code- BSS-111 &amp; BSS-211</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Acquaint themselves with the major features of Poetry and Short Story.	1,2,4,5,6	U,Ap,An
CO-2	Comprehend the themes, styles and language in the prescribed Poetry and Story.	1,2,4,5,6	U,Ap,An





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CO-3	Relate the prescribed works to their social, historical and cultural contexts in order to gain a richer understanding of both text as well as context	1,3,4,5	U,Ap,An
CO-4	Make inferences based on comprehension of a prescribed text.	3,4,5	U,Ap,An, E,C

### Course Title - General Awareness and Current Issues (Foundation Course) Course Code- BSS-126

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Develop the habit of reading newspaper daily and read topic specific information.	1,2,4	R,U,An,E
CO-2	Keep abreast with the latest in every field of knowledge.	1,2,4,5	R,U,An,E
CO-3	Learn the latest development that is taking place in the world.	1,2,4	U,An,E
CO-4	Read critically acclaimed articles, write-ups and other related information.	1,2,4,5	U,An,E
CO-5	Develop the inquisitiveness in every student of social science.	1,2,4	U,AP, An, E

### Course Title - Commerce (Interdisciplinary Course) Course Code- BSS-131

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand the fundamental and elementary aspects of commerce, management, accounting, taxation, banking and insurance.	1,2,4,5	R,U,An,E
CO-2	Gain knowledge about the various forms of business organisations.	1,2,4,5	U,Ap,E
CO-3	Apply the various accounting concepts, principles and conventions in the process of accounting.	1,2,4	,U,Ap,E
CO-4	Get acquainted with the procedure for opening of a bank account and obtaining an insurance policy.	1,2,4,5	U,Ap,An

## Semester-II

### Course Title - Political Theory (Major-II) Course Code- BSS-201

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Get knowledge of the students to understand political practices and institutions.	1,4	R,U,Ap





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CO-2	Widen their knowledge about genesis and decline of political ideologies worldwide.	1,4	R,U,An,E
CO-3	Learn about the underpinning and functions of the state.	1,4	U,An,E
CO-4	Familiarize themselves with various political theories and their relevance.	1,4	U,Ap,An,E
CO-5	Get knowledge about political concepts that are very basic to state's legitimacy.	1,4,5	R,U,E ,An,Ap

### Course Title - Indian Political System (Minor-II)

Course Code- BSS-202

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Know about historical developments and formation of Indian Constitution.	1,4	R,U,An, E
CO-2	Enrich their knowledge by discussing the philosophy of India Constitution.	1,4	R,U, An, E
CO-3	Acquaint themselves with the Preamble and its significance.	1,4	,U,E
CO-4	Understand about the constitutional pledges for accountable governance.	1,4	U,An,E
CO-5	Equip themselves with actual working of political institutions in the country.	1,4,5	U,An, E

### Course Title- Administrative Theory (Major-II)

Course Code- BSS-203

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Widen their knowledge about genesis and challenges of Public administration.	1,4,5	U,An, E
CO-2	Develop theoretical understanding of students with regard to public administration.	1,4	U,An, E
CO-3	Know about various theories of organizations.	1,4	U,An, E

### Course Title- Indian Administration (Minor-II)

Course Code- BSS-204

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Know about the historical evolution of Indian Administration.	1,4	R,U,An, E



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CO-2	Learn about the forms and substance of Indian Administration.	1,4	U,An, E
CO-3	Get themselves acquainted with the functioning of administration at various levels.	1,4	U,An, Ap, E
CO-4	Get themselves familiarized with local administration and its changing role.	4,5	U,An, Ap, E
CO-5	Study various issues of Indian administration.	1,4	U,An, Ap, E

### Course Title- Macro Economics (Major-II)

Course Code- BSS-205

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Know about various aggregate Macro-Economic variables, viz. Consumption, Investment, Multiplier etc.	1,4,5	R,U,An, Ap
CO-2	Learn about various empirical works of the classical and Modern Economists in context to income, consumption and employment.	1,4,5	U, Ap, E

### Course Title- History of India (A.D.1000-1707) (Major-II)

Course Code- BSS-207

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Get idea about Turko-Afghan (AD. 1000-1526) rule in India.	1,4	R,U,An
CO-2	Understand the formation, expansion and consolidation of Mughal Empire in India.	1,4	U,An, E

### Course Title- Fundamentals of Sociology-II (Major-II)

Course Code- BSS-209

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Learn integrated approach to understand the social and cultural construction of society.	1,4	R,U, Ap, E
CO-2	Get knowledge about various social processes which help to run society smoothly	1,4,5	U, An, E

### Course Title- Science and Technology (Foundation Course)

Course Code- BSS-226

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
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CO-1	Appreciate the contribution of science and technology to everyday life	1,2,4	R,U,An,E
CO-2	Develop critical thinking and problem solving ability and use the scientific process of inquiry to explore issues at the local, national and global level.	1,2,4,5	U,An,E,C
CO-3	Make observations, formulate pertinent questions, design investigations and find potential answers by assessing available evidences.	1,2,4,5	U,An,E
CO-4	Develop the ethical aspects of science and technology.	1,2,4,5	R,U

### Course Title- Physical Education (Interdisciplinary Course)

Course Code- BSS-231

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Acquire ability to develop strength, speed, endurance and coordination abilities.	1,2,4	R,U,An, Ap,E
CO-2	Get knowledge regarding Yoga, Exercises and Meditation etc.	1,2,4,5	R,U,Ap
CO-3	Have knowledge of different games viz. ancient and modern games.	1,2,4	An,Ap

### Semester-III

#### Course Title: Indian Political System (Major-III)

Course Code- BSS-301

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Become familiar with the process of formation of Indian Constitution.	1,4	R,U,E
CO-2	Get knowledge by discussing the philosophy of India Constitution.	1,4	R,U,E
CO-3	Acquaint themselves with the Preamble and its significance.	1,4	U,E
CO-4	Get updated with the constitutional pledges to accountable governance.	1,4	U,An,Ap
CO-5	Get equipped with actual working of political institutions in the country.	1,4,5	U,An,Ap

#### Course Title- Foreign Policy of India (Minor-III)

Course Code- BSS-302

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
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CO-1	Describe the overall thrust of India's foreign policy and its global outlook.	1,4	R,U,An,E
CO-2	Know that foreign policy of any country begins from home itself, hence deep acquaintance with country's socio-economic and politico-cultural settings are essential.	1,4,5	R,U,Ap,An,E,C
CO-3	Become familiar with external challenges and India's possible response.	4	An,C,Ap
CO-4	Become aware about India's stand on international issues, including know-how about country's participation in global institutions.	1,4,5	U,Ap,An
CO-5	Explore career in the subject and its related fields	1,4	An,E,U,Ap

**Course Title- Personnel and Financial Administration (Major-III)**  
**Course Code- BSS-303**

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Know how competent manpower constitutes an asset for any organization.	1,4	R,U,Ap
CO-2	Widen their knowledge about meaning and functioning of civil and public services.	1,4,5	R,U,An,C
CO-3	Describe the management of human resources as a key to any organization's success.	1,5	U,An,Ap
CO-4	Explain the employer-employee relations which have direct bearing on the efficiency of any administrative organization.	1,5	U,Ap,An
CO-5	Study the role of management of financial resources as a key to success for any organization.	1,4	U,Ap
CO-6	Widen their understanding about budgetary process and control of legislature over public finance.	1,5	U,An,E,C

**Course Title- Development and Social Welfare Administration in India (Minor-III)**  
**Course Code- BSS-304**

Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Widen their knowledge about the meaning and progress in development administration.	1,4	R,U,Ap,An
CO-2	Understand the concept of sustainable development and its challenges.	1,4	U,Ap,An
CO-3	Get holistic knowledge about how various government institutions work for people's welfare?	1	R,U





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CO-4	Widen their knowledge about the composition and functioning of welfare institutions, including key government's decisions in this regard.	1,5	U,Ap,An
CO-5	Become attentive about the underbelly of Indian society and the management to empower such vulnerable sections of the society.	1,5	U,Ap,An,C
<b>Course Title- Issues and Trends in Indian Politics (Honors-I)</b>			
<b>Course Code- BSS-313</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Get practical knowledge about the actual working of the Indian Political System.	1,3,4	R,U,Ap,E
CO-2	Know about Caste, language, religion and region based problems in a multi-dimensional society like India and nature of the state response to solve such problems.	1,3,4	R,U,An,E,C
CO-3	Get practical knowledge about the newly emerged issues and trends in Indian Politics.	1,3,4	Ap,E,U
CO-4	Do a systematic analysis of the working of Centre-State relations in a quasi- federal state and reactions of the states against the increasing tendencies towards centralization.	3,4	An,E
CO-5	Have practical knowledge about the actual working of Indian Polity which is very useful during interviews of competitive examinations.	3,4	An,E,C
<b>Course Title- Money, Banking, Finance and International Trade (Major-III)</b>			
<b>Course Code- BSS-305</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Become aware about the determinants and effects of Trade policy.	1,4,5	R,UAn,E
CO-2	Have knowledge about Money, its types, functions and the working of banking sector in India.	1,4,5	U,An,Ap,E
<b>Course Title- Economics of Agriculture (Honors-I)</b>			
<b>Course Code- BSS-314</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the Agriculture polices and their effects on sustainable agricultural development.	1,3,4	R,U,Ap,E





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CO-2	Knowledge about the institutional structure and agricultural credit.	1,3,4,5	U,Ap,An,E
<b>Course Title- History of India (A.D. 1707-1885) (Major-III)</b>			
<b>Course Code- BSS-307</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Discuss the advent of Europeans and their administration, formation, expansion and consolidation under East India Company.	1,4	R,U,E
CO-2	Evaluate the Anglo-Mysore wars, Anglo-Sikh wars and Socio-economic policies.	1,4	U,Ap,E
<b>Course Title- Economy, Society and Culture of India up to AD 1206 (Honors-I)</b>			
<b>Course Code- BSS-315</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the economic development (Agriculture and Trade), urban growth and social institutions of ancient India.	1,3,4,5	R,U,Ap
CO-2	Know about the political formations of the Mauryan Empire, Kushanas and the Satavahanas, agrarian and commercial economy, social practices and polity of the Gupta and post-Gupta period.	1,3,4,5	R,U,Ap,An
CO-3	Know about the cultural development in Ancient India with reference to literature, art and architecture.	1,3	U,An
<b>Course Title- Society in India (Major-III)</b>			
<b>Course Code- BSS-309</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the synthesis of cultures, religions and languages of the people belonging to different castes and communities.	1,4	R,U,Ap
CO-2	Get themselves acquainted with the division of society on caste and class basis and their relationship with politics.	1,4,5	R,U,Ap,E
CO-3	Get basic knowledge about social institutions like marriage, family and kinship along with their comparison with northern and southern regions.	1,4,5	U,Ap,An,E
<b>Course Title- Marriage, Family and Kinship In (Honors-I)</b>			
<b>Course Code- BSS-316</b>			



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Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand how the relationships, marriage and family are at the core of every community. Families are universally recognized as important source of support and security, so the knowledge and understanding developed through family studies can help to study social, cultural, economic, technological, environmental and wellness issues and can provide a strong foundation for vibrant, healthy and engaged citizenship.	1,3,4,5	R,U,Ap,An,E
CO-2	Study family and kinship to know how other institutions and family systems affect each other.	1,3,4,5	U,Ap,An,E
<b>Course Title- Elective English (Major-III&amp; IV)</b>			
<b>Course Code- BSS-311 &amp; BSS-411</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Relate the prescribed works to their social, historical and cultural contexts in order to gain a richer understanding of both text as well as context.	1,5,6	U,Ap
CO-2	Comprehend a prescribed text.	2,3,4	U,Ap,An
CO-3	Discern ethical principles and personal values in the light of academic experience.	4,5	U,Ap
CO-4	Equip with social science knowledge as to seek jobs in public service.	2,6	U,Ap,An
<b>Course Title- Geography of India and the World (Foundation Course)</b>			
<b>Course Code- BSS-326</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand where things are found, how they develop and change over time.	1,2,4	R,U
CO-2	Get basic knowledge on geography as a spatial science and train the undergraduates to secure employment in the sectors of geospatial analysis development and planning mapping and surveying.	1,2,4,5	R,U,Ap
CO-3	Understand the dynamic interrelationship between Physical and Human World.	1,2,4,5	R,U,Ap,An,E



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<b>Course Title- Computer Fundamentals (Interdisciplinary Course)</b>			
<b>Course Code- BSS-331</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Compare and contrast various types of computers.	1,2,4	R,U,Ap,An
CO-2	Explain the purpose of CPU and how it works.	1,2,4	U,Ap
CO-3	Describe how information is stored in memory.	1,2,4	U,Ap
CO-4	Know about various types of software's and their applications.	1,2,4	U,Ap,An,E
<b>Semester-IV</b>			
<b>Course Title - Western Political Thought (Major-IV)</b>			
<b>Course Code- BSS-401</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Become aware about the origin and evolution of Western Political Thought.	1,4	R,U
CO-2	Widen their knowledge about the basic political concepts.	1,4	R,U,An,E
CO-3	Have a deep look at the history of Western Political Thought to understand the present paradigm of political philosophy.	1,4	U,Ap
CO-4	Inculcate the values of critical and rational thinking.	1,4	U,Ap,E
CO-5	Become aware about state-individual relationship and relevance in modern life.	1,4	U,E,Ap,E
<b>Course Title - Indian Administration (Major-IV)</b>			
<b>Course Code- BSS-403</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the historical evolution of Indian Administration.	1,4	R,U,An,E
CO-2	Understand the forms and substance of Indian Administration.	1,4	R,U,An,E
CO-3	Get acquainted with the functioning of administration at various levels.	1,4	U,Ap,An,E
CO-4	Become familiar with local administration and its changing role.	1,4,5	U,Ap,An,E



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CO-5	Understand the issues of Indian administration.	1,4	U,Ap,An,E
<b>Course Title - Indian Political Thought (Honors-II)</b>			
<b>Course Code- BSS-413</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Build their thought process in order to develop their cognitive skills.	1,3	U,Ap,An,E,C
CO-2	Get political ideas of Indian scholars and their approaches to usher the country into a cohesive nation.	1,3	U,An,E
CO-3	Understand the rich historical domain of civilizational knowledge.	1,3	U,An,E
CO-4	Infuse a sense of fair aptitude of studying comparative political thoughts.	1,3,5	U,Ap,An,E,C
CO-5	Develop rational and critical thinking.	1,5	An,E,C
<b>Course Title- Quantitative Methods for Economists (Major-IV)</b>			
<b>Course Code- BSS-406</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Get introduced to the mathematical and statistical methods and the applications of these methods to economic analysis.	1,4,5	R,U,Ap,An,E
CO-2	Do research work by adopting these techniques.	1,4,5	R,U,Ap,An,E,C
<b>Course Title- Economic Theory (Minor-IV) 2021-22</b>			
<b>Course Code- BSS-406</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Know the basic fundamentals of Micro Economics as well as Macro Economics.	1,4	R,U
CO-2	Get knowledge on the functioning of the central and commercial Bank which further help them to increase their employment prospects .	1,4	U,E
<b>Course Title- Economics of Labour (Honors-II)</b>			
<b>Course Code- BSS-414</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand the latest development of labour market in developing nations with special reference to India.	1,3,4,5	U,An





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CO-2	Fetch knowledge regarding different theories on labor and employment from the point of view of economic research.	1,3,4,5	U,Ap,An,E
<b>Course Title- History of India (A.D. 1885-1947) (Major-IV)</b>			
<b>Course Code- BSS-407</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand about the Socio-religious reform movements in 19th century and the role of moderates and extremists in the freedom movement.	1,4,5	R,U,Ap,E
CO-2	Trace the impact of Non Cooperation movement, civil disobedience movement, quit India movements and learn the legacy of the British rule in India.	4,5	R,U,Ap,An,E
<b>Course Title- History of Ancient India (upto A. D.1000) (Minor-I)</b>			
<b>Course Code- BSS-408</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the salient features of Indus valley civilization, the features of Buddhism and Jainism.	1,4	U,R,An
CO-2	Understand the administration, art and architecture of Mauryas, Guptas, Kushanas, Vardhanas etc.	1,4,5	U,R,E,Ap
<b>Course Title- Economy, Society and Culture of India (AD. 1206-1707) (Honors-II)</b>			
<b>Course Code- BSS-415</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the economic development (Agriculture and Trade), urban growth and social institutions of Medieval India.	1,3,4	R,U,Ap
CO-2	Know the religious beliefs and practices with reference to various theistic cults: Sufi & Bhakti movement and Tantricism.	1,3,4	U,Ap
<b>Course Title- Social Change and Development (Major-IV)</b>			
<b>Course Code- BSS-409</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Get theoretical and methodological guidelines to study human development in changing socio-demographic and cultural contexts.	1,4,5	R,U,Ap,An



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CO-2	Learn about social changes which are necessary for people in order to adapt, learn in the changing environment.	1,4	R,U
<b>Course Title- Basic Concepts in Sociology-I (Minor-I)</b>			
<b>Course Code- BSS-410</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Study the concepts in sociology which provide better understanding about the reasons for social differences including differences in social behavior.	1,4,5	R,U,Ap,An
CO-2	Understand the relevance of social hierarchies and social power in everyday life.	1,4,5	U,Ap,An
<b>Course Title- Gender and Society (Honors-II)</b>			
<b>Course Code- BSS-416</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Examine and challenge the social norms regarding women or men in the society and to pursue justice and equality to all which are the fundamental factors of development.	1,3,4,5	U,Ap,An
CO-2	Understand how gender studies can help to build friendships and relationships based on a deep understanding of about who you are as individual rather than a gender.	1,3,4	R,U
CO-3	Understand the production, reproduction and resistance to norms that produce inequality between men and women.	1,3,4,5	U,Ap,An
<b>Course Title- Ethics and Integrity (Foundation Course)</b>			
<b>Course Code- BSS-426</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Become aware of some philosopher and ethical teachings.	1,2,4	R,U,Ap
CO-2	Understand the importance of ethical values in personal and professional life.	1,2,4	R,U,An
CO-3	Get themselves acquainted with the correlation between attitude and behavior.	1,2,4,5	U,Ap,An,E
CO-4	Get knowledge about Right to Information (Act.) and citizen charter.	1,2,4	U,Ap,An,E



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<b>Course Title- Psychology (Inter-Disciplinary Course)</b>			
<b>Course Code- BSS-431</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Qualify interview part of civil services by expressing verbally and non- verbally in an appropriate manner.	1,2,4	R,U,Ap,An
CO-2	Cope with stressful situations in an effective manner.	1,2,4	U,Ap,An
CO-3	Understand their thoughts, feelings and behaviors appropriately.	1,2,4,5	U,Ap,An
<b>Semester-V</b>			
<b>Course Title- International Politics (Major-V)</b>			
<b>Course Code- BSS-501</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Understand the meaning and evolution of international politics as a discipline.	1,4	R,U,An,E
CO-2	Know about how global cooperation and conflicts have bearings on country's polity and its working.	1,5	U,An,C
CO-3	Get themselves acquainted with the meaning of national interests and principles of India's global engagements.	1,5	U,An,C
CO-4	Get knowledge to understand about global concerns.	5	An,C
<b>Course Title- Comparative Political System (UK &amp; USA) (Honors-III)</b>			
<b>Course Code- BSS-513</b>			
Sr. No	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
CO-1	Get insight on comparative political systems and governments.	1,3,5	R,U,Ap
CO-2	Get familiar with theoretical knowledge and its application for better comparative scholarship.	1,3,5	R,U,Ap
CO-3	Develop comparative analysis skills by discussing the working of key institutions of various political systems.	3,5	U,Ap,C
CO-4	Get insight on the world constitutions to widen understanding about overseas political systems.	3,5	U,Ap,C



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CO-5	Scrutinize various forms and nature of key Political System.	3,5	U,Ap,C
<b>Course Title- Local Government in India (Major-V)</b>			
<b>Course Code- BSS-503</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Know about the grass root level governance in the light of consecutive constitutional amendments.	1,5	R,U,Ap,An
CO-2	Become familiar with the structures and intricacies of local governance in rural and localities.	1	R,U,An
CO-3	Understand about Punjab government's nodal department to monitor local governance.	1,5	U,Ap,An
CO-4	Know about state's tools to control local administration.	1,5	U,Ap,An
CO-5	Acquaint themselves with the work and challenges of Panchayati Raj System.	5	Ap,An
<b>Course Title- Statistical Techniques for Economists (Major-V)</b>			
<b>Course Code- BSS-505</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Know about how to analyse the data by using various statistical measures like central tendency, dispersion, correlation, regression.	1,4,5	U,Ap,An,E,C
CO-2	Do their research work in future by applying these statistical tools.	1,4,5	U,Ap,An,E,C
<b>Course Title- International Trade and Public Finance (Minor-II)</b>			
<b>Course Code- BSS-506</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Develop understanding of the models that explain the Direction, Composition and Consequences of International Trade.	1,4	R,U,Ap
CO-2	Study the processes, principles and outcomes of Fiscal Policy.	4	Ap,An,E
<b>Course Title- International Economics (Honors-III)</b>			
<b>Course Code- BSS-514</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>





Estd. 1892

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CO-1	Understand the concepts of Free trade and Protection, functions of various financial organizations like WTO, IMF, IBRD etc.	1,3,4,5	R,U,Ap
CO-2	Get knowledge regarding the ranking of Indian economy from development's point of view in comparison with other developed as well as developing nations.	1,3,4,5	U,Ap,An,E
<b>Course Title- History of the World (A.D 1500-1945) (Major-V)</b>			
<b>Course Code- BSS-507</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand Renaissance, Reformation, French Revolution and the achievements of Napoleon Bonaparte, the importance of the revolt of 1830 and 1848 in France and the unification of Italy and Germany.	1,4	R,U
CO-2	Understand the First world war and Second World War, examine the Nazism & Fascism and establishment of UNO.	1,4,5	U,Ap
<b>Course Title- History of Medieval India (A.D.1000-1707) (Minor -II)</b>			
<b>Course Code- BSS-508</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Get idea about Turko- Afghan (1000-1526) rule in India from Slave Dynasty to Lodhis.	1,4	R,U
CO-2	Learn about the formation, expansion and consolidation of Mughal Empire from Babur to Aurangzeb.	1,4,5	U,Ap,E
<b>Course Title- Economy, Society and Culture of India (AD. 1707-1857) (Honors-III)</b>			
<b>Course Code- BSS-515</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Get acquainted with the nature of British economic policies (trade and commerce) during the specified period.	1,3,4,5	R,U,Ap,An,E
CO-2	Understand about the Socio-religious reform movements in 19th century, nature of political expansion, revenue administration, religious beliefs and practices.	1,3,4	U



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<b>Course Title- Social Thought (Major-V)</b>			
<b>Course Code- BSS-509</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Study the causes of existing order.	1,4	R,U
CO-2	Understand how to draw a scientific theory about a social problem.	1,4,5	R,U,Ap
CO-3	Study an integrated approach to understand theoretical aspects of sociology.	1,4	U, An
CO-4	Understand general theories to explain actions and behaviors of society as a whole encompassing sociological, political and philosophical ideas.	1,4,5	U,Ap,An,E
<b>Course Title- Basic Concepts in Sociology-II (Minor -II)</b>			
<b>Course Code- BSS-510</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Get knowledge about various social processes which help to run the society.	1,4,5	R,U,Ap
CO-2	Get knowledge about the various social agencies which help to run the society into conformity.	1,4,5	R,U,Ap,An,E
CO-3	Become aware about the notion of deviant behavior and the forces which make people deviant.	1,4	U
<b>Course Title- Social Stratification (Honors-III)</b>			
<b>Course Code- BSS-516</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Study social stratification which brings the disparities in our society.	3,4,5	Ap,An,E
CO-2	Get familiar with the fact that competition exists in society and without competition society cannot progress.	1,3,4	U,Ap
<b>Course Title - Elective English (Major-V &amp; Major- VI)</b>			
<b>Course Code- BSS-511 &amp; BSS-611</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Develop interpretative skills.	U,Ap	4,5,6
CO-2	Acquire knowledge about the basic concepts of Literary writings.	U,Ap,An	1,2,4,5



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CO-3	Learn to situate literary works in their larger cultural contexts.	U,Ap,An	1,2,4,5
CO-4	Get prepared for higher studies in literature	U,Ap,An	1,2,4,5
CO-5	Find jobs in teaching literature after acquiring the degree.	U,Ap,An	2,3,4
<b>Course Title- Quantitative Aptitude and Reasoning-I (Foundation Course)</b>			
<b>Course Code- BSS-526</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Crack competitive exams at the National as well as state level.	1,4,5	R,U,Ap,An,E,C
CO-2	Enhance their reasoning aptitude.	1,4	U,Ap
<b>Course Title- Indian Heritage and Culture (Interdisciplinary Course)</b>			
<b>Course Code- BSS-531</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the definition of heritage; the meaning of 'antiquity', 'Art and Architecture' etc.	1,2,4	R,U,Ap
CO-2	Get introduced to the definition and history of popular culture.	1,2,4	R,U
CO-3	Know about performances—theatre and music, mythological stories and regional variations in fairs, festivals and rituals.	1,2,4	R,U,Ap,E
<b>Sem-VI</b>			
<b>Course Title- Foreign Policy of India (Major-VI)</b>			
<b>Course Code- BSS-601</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Describe the overall thrust of India's foreign policy that reveals India's global outlook.	1,5	R,U,Ap,An
CO-2	Become aware about the fact that foreign policy of any country begins from home itself, hence deep acquaintance with country's socio-economic and politico-cultural settings is essential.	1,4,5	U,Ap,An
CO-3	Become familiar with the external challenges and India's possible response.	1,5	U,Ap,An,C
CO-4	Get awareness about India's stand on International issues, including knowing about country's participation in global institutions.	1,5	U,Ap,An



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<b>Course Title- Government and Politics in Punjab (Honors-IV)</b>			
<b>Course Code- BSS-613</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the political developments and subsequent problems in a border state and the nature of the state initiatives to deal with such a politically sensitive region.	1,3,4,5	R,U,Ap,An,E
CO-2	Understand as to how an increasing sense of alienation among a minority community leads to separatist tendencies, ultimately challenging the unity and integrity of the state.	1,3,4	U,Ap,An
CO-3	Grasp knowledge about identity politics and its social and political implications.	1	U,An
CO-4	Do systematic analysis of the working of political structures and political process in a state.	1,3,4,5	U,Ap,An,C
<b>Course Title- Development and Social Welfare Administration (Major-VI)</b>			
<b>Course Code- BSS-603</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Widen the knowledge about the meaning and progress in development administration	1,4	R,U,Ap,An
CO-2	Understand about the concept of sustainable development and its challenges.	1,4	R,U,Ap,An
CO-3	Get holistic knowledge about how various government institutions work for people's welfare.	1	R,U
CO-4	Widen their knowledge about the composition and functioning of welfare institutions, including key government's decisions in this regard.	1,5	U,Ap,An
CO-5	Understand the underbelly of Indian society and management to empower such vulnerable sections of the society.	1,5	U,Ap,An,C
<b>Course Title- Indian Economy (Major-VI)</b>			
<b>Course Code- BSS-605</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Develop a critical thinking of the fundamental issues of Indian economy and which helps them to fetch great knowledge about various economic problems like population, inflation poverty and unemployment.	1,4,5	R,U,Ap,An,E





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CO-2	Know about diversified economic policies, their implications, implementation and consequences.	1,4,5	U,Ap,An,E,C
<b>Course Title- Development Economics and Indian Economy (Minor-III)</b>			
<b>Course Code- BSS-606</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Know about the meaning, functions and objective of economic planning in India.	1,4	R,U
CO-2	Understand various economic policies of Indian Government regarding problems like population, inflation, poverty and unemployment.	1,4,5	U,Ap,E
<b>Course Title- Public Finance (Honor-III)</b>			
<b>Course Code- BSS-614</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the economics of Government expenditure and taxation.	1,4	R,U,Ap
CO-2	Understand the critical approach to determine the processes, principles and outcomes of Financial Policy.	1,4,5	U,Ap,An,E
<b>Course Title- History of the Punjab (A.D. 1469-1849) (Major-VI)</b>			
<b>Course Code- BSS-607</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Get acquainted with major ideas and thoughts of the Sikh Gurus.	1,4	R,U
CO-2	Understand the history of Sikh struggle with Mughals and Afghans, and the foundation of Sikh Empire under Maharaja Ranjit Singh till annexation of the Punjab.	1,4,5	R,U,Ap,An,E
<b>Course Title- History of Modern India (A.D.1707-1947) (Minor-III)</b>			
<b>Course Code- BSS-608</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the Constitutional Developments/ Government of India Act of 1909, 1919 and 1935.	1,4	R,U
CO-2	Understand about the Socio-religious reform movements in 19th century and the role of moderates and extremists in the freedom movement.	1,4	R,U



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CO-3	Study the impact of Non Cooperation movement, civil disobedience movement, quit India moments etc. and learn the legacy of the British rule in India.	1,4,5	U,Ap,An,E
<b>Course Title- Economy, Society and Culture of India (AD. 1858-1950) (Honors-IV)</b>			
<b>Course Code- BSS-615</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Get acquainted with the nature of British Economic Policies (Trade and Commerce) During Period.	1,4,5	R,U,Ap,An,E
CO-2	Understand the Economic changes, Drain theory, modern industrial developments, agrarian policies, cultural changes and socio-religious reform movements in India.	1,4,5	U
<b>Course Title- Contemporary Sociological Theories (Major-VI)</b>			
<b>Course Code- BSS-609</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Frame sociological research and analyzation which are the result of collective bodies of sociological findings.	1,4,5	Ap,An,E,C
CO-2	Get a new perspective in the social world because with new perspectives, new opinions can be made.	1,4,5	R,U,Ap,An,E,C
CO-3	Clarify and predict the way the social world works.	4,5	Ap,An,E,C
<b>Course Title- Sociological Theories (Minor -III)</b>			
<b>Course Code- BSS-610</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Get familiar with the importance of sociological theory which guides us a way to speak about, describe and interpret various behaviors.	1,4,5	R,U,Ap,An,E
CO-2	Help social workers, students and researchers to better understand complex human behaviors and social environments which influence people's lives.	1,4,5	U,Ap
<b>Course Title- Sociology of Development (Honors-IV)</b>			
<b>Course Code- BSS-616</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Understand the practices and processes of Social changes. This course addresses pressing intellectual challenges like internal and international migration,	1,3,4,5	R,U,Ap,An,E



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	changes in household and family formations, technological changes, economic growth and the production and reproduction of Social and economic inequality.		
CO-2	Explore the linkages between Social, Culture, Political and Institutional spheres and the level of economic development in any society.	1,3,4,5	U,Ap,An,E,C
CO-3	Develop a worldview which unravels the hidden layers of phenomena and enable them to develop imaginative, novel and out of box thinking and also allow interpretation of society and economy from a perspective that is original and inventive.	1,3,4,5	U,Ap,An,E,C
<b>Course Title- Quantitative Aptitude and Reasoning-II (Foundation Course)</b>			
<b>Course Code- BSS-626</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Have knowledge about the verbal and non-verbal reasoning which help them to crack competitive exams at the National as well as State level.	2,4,5,1	R,U,Ap,An,E,C
CO-2	Enhance their reasoning skills.	2,4,1	U,Ap
<b>Course Title- Functional Hindi (Interdisciplinary Course)</b>			
<b>Course Code- BSS-631</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO-1	Enhance their communication skills in Hindi as it is used as official language in various services.	1,2,4	R,U,Ap,An
CO-2	Understand the core social and cultural aspects of Indian Society through glimpses of Hindi literature.	1,2,4	U,Ap,An



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### BACHELOR OF BUSINESS ADMINISTRATION (BBA)

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Programme Specific Outcome (PSOs)

<b>PSO-1</b>	This programme develops the ability to define, analyse and find the solutions for different business problems and use logical reasoning patterns for evaluating information, materials, and data for practical implementation.
<b>PSO-2</b>	Provides communication skill to solve specific business problems and decision making.
<b>PSO-3</b>	Apply ethical principles and commitments towards professional ethics and responsibility.
<b>PSO-4</b>	To function effectively as a member, leader, individual or group in diverse environment.
<b>PSO-5</b>	To develop ability to conceptualize a complex issue into a coherent written statement and oral presentation and to communicate effectively on complex activities with technical community.
<b>PSO-6</b>	Provides an opportunity for the students to gain practical exposure towards the workplace and various kinds of business organisation.
<b>PSO-7</b>	Promotes entrepreneurship skills by providing understanding of the fundamentals of creating and managing innovations and new business developments
<b>PSO-8</b>	Enhances ability to demonstrate technical competence in specifically domestic and global arena of business through the study of major disciplines related to the field of business.

COURSE OUTCOMES (COs)	
Semester-I	
<b>Course Title : Basic Accounting</b>	<b>Course</b>





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<b>Course: BBA-103</b>			
Sr. No.	On the completion of the course, Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Get an insight on various basic aspects of Accounting.	1,2,3,5,6,7,8	R,U, Ap, An
CO2	Understand accounting concepts, tools and techniques influencing business organizations.	1,2,3,4,6	U, Ap, An, E, C
CO3	Understand accounting procedure, maintenance of subsidiary books and final accounts.	1,2,4,5,7,8	U, Ap, An, E, C

<b>Course Title : Business Organisation &amp; System</b>			<b>Course</b>
<b>Course: BBA-104</b>			
Sr. No.	On the completion of the course ,Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the basics of Business Organization, analyse the components and objectives of business, role of business in the present-day society, trade, industry and commerce, concepts of Co-operative societies and sole proprietorship.	1,2,3,4,6,7,8	R,U,Ap,An
CO2	Analyse and apply requisites of an ideal form of business organization.	2,3,4,6,7,8	R, U, Ap,An,E
CO3	Understand the forms of business organizations, evaluate Partnership Firm and the concept of Company.	1,2,4,5,6	U, Ap, An, E, C
CO4	Understand the importance and role of Stock Exchanges and commodity exchange	1,2,4,5,6,7,8	U, Ap, An, E, C

<b>Course Title : Managerial Economics-I</b>			<b>Course Course: BBA-105</b>
Sr. No.	On the completion of the course ,Students will be able to:	PSOs Addressed	Cognitive Levels



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CO1	Understand the economic problems and correlate scarcity with the needs.	1,2,3,5,7	R,U,Ap,An,E
CO2	Evaluate demand and analyse costs in order to optimise cost production combinations.	1,2,4,6,8	U, Ap,An
CO3	Recognize the forms of existing markets, their features and determination of price which help them in taking appropriate decisions in business.	1,2,4,5,7,8	U, Ap, An, E, C

Course Title : Computer Applications For Business BBA-106		Course Course: CS-	
Sr. No.	On the completion of the course, Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Use word processors, spreadsheets and presentation software.	1,2,5,7	U, R, Ap
CO2	Understand and create a database using MS Access.	6,7,8	U,R, An
CO3	Describe the features and functions of the categories of application software.	1,2,4	U, Ap, An, E, C
CO4	Understand the dynamics of office environment	1,2,4,6	U An, An, E, C
CO5	Demonstrate the ability to apply the application software in an office environment	1,2,6	U, An, E, C

Course Title : Business Communication Course:BBA-107		Course	
Sr. No.	On the completion of the course, Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the communication process and the important 7C's of communication along with the models of communication.	1,2,3,4,5,7	R,U,Ap



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CO2	Understand the organisational communication with respect to formal and informal communication, internal and external communication.	2,4,6,7,8	R, U, Ap,An
CO3	Learn the concept of internal , customer , bank and secretarial correspondence.	1,2,4,5,8	U, Ap, An, E, C

### SEM-II

Course Title : Business Laws		Course	
Course:BBA-203			
Sr. No.	On the completion of the course, Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Get basic knowledge regarding creation of contract.	1,2,4	R,U
CO2	Get a brief idea about the frame work of Indian business law.	2,4,7	R, U, Ap,E
CO3	Get familiarized with case law studies related to business laws.	1,3,4,5,6	U, Ap, An, E, C
CO4	Get acquainted with laws related to Indian Contract Act 1872, Sale of goods Act 1930, and Consumer Protection Act.	3,4,7,8	U, Ap, An, E, C

Course Title : Principles Of Management		Course	
Course:BBA-204			
Sr. No.	On the completion of the course ,Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquire better managerial abilities and develop managerial skills.	1,2,4	R,U
CO2	Get detailed knowledge about the management process and various functions of management.	2,4,5,8	R, U, Ap,C



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CO3	Study the theory of management and manager's role in an organisation	1,2,3,4,7	U, Ap, An, E,
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Course Title : Managerial Economics-II		Course Course: BBA-205	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Improve their way of thinking about problems, issues and decisions related to the economy as whole.	1,2,3,5,6	R,U,Ap
CO2	Become more efficient in dealing with the problems and opportunities related to developing as well as developed economies.	1,2,3,4	R, U, Ap
CO3	Understand the meaning and nature of managerial economics and also the theories of consumer choice	1,2,4,5,7	U, Ap, An, E, C
CO4	Understand meaning and nature of macroeconomics and the concept of inflation	1,2,4,5,6,8	U, Ap, An, E, C
CO5	Understand the various macro-economic indicators.	1,2,4,5,6,7,8	U, Ap

Course Title : Computer Based Accounting System		Course Course: BBA-	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquire basic skills required for entering accounting information into a computerized accounting system	1,2	R,U,Ap,An
CO2	Demonstrate an understanding of accounting theory, reports and records.	1,2,4,5,6,7,8	R, U, Ap,E,C





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CO3	Utilize an application software to perform accounting tasks; maintain records , prepare and analyze reports for a business entity.	1,2,4,5,6,7	U, Ap, An, E, C
CO4	Work with well-known accounting software i.e. Tally Prime	1,2,3,4,7,8	U, Ap, An, E, C

Course Title : Fundamentals Of Banking 207		Course Course:BBA-	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Get fundamental knowledge of banking as service and bank as an institution.	1,2,3,4,6,7	R,U,Ap
CO2	Understand the practical aspects of banking such as functioning of negotiable instruments, their endorsement, clearing house and entries in pass book.	1,2,4,6,8	R, U, Ap,E,C
CO3	Learn the role of RBI in Indian economy along with the structure of banking system with respect to unit banking, chain banking, mixed banking, group banking and investment banking.	1,2,4,5,7,8	U, Ap, An, E, C

### SEM-III

Course Title : Statistics For Business Course Course:BBA-303			
Sr. No.	On the completion of the course,Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Become familiar with various statistical and mathematical tools and techniques	1,2,3,4,6,7,8	R,U,Ap,An



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CO2	Understand the applications of statistical techniques in the business world for increasing their work efficiency in corporate world.	1,2,4,5,6	U, Ap,An,E,C
CO3	Understand the application of Correlation and Regression Analysis and Probability Distributions: Binomial, Poisson and Normal Distribution.	1,2,4,5,7,8	U, Ap, An, E, C

**Course Title : Fundamentals Of Human Resource Management**      **Course Course:BI 304**

Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand various aspects of the management of human resources, their interaction in the execution of managerial functions.	1,2,3,4,5	R,U,Ap,E,C
CO2	Acquire skills required for the utilization and development of these resources for efficient execution of organizational functions.	2,4,3,6,7,8	U, Ap
CO3	Develop understanding about human resource policies	1,2,4,5,6,7	U, Ap, An, E, C
CO4	Gain insights on recruitment methods	3,4,5,6,7,8	U, Ap, An, E, C
CO5	Compare and contrast various types of training methods	2,4,5,6,8	U, Ap, An, E, C

**Course Title : Fundamentals Of Marketing Management**      **Course Course:BBA-305**

Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the relevant functional areas of marketing management and their applications.	1,2,3,4,5	R,U,Ap,U



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CO2	Become aware about the fundamentals of marketing which enable them to take better marketing decisions.	1,2,4,5,7,8	U, Ap,U
CO3	Understand about competitive strategies for market leader and various aspects of market.	1,2,4,5,6,7,8	U, Ap, An, E, C

Course Title : Indian Financial System		Course	
Course:BBA-306			
Sr. No.	On the completion of the course, Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Learn the structure and functions of the Indian financial system.	1,2,6,7	R,U,Ap,E,C
CO2	Understand the functioning of financial markets and government security market in the development of Indian financial system.	2,4,5,6,8	U, Ap,E,C
CO3	Evaluate the functioning of different financial institutions and financial instruments.	1,2,4,5,7,8	U, Ap, An, E, C

Course Title : Management Accounting		Course Course:BBA-307	
Sr. No.	On the completion of the course, Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand application of Management Accounting and its various tools.	1,2,4,5,6,7	R,U,Ap
CO2	Make inter-firm and inter-period comparison of financial statements.	3,4,5,6,7,8	U, Ap,An
CO3	Gain financial understanding using Ratio Analysis.	1,2,4,5,6,7	U, Ap, An, E, C
CO4	Compute working capital requirements.	1,2,3,4,6,7,8	U, Ap, An, E, C



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Course Title : Financial Management		Course Course: BBA-403	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1.	Understand the applicability of the concept of Financial Management to understand the managerial decisions and Corporate capital structure	1,4,5,6	Ap,C
CO2.	Apply the Leverage and EBIT EPS analysis associated with financial data in the corporate	6,8	U,Ap
CO3.	Demonstrate how the concepts of financial management and investment, financing and dividend policy decisions could integrate while identifying and solving the problems pertaining to business	1,5,7,8	U,Ap,An
CO4	Analyse the complexities associated with the management of cost of funds in the capital structure	5,6	U,Ap,An,E

#### SEM-IV

Course Title : Production and operations Management		Course Course: BBA-404	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Appreciate the strategic role of operations management in creating and enhancing a firm's competitive advantage.	1,5	R,U
CO2	Apply analytical skills and problem-solving tools to resolve the operational issues.	6,7,8	U,Ap,An
CO3	Analyze business processes for improvement.	1,5,7,8	Ap,An,C,E





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Course Title : Business Environment		Course Course: BBA-405	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the concept, significance and changing dimensions of business environment and various tools for scanning the environment	1,5,8	R,U
CO2	Gain insights on the role of economic systems, economic planning, government policies, public sector and development banks, economic reforms, liberalization and its impact on business.	5,6	Ap,An,E
CO3	Analyse the importance, impact of changing laws and regulations on a business firm, impact of socio-cultural environment and its relevance for a business firm	6,7	U,An,E
CO4	Learn about various economic policies like fiscal policy, monetary policy and FEMA.	1,6,7,8	U,An,E

Course Title : Operations Research		Course Course: BBA-406	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the concept and scope of operation research.	1,5	R,U
CO2	Understand the dynamics associated with linear programming like its formulation and solution by using graphic method and simplex method.	6,7,8	U,Ap



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<b>CO3</b>	Solve assignment problems, transportation problem, sequencing problems, the concept of game theory and PERT/CPM models.	<b>1,6,7,8</b>	<b>U,Ap,An,E</b>
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<b>Course Title : Fundamentals of Insurance</b>		<b>Course Code: BBA-407</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Gain knowledge about various risks and techniques of identifying, measuring and managing the risk of life and health.	<b>1,7,8</b>	<b>U,Ap</b>
<b>CO2</b>	Become familiar with different types of insurance and its modalities and get overview on insurance industry.	<b>6,7</b>	<b>An,Ap</b>
<b>CO3</b>	Understand various principles, governance mechanism of IRDA and provisions that govern the insurance sector.	<b>1,6,7,8</b>	<b>U,Ap,An,E</b>

<b>Course Title: Seminar</b>		<b>Course Code: BBA-408</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Gain Practical knowledge and presentation skills required for managerial positions.	-	-
<b>CO2</b>	Become familiar with different aspects of business and commerce	-	-

### SEM-V

<b>Course Title : Company Law</b>	<b>Course Code: BBA-503</b>
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Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Learn the basic concepts of companies act, 2013, the procedure and formation of the company along with the information about various documents required to form a company such as memorandum of association, article of association, prospectus etc	1,5,6,8	U,E
CO2	Understand the provisions associated with the appointment, removal, disqualifications of directors, essential elements and provisions of company meetings and modes of winding up of company	1,7,8	U,E
CO3	Get understanding of the different laws and clauses relating to company law .	1,6,7,8	U,An
CO4	Handle legal matters of business.	5,6,8	U,Ap,An,E,C

Course Title :Entrepreneurship and Small Business		Course Course:BBA-504	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquire basic understanding of Entrepreneurship and Small Businesses and appreciate their role in an economy	1,2,6	R,U,Ap
CO2	Develop an understanding of entrepreneurship and small business management by studying entrepreneurial strategies, the identification and pursuit of new venture opportunities and the development of business plans.	6,7,8	U,An



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<b>CO3</b>	Explain factors related to readiness for entrepreneurship and getting started in entrepreneurship career.	<b>2,6,7,8</b>	<b>U,Ap,An,E</b>
<b>CO4</b>	Demonstrate knowledge of Identifying key legal issues for small business.	<b>7,8</b>	<b>U,Ap,An,E,C</b>

<b>Course Title : Cost Accounting</b>		<b>Course Course:BBA-505</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Understand various costs on the basis of elements, behaviour and functions. It helps in ascertaining the cost of material, labour and overhead .They also study the basic concepts and processes used to determine product costs,interpret cost accounting statements, evaluate information for cost ascertainment, planning, control and decision making.	<b>1,6,7</b>	<b>U</b>
<b>CO-2</b>	Understand various techniques of costing like Contract, Process, Standard and Marginal ;and analyse the cost of both person and operation which help in preparation of budget and implementation of budgetary actions.	<b>1,7,8</b>	<b>U,Ap</b>
<b>CO-3</b>	Analyze the requisite data and fix the price of products manufactured and services rendered	<b>1,6,7,8</b>	<b>U,Ap,An,E,C</b>
<b>CO-4</b>	Learn how to act as Cost accountant, administrators, appraisers, secretarial consultants, Tax consultants, advisors in company matters etc. and they will be able to find opportunities in Management of public & private sector enterprises, Financial institutions , All India Cost Accounts Service (ICAS) , Teaching , Consultancy and Independent practice.	<b>6,7,8</b>	<b>Ap,An,E,C</b>





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Course Title : Consumer Behaviour		Course Course: BBA-511	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Identify the major influences in consumer behaviour	1,5	R,U
CO2	Distinguish between different consumer behaviour influences and their relationships	6,7,8	U,Ap,An
CO3	Establish the relevance of consumer behaviour theories and concepts to marketing decisions	5,7,8	Ap,An,E
CO4	Implement appropriate combinations of theories and concepts	7,8	U,Ap,An,E,C
CO5	Identify the major influences in consumer behaviour	3,6,7	Ap, An ,E

Course Title : Advertising & Sales Management		Course Course: BBA-512	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Describe different types of advertisements and identify key players in advertising industry.	1,8	R,U
CO2	Discuss the ethics in advertisement. Identify and make decisions regarding the most feasible advertising appeal and media mix.	6,7	U,Ap,An
CO3	Conduct pre-testing, post testing and concurrent testing of ads to determine their effectiveness.	1,6,7,8	R,U,Ap,An
CO4	Describe different types of sales persons and explain the steps involved in sales force management	6,7,8	U,Ap,An,E,C
CO5	Identify the dealer oriented promotion techniques, customer oriented promotion	1,6,8	Ap,E,C



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	techniques and the salesmen oriented promotion techniques.		
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Course Title : Industrial Relations & Labour Legislations		Course Course: BBA-521	
Sr. No.	On completion of the course, the students shall be able to:	PSOs Addressed	Cognitive Levels
CO1	Describe fundamental concepts and nature of Industrial Relations.	1,6	R,U
CO2	Understand the nature and role of trade unions for workers and industries	1,6,7	R,U,Ap
CO3	Study the relevance of collective bargaining and its impact on employee-management relations	1,6,7,8	U,Ap,E
CO4	Understand industrial disputes and ways to resolve them.	7,8	U,Ap,An,E,C

Course Title : Organisation Change And Development		Course Course: BBA-522	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Gain knowledge about organizational development process	1,8	R,U, Ap
CO2	Understand the process of change in any organizations.	1,6,7	U,Ap, E
CO3	Have better understanding of the changed management model.	1,6,7,8	U,Ap,An,E
CO4	Develop skills needed to advance an action plan for the development process.	7,8	Ap,An,E,C
CO5	Have better understanding of change resistance and learn methods to handle it	1,8	An,E,C



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Course Title : Management Of Banking Operations		Course Course:BBA-531	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the Origin and the growth of the Indian Banking System	1,5	R,U
CO2	Remember broad functions of RBI.	1,6,7	R,U,Ap
CO3	Analyze the functions of e-service in Modern Banking.	6,7,8	R,U,Ap,An
CO4	Classify the different types of Bank Accounts	5,6	U,Ap,An,E,C
CO5	Understand the concept of endorsement and its Kinds	1,5,6	U,An,E,C

Course Title : Insurance & Risk Management		Course	
Course:BBA-532			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Prepare themselves for a successful career in the risk management and insurance industry.	1,8	R,U,Ap
CO2	Gain insight on the role of insurance intermediaries and functions of insurers in emerging markets.	6,7	U,Ap
CO3	Learn the concepts of fire, marine, property and liability insurance etc.	1,6,7,8	R,U,Ap,An
CO4	Develop understanding about pricing of insurance products, private and foreign insurance players in India.	1,7,8	U,Ap,An,E,C

Course Title : International Business Environment		Course Course:BBA-541	
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Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1.	Explain the concepts in international business with respect to foreign trade/international business	1,6	R,U
CO2.	Apply the current business phenomenon and to evaluate the global business environment in terms of economic, social and legal aspects	6,7,8	U,Ap,An
CO3.	Analyse the principle of international business and strategies adopted by firms to expand	5,6,7,8	Ap,An,E
CO4.	Integrate concept in international business concepts with functioning of global trade	7,8	Ap,An,E,C

**Course Title :Management Of International Business Organisations** Course  
**Course:BBA-542**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Discuss the impact of globalization on countries, business and their citizens.	1,8	R,U
CO2	Analyse the political, legal, socio/cultural environment of multinational organisations in order to develop competitive strategies	6,7,8	U,Ap,An
CO3	Evaluate the impact of internationalisation on company strategies and on the mode of entry chosen by multinational organisation	7,8	Ap,An,E,C
CO4	Understand and analysing International Accounting issues.	1,6,7,8	U,Ap,An,E,C

### SEM-VI

**Course Title :Income Tax** Course  
**Course Course:BBA-603**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
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CO1	Provide an overview about the fundamental concepts of Income Tax Law	6,8	R,U
CO2	Compute the total income of the assessee from five heads of income.	6,7	R,U,Ap
CO3	Understand the provisions and procedure involved in computing total income and liability of individual and firm assessee.	1,6,7,8	R,U,Ap,An
CO4	Enhance knowledge about various deductions and eligibility to avail it.	7,8	U,Ap,An,E,C

**Course Title :Fundamentals of Capital Market****Course****Course:BBA-604**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the functions and working of the components and intermediaries of the financial system and how they are linked to each other.	1, 6,7,8	R,U
CO2	Gain familiarity of the Indian Capital Markets and the various Market Instruments introduced by the system for investment and tax savings.	1,3	U,Ap
CO3	Understand the various derivative instruments and enhance the theoretical and practical knowledge on role of depositories in Indian financial system.	1,6,8	U,Ap,An

**Course Title: VIVA-VOCE****Course Code:BBA-****605**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Gain Practical knowledge and enhance orientation skills required for various managerial positions.	-	-



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CO2	Gain insights on different aspects Commerce and industry.	-	-
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Course Title : Service Marketing			Course
Course: BBA-611			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquire the basic understanding of service marketing and its process and describe the opportunities and challenges offered by this sector.	1, 6,8	R,U
CO2	Demonstrate an extended understanding of the similarities and differences in service-based and physical product based marketing activities	6,7	U,Ap
CO3	Understand and identify Concept of Services and intangible products	1,6	R,U,Ap,An
CO4	Demonstrate a knowledge of the extended marketing mix for services	2, 7,8	U,Ap,An,E,C

Course Title :E-Marketing			Course Course: BBA-612
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Enhance knowledge and skills to understand the techniques of E-Marketing in the emerging competitive markets.	1,6,7	R,U
CO2	Learn the necessary skills and knowledge to develop E-Marketing Strategies.	6,8	R,U,Ap,C
CO3	Get conceptual knowledge of E-Marketing and will be able to differentiate between Traditional and E-Marketing.	1,4,7,8	R,U,Ap,An



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Course Title : Training & Development 621		Course Course: BBA-	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Gain insights on Training and Development methods	1,2,4	R,U
CO2	Compare and contrast various types of training methods	5,6,7	R,U,Ap
CO3	Improve concepts and skills required for utilization and development of these resources for efficient execution of organizational functions	1,6,7,8	R,U,Ap,An,C

Course Title: Contemporary Issues In Human Resource Management Course Course: BBA-622		Course Course: BBA-	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand various aspects of the management of human resources, their interaction in the execution of managerial functions.	1,6,8	R,U
CO2	Improve concepts and skills required for utilization and development of these resources for efficient execution of organizational functions.	6,7	R,U,Ap,C
CO3	Understanding about contemporary human resource policies	1,7,8	R,U,Ap,An
CO4	Gain insights on contemporary recruitment methods	2,3,7,8	U,R

Course Title : Security Analysis And Portfolio management 631		Course Course: BBA-	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels



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<b>CO1</b>	Provide a theoretical and practical background in the field of investments	<b>1,3</b>	<b>R,U</b>
<b>CO2</b>	Be Equipped with the knowledge of security analysis and measuring the portfolio performances.	<b>6,7</b>	<b>R,U,</b>
<b>CO3</b>	Design and manage the various sources of finances by valuing all financial instruments	<b>1,6,7,8</b>	<b>Ap,An,C</b>
<b>CO4</b>	Learn about investment avenues in less risk and more return securities.	<b>1,2,8</b>	<b>U,Ap</b>

<b>Course Title : Contemporary Issues In Accounting</b>		<b>Course Course:BBA-632</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Understand the criticism of Historical cost accounting and alternatives of Historical cost accounting.	<b>1,6,8</b>	<b>R,U</b>
<b>CO2</b>	Identify Current cost accounting features, advantages and disadvantages.	<b>6,7</b>	<b>U,Ap</b>
<b>CO3</b>	Understand the need and Concept of Human Resources Accounting	<b>1,6,7,8</b>	<b>U,An</b>
<b>CO4</b>	Identify the Corporate Social Responsibility, Social Accounting and inflation accounting	<b>3,4, 7,8</b>	<b>U,Ap</b>

<b>Course Title : Export Import Management &amp; Documentation</b>		<b>Course Course:BBA-641</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>





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<b>CO1</b>	Explain the concepts of trade documentation in international business with respect to foreign trade	<b>1, 6,8</b>	<b>U</b>
<b>CO2</b>	Apply the current business phenomenon and evaluate the global business environment in terms of economic, social and legal aspects	<b>2, 3, 6,7</b>	<b>U,Ap</b>
<b>CO3</b>	Analyse the principles of international business and strategies adopted by firms to expand globally.	<b>1,6,7,8</b>	<b>U,Ap,An</b>
<b>CO4</b>	Integrate the concepts of international business with the functioning of global trade	<b>6, 7,8</b>	<b>U,Ap,An,E</b>

<b>Course Title : Global Strategic Management</b>		<b>Course Course: BBA-642</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Understand the concepts of global strategic management , its nature in competitive and institutional landscape	<b>1,2,6,8</b>	<b>U,An</b>
<b>CO2</b>	Describe major theories, concepts and research output in the field of global strategic management.	<b>6,7,8</b>	<b>U,An</b>
<b>CO3</b>	Demonstrate effective application of the concepts, tools and techniques to practical situations for diagnosing and solving organisational problems	<b>3,6,7,8</b>	<b>U,Ap,An,C</b>



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### BACHELORS IN COMMERCE (HONOURS) B.COM (HONS.) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Program Specific Outcomes (PSOs)

**PSO-1:** The curriculum of B.Com. (Hons.) Programme is designed in such a way so that the students can get thorough knowledge about contemporary issues relating to different areas such as Finance, Human Resource Management, Business Economics, Business Statistics, Marketing, Internatinal Business, Indian Economy, Corporate and Business Laws, Insurance, Accounting and Taxation, etc.

**PSO-2:** Through specialised courses, the students will get practical training which help them with their jobs related to banks and companies.

**PSO-3:** The teaching/learning pedagogies used in the programme make the students skilled enough to deliver presentations and communicate information effectively with confidence.

**PSO-4:** The programme is helpful in developing the attitude of entrepreneurship by instilling in students the competencies and entrepreneurial skills needed for starting their own business or for them to become self employed.

**PSO-5:** The students become technologically updated as the programme has courses like Computerised Accounting System and Computer Applications. This helps them in using software and becoming independent in today's world of digitization.

**PSO-6:** After completing this programme, the students get opportunity to pursue higher studies or professional courses such as CA, CS, CMA and appear in other competitive exams.

**PSO-7:** Case studies, seminars, project work are very important part of this program curriculum which enable students to get practical exposure and bridge the gap between industry and academia. It also help them in higher education and research in Finance, Accounting, Commerce and Economics.

**PSO-8:** Students understand the basic statistical techniques which are very very useful for business and economic analysis.

#### COURSE OUTCOMES (COs)

##### Semester-I

Course Title: FINANCIAL ACCOUNTING		Course	Code:
BCG-103			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the nature and purpose of financial statements in relationship to decision making.	1,4,6	R,U



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<b>CO2</b>	Improve their ability to use a basic accounting system to create (record, classify, and summarize) the data needed to solve a variety of business problems.	1,2,4,6	U,Ap
<b>CO3</b>	Gain knowledge of various accounting concepts, conventions and policies developed by ICAI.	1,4,6	U,Ap,An
<b>CO4</b>	Know the techniques, methods and practice of preparing final accounts, voyage accounting, branch accounting and departmental accounting.	1,4,6,7	U,Ap,An,E,C

<b>Course Title: BUSINESS ORGANISATION</b>		<b>Course Code: BCG-104</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Familiarize themselves with theoretical knowledge on management and the various aspects of managing people.	1,3,4,6	R,U,Ap
<b>CO2</b>	Develop the ability to manage, lead and work with other people in managing organizations.	1,2,4,6	U,An,E,C
<b>CO3</b>	Evaluate and improve the behavior of people working in the organization.	1,4,6,7	U,An,Ap,E,C

<b>Course Title: BUSINESS COMMUNICATION</b>		<b>Course Code: BCG-105</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Learn the art of fluent communication.	1,3,6,7	R,U,Ap
<b>CO2</b>	Enhance their speaking, listening as well as writing skills .	1,3,4,6,7	U,Ap,C

<b>Course Title: BUSINESS STATISTICS</b>		<b>Course Code: BCG-106</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Acquire knowledge in descriptive and inferential statistics and it's applications in diverse fields	1,3,6,7,8	R,U,An
<b>CO2</b>	Calculate and interpret the correlation between two variables.	1,6,7,8	U,Ap,An
<b>CO3</b>	Estimate simple linear regression equations, regression coefficients and fit regression model to study relationship between variables	1,7,8	U,Ap,An



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<b>CO4</b>	Demonstrate understanding of the concepts of time series and index numbers and their applications in different areas	1,8	U,Ap,An
<b>CO5</b>	Use the basic probability rules, including the additive and multiplicative laws of probability.	1,8	U,Ap

<b>Course Title: COMPUTER FUNDAMENTALS</b>		<b>Course Code: CS-BCG-107</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Acquire knowledge about computer terminology	1,3,4,5	R,U
<b>CO2</b>	Gain insight on the working of input and output devices.	1,3,4,5	R,U
<b>CO3</b>	Possess the knowledge about the importance of operating system in computer.	1,3,4,5	U
<b>CO4</b>	Understand the concept of storing data in memory and its types.	1,3,4,5	U,C

### Semester: II

<b>Course Title: ADVANCED FINANCIAL ACCOUNTING</b>		<b>Course Code:</b>	
<b>BCG-203</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Gain in-depth technical and conceptual knowledge about advanced accounting topics.	1,2,4,6,7	R,U,Ap
<b>CO2</b>	Understand the accounting procedures at the time of admission, retirement and death of a partner and its dissolution.	1,2,4,6	U,Ap,An
<b>CO3</b>	Become well versed with accounting for Hire Purchase System and Single entry System.	1,2,4,6	U,Ap,C

<b>Course Title: COMMERCIAL LAWS</b>		<b>Course Code: BCG-204</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO-1.</b>	Get basic knowledge regarding creation of contract.	1,4,6,7	R,U,Ap
<b>CO-2.</b>	Get a brief idea about the frame work of Indian Commercial laws.	1,4,6,7	Ap,An
<b>CO-3.</b>	Familiarize themselves with case law studies related to Commercial law.	1,4,6,7	An,E
<b>CO-4.</b>	Get acquainted with laws related to Indian Contract Act 1872, Sale of goods Act 1930, Consumer Protection Act 1986, LLP Act 2008 and RTI Act 2005.	1,4,6,7	U,An





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Course Title: BUSINESS ECONOMICS		Course Code: BCG-205	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Learn about basic concepts related to Business Economics	1,6	U,An
CO2	Gain in depth knowledge about utility analysis, law of demand and indifference curve	1,6,7	U,An,E,Ap
CO3	Understand the theory of production , short run and long run cost concepts	1,6,7	U,An
CO4	Learn about various market forms, their features and equilibrium	1,6,7	U,An,E
CO5	Learn about consumption, National income and related concepts	1,6,7	U,An,E

Course Title: FUNCTIONAL MANAGEMENT 206		Course Code: BCG-	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Familiarize themselves with the basic concepts of management in order to understand the functioning of an organization, its complexities and various issues faced by managers in today's business world.	1,4,6	R,U,Ap
CO2	Gain practical skills, personal attributes and competencies required for managerial position.	1,2,4,6	U,Ap,An
CO3	Compare and contrast classical, neo-classical and contemporary theories of management	1,4,6	Ap,An,E
CO4	Develop insights on organization's structure.	1,4,6,7	U,An
CO5	Examine the role of managers in the changing environment.	1,4	U,An,E

Course Title: SEMINAR 207		Course Code: BCG-	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Gain practical competencies, presentation skills, attributes required for managerial position.	-	-
CO2	Develop insights on various aspects of Commerce and Business.	-	-



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<b>Course Title: PC SOFTWARES IN BUSINESS APPLICATIONS</b>			
<b>Course Code: CS-BCG-208</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Use word processors, spreadsheets, presentation softwares.	1,3,4,5	R,U
<b>CO2</b>	Describe the features and functions of the categories of application software.	1,3,4,5	R,U
<b>CO3</b>	Understand the dynamics of an office environment.	1,3,4,5	U
<b>CO4</b>	Demonstrate the ability to apply application software in an office environment.	1,3,4,5	U,C

<b>Course Title: BANKING AND FINANCIAL SYSTEM</b>			
<b>Course Code: BCH-209</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Gather knowledge on banking and financial systems such as commercial banks and their services in India.	1,2,3	R,U,Ap
<b>CO2</b>	Demonstrate the regulatory framework of banking, Anti money Laundering and KYC norms.	1,2,3,4	U,Ap,An
<b>CO3</b>	Understand various principles and provisions that govern banking companies regarding paying and collecting banker, endorsement and bouncing of cheque.	1,2,3,4,5	U,Ap,E
<b>CO4</b>	Understand various provisions regarding lending such as documentation procedures, priority sector etc.	3,4,5,6	U,Ap,C

<b>Course Title: PRODUCTION MANAGEMENT</b>			
<b>Course Code: BCH-210</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Gain knowledge about managing production processes	2,4	U, Ap
<b>CO2</b>	Learn about how to run operations effectively	1,2,5	U,An, Ap
<b>CO3</b>	Understand modern production techniques	3,5	U,E
<b>CO4</b>	Analyse the concept of quality management	2,3	U, An



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<b>Course Title: PRINCIPLES AND PRACTICE OF LIFE INSURANCE</b>			
<b>Course Code: BCH-211</b>			
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO- 1	Know about the structure of Life Insurance Corporation.	1,2	R, U,An
CO- 2	Distinguish between various Life Insurance Plans	2, 6	R, U, An, E
CO- 3	Understand the concept of ULIP and Group Insurance	1, 6	U, An
CO- 4	Understand the process of life Insurance documentation	1,6,7	U, An
CO- 5	Learn the policy claim procedure	1,2,6,7	U, An, E

<b>Course Title: MANAGEMENT OF INTERNATIONAL BUSINESS OPERATIONS</b>			
<b>Course Code: BCH-212</b>			
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Apply theoretical concepts and analytical tools to analyse cross-border business scenarios and identify opportunities and risks entailed in various international decisions.	1,3	R,U
CO2	Explain the concepts of international business with respect to foreign trade/international business	2,3	R,U,Ap
CO3	Apply the current business phenomenon and evaluate the global business environment in terms of economic, social and legal aspects.	3,4	Ap,An,E
CO4	Analyse the principles of international business and strategies adopted by the firms to enter and expand globally.	1,3,6	U,E,Ap
CO5	Understand trends of global sourcing and Foreign Corrupt Practices Act.	1,2	U,R

### Semester: III

<b>Course Title: CORPORATE ACCOUNTING</b>		<b>Course Code: BCG-303</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>



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CO1	Learn about the accounting treatment in case of issue of share capital, redemption etc.	1,4,6,7	U,Ap,An
CO2	Comprehend with the accounting of a banking company.	1,6,7	U,Ap,An
CO3	Learn about accounting issues related to redemption of debentures and valuation of goodwill and Shares.	1,3,4,6,7	U,An,Ap,E

Course Title: COMPANY LAWS		Course Code:	
BCG-304			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Learn the basic concepts of Companies Act 2013, the procedure and formation of the company along with the information about various documents required to form a company such as Memorandum of Association, Article of Association, Prospectus etc.	1,3,4,6,7	U,Ap
CO2	Understand the provisions associated with appointment, removal, disqualifications of directors, essential elements and provisions of company meetings (AGM, EGM and BOD) and modes of winding up a company.	1,3,4,6,7	U,Ap
CO3	Learn the emerging issues associated with company form of organisations such as OPC, NCLT, LLP, CIN, DIN.	1,3,4,7	U,An,Ap

Course Title: FINANCIAL MANAGEMENT		Course Code:	
BCG-305			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Know both the theoretical and practical role of financial management in business concerns.	1,2,4,5	R, U, Ap
CO2	Explore the financial statements of individual corporations both in terms of their performance and capital requirements.	1,2,4,5	U, An, Ap, E
CO3	Access provides knowledge of long term investment decisions, planning and risk of investment projected with it.	1,2,5	U, An, Ap, E

Course Title: INTERNATIONAL BUSINESS		Course Code: BCG-306	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand and assess emerging issues in international business.	1,4,7	R,U,Ap





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<b>CO2</b>	Evaluate the impact of international business environment on foreign market operations.	1,4,6,7	U,An,E
<b>CO3</b>	Express the importance of foreign trade for Indian economy.	1,4,6,7	U,An,Ap,E

<b>Course Title: INDUSTRIAL LAWS</b>		<b>Course Code: BCG-307</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Understand the provisions and employment under Factories Act 1948.	1,3,4,6,7	R,U,Ap
<b>CO2</b>	Calculation of compensation and the disabilities of workmen.	4,6,7	U,An,E,C
<b>CO3</b>	Analyse disputes and the machineries under Industrial disputes Act 1947.	4,6,7	U,An,Ap
<b>CO4</b>	Gain knowledge about procedure, registration and cancellation of Trade Union.	1,3,4,6,7	U,Ap

<b>Course Title: ELECTRONIC BANKING AND RISK MANAGEMENT</b>			
<b>Course Code: BCG-308</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Learn the basic concepts of online banking such as facilities provided and Security Issues, Cheque Truncation, Microfiche, Phone and Mobile Banking.	1,2,4,5,6	R,U,Ap,An
<b>CO2</b>	Understand the recent trends in information technology such as computer audit, information system audit and impact of technology on banks in detail.	1,2,3,4,5	U,An,E
<b>CO3</b>	Learn the Risk Management Frame work in Banks, Systematic Risk Management in Banks, different Measures of measuring Risks, risk management and its process and techniques for the assessment and management. Along with this the students understand the concept of Asset- liability management in banks.	1,2,4,6	U,An,Ap,E

<b>Course Title: QUALITY MANAGEMENT</b>	<b>Course Code: BCH-309</b>
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Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Explain the meaning of the quality concept and its influence.	2,3,7	Ap, An, C
CO2	Describe, distinguish and use several techniques and quality management tools	4,8,2	U, E, An
CO3	Explain the regulation and the phases of a quality system certification process	2,3,7	R, Ap
CO4	Predict the errors in the measuring process, distinguishing its nature and the root causes.	3,7,8	An, Ap, E

## Course Title: PRINCIPLES AND PRACTICE OF GENERAL INSURANCE

Course Code: BCH-310

Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO- 1	Understand policy documents and forms used in general insurance.	1, 6	R, U, An
CO- 2	Classify and analyze various categories of general insurance products.	1, 6,7	U, An, E
CO- 3	Understand the concept of underwriting, ratings and premiums in general insurance.	2, 6	U, An
CO- 4	Classify and analyze policy claims	1, 6,7	U, An

## Course Title: INDIA'S FOREIGN TRADE

Course Code: BCH-311

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the importance of Foreign Trade in India. and study the new theories of trade with respect to international scenario	1,3	U,R
CO2	Apply appropriate terms of trade mechanism to supervise foreign trade in India.	1,2,3	An, Ap
CO3	Get clear picture about regulatory framework of export/import promotion policies and its related concepts	1,2	U
CO4	Understand the trade promotion institution and export concerns in India and get knowledge on various types of international investment in international trade	2,4,6	An, Ap,E
CO5	Study the Instruments of import policy and the concepts related to imports substitution and restrictions.	7,8	U,E,Ap



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**Semester: IV**

Course Title: GOODS AND SERVICE TAX (GST) 403			Course Code: BCG-
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the tax system in India particularly the GST	1,2,3,5	R,U,Ap
CO2	Gain knowledge regarding the process of valuation, payment and filing of returns in GST to be able to file self-returns.	1,2,3	U,An,E
CO3	Become GST Professional Advisor or/ and consultant.	1,2,3	An,Ap,C

Course Title: INDIAN ECONOMY 404			Course Code: BCG-
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquire understanding about various sectors of Indian economy	1,6	U,An
CO2	Analyse various issues related to Indian agriculture sector	1,6,7	U, An, E
CO3	Get an in-depth understanding about Indian Industrial sector in general and small scale and large scale Industries in particular	1,6,7	U,An, E
CO4	Get an overview on Agricultural marketing and Agricultural prices,	1,6,7	U, An, E
CO5	Acquire knowledge about Industrial Policy Resolutions	1,6,7	U, An,E

Course Title: PRINCIPLES AND PRACTICES OF BANKING AND INSURANCE Course Code: BCG- 405			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Know the basics of Indian Banking system and its structure, various types of accounts in banks, documentation procedure during lending and management and organizational structure of banks in India.	1,3,4,6,7	R,U,Ap



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<b>CO2</b>	Get knowledge about Financial markets and its instruments and recent trends in banking like Merchant banking and E-Banking etc.	1,3,4,7	U,An
<b>CO3</b>	Get basic understanding of the insurance mechanism, various concept of insurance and how it is used to cover risk.	1,3,4,7	U,Ap,E
<b>CO4</b>	Get an overview of major life insurance and general insurance products.	1,3,4,7	U,An,E
<b>CO5</b>	Get familiar with Banking and Insurance sector Regulators (RBI, IRDA) and their rights, powers and guidelines.	1,3,4,7	U,An,Ap

<b>Course Title: COST ACCOUNTING</b>		<b>Course Code: BCG-406</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Understand various costs on the basis of element, behaviour and functions. It helps in ascertaining the cost of material, labour and overhead allocation and to understand the basic concepts and processes used to determine product costs, interpret cost accounting statements, evaluation of information for cost ascertainment, planning, control and decision making.	1,4,6,7	R,U,Ap
<b>CO2</b>	Understand various techniques of costing like Contract, Process, Standard and Marginal and Analyse the cost of both person and operation which helps in the preparation of budget and implementation of budgetary actions.	14,6,7	U,An,Ap
<b>CO3</b>	Analyze the requisite data and fix the price of products manufactured and services rendered	1,4,6,7	U,An,Ap,E,C
<b>CO4</b>	Act as Cost accountant, administrators, appraisers, secretarial Consultants, tax consultants, advisors in company matters etc. and be able to find opportunities in the management of public & private sector enterprises, financial institutions, All India Cost Accounts Service (ICAS) ,teaching , consultancy and independent practice.	1,4,6,7	An,Ap,C

<b>Course Title: SEMINAR</b>		<b>Course Code: BCG-407</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>





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CO1	Gain practical competencies, presentation skills and attributes required for managerial position.	-	-
CO2	Develop insights on various aspects of commerce and business.	-	-

Course Title: ACCOUNTING FOR BANKERS		Course Code:	
BCH-408			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the basic concepts of business mathematics, interest calculation, annuity calculation and EMI calculation.	1,2,3,6	R,U,Ap
CO2	Evaluate Capital Budgeting Projects with different techniques.	1,2,3,6	U,An,Ap,E
CO3	Understand accounting in banks and branches including rules for bank accounts, account books, accounting for NPA, final accounts of banking companies and bank reconciliation statement.	1,2,6	U,An,Ap,E,C
CO4	Have clear knowledge about inventory valuation, bill of exchange, lease and hire purchase and ratio analysis.	1,2,6	U,An,Ap,E,C

Course Title: PROJECT EVALUATION AND MANAGEMENT		Course Code: BCH-409	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Gain knowledge on essential elements of management	2,3,4	U, Ap, E
CO2	Acquire skill in designing project proposal for various domains.	5,7,8	U,
CO3	Understand and analyze different techniques of project management- financial, technical, environmental and market demand.	2,3,4,5	An, Ap
CO4	Develop the abilities in project evaluation techniques like PERT, CPM etc.,	7,8	Ap, An

Course Title: ACCOUNTING FOR INSURERS		Course Code: BCH-410	
Sr. No.	On the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels



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# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

## Khalsa College Amritsar

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UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

☎ (O) : +91-183-2258097  
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Fax : +91-183-2255619  
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Web : www.khalsacollege.edu.in

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CO- 1	Get knowledge on basic accounting and its concepts such as journal, ledger, subsidiary book, journal proper and bank reconciliation statements.	1, 6	R, U, An
CO- 2	Understand the application of financial management concepts like assets liability management, cash management etc in insurance industry.	1, 6,7	U, An, E
CO- 3	Understand insurance reserves and accounting.	2, 6	U, An
CO- 4	Understand the practical aspects of reinsurance and underwriting in insurance sector.	1, 6,7	U, An

<b>Course Title: INTERNATIONAL FINANCIAL MANAGEMENT</b>			
<b>Course Code: BCH-411</b>			
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Recall and discuss the need of Derivatives market with the changing business scenario and become aware of derivative products like forward contracts, futures contract, etc.	1,4,7,8	R, Ap, C
CO2	Get well versed with various terms related to foreign exchange accounts, foreign exchange quotes and major foreign currencies around the world.	1,4,7,8	Ap, C
CO3	Discuss various risks involved in foreign exchange dealings and management of the risks using various hedging techniques and theories for the determination of foreign exchange rate and the calculation of forward rate and spot rate.	1,4,7,8	U,An



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Semester: V

Course Title: MANAGEMENT ACCOUNTING		Course Code: BCG-503	
Sr. No.	Upon the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Analyze and compare the financial statements of an organization with the help of different ratios and understand ratios to be used in decision making.	1,4,5,6,7,8	An, U, Ap
CO2	Get thorough knowledge on management accounting concepts and techniques such as fund flow and cash flow statements.	1,4,5,6,7,8	U, An, E
CO3	Understand the emerging techniques for analyzing accounting information.	1,4,6,7,8	U, E, Ap, An

Course Title: DIRECT TAX LAWS		Course Code: BCG-504	
Course Title: AUDITING			
Sr. No.	Upon the completion of the course Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Get proper knowledge about direct taxes in India, classification of direct taxes: income tax and under different heads, salient features of methods of auditing.	1,2,6,7	R,U,Ap
CO1	Know the concepts of auditing, types and methods of auditing.	1,2,6,7	R,U,An
CO2	properly know profits and gains from business & profession and capital gains	1,2,6,7	U, An,Ap
CO2	Compute income under various heads namely income from salaries, house property, business/ profession, capital gains and income from other sources.	1,2,4,6,7	U,Ap
CO3	Learn about preparation of different methods & auditors responsibility regarding depreciation and reserves	1,2,6,7	U,An,Ap,E
CO4	Know various deductions under Chapter VIA of the Income tax act 1961	1,2,4,6,7	U,An, Ap
CO4	Comprehend knowledge about appointment of different types of auditors, their rights and duties and the recent trends in Auditing.	1,2,6,7	U,An
CO5	Compute the net total taxable income of an individual.	1,2,4,6,7	U,An
CO5	File their income tax returns and give consultancies in tax related matters	1,2,4,6,7	An,Ap,E,C



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<b>Course Title: SEMINAR REPORT BASED ON PRACTICAL TRAINING</b>			
<b>Course Code: BCH-506</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Gain practical competencies, presentation skills, attributes required for managerial position.	-	-
<b>CO2</b>	Develop insights on various aspects of Commerce and Business.	-	-

<b>Course Title: CONTEMPORARY ACCOUNTING</b>			<b>Course Code: BCG-511</b>
<b>Sr. No.</b>	<b>Upon the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Get acquainted with the emergence of contemporary issues in accounting	1,2,4,5,6,7,8	R,U,An
<b>CO2</b>	Apply different approaches adopted for the valuation of human resources, Price Level Accounting and Corporate Social Reporting	1,2,4,5,6,7,8	An,Ap, E
<b>CO3</b>	Comprehend the conceptual framework of Corporate Reporting in India and recent trends in the presentation of Published Accounts	1,2,3,5,6	U,An,E
<b>CO4</b>	Gain knowledge about the preparation and disclosure of Value Added Statements, Basel Norms, significance and formulation of Accounting Standards in India	1,2,3,4,8	U,An,Ap

<b>Course Title: Financial Market Operations</b>			<b>Course Code: BCG-512</b>
<b>Sr. No.</b>	<b>Upon the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Develop knowledge on financial innovation, advances in technology and changes in regulations having impact on the structure of the financial firms/industry.	1,4,6,7,8	R,U,An





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<b>CO2</b>	Understand contemporary managerial risk management oversight processes and learn about financial services component industries (insurance, banking, securities, real estate and financial planning) interact.	1,4,6,7,8	U, An,Ap, E
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<b>Course Title: BANKING SERVICES MANAGEMENT</b>		<b>Course Code: BCG-521</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Develop an understanding of various services provided by banks.	1,2,3,7	R,U,An
<b>CO2</b>	Gain insights on legal aspects of banking.	1,2,3,7	U, An, Ap
<b>CO3</b>	Update themselves regarding recent trends in banking services in India.	1,2,3,4,7	An,Ap,E

<b>Course Title: INSURANCE SERVICE MANAGEMENT</b>		<b>Course Code: BCG-522</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Explore the life and health insurance organizations and their office administration.	2,3,4	R,U
<b>CO2</b>	Gain insights on the role of insurance intermediaries in emerging markets.	2,3,4	U, An
<b>CO3</b>	Improve their skills to compute the premium amount and handling claims settlement.	2,3,4	An,Ap,E
<b>CO4</b>	Develop understanding about pricing of insurance products.	2,3,4	U,An

<b>Course Title: COMPUTED BASED ACCOUNTING</b>		<b>Course Code: BCG-531</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>



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<b>CO1</b>	Work with well-known accounting software i.e. Tally Prime	1,2,5	R,U,An,Ap
<b>CO2</b>	Learn application software to perform accounting tasks; maintain records and prepare and analyze reports for a business entity.	1,2,5	R, U, Ap
<b>CO3</b>	Demonstrate the basic skills of entering accounting information into a computerized accounting system.	1,2,5	U,Ap, An
<b>CO4</b>	Demonstrate an understanding of accounting theory, reports and records	1,2,5	U,Ap, An
<b>CO5</b>	Work as Data entry operators.	1,2,5	U,An

<b>Course Title: E-COMMERCE</b>		<b>Course Code: BCG-532</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Learn the basic concepts of e-commerce, its challenges, infrastructure, supply chain management, concept of EDI and business models.	1,2,3,4	R, U
<b>CO2</b>	Understand the terms associated with marketing strategies of e-commerce such as search engine, internet advertising and designing website for e-commerce.	1,2,3,4	R, U, An, Ap
<b>CO3</b>	Learn the concept of electronic payment system along with the security issues on electronic payment system and biometrics.	1,2,3,4	U,Ap, An
<b>CO4</b>	Understand the legal and ethical issues in e-commerce.	1,2,3,4	U, An

## Semester: VI

<b>Course Title: OPERATIONS RESEARCH</b>		<b>Course Code: BCG-603</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>



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<b>CO1</b>	Understand the fundamental and elementary aspects of Operations Research	1,2,4,7,8	R, U
<b>CO2</b>	Identify and develop operations research models from the verbal description of the real system	1,2,4,7,8	U, An
<b>CO3</b>	Understand the mathematical tools of Operations Research like Linear Programming Problem, Assignment Problem, Transportations Problem etc. that are required to solve optimization problems	1,2,4,7,8	U, An, Ap,E
<b>CO4</b>	Apply various techniques of Operations Research for effective decision making that enable them to solve business decision problems	1,2,4,7,8	An, Ap,E

<b>Course Title: CORPORATE GOVERNANCE</b>		<b>Course Code: BCG-604</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Demonstrate a solid understanding of the purpose and nature of corporations and the significance of business ethics and corporate governance.	1,3,4,7	R,U
<b>CO2</b>	Understand the relationship of Business Ethics with corporate governance and with globalization.	1,3,4	U,An,E
<b>CO3</b>	Evaluate different stakeholders' roles and their significance in relation to corporate governance.	1,3,4	An,Ap,E
<b>CO4</b>	Explain the corporate governance reforms and corporate governance problems.	1,3,4	U,An
<b>CO5</b>	Evaluate major corporate scandals and codes and standards on corporate governance.	1,3,4	An,Ap,E

<b>Course Title: WORKSHOP ON INCOME TAX AND E-FILING</b>		<b>Course Code: BCG-605</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>



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<b>CO1</b>	Get conceptual understanding about filling of returns and e-filing	1,2,3,4,6	R,U
<b>CO2</b>	Learn different forms like various ITRs, Challan forms relating to income tax and E-filing .	1,2,3,4,6	U,An
<b>CO3</b>	Skilfully understand e-filing registration process as well as registration portal.	1,2,3,4,6	U,An,Ap
<b>CO4</b>	Equip themselves for self-employment and application oriented jobs in government, PSU's, private organizations	1,2,3,4,6	E

<b>Course Title: Bank Marketing</b>		<b>Course Code: BCH-606</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Enrich with concepts of marketing and their application in banking sector.	1,3,8	R,U,An
<b>CO2</b>	Understand various factors to be kept in mind while designing products of banks.	1,3,8	An,Ap,E

<b>Course Title: LOGISTICS AND SUPPLY CHAIN MANAGEMENT</b>			
<b>Course Code: BCH-607</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Develop a sound understanding of the important role of supply chain management in today's business environment	4,7,8	An, Ap, C
<b>CO2</b>	Become familiar with current supply chain management trends, apply the current supply chain theories, understand concepts utilizing case problems and problem-based learning situations	2,4,5	U, E
<b>CO3</b>	Learn to use and apply computer-based supply chain optimization tools including the use of selected state of the art supply chain management softwares currently used in business	1,5,8	An, Ap
<b>CO4</b>	Develop and utilize critical management skills such as negotiating, working effectively within a diverse	5,7,8	C, Ap, E





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business environment, ethical decision making and use of information technology		
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<b>Course Title: INSURANCE MARKETING</b>			
<b>Course Code: BCH-608</b>			
<b>Sr. No.</b>	<b>On the completion of the course Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Know dynamic market environment for insurance in India	1,2	R, U, An
<b>CO-2</b>	Understand various urgent needs and customer segmentation, products, pricing criteria, distribution channels and communication strategy	2, 6	R, U, An, E
<b>CO-3</b>	Understand the market opportunities and challenges	1, 2, 6	U, An
<b>CO-4</b>	Understand industry outlook and major players of Life Insurance	1,6,7	U, An
<b>CO-5</b>	Understand industry outlook and major players of health insurance	1,,7	U, An, E

<b>Course Title: INTERNATIONAL MARKETING</b>			
<b>Course Code: BCH-609</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Apply core theoretical concepts in international marketing to find practical solutions to the constraints of small businesses.	1,2,7	R, U
<b>CO2</b>	Classify strategies for entering export markets from extant knowledge and research and able to understand various regulations and procedures of export import policies.	1,2,	U, An,
<b>CO3</b>	Develop an understanding for the basic international marketing concepts, theories, principles and terminology and become capable of developing a global marketing strategy by applying the basic concepts of product, pricing, promotion and channels of distribution in international settings.	3,6	U, E, An
<b>CO4</b>	Demonstrate an awareness about the the impact of environmental factors (cultural, economic, institutional, legal and political) on international marketing activities.	1,8	Ap, An, E



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CO5	Apply an integrated understanding of the course by conducting an analysis of international marketing issues in relevant case studies and current events and developing corresponding solution options based on multiple perspectives.	1,2,7	Ap, An, E, C
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Course Title: PORTFOLIO MANAGEMENT Course Code: BCG-611			
Sr. No.	Upon the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Develop their own perspectives on the basics of investment and select the optimal investment avenues after measuring its risk and return.	1,2,3,4,6	U,An
CO2	Analyze the selected individual securities through fundamental analysis tools.	1,2,3,4,6	An,Ap,E
CO3	Predict the Market trends for the selected securities using the technical indicators, identify the optimal portfolio and determine the efficient frontier for a portfolio using the theoretical framework.	1,2,3,4,6	U,An,Ap,E,C

Course Title: FINANCIAL SERVICES Course Code: BCG-612			
Sr. No.	Upon the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the concept, importance and contribution of financial services in promoting the industry in India	1,2,3,4,7	R,U
CO2	Comprehend the role and functions of Merchant Bankers in India	1,2,3,4	U,An
CO3	Gain knowledge about the concept, growth and functioning of Mutual Funds in India	1,2,3,4,7	U,An
CO4	Understand the concept and mechanism of factoring, securitization of debt and venture capital	1,2,3,4,8	U,An,Ap



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<b>CO5</b>	Get acquainted with retail banking services including the concept of Plastic Money	1,2,3,4,7	U,An
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**Course Title: FOREIGN EXCHANGE MANAGEMENT**  
**Course Code: BCG-621**

Sr. No.	Upon the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
<b>CO1</b>	Understand different concepts of currency and the trading of different national currencies or units of account.	1,4,7,8	R,U,An
<b>CO2</b>	Learn the concepts regarding exchange rate, the price of one currency in terms of another, which help them to determine a nation's economic health and hence the well-being of the people residing in it.	1,4,7,8	U,An
<b>CO3</b>	Understand the basics of trading, foreign exchange management terminology and words like lot, pip, strike price which are instrumental for the foreign exchange trader. These words provide information to understand the foreign exchange market and enable students to play the role of good investor in foreign exchange transactions in the future.	1,4,7,8	U,An,Ap,E
<b>CO4</b>	Learn about availability of employment opportunities for them by studying about abroad, trading, volume and various other activities.	1,4,7,8	An,E,C
<b>CO5</b>	Learn minutely the basic concepts related to foreign exchange management and International learning and knowledge propels students towards the understanding of an array of different cultural and community perspectives.	1,4,7,8	U,An,Ap,E

**Course Title: RISK MANAGEMENT AND INSURANCE**  
**Course Code: BCG-622**

Sr. No.	Upon the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
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<b>CO1</b>	Get prepared for successful career in the risk management and insurance industry.	1,2,3,4,7	R,U,An
<b>CO2</b>	Gain insights on the role of insurance intermediaries and functions of insurers in the emerging markets.	2,3	R, U, An,Ap
<b>CO3</b>	Learn the concepts of fire, marine, property and liability insurance etc.	2,3,4,7	R,U, An
<b>CO4</b>	Develop understanding about pricing of insurance products, private and foreign insurance players in India.	1,2,3,4,7	U,An,E,C

### Course Title: WINDOWS AND NETWORKING

#### Course Code: CS-BCG-631

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
<b>CO1</b>	Understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.	1,3,4,5	R,U,L
<b>CO2</b>	Understand the main components of an operating systems and their functions.	1,3,4,5	U
<b>CO3</b>	Describe the important computer system resources and the role of operating system in their management policies and algorithms.	1,3,4,5	U
<b>CO4</b>	Evaluate the requirement for process synchronization and coordination handled by operating system.	1,3,4,5	U,C
<b>CO5</b>	Learn to implement advance features of operating system in other various language(s).	1,3,4,5	U,C

### Course Title: E-Marketing

#### Course Code: BCG-632

Sr. No.	Upon the completion of the course Students will be able to:	PSOs Addressed	Cognitive Levels
<b>CO1</b>	Have knowledge and skills to understand the techniques of E-Marketing in the emerging competitive markets.	1,2,3,4,7	R,U,An,Ap
<b>CO2</b>	Learn the necessary skills and knowledge to develop E-Marketing Strategies.	1,2,3,4,7	U,An,Ap,E





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# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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<b>CO3</b>	Get conceptual knowledge of E-Marketing which enables them to differentiate between traditional and E-Marketing.	1,2,3,4,7	U,An,E,C
<b>CO4</b>	Learn various methods of electronic payment systems and and their emerging issues	1,2,3,4,7	U,An,Ap



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## BACHELORS IN COMMERCE (PASS) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

### Program Specific Outcomes (PSOs)

**PSO-1:** To knowledge and skills after completing B.com degree programme which will enable them to become Manager, Accountant, Auditor, Stock Agents, Tax consultant and help in other financial supporting services.

**PSO-2:** To pursue professional programs such as C.A., C.S., CMA as well as other courses, etc.

**PSO-3:** To acquire the knowledge and required skills in the areas of communication, decision making, innovations and problem solving which would be very helpful in tackling their day to day business activities.

**PSO-4:** To gain knowledge about various disciplines of commerce such as Finance, Auditing, Taxation, Accounting, Management, Business Communications, Business Statistics, Business Economics, Indian Economy and Computers.

**PSO-5:** Advanced accounting career skills will enable the students to apply both quantitative and qualitative knowledge to their future business careers.

**PSO-6:** After B.Com, the students can pursue their higher education and can do research in the field of Finance, Accounting, Commerce and Economics.

**PSO-7:** To analyse the contemporary issues and problems of Indian economy, the knowledge of which would help them in clearing competitive exams.

**PSO-8:** To understand basic statistical techniques which would be very useful for business and economic analysis.

### COURSE OUTCOMES (COs)

#### Semester-I

**Course Title: FINANCIAL ACCOUNTING** **Course** **Code:**  
**BCG-103**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
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<b>CO1</b>	Develop and understand the nature and purpose of financial statements in relationship to decision making.	1,2,4,5,6	R,U
<b>CO2</b>	Enhance their ability to use a basic accounting system to create (record, classify, and summarize) the data needed to solve a variety of business problems.	1,2,3,4,5,6	R,U,Ap
<b>CO3</b>	Gain knowledge of various accounting concepts, conventions and policies developed by ICAI.	1,2,3,4,5,6	R,U,Ap,An
<b>CO4</b>	Acquire the techniques, methods and practice of preparing final accounts, voyage accounting, branch accounting and departmental accounting.	1,2,3,4,5	U,Ap,An,E,C

<b>Course Title: BUSINESS ORGANISATION</b>		<b>Course</b>	<b>Code:</b>
<b>BCG-104</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Familiarize with theoretical knowledge in management and the various aspects of managing people.	1,3,4	R,U,Ap
<b>CO2</b>	Manage, lead and work with other people in managing organization.	1,2,3,4	U,An,E,C
<b>CO3</b>	Evaluate and improve the behavior of people working in the organization.	1,2,3,4,6,7	U,An,Ap,E,C

<b>Course Title: BUSINESS COMMUNICATION</b>		<b>Course</b>	<b>Code:</b>
<b>BCG-105</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Learn the art of fluent communication.	1,2,3,4	R,U,Ap



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CO2	Enhance the speaking, listening as well as writing skills.	1,2,3,4,6	U,Ap,C
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Course Title: BUSINESS STATISTICS		Course Code: BCG-106	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquire knowledge in descriptive and inferential statistics and it's applications in diverse field	4, 6, 8	R, U,An
CO2	Calculate and interpret the correlation between two variables.	4, 6, 8	U,Ap, An
CO3	Estimate simple linear regression analysis, regression coefficients and fit regression model to study relationships between variables	4, 6, 8	U,Ap, An
CO4	Demonstrate understanding of concepts of time series and index numbers and it's applications in different areas	4, 6, 8	U,Ap, An
CO5	Use the basic probability rules, including additive and multiplicative laws.	4, 6, 8	U,Ap

Course Title: COMPUTER FUNDAMENTALS 107		Course Code: CS-BCG-107	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Acquire the computer terminology	1,3,4,5	R,U,L
CO2	Gain insight of working of input and output devices.	1,4,5	R,U,L
CO3	Possess the knowledge of importance of operating system in computer.	1,4,5	R,U,L
CO4	Understand the concept of storing of data in memory and its types.	1,3,4,5	R,U,L,C





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### Semester: II

Course Title: <b>ADVANCED FINANCIAL ACCOUNTING</b>		Course Code:	
<b>BCG-203</b>			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Gain in-depth technical and conceptual knowledge of advanced accounting topics.	1,2,3,4,5,6	R,U,Ap
CO2	Understand the accounting procedures at the time of Admission, Retirement and Death of a partner and its Dissolution.	1,2,3,4,5,6	U,Ap,An
CO3	Know accounting for Hire Purchase System, Single entry System.	1,2,3,4,5,6	U,Ap,C

Course Title: <b>COMMERCIAL LAWS</b>		Course Code:	
<b>BCG-204</b>			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO-1.	Acquire basic knowledge regarding creation of contract.	3,4	R,U,Ap
CO-2.	Gain a brief idea about the frame work of Indian Commercial law.	3,4,6	Ap,An,c
CO-3.	Familiarize with case law studies related to Commercial law.	3,4,6	An,E,C
CO-4.	Understand laws related to Indian Contract Act ,1872, Sale of goods Act,1930, and Consumer Protection Act,1986,LLP Act,2008, RTI Act,2005.	3,4,6	U,An,C

Course Title: <b>BUSINESS ECONOMICS</b>		Course Code:	
<b>BCG-205</b>			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels



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CO1	Learn about basic concepts related to Business Economics	1,4, 6	U,An
CO2	Gain in depth knowledge about utility analysis, law of demand, and indifference curve	1,4, 6	U,Ap, An,E
CO3	Understand theory of production and short run,long run cost concepts	1,4, 6	U, An
CO4	Learn about various market forms, their features and equilibrium	1,4, 6	U, An, E
CO5	Learn about consumption, National income and related concepts	1,4, 6	U, An, Ap, E

<b>Course Title: FUNCTIONAL MANAGEMENT</b>		<b>Course Code:</b>	
<b>BCG-206</b>			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Get familiar with the basic concepts of management in order to understand the functioning of an organization, its complexities and various issues faced by managers in today's business world.	1,2,3,4	R,U,Ap
CO2	Gain practical skills and personal attributes and competencies required for managerial position.	1,2,3,4	U,Ap,An
CO3	Compare and contrast classical, neo-classical and contemporary theories in management	2,3,4	Ap,An,E
CO4	Develop insights on organization structure.	1,2,3,4,6	U,An
CO5	Examine the role of managers in changing environment.	1,2,3,4,6	U,An,E,C

<b>Course Title: SEMINAR</b>		<b>Course Code: BCG-</b>	
<b>207</b>			
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Gain practical competencies, presentation skills, attributes required for managerial position.	-	-
CO2	Develop insights on various aspects of Commerce and Business.	-	-



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<b>Course Title: PC SOFTWARES IN BUSINESS APPLICATIONS</b>			
<b>Course Code: CS-BCG-208</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Use word processors, spreadsheets, presentation software.	1,3,4,5	R,U,L
CO2	Describe the features and functions of the categories of application software.	1,3,4,5	R,U,L
CO3	Understand the dynamics of an office environment.	1,3,4,5	R,U,L
CO4	Demonstrate the ability to apply application software in an office environment.	1,3,4,5	R,U,L,C

### Semester: III

<b>Course Title: CORPORATE ACCOUNTING</b>			<b>Course Code: BCG-303</b>
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Learn about the accounting treatment in case of issue of share capital, redemption etc.	1,2,4,5,6	U,Ap,An
CO2	Understand the accounting of a banking company.	1,2,4,5,6	U,Ap,An
CO3	Learn about accounting issues related to redemption of debentures and valuation of goodwill and Shares.	1,2,4,5,6	U,An,Ap,E

<b>Course Title: COMPANY LAWS</b>			<b>Course Code: BCG-304</b>
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
CO1	Study the basic concepts of Companies Act, 2013, the procedure and formation of the company and various documents required to form a company such as Memorandum of Association, Article of Association, Prospectus etc.	1,2,4,5,6	R,U,Ap



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<b>CO2</b>	Understand the provisions associated with appointment, removal, disqualifications of directors and essential elements and provisions of company meetings (AGM, EGM and BOD) and modes of winding up of company.	1,2,4,5,6	R,U,Ap
<b>CO3</b>	Learn the emerging issues associated with company form of organisation such as OPC, NCLT, LLP, CIN, DIN.	1,2,4,5,6	U,An,Ap,C

<b>Course Title: FINANCIAL MANAGEMENT</b>		<b>Course Code:</b>	
<b>BCG-305</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Know both the theoretical and practical role of financial management in business concerns.	1,2,3,4,5,6	R, U, Ap
<b>CO2</b>	Explore the financial statements of individual corporations both in terms of their performance and capital requirements.	3,4,5,6	U, An, Ap, E
<b>CO3</b>	Know long term investment decisions, planning and risk of investment projected with it.	1,2,3,4,5,6	U, An, Ap, E

<b>Course Title: INTERNATIONAL BUSINESS</b>		<b>Course Code: BCG-306</b>	
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Understand and assess emerging issues in international business.	3,4,6	R,U,Ap
<b>CO2</b>	Evaluate the impact of international business environment on foreign market operations.	3,4,6	U,An,E
<b>CO3</b>	Express the importance of foreign trade for Indian economy.	3,4,6	U,An,Ap,E
<b>Course Title: INDUSTRIAL LAWS</b>		<b>Course Code:</b>	
<b>BCG-307</b>			
<b>Sr. No.</b>	<b>On completion of this course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Understand the provisions and employment under Factories Act 1948.	1,2,3,4,5	R,U,Ap





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<b>CO2</b>	Calculate compensation and the disabilities of workmen.	1,2,3,4,5	R,U,An,E,C
<b>CO3</b>	Analyse disputes and the machineries under Industrial disputes Act 1947.	1,2,3,4,5	U,An,Ap
<b>CO4</b>	Gain knowledge about procedure, registration and cancellation of Trade Union.	1,2,3,4,5	R,U,Ap

**Semester: IV**

Course Title: GOODS AND SERVICE TAX (GST) Code: BCG-403			Course
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
<b>CO1</b>	Know the tax system in India particularly GST	1,2,3,4,6	R,U,Ap
<b>CO2</b>	Acquire the knowledge regarding the process of Valuation, payment and filing of returns in GST so that students will be able to file self-returns.	1,2,3,4,6	U,An,E
<b>CO3</b>	Become a GST Professional Advisor or/ and consultant.	1,2,3,4,5,6	U,An,Ap,E,C

Course Title: INDIAN ECONOMY BCG-404			Course Code:
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
<b>CO1</b>	Acquire understanding about various sectors of the Indian economy	6, 7	U,An
<b>CO2</b>	Analyse various issues related to Indian Agriculture sector	6, 7	U, An, E
<b>CO3</b>	Get an in-depth understanding about Indian Industrial sector, in general and small scale and large scale Industries in particular	6, 7	U, An, E



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<b>CO4</b>	Get an overview of Agricultural Marketing and Agricultural Prices,	6, 7	U, An, E
<b>CO5</b>	Acquire knowledge about Industrial Policy Resolutions	6, 7	U, An, E

**Course Title: PRINCIPLES AND PRACTICES OF BANKING AND INSURANCE**  
**Course Code: BCG-405**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
<b>CO1</b>	Know the basics of Indian Banking system and its structure, various types of Accounts in Banks, documentation procedure during lending and management and organizational structure of Banks in India.	1,2,3,4,6	R,U,Ap
<b>CO2</b>	Get an in-depth knowledge on Financial markets and its instruments and recent trends in banking like Merchant banking and E-Banking, etc.	1,2,3,4,6	U,An
<b>CO3</b>	Understand the insurance mechanism that will explains the concept of insurance and how it is used to cover risk.	1,2,3,4,6	R,U,Ap,E
<b>CO4</b>	Get an overview on major life insurance and general insurance products.	1,2,3,4,6	U,An,E
<b>CO5</b>	Get familiar with regard to Banking and Insurance sector Regulators (RBI, IRDA) and their Rights, Powers and guidelines.	1,2,3,4,6	R,U,An,Ap

**Course Title: Cost Accounting**

**Course Code: BCG-406**

Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
<b>CO1</b>	Understand the various costs on the basis of element, behaviour and functions. It helps in ascertaining the cost of material, labour and overhead allocation and to understand the basic concepts and processes used to determine	1,2,3,4,5	R,U,Ap



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UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

☎ (O) : +91-183-2258097  
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Fax : +91-183-2255619  
Pin : 143002 (Pb.) India

e-mail : khalsacollegeamritsar@yahoo.com

Web : www.khalsacollege.edu.in

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♦ NAAC REACCREDITED "A" GRADE (CGPA) ♦ STAR STATUS CONFERRED BY DBT, NEW DELHI ♦ AN ISO CERTIFIED COLLEGE ♦

	product costs, interpret cost accounting statements, evaluation of information for cost ascertainment, planning, control and decision making.		
CO2	Understand the various techniques of costing like Contract, Process, Standard and Marginal and Analyses the cost of both person and operation.	1,2,3,4,5,6	U,An,Ap
CO3	Analyze the requisite data and fix the price of products manufactured and services rendered	1,2,3,4,5,6	U,An,Ap,E,C
CO4	Act as Cost accountant, Administrators, Appraisers, Secretarial Consultants, Tax Consultants, Advisors in company matters etc.	1,2,3,4,5	U,An,Ap,E,C

<b>Course Title: SEMINAR</b>		<b>Course Code: BCG-407</b>	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Gain practical competencies, presentation skills, attributes required for managerial position.	-	-
CO2	Develop insights on various aspects of Commerce and Business.	-	-

**Semester: V**



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Course Title: MANAGEMENT ACCOUNTING BCG-503		Course Code:	
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Analyze and compare the financial statements of an organization with the help of different ratios and understanding ratios help users in decision making.	1,2,3,4,5	An, U, Ap
CO2	Develop thorough knowledge on management accounting concepts and techniques such as fund flow and cash flow statements.	1,2,3,4,5	R, U, An, E
CO3	Understand the emerging techniques for analyzing accounting information.	1,2,3,4,5,8	U, E, Ap, An

Course Title: DIRECT TAX LAWS BCG-504		Course Code:	
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Get proper knowledge about direct tax in India.	1,2,4	R,U,Ap
CO2	Compute income under various heads namely income from salaries, house property, business/ profession, capital gains and income from other sources	1,2,4	R,U,Ap
CO3	Know various deductions under Chapter VIA of the Income tax act, 1961	1,2,4	R,U,An, Ap
CO4	Compute the net total taxable income of an individual.	1,2,4	R,U,An
CO5	File their income tax returns and give consultancies in tax related matters	1,2,4	An,Ap,E,C





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Course Title: AUDITING		Course Code:	
BCG-505			
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Know the concepts of auditing, types and methods of auditing.	1,2,4,6	R,U,An
CO2	Acquires knowledge about vouching of cash & credit transaction, verification of assets & liabilities.	1,2,4,6	U, An,Ap
CO3	Learn about preparation of different methods & auditors' responsibility regarding depreciation & reserves	1,2,4,6,7	U,An,Ap,E
CO4	Comprehend the knowledge about appointment of different types of auditor, their rights and duties. The Students gain the knowledge about Recent Trends in Auditing.	1,2,4,6,7	R,U,An

Course Title: CONTEMPORARY ACCOUNTING		Course Code:	
BCG-511			
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Get acquainted with the emergence of contemporary issues in Accounting	1,2,3,5,6,7	R,U,An
CO2	Apply the different approaches adopted for the valuation of human resources, Price Level Accounting and Corporate Social Reporting	1,2,4,5,6,7	An,Ap, E
CO3	Comprehend the conceptual framework of Corporate Reporting in India and Recent trends in the presentation of Published Accounts	1,2,4,5,6,7	U,An,E



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<b>CO4</b>	Gain knowledge about the preparation and disclosure of Value Added Statements, Basel Norms, Significance and Formulation of Accounting Standards in India	1,2,4,5,6,7	R,U,An,Ap
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<b>Course Title: Financial Market Operations</b>		<b>Course Code: BCG-512</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course, Students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Develop the knowledge on financial innovation, advances in technology, and changes in regulations had on the structure of the financial firms/industry.	1,3,4,6,7,8	R,U,An
<b>CO2</b>	Understand contemporary managerial risk management oversight processes and learn the financial services component industries (insurance, banking, securities, real estate and financial planning) interact.	1,4,6,7,8	U, An,Ap, E

<b>Course Title: BANKING SERVICES MANAGEMENT</b>		<b>Course Code: BCG-521</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course, Students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Develop an understanding of various services provided by banks.	1,2,3,4,7	R,U,An
<b>CO2</b>	Gain insights on legal aspects of banking.	1,2,3,4,7	R, U, An, Ap
<b>CO3</b>	Update themselves towards recent trends in banking services in India.	1,2,3,4,7	An,Ap,E



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Course Title: INSURANCE SERVICE MANAGEMENT			Course Code:
BCG-522			
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Explore the life and health insurance organizations and their office administration.	1,2,3,4,7	R,U
CO2	Gain insights on the role of insurance intermediaries in emerging markets.	1,2,3,4,7	R, U, An
CO3	Compute the premium amount and handling claims settlement.	1,2,3,4,7	An,Ap,E
CO4	Develop understanding on pricing of insurance products.	1,2,3,4,7	U,An

Course Title: COMPUTED BASED ACCOUNTING			Course Code: BCG-531
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Work with well-known accounting software i.e. Tally Prime	1,4,5,8	R,U,An,Ap
CO2	Perform accounting tasks, maintain records and prepare and analyze reports for a business entity.	1,4,5,8	R, U, Ap
CO3	Demonstrate basic skills in entering accounting information into a computerized accounting system.	1,4,8	U,Ap, An
CO4	Understand accounting theory, reports and records	1,4,8	U,Ap, An
CO5	Work as data entry operators.	1,4,8	U,An



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Course Title: E-COMMERCE		Course Code: BCG-532	
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Learn the basic concepts of e-commerce, its challenges, infrastructure, supply chain management, concept of EDI and business models.	1,6,7	R, U
CO2	Understand the terms associated with marketing strategies of e-commerce such as search engine, internet advertising and designing website for e-commerce.	1,4,6,7	R, U, An, Ap
CO3	Learn the concept of electronic payment system along with the security issues on electronic payment system and biometrics.	1,4,6,7	U,Ap, An
CO4	Will versed in legal and ethical issues in e-commerce.	1,6,7	U, An

### Semester: VI

Course Title: OPERATIONS RESEARCH		Course Code: BCG-603	
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Understand the fundamental and elementary aspects of Operations Research.	1,4,6,7	R, U
CO2	Identify and develop operations research models from the verbal description of the real system.	1,4,6,7,8	R, U, An
CO3	Understand the mathematical tools of Operations Research like Linear Programming Problem, Assignment Problem, Transportations Problem etc.that are required to solve optimization problems.	1,4,6,7,8	U, An, Ap,E
CO4	Apply the various techniques of Operations Research for effective decision making that enables to solve business decision problems.	1,4,6,7,8	An, Ap,E





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Course Title: CORPORATE GOVERNANCE		Course Code: BCG-604	
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Demonstrate a solid understanding of the purpose and nature of corporations and the significance of Business Ethics and Corporate Governance.	1,2,3,4	R,U
CO2	Understand the relationship of Business Ethics with Corporate Governance and with Globalization.	1,2,3,8	U,An,E
CO3	Evaluate different stakeholders' roles and significance in relation to corporate governance.	1,2,7,8	An,Ap,E
CO4	Explain the Corporate Governance Reforms and Corporate Governance Problems.	1,7,8	U,An
CO5	Evaluate major Corporate Scandals and Codes and Standards on Corporate Governance.	1,2,7,8	An,Ap,E

Course Title: WORKSHOP ON INCOME TAX AND E-FILING		Course Code: BCG-605	
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Learn the conceptual understanding about filling of returns and e-filing	1,2,4,6	R,U
CO2	Know different forms like various ITRs, Challanforms relating to Income Tax and E-filing .	1,2,4	R,U,An
CO3	Skillfully understand e-filing registration process as well as registration portal.	1,2,4,6	U,An,Ap
CO4	Attain self-employment and application oriented jobs in Government, PSU's, Private Organizations	1,2,6	E,C

Course Title: PORTFOLIO MANAGEMENT

Course Code: BCG-611



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Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Extract their own perspectives on the basics of investment and to select the Optimal Investment Avenue after measuring its risk and return.	1,4,6,7	U,An
CO2	Analyze the selected individual Securities through Fundamental Analysis tools.	1,4,6,7	An,Ap,E
CO3	Predict the market trends for the select Securities using the Technical Indicators, identify the Optimal Portfolio and the efficient form of Market and determine the Efficient Frontier for a Portfolio using the theoretical framework.	1,4,6,7,8	U,An,Ap,E,C

Course Title: FINANCIAL SERVICES		Course Code: BCG-612	
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Understand the concept, importance and contribution of Financial Services in promoting the industry in India	1,4,6,7	R,U
CO2	Comprehend the role and functions of Merchant Bankers in India	1,4,6,7	U,An
CO3	Gain knowledge about the concept, growth and functioning of Mutual Funds in India	1,4,6,7	R,U,An
CO4	Understand the concept and mechanism of Factoring, Securitization of Debt and Venture Capital	1,4,6,7	R,U,An,Ap
CO5	Get acquainted with Retail Banking Services including the concept of Plastic Money	1,4,6,7	U,An

Course Title: FOREIGN EXCHANGE MANAGEMENT

Course Code: BCG-621

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Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Will versed with the various terms related to foreign exchange markets, foreign exchange quotes and exchange rates.	1,2,6,7,8	U,R,Ap
CO2	Learn about the various risks in foreign exchange dealings and how to manage and hedge those risks.	1,2,6,7,8	U,R,An,Ap
CO3	Gain an insight on the Futures, Swaps and other derivative products and learn about how to manage foreign exchange exposure and Interest Rate risk management.	1,2,6,7,8	An,E

Course Title: RISK MANAGEMENT AND INSURANCE		Course Code: BCG-622	
Sr. No.	Upon the completion of the course, Students will be able to:	PSO's Addressed	Cognitive Levels
CO1	Attain successful career in the risk management and insurance industry.	1,3,4,6	R,U,An
CO2	Gain insights on the role of insurance intermediaries and functions of insurers in emerging markets.	1,3,4,7	R, U, An,Ap
CO3	Learn the concepts of fire, marine, property and liability insurance etc.	1,3,4,6	U, An
CO4	Develop understanding about pricing of insurance products, private and foreign insurance players in India.	1,3,4,7	U,An,E,C

Course Title: : WINDOWS AND NETWORKING		Course Code: CS-BCG-631	
Sr. No.	On completion of this course, the students will be able to:	PSOs Addressed	Cognitive Levels
CO1	Understand the working of an OS as a resource manager,	1,3,4	R,U,L



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	file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.		
<b>CO2</b>	Understand the main components of an OS & their functions.	1,3,4	R,U,L
<b>CO3</b>	Describe the important computer system resources and the role of operating system in their management policies and algorithms.	1,3,4	R,U,L
<b>CO4</b>	Evaluate the requirement for process synchronization and coordination handled by operating system.	1,3,4	R,U,L,C
<b>CO5</b>	Implement advance features of operating system in other various language(s).		

<b>Course Title: E-Marketing</b>		<b>Course Code: BCG-632</b>	
<b>Sr. No.</b>	<b>Upon the completion of the course, Students will be able to:</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels</b>
<b>CO1</b>	Acquire the knowledge and skills to understand the techniques of E-Marketing in the emerging competitive markets.	1,3,4,6,7	R,U,An,Ap
<b>CO2</b>	Learn the necessary skills and knowledge to develop E-Marketing Strategies.	1,3,4,6,7	U,An,Ap,E
<b>CO3</b>	Get conceptual knowledge of E-Marketing and will be able to differentiate between Traditional and E-Marketing.	1,3,4,6,7	U,An,E,C
<b>CO4</b>	Learn various methods of Electronic Payment Systems and various techniques and emerging issues of it.	1,3,4,6,7	U,An,Ap





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### B.Sc. FASHION DESIGNING

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Programme Specific Outcomes (PSOs)

<b>PSO1.</b> The students will have the basic foundation in designing and have the ability to visually represent it by illustrations, photographs, graphics and visual display of merchandise.
<b>PSO2.</b> The students will be able to convert their designs into a garment using appropriate construction techniques.
<b>PSO3.</b> The student will have a strong foundation and understanding of the garment manufacturing process and procedures
<b>PSO4.</b> Students will learn the skills required to become professional through the practical and theoretical study of Textile, apparel, fashion and design.
<b>PSO5.</b> Students will be able to work in a team with a forward- thinking ability to promote their inventive personal design vision through creative work and research.
<b>PSO6.</b> Become globally competitive industry ready graduate through strong industry connect, so as to get employed in worldwide garment and fashion industries.
<b>PSO7.</b> Design and develop the strategies required to manage the garment and fashion industries also able to solve the real time problems related to the above industries.

#### COURSE OUTCOMES (COs)

##### Semester-I

Course title: BASIC OF DESIGN AND ILLUSTRATION

Course Code: BFD 111

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Learn the basic techniques of sketching.	1,2,3	U,Ap,An,C
CO2	know the drawing methods of fashion Figures	1,2,3	U,Ap,An,C,E
CO3	know the sketching methods of different garments and ornaments	2,3	U,E,C
CO4	Find the human body in proportions relevant to fashion illustration	1,2,3	An,C,E,Ap



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<b>CO5</b>	Classify the sketches of clothing items on the Human body	2,3	U,Ap,An,C,E
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**Course title : CONCEPT OF FASHION**

**Course Code: BFD 112**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO 1-</b>	Develop an understanding about Fashion, Fashion terminologies and Fashion forecasting.	1,2,3	U,Ap,An,C
<b>CO2</b>	learn about factors affecting fashion	1,2,3	U,Ap,An,C,E
<b>CO3</b>	Learn the role of social and psychological aspects of fashion	2,3	U,E,C

**Course title :BASIC OF SEWING-I**

**Course Code: BFD 113**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO 1-</b>	Gain Knowledge in Seams and seam Finishes.	2,3	U,Ap,An,C
<b>CO2</b>	Learn about hems and Fullness.	2,3	U,Ap,An,C,E
<b>CO3</b>	Study basic garment construction detail.	2,3	U,E,C
<b>CO4</b>	learn about the parts and functions of sewing machines and tools used for garment Construction	2,3	An,C,E,Ap
<b>CO5</b>	Classify the sketches of clothing items on the Human body	2,3	U,Ap,An,C,E

**Course title :Fiber to Fabric**

**Course Code: BFD 115**

R.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO 1-</b>	Get knowledge of fiber, sources of fiber, their definitions and properties.	1,2,3,6,7	R,U,E



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<b>CO2</b>	Develop understanding regarding the identification and testing parameters of textiles	1,2,3,6,7	U,Ap,C,An
<b>CO3</b>	Study different plants, animals and synthetic fibres as well as different methods to get fabric from yarn	1,2,3,6,7	U,E,C,An
<b>CO4</b>	Get knowledge of yarn science and yarn properties	1,2,3,6,7	U,An,C,E,Ap

### Semester: II

**Course title : TRADITIONAL TEXTILES** **Course Code: BFD 121**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO 1-</b>	Get knowledge of traditional design and motifs of textiles.	1,3,4,6	U,Ap,An,C
<b>CO2</b>	Learn about traditional design and motifs of textiles	1,2,3,4,6	U,Ap,An,C,E
<b>CO3</b>	Explore and bring into practice their ideas through embroidery techniques	2,3,4,6	U,E,C
<b>CO4</b>	Create innovative designs by combining number of stitches and by using creative raw material.	1,2,3	An,C,E,Ap

**Course title : FABRIC CONSTRUCTION** **Course Code: BFD 122**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO 1</b>	Acquire knowledge to identify different kinds of fabrics – composition, weave etc.	1,3,6,4	U,Ap,An,C
<b>CO2</b>	Develop understanding regarding the identification and testing parameters of textiles	1,2,3,4,6	U,Ap,An,C,E
<b>CO3</b>	Understand about different textile materials (Fiber, yarn, fabric, weave)	2,3,4,6	U,E,C



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Course title : BASICS OF SEWING – II			Course Code: BFD 123
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Gain knowledge about the Basic Garment Techniques.	2,3	U,Ap,An,C
CO2	Identify the components in garment Construction.	2,3	U,Ap,An,C,E
CO3	Develop fine motor skills appropriately.	2,3	U,E,C
CO4	Achieve confidence in their sewing skills.	2,3	U,Ap,An,C

### Semester: III

Course title :FASHION DESIGN AND ILLUSTRATION			Course Code: BFD 231
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Enhance their drawing skills and illustrate their ideas in different styles with rendering skills and detailing.	1,3	U,Ap,An,C
CO2	Gain knowledge of rendering textures of fabrics	1,2,	U,Ap,An,C,E
CO3	Draw fashion figures by understanding body proportions	2,3	U,E,C

Course title :COLOUR CONCEPTS & COLOURATION			Course Code: BFD 232
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SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
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CO 1-	Develop practical skills of printing and dyeing.	1,2,3,4	U,Ap,An,C
CO2	Understand the process of making and using different fashion and textile materials.	1,2,3,4	U,Ap,An,C,E
CO3	Develop their ideas in real and use it as per the market demand.	2,3,4	U,E,C

**Course title :PATTERN MAKING AND GARMENT CONSTRUCTION Course Code: BFD 233**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Learn how to prepare fabric for the garment.	1,2,3	U,Ap,An,C
CO2	Learn how to create basic commercial paper patterns and create new designs	1,2,3	U,Ap,An,C,E
CO3	Gain understanding regarding different garment components and their construction	2,3	R,U,E,C
CO4	Learn how to stitch sleeves, necklines and other parts of garments.	1,2,3	U,Ap,An,C,E

**Course title : NEEDLE CRAFT**

**Course Code: BFD 234**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Learn method of surface ornamentations of fabric using different techniques to produce value added products	1,2,3,4	U,Ap,An,C
CO2	Develop practical skills in needle craft techniques.	1,2,3,4	U,Ap,An,C,E

**Course title :KNITTING TECHNOLOGY**

**Course Code: BFD 235**



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SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Understand the basic types and functions of knitting machine.	1,2,3,4	U,Ap,An,C
CO2	Understand the basic types and functions of knitting machine.	1,2,3,4	U,Ap,An,C,E
CO3	Analyse the knitted fabric to find the fabric parameters	1,2,3,4	U,E,C

Semester: IV

Course title: FASHION DESIGN AND ILLUSTRATION (CAD) Course Code: BFD 241

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Perform complex design analysis in short time	1,4,5	U,Ap,C
CO2	Make designs digitally in Coral Draw and Adobe Photoshop	1,4,5	U,Ap,,C
CO3	Develop and conceptualize their designs and creations.	1,4,5	R,U,C

Course title: HISTORY OF COSTUMES		Course Code: BFD 243	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Develop understanding about ancient and contemporary costumes of India and Identify historical periods of clothing and describe how the themes of politics, morality, social issues, the economy, technology, culture, and geography impact society and influence fashion development.	5,6	U,Ap,C,R
CO2	Understand and discuss the fabric, style, color, and fashion terminology used to identify characteristics of fashions of the past and present.	5,6	U,Ap,,C,E,R



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<b>CO3</b>	Compare contemporary designs manufactured in today's apparel industry with their classic style counterparts of past centuries, and predicts or evaluates trends.	5,6	U,E,C
<b>CO4</b>	Evaluate and identify costumes of various periods for authenticity, fit, and appearance on a body in motion when viewing historic/period videos	5,6	U,E,C

**Course title :GARMENT CONSTRUCTION AND DRAPING**

**Course Code: BFD 243**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO 1-</b>	Get knowledge of different garment components.	1,2,3,4	U,Ap,C
<b>CO2</b>	Equip themselves with the knowledge and confidence to respond creatively to design a garment.	1,2,3,4	U,Ap,,C,E
<b>CO3</b>	Understand various draping techniques to create a garment	1,2,3,4	U, E, C

**Course title :FASHION ILLUSTRATION AND APPRECIATION**

**Course Code: BFD 244**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO 1-</b>	Gain knowledge about different designers and their work required in the field of fashion.	1,2,3,6	U,Ap,C
<b>CO2</b>	Conceptualize their ideas and amalgamation of different accessories with the garments.	1,2,3,6	U,Ap,,C,E
<b>CO3</b>	Create stylized figures and innovative fabric textures that enhance their capability as an illustrator	1,2,3,6	U,E,C
<b>CO4</b>	Get the knowledge about designer's brand and logos	1,3,6	U,Ap,C,E



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Course title: PATTERN AND MARKER MAKING ON COMPUTER		Course Code: BFD 245	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Develop commercial paper pattern to meet industry standards	1,2,3,4,7	U,Ap,C
CO2	Conceptualize their ideas and amalgamation of different accessories with the garments.	1,2,3,4,7	U,Ap,,C,E
CO3	Know about the importance of darts and their uses.	1,2,3,4,7	R, U, E, C
CO4	Develop commercial paper pattern to meet industry standards	1,3,4,7	U,Ap,C,E

Semester: V

Course title: Fashion Illustration and Appreciation		Course Code: BFD351	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Develop an approach towards ideation.	1,2,3	U,Ap,C
CO2	Learn to draw fashion figures by understanding body proportions	1,2,3	U,Ap,C,E
CO3	Drape the desired idea of their design onto the fashion figure.	1,2,3	R,U,E,C
CO4	Enhance their rendering skills using different colour mediums.	1,3	U,Ap,C,E

Course title: Draping, Pattern Making and Construction		Course Code: BFD 352	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Get the knowledge of different garment components.	1,2,3	U,Ap,C,An
CO2	Draw fashion figures by understanding body proportions	1,2,	U,Ap,C,E,





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<b>CO3</b>	Understand various draping techniques to create a garment.	1,2,3	R,U,E,C
<b>CO4</b>	Create new designs with basic garments and use them in making designer costumes.	1,3	U,Ap,C,E
<b>CO5</b>	Construct complete garment.	1,2,3	U,Ap,An,C

Course title : CAD (Computer Aided Designing) 353		Course Code: BFD	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO 1-</b>	Gain knowledge about different themes required in the field of fashion.	1,2,3,7	U,Ap,C,An
<b>CO2</b>	Make designs digitally in Coral Draw and Adobe Photoshop.	1,2,3,7	U,Ap,C,E,
<b>CO3</b>	Develop and conceptualize their designs and creations	1,2,3,7	R,U,E,C
<b>CO4</b>	Conceptualize their ideas and amalgamation of different accessories with the garments.	1,3,7	U,Ap,C,E

Course title: Internship for Design and Construction of Garments		Course Code: BFD354	
SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
<b>CO 1-</b>	Understand the different concepts and processes of Apparel Industry.	1,2,3,4,6,7	U,Ap,C,An,R
<b>CO2</b>	Get practical knowledge about the construction of different types of sleeve, collars, yokes, waist bands, frocks etc.	1,2,3,4,6,7	U,Ap,C,E,
<b>CO3</b>	Get knowledge regarding the origin and development of textiles and become aware of the basic textile design concepts and fashion theories.	1,2,3,4,6,7	R,U,E,C



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<b>CO4</b>	Understand different concepts and processes of Apparel Industry.	1,3,4,6,7	U,Ap,C,E
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<b>Course title : Leather Technology</b>		<b>Course Code: BFD355</b>	
<b>SR.NO</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO 1-</b>	Get knowledge about leather technology..	1,2,3,6	U,An,R
<b>CO2</b>	Develop practical skills of leather.	1,2,3,6	U,R,A

### Semester: VI

<b>Course title : Fashion Illustration and Appreciation</b>		<b>Course Code: BFD 361</b>	
<b>SR.NO</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO 1-</b>	Gain knowledge about different designers and their work required in the field of fashion	1,2,3	U,Ap,C,An,R
<b>CO2</b>	Conceptualize their ideas and amalgamation of different accessories with the garments.	1,2,3	U,Ap,C,E,
<b>CO3</b>	Create stylized figures and innovative fabric textures that enhance their capability as an illustrator	1,2,3	R,U,E,C
<b>CO4</b>	Get knowledge about designer's brand and logos.	1,3	U,Ap,C,E

<b>Course title : Pattern Making and Construction</b>		<b>Course Code: BFD 362</b>	
<b>SR.NO</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO 1-</b>	Create basic garments for adults	2,3	U,Ap,C,An,R



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<b>CO2</b>	Create new designs with basic garments and use them in making designer costumes	2,3	U,Ap,C,E,
<b>CO3</b>	Gain the understanding regarding different garment components and their construction.	2,3	R,U,E,C
<b>CO4</b>	Stitch sleeves, necklines and other parts of garments	2,3	U,Ap,C,E
<b>CO5</b>	Construct complete garments	2,3	R,U,E,C

<b>Course title : Computer Aided Designing</b>		<b>Course Code: BFD-363</b>	
<b>SR.NO</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO 1-</b>	gain knowledge about different themes required in the field of fashion	1,7	Ap,C,An,R
<b>CO2</b>	Make designs digitally in Coral Draw and Adobe Photoshop.	1,7	Ap,C
<b>CO3</b>	Develop and conceptualize their designs and creations	1,7	R,UC,Ap
<b>CO4</b>	Conceptualize their ideas and amalgamation of different accessories with the garments.	1,7	U,Ap,C,

<b>Course title : Survey and Project Report</b>		<b>Course Code: BFD364</b>	
<b>SR.NO</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
<b>CO 1-</b>	Gain knowledge about different themes required in the field of fashion	5,6	U,Ap,C,An,R
<b>CO2</b>	Demonstrate the various opportunities in the Textile field.	5,6	U,Ap,C,E,
<b>CO3</b>	Relate their theoretical knowledge with the application domain of the Textile processing/ weaving/ Spinning/ Knitting/ garment industry	5,6	U,E,C,Ap



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Sr. No.	On Completing the course, the students will be able to:				
CO 1	This course will outfit members with the essential information on CorelDraw Graphics Suite.			1	U,Ap
CO 2	Toward the finish of the course, understudies will be comfortable with the CorelDraw work area, tools, boards, and fundamental methods and understand the strategies of making and controlling vector (plan) articles, shapes and variety fill.			1	U
CO 3	They can likewise work with imaginative text for the making of logos, marks and any other one-page print plan material.			1	Ap
CO 4	With the assistance of the apparatuses, you can add an extraordinary level of layered impact and wealth to your drawings			1	Ap
CO 5	Work on Corel Draw, Vector Graphics, Color Palette and Pasteboard.			1	C

**Course Code : Fashion Industry, Marketing and Management      Course Code: BFD365**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1-	Use basic buying management methods to meet the needs of a simulated retail Market.	6,7	U,C,R
CO2	Evaluate relevant data in order to determine a Suitable assortment of merchandise.	6,7	U,C,
CO3	Work effectively and productively as a team members in order to negotiate and achieve a desired outcome	6,7	R,C,U





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## B.Sc. (Information Technology) Program Specific Outcomes (PSOs) & Course Outcomes (COs)

### PROGRAM SPECIFIC OUTCOMES (PSOs):

<b>PSO-1</b>	To widen the understanding of computing technologies and covers high level concept that enable the effective management and planning of IT project and services.
<b>PSO-2</b>	To gain understanding about techniques, technologies and methods used in managing and implementing information technology systems.
<b>PSO-3</b>	To gain technical specializations, management and planning of IT project and services.
<b>PSO-4</b>	To develop and analyze quality computer applications by applying knowledge of software engineering, algorithms, programming, databases and networking.
<b>PSO-5</b>	To identify and utilize the state-of-the-art tools and techniques in the design and development of software products and solutions.
<b>PSO-6</b>	To gain practical experience in shipping real world software, using recent industry standard tools and collaboration techniques will equip to secure and succeed in IT industry.
<b>PSO-7</b>	To develop an ability to communicate effectively with a range of audiences, develop written and oral presentations of information technology solutions appropriate for a wide range of audiences.

### COURSE OUTCOMES (COs)

#### Semester: I

<b>Course Title: Fundamentals of Computer</b>		<b>Course Code: BIT-111</b>	
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>



Estd. 1892

# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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CO1	Describe the usage of computers and why computers are essential components in business and society.	1,2	R,U,Ap,C
CO2	Solve common problems using appropriate Computer Fundamentals.	1,2	Ap,U,An,E
CO3	Identify categories of programs, system software and applications. Organize and work with files and folders.	3,4,5,6	Ap,An,E,C
CO4	Describe the important computer system resources and the role of operating system in their management policies and algorithms.	2,3,5	Ap,An,E

Course Title: Introduction to Programming C		Course Code: BIT-112	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use the fundamentals of C programming in trivial problem solving.	2,3,4	R, U, C
CO2	Apply skill of identifying appropriate programming constructs for problem Solving.	5,6,7	Ap, E
CO3	Enhance skill on problem solving by constructing algorithms.	3,5,6	An, R, U
CO4	Identify solution to a problem and apply control structures and use defined functions for solving the problem.	1,2,5	R, U, E



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<b>Course Title: Applied and Discrete Mathematics</b>			
<b>Course Code: BIT-113</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Evaluate basic logic statements using compound statements, implications, inverses, converses, and contra positives using truth tables and the properties of logic.	1,2,3	R, U, E
CO2	Develop ability of conversion of logic sentence in terms of predicates, quantifiers, and logical connectives.	3,4,5	Ap, An
CO3	Learn to use various matrix operations such as matrix addition, multiplication, transpose, inverse and calculation of rank of matrix.	5,6,7	R, U, C
CO4	Apply the operations of sets, relations and use Venn diagrams to solve real life mathematical.	2,4,5	U, C, An
CO5	Get in-depth knowledge of graph theory from the point of view of problem solving strategy used in game design and assignment problems.	2,4,6	U,Ap,An

<b>Course Title: Practical- PC Computing &amp; C - Language</b>			
<b>Course Code: BIT-114P</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Understand the basic terminology of computers.	1,2,6	R,U



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CO2	Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components.	1,2,3,4	U,E,C
CO3	Understand the difference between an operating system and an application program, and what each is used for in a computer.	2,3,4,5	U, An, Ap, E
CO4	Describe some examples of computers and state the effect that the use of computer technology has had on some common products.	4,5,7	R, Ap, An, E
CO5	Identify the applications of computer in daily life.	2,3,4,5	An, E, C
CO6	Understand the practical concepts of MSWord, MS Excel and MS PowerPoint.	2,3,5,7	U, Ap, E, C
CO7	Develop programming ability in C Language.	3,5,7	U,Ap,E,C

### Semester: II

**Course Title: Principles of Digital Electronics**

**Course Code: BIT-121**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain knowledge on different types of number systems and their conversions in digital electronics.	1,2,3,5,7	R, U, An, E,C
CO2	Use Boolean algebra to minimize and simplify Boolean expressions.	1,2,3,7	E
CO3	Illustrate realization of SOP and POS forms.	3,6	U, R, E,C
CO4	Design of various combinational circuits using logic gates	5,7	Ap, E,C





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CO5	Design and develop sequential circuits using flip flops.	1,2,3	U,An, E
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<b>Course Title: Introduction to Programming -C++</b>			
<b>Course Code: BIT-122</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Use the fundamentals of C programming in trivial problem solving.	1,2,3,4	R,U,E
CO2	Enhance skill on problem solving by constructing algorithms.	3 ,6, 7	U, R, E,C
CO3	Identify solution to a problem and apply control structures and user defined functions for solving the problem.	4,5,7	Ap, E,C
CO4	Apply skill of identifying appropriate programming constructs for problem Solving.	1,2,3	Ap, An, E

<b>Course Title: Numerical Methods &amp; Statistical Techniques</b>			
<b>Course Code: BIT-123</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Understand numerical techniques to find the roots of non-linear equations and solution of system of linear equations.	1,2,3,4	E
CO2	Apply numerical methods to obtain approximate solutions to mathematical problems.	3 ,6	U, R, E,C
CO3	Understand the difference operators and the use of interpolation.	4,5,7	U, E,C
CO4	Analyses and evaluate the accuracy of common numerical methods	1,2,3	U,An, E



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CO5	Interpret calculation and errors in numerical method.	4,6	E,C
CO6	Write mathematical solutions and their interpretation in a clear and concise manner.	1,2,3	U,An, E

**Course Title: Practical- C++Programming Language****Course Code:BIT-124P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use C++ more effectively.	1,2,3,4	R,U,E
CO2	Learn to think more analogously, creatively as well as comparatively.	1,3,6	U, R, E,C
CO3	Develop better software development skills in other language too.	4,5,7	U, E,C
CO4	Review Programming in C and become aware of the limitation of C, thereby, understand the need of the origin of C++.	1,2,3	U, An, E
CO5	Raise their programming level in C++to be able to apply it in the real life.	4,6	E, C
CO6	Get knowledge to use the concept of Object-Oriented Programming approach in their programming skills.	1,2,3	U, An, E
CO7	Get knowledge on the implementation of various features of C++i.e. concept of Object, Object communication, Encapsulation, Data hiding, overloading, etc.	1,2,3,4	E
CO8	Acquire in depth knowledge and develop software in C++.	5,6	U, R, E,C
CO9	Understand how to do programming in C++environment.	4,5,7	U, E,C
CO10	Understand and implement the concepts of object-oriented approach using C++.	1,2,3	U,An, E



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CO11	Identify different class attributes, member functions, base class and derived class and their relationships among them.	3,6	E,C
CO12	Learn how to reuse the code using polymorphism.	1,2,4	U, R, E
CO13	Solve real-life existing problems using the features of C++.	1,2,3	U, R, E
CO14	Develop software/big and complex programs for a complex problem.	5,6	E,C
CO15	Implement advance features of object-oriented approach in other various language(s).	1,2,4	U,An, E, C

### Semester: III

<b>Course Title: Introduction to Python</b>			
<b>Course Code:BIT-231</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Acquire knowledge on Python's basic concepts, such as, Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types, Control structures, and Iterations.	1,2,3	R, U, An, E
CO2	Understand the concepts of recursion, list, and functions.	2,3, 6	U, E,C
CO3	Develop applications using object oriented approach	1,2,4	U, R, E, Ap
CO4	Implement real word applications using top down approach.	1,2,3	Ap, An, E
CO5	Make database connectivity in Python programming language.	5,6	E,C



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<b>Course Title: Data Structure</b>			
<b>Course Code:BIT-232</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Understand the concept of algorithm complexity and will acquire knowledge about mathematical notations which can be used to measure the algorithm's complexity.	1,2,3, 4	U, R, E
CO2	Comprehend different data structure techniques, such as array, stacks, queue, linked list, trees, and graphs, along with the operations performed on them.	3, 5, 6	E, C
CO3	Understand the memory representation of the above mentioned data structures.	1,2,4, 6	U, R, E
CO4	Apply linear search and binary search techniques in real word applications to identify the particular element.	1,2,3	Ap, R, E
CO5	Get knowledge about different sorting algorithms along with their time complexities.	5,6	E,C, An

<b>Course Title: System Analysis &amp; Design</b>			
<b>Course Code: BIT-233</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Identify and describe the phases of the system development life cycle.	3, 4	U, R, E
CO2	Conduct study on existing systems, develop and evaluate system requirements.	2, 3, 5, 6	E, C
CO3	Make the feasibility study about the system and decide whether the system is feasible or not.	1,2,4, 6, 7	U, R, E





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CO4	Use tools and techniques for process and data modeling.	1,2,3	Ap, R, E
CO5	Develop and deliver a Requirements Definition Proposal for a new system to client.	5,6	E,C, An

### Course Title: Programming Lab I (Python Programming Language)

Course Code:BIT-234P

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Read, write, and execute simple Python programs.	1, 2, 3, 4,5	U, R, E
CO2	Write simple Python programs for solving problems.	2, 3, 5, 6	E, C
CO3	Decompose a Python program into functions, lists etc.	1,2,4, 6, 7	U, R, E
CO4	Read and write data from/to files in Python Programs.	1,2,3	Ap, R, E
CO5	Underline the use of package.	5,6	E,C, An

### Course Title: Programming Lab – II (Data Structure)

Course Code: BIT-235P

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Implement the real world applications by making use of linear data structure, such as, arrays, stacks, queues, linked lists, trees and graphs, to handle the data stored in computer's memory.	1,2,4, 6, 7	U, R, E
CO2	Perform the implementation using non-linear data structure, such as, trees and graphs.	1,2,3	Ap, R, E



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CO3	Perform traversing, insertion, and deletion operations on the above mentioned data structures.	5,6	E,C, An
CO4	Perform the search operations by making use of suitable search technique.	1, 2, 3, 4,5	U, R, E
CO5	Sort the data by using different sorting techniques and assess the time requirement of the available sorting techniques.	2, 3, 5, 6	E, C

### Semester: IV

**Course Title: Database Management System**

**Course Code: BIT-241**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Describe the fundamental elements of relational database management systems.	1,2,3	U, An, E
CO2	Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.	4,6	E, C
CO3	Design ER-models to represent simple database application scenarios.	1,2,3	U, An, E
CO4	Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.	1,2,3,4	R, U, E
CO5	Gain knowledge to improve the database design by normalization.	5, 6	U, R, E,C

**Course Title: Computer Architecture**

**Course Code: BIT-242**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Describe basic organization of computer.	1,2,4, 6, 7	U, R, E



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CO2	Demonstrate control unit operations and conceptualize instruction level parallelism.	1,2,3	Ap, R, E
CO3	Demonstrate and perform computer arithmetic operations.	5,6	E,C, An
CO4	Categorize memory organization and explain the function of each element of a memory hierarchy.	1, 2, 3, 4,5	U, R, E
CO5	Identify and compare different methods for computer I/O mechanisms.	2, 3, 5, 6	E, C

<b>Course Title: Java Programming</b>			
<b>Course Code: BIT-243</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the concept of OOPs as well as the purpose and uses principal of inheritance, polymorphism in encapsulation and method overloading.	1, 2, 3, 4,5	U, R, E
CO2	Identify classes, objects, members of a class and the relationship among them which is needed for a specific problem.	3, 5, 6	An, Ap, E, C
CO3	Create a java applications and programs using sound oops practices	1, 2, 3, 4,5	U, R, E
CO4	Develop programs using the java collection API as well as the java standard class library.	2, 3, 5	R, U, E, C
CO5	Develop and understand exception handling.	2, 5, 6	R, An, E, C

<b>Course Title: Compiler Design</b>			
<b>Course Code: BIT-244</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level



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CO1	Study the lexical, syntactic and semantic structures of high-level language codes.	1,2,3	U, An, E
CO2	Learn about compiler generation tools and techniques.	4,6	E, C
CO3	Understand the applications of Regular Expressions, finite state machines and context free grammars in design of compilers.	1,2,3	U, An, E
CO4	Know about importance of code optimization.	1,2,3,4	R, U, E
CO5	Understand memory management both in the compiler and in the generated code.	5,6	U, R, E,C

**Course Title: Programming Lab – I (Oracle)**

**Course Code: BIT-245P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain knowledge on Databases and their design & development.	1,2,4, 6, 7	U, R, E
CO2	Develop intellectual Cognitive/ analytical skills: Normalization of Databases.	1,2,3	Ap, R, E
CO3	Develop practical Skills, using SQL and PL/SQL.	5,6,7	E,C, An
CO4	Develop transferable skills: Usage of DBMS design and administration.	4,5,6	U,R,An,Ap, C

**Course Title: Programming Lab – II (Java)**

**Course Code: BIT-246P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Apply the basic constructs for developing java programs.	1,2,3	Ap, U, An, E





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CO2	Construct the applications incorporating inheritance and polymorphism features.	5, 4,6	E, C
CO3	Implement inter-process communication by utilizing the concept of threads.	2,3, 4	U, An, E, C
CO4	Develop applications capable of handling exceptions.	3,4,5	Ap, R, U, E
CO5	Implement the concept of file handling.	5 ,6,7	U, Ap, An, C

### Semester: V

**Course Title: Computer Networks**

**Course Code: BIT-351**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the concepts of data communication and networks, TCP/IP and OSI reference models.	1,2,3	Ap, U, An, E
CO2	Discuss the process of Multiplexing, switching and transmission media in networks.	5, 4,6	E, C
CO3	Understand the services of data link layer and protocols.	2,3, 4	U, An, E, C
CO4	Understand multiple access protocols and Ethernet	3,4,5	Ap, R, U, E
CO5	Know about the services of network layer, transport layer and application layer.	5 ,6,7	U, Ap, An, C

**Course Title: Operating System**

**Course Code: BIT-352**



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# ਖਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

## Khalsa College Amritsar

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Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.	1,2,3,4	R, U, E
CO2	Understand the main components of an OS & their functions.	1,2,3	U, An, E
CO3	Describe the important computer system resources and the role of operating system in their management policies and algorithms.	4,6	E, C
CO4	Evaluate the requirement for process synchronization and coordination handled by operating system.	1,2,3	U, An, E
CO5	Implement advance features of object-oriented approach in other various language(s).	1,2,3,4	R, U, E
CO6	Describe and analyse the memory management and its allocation policies.	5,6	U, R, E,C
CO7	Identify use and evaluate the storage management policies with respect to different storage management technologies.	1,2,3	U, An, E
CO8	Identify the need to create the special purpose operating system	4,6	E, C
CO9	Understand the concepts and implementation, memory management policies and virtual Memory.	1,2,3	U, An, E
CO10	Understand various issues in Inter Process Communication (IPC) and the role of OS in IPC.	1,2,3,4	R, U, E
CO11	Understand the process management policies and scheduling of processes by CPU.	5,6	U, R, E,C



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<b>Course Title: Web Development Using PHP</b>			
<b>Course Code: BIT-353</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Design and develop websites in PHP.	1,2,3,4	R, U, E
CO2	Understand about database connectivity used for fetching data from servers.	1,2,3,5	U, An, E
CO3	Get placements in IT companies as a Website designer/developer.	3,4	R, U, E
CO4	Get placed in IT companies as many leading websites and projects are based on PHP and MySQL.	5 ,6,7	U, R, E,C
CO5	Become freelancer website designers/developers.	1,2,3	U, An, E

<b>Course Title: Lab – I Computer Networks and Operating System</b>			
<b>Course Code: BIT-354P</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.	1,2,3	U, An, E
CO2	Understand the main components of an OS & their functions.	1,2,3	U, An, E
CO3	Describe the important computer system resources and the role of operating system in their management policies and algorithms.	1,2,3,4	R, U, E
CO4	Evaluate the requirement for process synchronization and coordination handled by operating system.	5 ,6	U, R, E,C



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CO5	Implement advance features of operating system in other various language(s).	1,2,3	U, An, E
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<b>Course Title: Lab-II PHP</b>			
<b>Course Code: BIT-355P</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Design and develop websites in PHP.	1,2,3,4	R, U, E
CO2	Gain ability to implement client-server model.	5,6	U, R, E,C
CO3	Understand about basics of database, SQL operations and connectivity of PHP with MYSQL used for fetching data from servers in practical way.	2,3,7	U, R, E
CO4	Get hands on training in website designing and logic development using PHP and MySQL which help them to get placement in IT companies.	4,5	U, An, E,C
CO5	Work as freelancer website designers/developers	6,7	U, Ap, C

### Sem VI

<b>Course Title: Computer Graphics</b>			
<b>Course Code: BIT-361</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the different areas and applications of Computer Graphics.	1,2,3,4	R, U, Ap
CO2	Get knowledge on the fundamental computer graphics algorithm.	1,2,3,5	U, An, E





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CO3	Get knowledge on designing and developing 2D and 3D objects using programs.	3,4	R, U, C
CO4	Understand the different geometric transformations on graphic objects and apply them in composite form.	5 ,6,7	U, An, E,C
CO5	Learn different projections and visible surface detection techniques.	1,2,3	U, An, E
CO6	Use of Line Clipping algorithms to extract lines.	4 ,5,7	Ap, R, E,C

**Course Title: Internet Applications and E-Business**

**Course Code: BIT-362**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Describe how to define internet, www and various protocols	1 ,2,6,7	U, R, E
CO2	Demonstrate an understanding of working of internet.	1,2,3,4	U, E
CO3	Create email id and use it for sending online mails and attachments.	3,4 ,6	Ap, R, E,C
CO4	Judge which connection they should use for getting an internet at home or work.	2,3,7	U, R, E
CO5	Analyse the impact of E-commerce on business models and strategy.	4,5	U, An, E,C
CO6	Understand the foundation and importance of E-commerce.	3,6,7	U, Ap, C
CO7	Describe Internet trading relationships including Business to Consumer, Business-to Business, Intra-organizational.	4,5 ,6	U,An, E,C
CO8	Discuss legal issues and privacy in E-Commerce and assess electronic payment systems.	2,3,7	U, Ap, E



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<b>Course Title: Lab (Applications of Computer Graphics in C/C++ and HTML)</b>			
<b>Course Code: BIT-363P</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Learn the concept of raster and random scans.	1,2,3,4,6	U, R
CO2	Implement the algorithms for 2D primitives: Line and Circle drawing.	1, 2,3,7	U, R, E, Ap
CO3	Implement different line clipping algorithms.	4, 5 ,6	U, Ap, An,C
CO4	Apply various 2D and 3D transformation techniques (Translation, Rotation, Scaling, Reflection and Shearing).	2,3,6,7	U, Ap, E
CO5	Study the implementation of different types of Projections (Parallel and Perspective).	5 ,6	Ap, An, E,C

<b>Course Title: Project</b>			
<b>Course Code: BIT-364P</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Design and develop a software module or website.	1,2,3,4,6	U, R, E
CO2	Opt for software/website development field to build their career.	3,7	U, An, E, Ap
CO3	Work as freelancer to build solutions of various programming and/or website development related problems.	3, 4 ,6	Ap, An,C
CO4	Deploy the database enabled dynamic websites/projects on servers in practical point of view.	1, 2,3,6,7	U, Ap, E
CO5	Get excellent placements in various multinational companies.	2,3, 5 ,6	Ap, An, E,C



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<b>B.Sc. ECONOMICS</b>	
<b>Program Specific Outcomes (PSOs) &amp; COURSE OUTCOMES (COs)</b>	
<b>PSO-1</b>	To understand the basic terms, concepts and principles of economics alongwith statistics.
<b>PSO-2</b>	To learn data presentation, various statistical and mathematical techniques, which are used in economic analysis.
<b>PSO-3</b>	To understand various macroeconomic theories like consumption, investment, banking, money, international trade, economic development and public finance.
<b>PSO-4</b>	To gain knowledge on the concepts and basic theories related to consumer behaviour, producer behaviour and market structure.
<b>PSO-5</b>	To learn about various problems of Indian economy and latest developments in the economy during post globalization era
<b>PSO-6</b>	To understand the fundamental concepts of mathematics and develop problem solving skills, innovative thinking and creativity.
<b>PSO-7</b>	To prepare students to pursue higher studies in mathematics and motivate them towards research in mathematics and related fields.
<b>PSO-8</b>	To gain knowledge on computer fundamentals , information technology and computer oriented numerical and statistical methods methods
<b>PSO-9</b>	To get proficient in computer programming like C, C++, Python, Database management system and oracle
<b>COURSE OUTCOMES (COs)</b>	

### Semester I

<b>Course Title: Micro Economics</b>		<b>Course code :BECO-1120</b>	
<b>S. No</b>	<b>On completing the course, the students will be able to:</b>	<b>PSO'S addressed</b>	<b>Cognitive levels</b>
CO- 1	Learn about various definitions of Economics and the basic concepts related to Economics	1,4	U,R
CO- 2	Gain in depth knowledge on consumer behaviour	1,4	U,R



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CO- 3	Understand theory of production , costs and revenue	1,3,4	U, Ap,AN
CO- 4	Learn about various market forms, their features and equilibrium	3,4	U, AN,E
CO- 5	Understand theories of distribution	1,3	U, Ap, AN

Course Title: Quantitative Techniques- I		Course code :BQT-1121	
S. No	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO- 1	Understand basic mathematical techniques like linear equations, quadratic equations, arithmetic progression, geometric progression etc.	1,2	U,An,C
CO- 2	Learn about advanced mathematical techniques like differentiation, limits and continuity, set theory etc.	1,2	U,An,E
CO- 3	Apply these mathematical techniques in different areas of economics, as these techniques have a wide range of economic applications	2,4	U,Ap,An,
CO- 4	Develop their reasoning ability	1,2,5	U,Ap, C
CO- 5	Use these quantitative techniques to find solutions to economic and business problems.	4,5	U, Ap, An,

Course Title: Algebra

Course Code: MAT-111A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Solve problems based on matrices, vector spaces, eigen roots and eigen vectors	6,7	R,U
CO2	Recognise consistency and inconsistency of linear equations.	6,7	U, An
CO3	Understand the relation between roots and coefficients.	6,7	U, An

Course Title: Calculus and Trigonometry

Course Code:MAT-111B





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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquaint themselves with the limits, functions, derivatives, integrals, and infinite series.	6,7	R, U, Ap
CO2	Associate differential equations with the Mathematical modeling.	6,7	U, An
CO3	Solve multifarious differential equations that relate functions with its derivatives.	6,7	An, E, Ap
CO4	Know about concavity and convexity of the functions, Asymptotes and multiple points of a curve.	6,7	U, C
CO5	Have knowledge about applications in the fields of engineering, physics, economics, and biology	6,7	U,Ap C

### Course Title: Computer Fundamental & Information Technology

Course Code: CSC-111

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the fundamental concepts of computers	8	R,U,Ap,An,E
CO2	Familiarise with operating systems, peripheral devices, networking and internet.	8	R,U,Ap
CO3	Identify the hardware and software concepts, input and output components of a computer system.	8	U,Ap,C
CO4	Demonstrate different communication medias.	8	U,Ap,C
CO5	Learn Information systems, system development life cycle, tools and its applications	8	U,Ap,C



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### Semester II

Course Title: Macro Economics		Course code :BECO-1220	
S. No	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO- 1	Understand and evaluate different theories of income and employment determination	1,2,3	U,R, E
CO- 2	Learn about consumption and investment functions	2,3	U,R, E
CO- 3	Understand the meaning, types, role and functions of money	1,3,4	U,An
CO- 4	Understand the problem of inflation, its causes, effects and solutions in an economy	1,4,5	U, An
CO- 5	Get an overview on fiscal and monetary policy	2,3,4	U, An, E

Course Title: Quantitative Techniques II		Course code :BQT-1221	
S .No	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO- 1	Learn various statistical techniques like Mean, Median, Mode, various measures of Dispersion, correlation etc., the scope of which is very vast and ever expanding.	1,2	U, Ap, An,
CO- 2	Use statistical methods in diverse fields such as business and economics.	2, 4	Ap,An
CO- 3	Pursue higher studies like M A, M. Phil. and Ph.D. where these techniques can be of utmost importance.	4, 5	Ap,An
CO- 4	Understand Index Numbers and Time series techniques which are helpful in understanding the changing trends in economic variables like Inflation, GDP growth rates etc. in a better way	4, 5	U, Ap
CO- 5	Move abroad for further studies as these techniques are generally used in research work/ projects.	2 , 3	Ap,An

Course Title: Calculus and Differential equations

Course Code:MAT-121A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Acquaint themselves with the limits, functions, derivatives, integrals, and infinite series.	6,7	An, E, C
CO2	Associate differential equations with the mathematical modelling.	6,7	Ap, An
CO3	Solve multifarious differential equations that relate functions with its derivatives.	6,7	U, Ap, E
CO4	Know about concavity and convexity of the functions, Asymptotes and multiple points of a curve.	6,7	R, U
CO5	Have knowledge about applications in fields of engineering, physics, economics, and biology.	6,7	Ap, E

Course Title: Calculus

Course Code: MAT-121B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply Calculus to various fields such as computer graphics, physical sciences, economics and engineering.	6,7	Ap, E, C
CO2	Use Calculus in oceanography to calculate the height of tides in oceans.	6,7	An, Ap, E
CO3	Understand the concept of partial derivatives which are used in the fields such as computer graphics, physical sciences, vector calculus and engineering.	6,7	R, U, C
CO4	Learn about evaluating double and triple integrals of functions of several variables and apply them in evaluating area and volume of solids.	6,7	R, U, Ap
CO5	Understand the concepts of jacobians, maxima and minima of functions of two variables, envelopes and evolutes.	6,7	R, U

Course Title: Programming Using C

Course Code: CSC-121

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
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CO1	Use the fundamentals of C programming in trivial problem solving	9	R,U
CO2	Identify solution to a problem and apply control structures and user defined functions for solving the problem	9	Ap, U,An, E
CO3	Demonstrate the use of Strings and string handling functions	9	Ap, An,E, C
CO4	Work with arrays of complex objects.	9	An, Ap, E
CO5	Apply skill of identifying appropriate programming constructs for problem solving.	9	Ap, An, E, C

**Semester: III**

<b>Course Title: Indian Economy</b>		<b>Course Code: BECO-2320</b>	
Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Get an overall understanding about various sectors of the Indian economy	1,5	U, An, E
CO-2	Analyse various issues related to Indian Agriculture Sector	1,4,5	U, Ap, An, E
CO-3	Get an in-depth understanding about Indian Industrial sector, its growth, problems and policies	1,3,5	U, Ap, An, E
CO-4	Get an overview of foreign trade of India	1,3,4,5	U, An, E
CO-5	Knowledge about various problems of Indian economy, Indian tax structure and economic planning	1,3,5	U, Ap, An, E

<b>Course Title: Quantitative Techniques III</b>		<b>Course Code: BQT- 2321</b>	
Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels





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CO- 1	Learn mathematical tools like matrices which will be used to solve system of linear equations and check the consistency of the system	1, 2, 4, 5	U, Ap, An
CO-2	Enhance analytical ability by using the concepts of derivatives to calculate maximum and minimum values of different variables	4, 5	U, Ap, An
CO-3	Understand and apply the concept of integration in solving various economic problems	4, 5	U, Ap, An
CO-4	Enhance their research capability by learning to solve the problems of linear Programming, graphically and iteratively	4, 5	U, Ap, An
CO-5	Understand interdependence between different economic sectors or industries through input output analysis	1, 3, 4 ,5	U, Ap, An

**Course Title: Analysis**

**Course Code:MAT-231A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the behaviour of real numbers, sequences and series of real numbers.	6,7	U, An
CO2	Test the convergence of sequences and series of various types and the convergence of improper integrals.	6,7	An, Ap
CO3	Apply the concept of Riemann integrability, the use of beta and gamma functions to solve various problems of calculus.	6,7	E, C

**Course Title: Analytical Geometry**

**Course Code:MAT-231B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand and apply the concepts of geometry in various problems.	6,7	U, Ap
CO2	Analyse the applications of geometry in different fields such as art, robotics, Computer, and video games.	6,7	An, E



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CO3	Realize the important role of Analytical Geometry in architecture and also in the construction of stairs by making use of angles.	6,7	E, C
CO4	Comprehend the concepts of change of origin, rotation of axes and invariants for second degree equations in two and three dimensions.	6,7	U, Ap
CO5	Know about the properties of conics (parabola, ellipse, hyperbola and sphere).	6,7	R, U

<b>Course Title: Computer Oriented Numerical And Statistical Methods</b>			
<b>Course Code: CSC-231</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions	8	R, U, E
CO2	Apply various numerical methods to find our solution of algebraic and transcendental non-linear equations and also solve system of linear equations numerically using direct and iterative methods.	8	R, U, An, Ap
CO3	Understand the methods to construct interpolating polynomials and finite difference concepts (forward, backward, divided, and central difference) for prediction and also find integration to find area under curve.	8	Ap, An, E, C
CO4	Learn fundamentals concepts of statistical and optimization methods.	8	U, An, Ap, E, C

### Semester: IV

<b>Course Title: International Economics and Public Finance</b>		<b>Course Code:</b>	
<b>BQT- 2321</b>			
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive levels</b>
CO- 1	Gain knowledge about theories of International Trade	1,2,3,4	U, Ap, An, E
CO-2	Understand the concept and structure of balance of payments; causes of disequilibrium and measures	1,3,4,5	U, Ap, An, E



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	through which disequilibrium in balance of payments can be corrected		
CO-3	Understand how the exchange rate is determined	1,2,3,4	U, An, E
CO-4	Understand the basic aspects of public finance like taxes, public revenue, public expenditure, public debt etc.	1,3,5	U, An, E
CO-5	learn about commercial policy	1,3,4,5	U, An, E

Course Title: Quantitative Techniques IV		Course Code :BQT- 2421	
Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Enhance decision making ability by learning the concept and application of correlation	3, 4, 5	U, Ap, An
CO-2	Learn regression analysis which improves the predictive ability	3, 4, 5	U, Ap, An
CO-3	Understand decision making under risk by learning the theory of probability	3, 4, 5	U, Ap, An
CO-4	Understand various probability distributions	3, 4, 5	U, Ap, An
CO-5	Learn various concepts of sampling	4, 5	U, Ap, An

Course Title: Statics and Vector Calculus

Course Code: MAT-241A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the study of system of forces in equilibrium and differentiation and integration of vector functions.	6,7	U, R, An
CO2	Define the resolution and composition of a number of forces, parallel forces and couples, moments of forces and couples about a point and a line.	6,7	R, U, E
CO3	Generalise the theory behind the friction and centre of gravity.	6,7	E, C
CO4	Understand the definition of directional derivative and gradient and illustrate geometric meanings with the aid of sketches.	6,7	R, U, Ap
CO5	Apply concept of a vector integration in a plane and in space.	6,7	Ap,An

Course Title: Solid Geometry

Course Code: MAT-241B



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of 3-D Euclidean geometry.	6,7	R, U
CO2	Generalise the concepts and ideas of plane geometry.	6,7	E, C
CO3	Understand the basic geometric views of shape, size, length, angle, volume, surface area, rotation, translation, location etc. associated with any figure.	6,7	U, Ap
CO4	Learn about the applications of solid geometry in 3-D modelling, Architectural designing, 3-D Computer graphics.	6,7	U, Ap
CO5	Understand the concepts and properties of solids like cone, right circular cone, cylinder, right circular cylinder and sphere.	6,7	U, Ap

Course Title: Data Structures & Programming Language Using C++			
Course Code: CSC-241			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Learn the basic types of data structures, their implementation and applications.	9	U
CO2	Use linear and non-linear data structure like stacks, queues, linked list etc.	9	R, U, An, Ap
CO3	Implement various searching and sorting algorithms	9	Ap, An, E, C
CO4	Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.	9	U, An, Ap, E, C
CO5	Develop programming skills	9	U, An, Ap

## Semester V

Course Title: Economics of Development		Course code :BECO-3520	
S. No	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels





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CO- 1	Understand the meaning, measurement and the determinants of Economic Development.	1,3	R, U, An
CO- 2	Understand the characteristics of underdeveloped countries and the concept of dualism	1,3	U, An
CO- 3	Analyse various growth models and strategies of economic development.	1,3	U, An, E
CO- 4	Discuss the concept of capital formation and choice of technique	1,3	U, An, E
CO- 5	Understand the need, objectives, strategies and problems of economic planning	1,3	U, An, E

Course Title: Quantitative Techniques V		Course code :BQT-3521	
S. No	On completing the course, the students will be able to:	PSO'S addressed	Cognitive levels
CO- 1	Learn about various sampling distributions	1,2	U,Ap,An,E
CO- 2	Understand various theoretical distributions	1,2	U,Ap,An,E
CO- 3	Understand the technique of ANOVA	1,2,5	U,Ap,An,E
CO- 4	Learn the tests of significance	1,2,3	U,Ap,An,E
CO- 5	Understand the practical applications of these techniques	4,5	U,Ap,An

Course Title: Dynamics

Course Code: MAT-351A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Handle the problems based on rectilinear motion.	6,7	C, E
CO2	Use Newton's laws of motion in numerical problems.	6,7	Ap, E
CO3	Deal with problems based on variable acceleration.	6,7	Ap, An
CO4	Use concepts of work, power and energy to solve practical problems.	6,7	E, C



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### Course Title: Number Theory

### Course Code: MAT-351B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about some discoveries related to properties of prime numbers.	6,7	An, E, C
CO2	Interpret the concept of divisibility and fundamental theorem of Arithmetic.	6,7	R, U
CO3	Have knowledge about applications such as security system like used in banking securities, coding theory, barcodes and memory management systems.	6,7	Ap, An
CO4	Understand the various types of numbers, their properties and various arithmetic functions.	6,7	U, E
CO5	Understand the concept of G.C.D. and L.C.M. of numbers and the relation of linear Diophantine equations and congruences to solve various arithmetic problems.	6,7	R, U, Ap

### Course Title: Database Management System & Oracle

### Course Code: CSC-351

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain ability to handle large volumes of structured, semi-structured, and unstructured data using database technologies.	9	U, E
CO2	Appreciate the need for DB approach and understand the components and roles of DBMS.	9	R, U, An, Ap
CO3	Apply DB system development life cycle to business problems.	9	An, E, C
CO4	Implement a set of relations in the chosen DBMS.	9	An, Ap, E, C
CO5	Study the development and administration using MySQL and understand about how to read and write files.	9	U, An, Ap

### Semester VI

### Course Title: Quantitative Methods for Economists

### Course code :BECO-3620



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S.No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Learn about the concepts of set theory, relations , functions and continuity, Derivatives, Matrices and their economic applications	1,2	R,U,Ap
CO- 2	Understand different measures of central tendency	1,2	U,Ap
CO- 3	Understand different measures of dispersion	1,2	U,Ap
CO- 4	Understand the concepts and measurement of skewness, kurtosis, correlation and regression	1,2	U, Ap
CO- 5	Understand the concepts of Interpolation & extrapolation and the calculation of Index numbers	1,2	U, Ap

Course Title: Quantitative Techniques VI		Course code :BQT-3621	
S.No	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO- 1	Learn basic concepts of Econometrics	1,2	U,Ap,An
CO- 2	Understand linear regression models, their assumptions and properties	1,2	U,Ap,An,E
CO- 3	Gain knowledge about econometric problems	2,3,5	U,Ap,An,E
CO- 4	Learn to practically apply the techniques in business and economics	1,2,5	Ap,An
CO- 5	Use econometric techniques in research and for making future policy decisions.	1,4,5	U,Ap,An

Course Title: Linear Algebra Course Code: MAT-361A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Handle the problems based on vector spaces, subspaces, basis and dimensions.	6,7	E, C
CO2	Check the linear independence of vectors.	6,7	R, U
CO3	Form the linear combination of vectors.	6,7	An, Ap, C



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CO4	Find the matrix corresponding to a linear transformation and vice versa.	6,7	Ap, E
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**Course Title: Numerical Analysis**      **Course Code: MAT-361B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the use of Numerical analysis in detecting errors in numerical calculations.	6,7	U,E
CO2	Solve linear and non-linear equations, numerical problems based on differentiation, integration and differential equations.	6,7	Ap, An, E
CO3	Have knowledge on algorithms that use numerical approximation for the problems of mathematical analysis.	6,7	U, Ap
CO4	Apply numerical analysis to all the fields of physical sciences, life sciences, social sciences, medicine and business.	6,7	Ap, An, C
CO5	Analyse and evaluate the accuracy of common numerical methods.	6,7	An, E

**Course Title: Programming using Python**

**Course Code: CSC-361**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain knowledge of one of the latest and powerful programming languages – Python.	9	U, E
CO2	Understand about how to read and write files.	9	R, U, An, Ap
CO3	Get a broader view on the concept of Object-Oriented Programming (OOP) applied in Python.	9	U, An, E, C
CO4	Study how to connect Python programs to a database.	9	An, Ap, E, C
CO5	Learn how to identify Python object types.	9	U, An, Ap





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### B.SC. (HONS.) AGRICULTURE

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1	To disseminate ancient agricultural practices to modern agriculture
PSO-2	To impart in-depth practical knowledge about a package of practices for agronomic and horticultural crops and economic forest trees.
PSO-3	To provide knowledge on working of different farm implements and plant protection equipment.
PSO-4	To serve the rural agricultural population through dissemination and adoption of recent agricultural innovations.
PSO-5	Detailed knowledge on various agro-based businesses, farm management, various marketing strategies and finance management
PSO-6	To provide knowledge about processing of horticultural, food and forage crops.
PSO-7	To get detailed knowledge on the weather system, relationship of weather with crops and insects-pest and diseases.
PSO-8	To provide knowledge on precision farming, use of GIS, GPS in Agriculture, Sustainable agricultural practices and organic farming
PSO-9	To understand the basic morphology, physiology, classification, biology and nature of damage of different insect-pests, diseases and viruses.
PSO-10	To acquaint students with the role of mathematics and statistics in agriculture, economics and allied sciences.
PSO-11	To make the student entrepreneur in different agricultural fields like mushroom cultivation, agrochemicals, beekeeping, dairy, food processing and organic production of crops.
PSO-12	To understand genetic variation among various crops and their application in agriculture.
PSO-13	To develop communication, presentation and demonstration skills.



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### COURSE OUTCOMES

#### Semester I

Course Title: Agricultural Microbiology

Course Code: MBL-111

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about general characteristics of bacteria and their isolation using various techniques.	8,9	U, Ap
CO2	Deal with microbiology of soil fertility using various processes such as nitrogen fixation, microbial degradation of organic matter and soil nutrient transformation	8,9	U, Ap

Course Title: Fundamentals of Genetics

Course Code: PBG-112

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study about production of Genetically modified varieties/breeds of crops/livestock	12	R, U, Ap, C
CO2	Understand the genetic concepts related to health and diseases, food and natural resources, environment and role of genetic mechanisms in evolution.	12	U, Ap

Course Title: Fundamentals of Soil Science

Course Code: SSC-113

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about soil, its formation and weathering process	1,2,8	R, U
CO2	Understand about physical and chemical properties of soil and their effect on plant's health.	1,2,4,8	U, Ap, C
CO3	Get knowledge on organic matter and describe how to promote populations of beneficial soil organisms.	2,4	U, Ap, An, E,C
CO4	Learn how soil health relates to the ecology and environments, both currently and in the future	1,2,8	U, Ap, An, E

Course Title Introduction to Forestry

Course Code: FOR-114

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know how to grow nurseries and various forest trees, their management at field level.	1,4	R, U, Ap, C
CO2	Study the production potential of trees by measuring their biomass production.	2,4,	U, Ap



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### Course Title: Fundamentals of Agronomy

Course Code: AGR-115

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about various aspects of crop cultivation and production.	1,2,4	R, U
CO2	Know how agronomy often involves a summoning of resources from related disciplines such as Botany, Soil Science, Irrigation, plant protection, Plant Genetics and Breeding, Agro meteorology etc.	2	U, Ap, C
CO3	Learn crop cultivation and management for the purpose of producing food for humans, feed for animals as well as raw materials for the industry.	2	U, Ap, C
CO4	Get knowledge about Indian agriculture, its importance, present status, scope and future prospect	1	R, U, Ap
CO5	Know about cropping seasons of India; soil formation, classification, physical, chemical properties; identification of important crops and crop seeds.	1,2	U, An, Ap

### Course Title: Rural Sociology & Educational Psychology

Course Code: EXT-116

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concepts of rural sociology, its importance in Agricultural Extension, characteristics of Indian rural sociology.	1,4,5	R, U, Ap, C
CO2	Get themselves acquainted with village institutions and social organizations.	5	R, U, Ap, C
CO3	Study personality types, leadership types and emotions of human beings	4,5	U, Ap, C

### Course Title: Introductory Biology

Course Code: BOT-117

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the basics of biology, origin of life, evolution of new species and eugenics.	1,4,9	R, U,



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CO2	Study cell structures and cell division which will help them to understand the functions of life and genetics, crop physiology and plant breeding.	1,4,9	U, R
CO3	Know that the Study of classification and taxonomy of plants forms the basis for selection of close relatives of crop plants during their breeding.	1,4,9	U, Ap, An
CO4	Know how the study of morphology of plants and their anatomy is essential for identification of crop plants, their wild relatives and various varieties. Study of fruits is essential in horticulture.	1,4,9	R, U, An, Ap
CO5	Understand the role of animals in agriculture is important in crop protection, apiculture, aquaculture, poultry, animal husbandry, etc.	1,4,9	U, An, Ap

### Semester-II

Course Title: Elementary Mathematics  
117

Course Code: MAT-

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about Straight lines, Circle, Differential Calculus, Integral Calculus, Matrix and Determinants.	10	R, U, Ap
CO2	Study about equations of circle, derivative of sum and quotient of two functions.	10	U, Ap

Course Title: Agricultural Heritage  
118

Course Code: AGH-

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Relate past experience of agriculture with present situation.	1	U, Ap
CO2	Learn about plant production and protection through indigenous traditional knowledge.	1	U, Ap
CO3	Study about the current scenario of Indian agriculture, agricultural concerns and future prospects.	1	U, Ap





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# ਖਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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### Course Title: Communication Skills in English 119

Course Code: ENG-

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge to enhance their reading and writing skills.	13	R, U, Ap
CO2	Learn vocabulary and transformation of sentences	13	U, Ap

### Course Title: Punjabi (Compulsory) 1110

Course Code: GPB-

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about various forms of Punjabi literature	13	R, U

### Course Title: Basic Punjabi 1110

Course Code: BPB-

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get basic knowledge about Punjabi language	13	R, U
CO2	Study about the Punjabi Grammer	13	R,U

### Course Title: Fundamentals of Plant Biochemistry and Biotechnology Course Code: BCT-121

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic behavior and nature of the bio-molecules.	4,8	R, U,
CO2	Study the basic bio-physiological pathways operating inside the plants at the molecular level.	4,8	U, R
CO3	Get basic understanding of the bio-molecules and their interactions which help in developing more potent plant pesticides and plant weedicides.	4,8	U,C
CO4	Understand the manipulation of the plant genome for its better adaptability to the environment.	4,8	U, An, Ap
CO5	Understand how to use suitable application of the subject for getting higher yield from the field.	4,8	U, An, Ap

### Course Title: Fundamentals of Horticulture 122

Course Code: FSC-



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Identify plant vegetative structure	2,6	R, U
CO2	Gain knowledge of basic principles, processes and plant propagation methods	2,6	R, U, Ap, C
CO3	Understand how to propagate plant, manage and harvest a variety of plant.	2,6	U, Ap, An, E, C
CO4	Learn how horticulture relates to the economy and environment, both currently and in the future	2,6	U, Ap, An

**Course Title: Soil and Water Conservation Engineering 123**

**Course Code: SWE-**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge about soil erosion and consequences of erosion.	2,4	R, U
CO2	Understand and label contour maps	2,4	U, Ap
CO3	Design engineering measures of bunding and terraces	2,4	An, E, C
CO4	Design and develop water harvesting structures	2,4	An, E, C

**Course Title: Fundamentals of Crop Physiology**

**Course Code: BOT-124**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study about the different physiological processes including photosynthesis, respiration, nutrient uptake mechanisms.	2,8	R, U
CO2	Become more familiar with the process of stomatal movements and its role in the maintenance of plant water relation and importance of plant growth regulators in plant.	2,8	R, U

**Course Title: Fundamentals of Agricultural Economics:**

**Course Code: AGE-125**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the basic concepts of economics like demand, consumer equilibrium and utility analysis.	2,5,10	R, U, Ap, An
CO2	Study the supply aspects like laws of supply, market structures and produce's equilibrium.	2,5,10	U, Ap

**Course Title: Fundamentals of Plant Pathology**

**Course Code: PPL-126**



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study about disease cycle	7,9	U, An
CO2	Study factors effecting disease development	7,9	U, Ap, C
CO3	Know about important plant pathogenic organism	7,9	U, Ap, An,E,C
CO4	Study about growth and reproduction of plant pathogens	7,9	U, Ap, An, E
CO5	Know about mode of action and formulation of different fungicides and antibiotics	7,9	U, Ap, An, E
CO6	Know about defense mechanism in plants.	7,9	U, Ap, An, E

### Course Title: Fundamentals of Entomology

Course Code: ENT-127

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Differentiate an insect from other life forms and know the basic morphology and anatomy of an insect.	9	R,U,Ap,E
CO2	Understand the classification of insects, importance of taxonomy to other disciplines, and appreciate the vast diversity of insect life and form and function	9	U,Ap
CO3	Describe basic insect physiology, including growth and development of different types of insects	9	U,Ap,E
CO4	Recognize, evaluate and articulate the advantages and disadvantages of different management strategies in pest control of insects.	2,3,9	U,Ap,An,E
CO5	Study the role of abiotic and biotic factors in life history of insects	7	U,An

### Course Title: Fundamentals of Agricultural Extension Education

Course Code: EXT-128

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get detailed Knowledge of Extension Education	1,5,13	R,U,Ap,E
CO2	Get detailed Knowledge about rural development and community development Programmes	1,5,13	R,U,Ap
CO3	Get knowledge about new concepts of cyber extension	1,5,13	U,Ap,E
CO4	Get themselves acquainted with different methods of communication and diffusion of innovation process	1,5,13	U,Ap,An,E



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**Course Title: Communication skills and personality development**      **Course Code: EXT-129**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Write synopsis on particular subject	13	R, U
CO2	Learn how to organize seminars and conference	13	U, Ap, An, C
CO3	Learn how to write scientific articles	13	An, E, C

### Semester III

**Course Title: Crop Production Technology-I (Kharif Crops)**      **Course Code: AGR-211**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about Soil and climatic requirements, varieties, cultural practices and yield of Kharif crops.	1,2	R, U, Ap, C
CO2	Analyze comparative benefits of the different kharif crops	1,2	U, Ap, C
CO3	Identify constraints in production of oilseeds and pulses	1,2	U, Ap, An
CO4	Understand production technology of kharif cereals and millets which fulfill the needs of human consumption and milch cattle.	1,2	U, An, Ap

**Course Title: Agricultural Marketing, Trade and Prices**      **Course Code: AGE-212**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get detailed knowledge on agricultural marketing, meaning, structure, types and functions of agricultural markets.	5,10	R, U, Ap,sA C
CO2	Study marketing mix, market segmentation and characteristics of agriculture markets.	5,10	U, Ap,An

**Course Title: Agricultural Finance and Co-Operation**      **Course Code: AGE-213**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Get detailed knowledge on agricultural finance-meaning, scope and significance, credit needs and its role in Indian agriculture.	5,10	R, U, Ap, C
CO2	Study agriculture credit acquisition appraisal and institutional framework in credit provision.	5,10	U, Ap, C
CO3	Study about Agricultural cooperation, its meaning, history and development, and the significance of cooperative movement in India.	5,10	U, Ap, C

**Course Title: Production Technology for Fruits and Plantation Crops Course Code: FSC-214**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the importance of different fruit crops and plantation crops	1,2,4,3,8	U, E
CO2	Understand canopy architecture for higher productivity in mango and grapes	1,3,8	U, Ap, C
CO3	Learn package of practices for the major crops like mango, banana, guava, lemon, pineapple, coffee, coconut and rubber	1,2,4,8	U, Ap, An, E, C
CO4	Understand the concept of high density planting in different fruit crops	1,2,4,8	U, Ap, C

**Course Title: Farm Machinery and Power**

**Course Code: AEN-215**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain understanding of working of 2 and 4 stroke engines/ petrol and diesel engines.	3,4	U
CO2	Know the working of different components of a farm tractor i.e. transmission system, steering and braking system, hydraulic system and PTO.	3,4	U, An
CO3	Calibrate seed drill.	3,4	U, Ap, An, E
CO4	Acquire knowledge about different farm machinery for crop sowing, harvesting, threshing and plant protection.	3,4	U, An



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### Course Title: Production Technology for Vegetables and Spices Course Code: VSC-216

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Have the practical knowledge on various production techniques of vegetables and spices.	1,2,3,8	U, E
CO2	Learn the importance of vegetables and spices in human nutrition	1,2,3,8	R, U, Ap, C
CO3	Understand the quality of produce and its maintenance	1,2,3,8	U, Ap, An, E, C
CO4	Learn skills for solving field problems	1,2,3,8	U, Ap,

### Course Title: Livestock and Poultry Management Course Code LPM-217

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get themselves acquainted with different animals, their habits and habitat.	4,5	R, U, Ap, C
CO2	Guide farmers about various problems they face with livestock and their management so that they can get maximum from that.	4,5	U, Ap, C

### Course Title: Statistical Methods Course Code: STA-218

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about various statistical techniques and their application in agriculture	10	R, U, Ap
CO2	Study various tests of significance and analysis of variance.	10	U

### Course Title: Disaster Management Course Code: DMT-219

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn various disasters and their management	4,7	R, U, Ap, C
CO2	Study about the role of NGOs, community- based organizations and media.	4	Ap



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### Course Title: Environmental Studies

Course Code: ESL-220

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study about management of agricultural waste, management of biodegradable waste with composting and vermicomposting and other methods.	3,8	R, U, Ap, C
CO2	visit farmers regarding various insights on agriculture practices and environmental problems relating to stubble burning and other agricultural issues relating to climate, soil and water.	3,8	U, Ap

### Course Title: Human values and ethics

Course Code: HVE- 111

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about human values, morality and good behavior towards the society	12,13	R, U, Ap, C
CO2	know their rights and duties in the society	12,13	U, Ap, C
CO3	Learn about management of anger and stress	12,13	Ap

### SEMESTER IV:

### Course Title: Crop Production Technology-II (Rabi crops)

Course Code: AGR-221

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of Rabi crops.	1,2,4	R, U, Ap, C
CO2	Identify weeds in Rabi season crops, pulses-chickpea, lentil, peas; oilseeds-rapeseed, mustard and sunflower; sugar crops-sugarcane, medicinal and aromatic crops-mentha, lemongrass and citronella, forage crops-berseem, lucerne and oat.	1,2,4	U, Ap, C
CO3	Get knowledge on irrigation scheduling in Rabi crops, additional area can be Increased of low water requiring crops.	1,2,4	U, Ap, An, C
CO4	Know about basic morphological characteristics of Rabi crops.	1,2,4	U, An, Ap



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### Course Title: Production Technology for Ornamental Crops, MAP and Landscaping Course Code: FSC-222:

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Evaluate natural herbal products from an economic perspective.	1,2,8	U, Ap, C
CO2	Learn the technique of using medicinal and aromatic herbs sustainably	1,2,8	U, Ap, C
CO3	Set up business related to medicinal, aromatic and landscaping	1,2,8	U, Ap,
CO4	Develop effective ideas related to collecting, processing and marketing herbal natural sources.	1,2,8	U, C

### Course Title: Renewable Energy & Green Technology

Course Code: AEN-223

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the working of non-conventional energy resources and compare them with various conventional energy systems	1,3	R, U
CO2	Understand the solar energy with respect to applications like - heating, cooling, desalination, power generation, drying, cooking.	1,3	U, Ap, C
CO3	Understand about types and working of Biogas Plants	1,3	U, Ap, An
CO4	Understand about wind energy and the various techniques used in energy generation.	1,3	U, Ap, E

### Course Title: Problematic Soils and their Management

Course Code: SSC-224

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know in detail about soil quality & health, types and distribution of different problematic soils.	2,4,8	R, U
CO2	Use different reclamation and management techniques for problematic soils, bio-remediation, use of Remote sensing and GIS techniques in diagnosis.	2,4,8	R, U, Ap, C
CO3	Study about management of problematic soils, land use capability and classification, land suitability classification and irrigation quality.	2,4,8	U, Ap,





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### Course Title: Agricultural Informatics 225

Course Code: AGI-

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand analogy of computer	8	R, U
CO2	Basic knowledge of MS Office	8	R, U, Ap, C
CO3	Have basic knowledge of the Internet and WWW.	8	U, Ap,
CO4	Use IT application and different IT tools in Agriculture	8	U, ,C
CO5	Use decision support systems, Agriculture expert system and soil information	8	U, Ap, C

### Course Title: Principles of Seed Technology 226

Course Code: PBG-

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about the strategies of seed production, maintenance, seed sampling, seed testing and seed processing.	4,7	U, Ap, C
CO2	Study about role of WTO & OEOD in seed marketing	4,7	U, Ap

### Course Title: Farming System and Sustainable Agriculture 227

Course Code: AGR-

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain the major aspects of agricultural practices and traditions through time and throughout the world.	1,8	R, U, Ap, C
CO2	Explain in general the relationships among culture, economics, politics, science, and agricultural development	1,8	U, Ap, C
CO3	Understand the cross-cultural interactions and exchange that link people together and facilitate agricultural development.	1,8	U, Ap, , C

### Course Title: Fundamentals of Plant Breeding

Course Code: PBG- 228

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Get knowledge on basic concepts of plant breeding, modes of reproduction, traditional and modern methods of plant breeding and IPR.	12	R, U, Ap, C
CO2	Study about biotechnology tools- DNA markers assisted selection.	12	U, C

**Course Title: Introductory Agro-meteorology & Climate Change Course Code: AGM-229**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand roles of agro meteorology in agriculture and its relation to other areas of agriculture to get acquainted with recent developments in agro meteorology along with historical development of climate change.	7	R, U, Ap, C
CO2	Study about agro meteorology or agricultural meteorological and hydrological factors in relation to agriculture.	7	U, Ap, C
CO3	Study the behavior of the weather elements that have direct relevance to agriculture and their effect on crop production.	7	U, Ap, An, C
CO4	Understand weather and climate related factors determining the success or failure of agriculture	7	U, An, Ap

**Course Title: Agrochemicals  
2210**

**Course Code: ACH-**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about agro-chemicals and their role in agriculture.	11	R, U
CO2	Get knowledge on agrochemicals viz., fertilizers and pesticides.	11	U, Ap, C
CO3	Understand fertilizers, manufacturing processes and their importance.	11	U, Ap, An, E, C
CO4	Get knowledge on choice of agrochemicals and their impact on the environment.	11	U, Ap, C



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**Course Title: Weed Management  
2210:**

**Course Code: WMG-**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get themselves acquainted about why to undertake environmental weed control.	1,2	R, U, Ap, C
CO2	Learn about different approaches of weed management.	1,2	U, Ap, C
CO3	Study the harmful and beneficial effects of weeds in Agriculture.	1,2	U, Ap, An, C
CO4	Get themselves acquainted with planning for weed management and weed management processes.	1,2	U, An, Ap

**Course Title: Biopesticides & Biofertilizers  
2210**

**Course Code: BPF-**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get an overview on the relevance of use of microbial bio pesticides and bio fertilizers.	1,2	R, U, Ap
CO2	Become familiar with vast reserves of microbial biodiversity that provides the opportunity to harness the ability of microorganisms to sustainably minimize damage from pests.	1,2	U, Ap, C

**Course Title: System Simulation and Agro-advisory  
2210**

**Course Code: SSA-**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn System Approach for representing soil-plant-atmosphere continuum, system boundaries, Crop models, concepts & techniques.	7,8	R, U, Ap, C
CO2	Study about types of crop models, data requirements and relational diagrams.	7,8	U, Ap, C

### SEMESTER V

**Course Title: Practical Crop Production-I (Kharif Crops)  
311**

**Course Code: AGR-**



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get acquainted with the knowledge of profitable crop production technology	1,2	R, U, Ap, C
CO2	Guide farmers about ruminative crop production techniques.	1,2	U, Ap, C
CO3	Adopt a diversified farming system according to available farming situation.	1,2	U, Ap, An, C
CO4	Encourage the sustainable agriculture system.	1,2	U, An, Ap

### Course Title: Principles of Integrated Pest and Disease Management Course Code: PPL-312

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	know about different categories of insect pest and diseases	7,8,9	R, U, Ap,
CO2	Study the economic importance of insect, pest, diseases and pest risk analysis.	7,8,9	U, Ap,
CO3	Identify different methods of detection and diagnosis of insect, pest and diseases	7,8,9	U, Ap, An,
CO4	Study about different methods of control insect, pest and diseases	7,8,9	U, An, Ap
CO5	Know safety issues in pesticides use.	7,8,9	U, An, Ap
CO6	Study the political, social and legal implications of IPM.	7,8,9	U, An, Ap

### Course Title: Manures, Fertilizers and Soil Fertility Management Course Code SSC-313

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge on essential nutrients, soil fertility, nutrient transformations in soil.	1,2,8	R, U
CO2	Understand manures, fertilizers and soil fertility management through various approaches.	1,2,8	U, Ap, C
CO3	Make decisions on nutrient dose, choice of fertilizers and method of application etc. practiced in crop production.	1,2,8	U, Ap, An, E, C
CO4	Understand various nutrient management concepts and nutrient use efficiencies of major and micronutrients and enhancement techniques.	1,2,8	R, U, Ap, An, E





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CO5	Study about soil health - quality indices and their management - Organic farming and Precision Farming - Long term effect of fertilization on soil	1,2,8	U, Ap, An,E,C
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**Course Title: Pests of Crops and Stored Grains and their Management****Course****Code:ENT-314**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to identify different insect pests of field crop, vegetable crop, fruit crop, plantation crops, ornamental crops, spices and condiments, their nature of damage and management practices.	9,11	R,U,Ap,E
CO2	Know about stored grain pests and factors responsible for losses in stored grains	9,11	U,Ap,E
CO3	Study different storage structures used for grain storage and their effectiveness	9,11	U,Ap,E

**Course Title: Diseases of Field & Horticultural Crops & their Management-I****Course Code:PPL-315**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Identify different disease samples	2,7,9	R, U, Ap, C
CO2	Study about symptoms of disease samples of different field and horticultural crops (Kharif crops like Rice, Maize, Bajra, Groundnut, Soyabean)	2,7,9	U, Ap, C
CO3	Study about etiology of disease samples of different field and horticultural crops (Kharif crops like Rice, Maize, Bajra, Groundnut, Soyabean)	2,7,9	U, Ap, An, C
CO4	Study about disease cycle of disease samples of different field and horticultural crops (Kharif crops like Rice, Maize, Bajra, Groundnut, Soyabean)	2,7,9	U, An, Ap
CO5	Study about management of disease samples of different field and horticultural crops (Kharif crops like Rice, Maize, Bajra, Groundnut, Soyabean)	2,9	U, An, Ap
CO6	Study the collection and preservation of plant diseased kharif specimen for Herbarium	2,9	U, An, Ap



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### Course Title: Crop Improvement – I (*kharif*)

Course Code: PBG-316

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about the importance of floral biology.	2,12	R, U, Ap, C
CO2	Understand emasculation and hybridisation techniques in different kharif crop species like cereals; pulses; oilseeds; forage crops; vegetable and horticultural crops.	2,12	U, Ap, C
CO3	Understand conventional and modern approaches for the development of hybrids and varieties for yield and adaptability.	2,12	U, Ap, An, C

### Course Title: Entrepreneurship Development and Business Communication

Course Code: EXT-317

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about setting up various enterprises.	4,13	R, U, Ap, C
CO2	Get acquainted with importance of planning and monitoring of enterprises	4,13	U, Ap, C
CO3	Get knowledge about various government institutes and scheme related to entrepreneurship development	4,13	U, Ap, An, C
CO4	Get knowledge about business communication methods	4,13	U, An, Ap

### Course Title: Geoinformatics, Nano-technology and Precision Farming

Course Code: AGR-318

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the concept of "doing the right thing in the right place at the right time" having a strong intuitive appeal which gives farmers the ability to use all operations and crop inputs more effectively.	8	R, U, Ap, C
CO2	Use inputs which result in greater crop yield and/or quality, without polluting the environment.	8	U, Ap, C
CO3	Understand precision agriculture which addresses both economic and environmental issues that surround production agriculture these days.	8	U, Ap, An, C
CO4	Encourage the farmers to study spatial and temporal variability of the input parameters using primary data at field level.	8	U, An, Ap



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### Course Title: Principles of food science and nutrition

Course Code: FST-319

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand food composition and chemistry.	5,11	R, U, Ap,
CO2	Know the role of microbiology in food industry.	5,11	U, Ap,
CO3	Get knowledge about balanced nutrition and new trends in food science and nutrition.	5,11	U, Ap, An,

### Course Title: Protected Cultivation

Course Code: PCV-

3110

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge about greenhouse technology, types of greenhouses and construction of greenhouses and various other protected structures.	4,7,8	R, U, Ap, E, C
CO2	Gain the knowledge of greenhouse equipments, materials of construction for traditional and low cost green houses	4,7,8	U, Ap, An, C
CO3	Learn about Irrigation systems used in greenhouses, shade net house in protected cultivation	4,7,8	U, Ap, E, C
CO4	Learn the concepts of cleaning and grading moisture measurement.	4,7,8	U, Ap
CO5	Understand the material handling equipment, principle and working.	4,7,8	U, Ap

### Course Title: Micro Propagation Technique

Course Code: MPT-

3110

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn how to produce a large number of plantlets from a small explant.	4,5,6	R, U, Ap, E, C
CO2	Get knowledge about the production of microbe free plantlets; how to save the endangered plants species by regenerating plantlets from small explants.	4,5,6	U, Ap, An, E,C
CO3	Generate a new variety of agriculturally important crops with a shorter time span and space than the conventional breeding method.	4,5,6	U, Ap, An, E,C



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### Course Title: Landscaping

Course Code: LSP -3110

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Become familiarize with the annuals, flowers, trees, shrubs, principles and practices of landscaping and ornamental plants	2,3,4	R, U, Ap, E, C
CO2	Get knowledge about the landscape designs, its principles and practices of garden features and structures and how to save the endangered plants species by regenerating plantlets from small explants.	2,3,4	U, Ap, An, E, C
CO3	Identify types of gardens, their styles in view of English, Mughal, Japanese and other popular gardens of India.	2,3,4	U, Ap, An, C
CO4	Learn the skill of propagation of trees, shrubs and ornamental plants.	2,3,4	U, Ap, C
CO5	Prepare layout of landscaping of schools, public places and government institutions.	2,3,4	U, Ap, An, C

### Course Title: Hi-Tech Horticulture

Course Code: HTH-3110

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get detailed knowledge on modern advanced technologies and their application in horticulture like micro propagation, precision farming and high density orchard mechanization and management.	8	R, U, Ap, E, C
CO2	Get knowledge on remote sensing, geographical information system, differential geo positioning system, variable rate applicator.	8	U, Ap, An, E,C
CO3	Get themselves acquainted with the application of precision farming in horticultural crops	5,8	U, Ap, An, C

## SEMESTER VI

Course Title: Practical Crop Production-II (Rabi Crops)  
321

Course Code: AGR-





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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get acquainted with the knowledge of profitable crop production technology	1,2	R, U, Ap, C
CO2	Guide farmers about ruminative crop production techniques.	1,2	U, Ap, C
CO3	Adopt a diversified farming system according to available farming situations.	1,2	U, Ap, An, C
CO4	Encourage the sustainable agriculture system.	1,2	U, An, Ap

**Course Title: Rainfed Agriculture and Watershed Management Course Code: AGR-322**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the various techniques of crop raising in rainfed conditions.	7,8	R, U, Ap, C
CO2	Learn about the various water conservation techniques in rainfed farming.	7,8	U, Ap, C
CO3	Learn how the rainfall water can be used for a larger area by suitable watershed management techniques	7,8	U, Ap, An, C

**Course Title: Protected Cultivation and Secondary Agriculture Course Code: AEN-323**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the greenhouse technology	3,7,8,11	R, U, Ap
CO2	Design greenhouse cooling and heating systems	3,7,8,11	U, E, Ap, C
CO3	Do cost estimation and economic analysis of protected cultivation structures	3,7,8,11	U, An, C
CO4	Understand the working of different conveying and drying systems used in the food industry	3,7,8,11	U, An

**Course Title: Diseases of Field & Horticultural Crops & their Management-II Course Code: PPL-324**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Identify different disease samples	7,9	R, U, Ap, C



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CO2	Study about symptoms of disease samples of different field and horticultural crops (Rabi crops like Wheat, Barley, Mustard, sesame, peas, bean, brinjal, broccoli, chickpea, sweet potato, turnip)	7,9	U, Ap, C
CO3	Study about etiology of disease samples of different field and horticultural crops (Rabi crops like Wheat, Barley, Mustard, sesame, peas, bean, brinjal, broccoli, chickpea, sweet potato, turnip)	7,9	U, Ap, An, C
CO4	Study about disease cycle of disease samples of different field and horticultural crops (Rabi crops like Wheat, Barley, Mustard, sesame, peas, bean, brinjal, broccoli, chickpea, sweet potato, turnip)	7,9	U, An, Ap
CO5	Study about management of disease samples of different field and horticultural crops (Rabi crops like Wheat, Barley, Mustard, sesame, peas, bean, brinjal, broccoli, chickpea, sweet potato, turnip)	7,9	U, An, Ap
CO6	Understand about the collection and preservation of plant diseased Rabi specimen for Herbarium	7,9	U, An, Ap

**Course Title: Production Technology for Fruits and Plantation Crops**

**Course Code: FSC-325**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the post-harvest technology of horticultural crops.	2,11	R, U, Ap, E, C
CO2	Know the value addition of horticulture crops.	2,11	R, U, Ap, An, E
CO3	Have knowledge on the work space, tool and equipment design for PHT and value addition.	2,11	R, U, Ap, An, C
CO4	Get acquainted with the various certification and accreditation i.e. FPO, ISO and other leveling	2,11	U, Ap, An, E



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### Course Title: Management of Beneficial Insects

Course Code:ENT-326

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about the importance of beneficial insects, their rearing and various problems associated with them and their management.	9	U,Ap,An,E
CO2	Establish small scale venture based on these beneficial insects and contribute to the overall development of the society	9	Ap,An,E,C

### Course Title: Crop Improvement – II (Rabi)

Course Code:PBG-327

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about the importance of floral biology, emasculation and hybridisation techniques in different rabi crop species like cereals; pulses; oilseeds; fodder crops and cash crops; vegetable and horticultural crops.	9,12	U,Ap,An,E
CO2	Learn the major breeding objectives and procedures including conventional and modern approaches for development of hybrids and varieties for yield, adaptability, stability, abiotic and biotic stress tolerance and quality (physical, chemical and nutritional).	9,12	Ap,An,E,C
CO3	Be well equipped with the practices and techniques of handling of Germplasm and segregating populations and also the role of Ideotype concept and climate resilient rabi crop varieties for future.	9,12	Ap,An,E,C

### Course Title: Principles of Organic Farming

Course Code: AGR-328

Sr. no	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study about the initiative from Government for organic produce.	7,8,11	R, U, Ap, E, C
CO2	Study the role of NGOs in producing organic products.	7,8,11	R, U, Ap, An, E
CO3	Select crops and varieties for organic produce	7,8,11	R, U, Ap, An, C
CO4	Get knowledge about the Certification of organic produce.	7,8,11	U, Ap, An, E



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### Course Title: Farm Management, Production and Resource Economics Course Code: AGE-329

Sr. no	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the meaning and scope of farm management, objectives, principles and applications.	5	R, U, Ap, E, C
CO2	Get knowledge about types & systems of farming, planning & budgeting techniques.	5	R, U, Ap, An, E
CO3	Study the risks and uncertainty sources, their types and management.	5,10	U, Ap, An, C

### Course Title: Intellectual Property Rights

Course Code: IPR-3210

Sr. no	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study brief introduction to GATT, WTO, history, legislations of IPR in India.	4	R, U, Ap, E, C
CO2	Study the copyrights, patents, trademarks and geographical indications	4,5	U, Ap, An, E
CO3	Get knowledge about Indian Biological Diversity Act 2012: Features, access and benefit sharing.	1	U, Ap, An, C

### Course Title: Principles of Food Science and Nutrition 3210

Course Code: FST-

Sr. no	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about food science, food microbiology, principles and methods of food processing and preservation.	4,6	R, U, Ap, E, C
CO2	Study about balanced/ modified diets, menu planning and new trends in food science and nutrition.	4,6	U, Ap, E, C

### Course Title: Agri-business Management

Course Code: ABM-3211

Sr. no	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Get knowledge about transformation of agriculture and agribusiness, components, stakeholders and importance of agribusiness in India.	4,5	R, U, Ap, E, C
CO2	Understand marketing management, segmentation, marketing strategies, pricing policies and sales & distribution management.	4,5	U, Ap, An, E

**Course Title: Commercial Plant Breeding**

**Course Code: CPB-3211**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get basic knowledge on various principles and practices of plant breeding, hybrid seed production techniques (two and three line method)	9,12	R, U, Ap, E, C
CO2	Study the advancement in hybrid seed production of various crops, release of varieties and IPR.	9,12	U, Ap, E, C

**Course Title: Food Safety and Standards 3211**

**Course Code: FSS-3211**

Sr. no	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about food safety, types of hazards, control of parameters and waste disposal.	5,11	R, U, Ap, E, C
CO2	Learn about food safety management tools.	5,11	U, Ap, E, C

**Course Title: Agricultural Journalism**

**Course Code: ACJ-3211**

Sr. no	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about Agricultural Journalism, types of journalism and agriculture story.	4,13	R, U, Ap, E, C
CO2	Study about sources of agriculture information, interviews and editorial mechanics.	4,13	U, Ap, E, C



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An Autonomous College affiliated to G.N.D.U., Amritsar  
UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

(O) : +91-183-2258097  
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e-mail : khalsacollegeamritsar@yahoo.com

Web : www.khalsacollege.edu.in

◆ A HERITAGE INSTITUTION AND COLLEGE WITH POTENTIAL FOR EXCELLENCE - Status conferred by UGC ◆  
◆ NAAC REACCREDITED "A" GRADE (CGPA) ◆ STAR STATUS CONFERRED BY DBT, NEW DELHI ◆ AN ISO CERTIFIED COLLEGE ◆

### SEMESTER VII (GROUP-A)

**Course Title: General Orientation**

**Course Code: RAWE-411**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand various facts to participate with community	2,4,5,6,	R, U, Ap, C
CO2	understand the problems of farmers, their economic status, cropping pattern followed by them while interacting on a farm level.	4,5,6	U, Ap, C

**Course Title: Plant clinic**

**Course Code:RAWE-412**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the importance of plant clinic and its working.	4,5,6	R, U, Ap, C
CO2	Study the identification and management of diseases, pests and weeds at field level	2,4,5,6	U, Ap, An, E, C
CO3	Know about deficiency symptoms of nutrients	2,4,5,6	U, An, E

**Course Title: Village Attachment Training Programmes**

**Course Code: RAWE-413**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about problems faced by farmers and their solutions	4	R, U, Ap, C
CO2	Disseminate the latest technology and innovation to the farmers	4	U, Ap, C

**Course Title: Agro-Industrial Attachment-I**

**Course Code: AIA-414**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get an experience of the industrial environment and working.	4,5	U, Ap, C
CO2	Know how does agriculture industry work	4,5	U, Ap, C



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CO3	know how these industries are helpful to the farmer	4,5	U, Ap, C
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**Course Title: Agro-Industrial Attachment-II**

**Course Code: AIA-414**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get an experience of the industrial environment and working.	4,5	R, U, Ap, C
CO2	Learn the principle of Agro industry working.	4,5	U, Ap, C

**Course Title: commercial dairy production**

**Course Code: ELM-421**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the management of milch animals and their nutrition	5,11	R, U, Ap, C
CO2	Learn about the identification and management of common dairy animal diseases.	5,11	U, Ap, An, E, C
CO3	Learn about the manufacturing and production of dairy products.	11	U, An, E

**Course Title: Mushroom cultivation technology**

**Course Code: ELM-422**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the different varieties, nutritional content as well as production of mushroom	11	R, U, Ap, C
CO2	Learn about how to convert agricultural waste into proteinaceous food	11	U, Ap, An, E, C
CO3	Get knowledge about marketing skills	11	U, An, E

**Semester VII (Group-B)**

**Course Title: Soil, Water and Seed Testing**

**Course Code: ELM-423**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Prepare standard solution and study reagents which are used for soil water and seed testing.	3,4,8	R, U, Ap, C
CO2	Learn how to analyse soil and plant for the recommendation of fertilizers	2,4,8	R, U, Ap, An, E, C
CO3	Identify various nutrient deficiency and toxicity symptoms of different crops	2,8	U, An, E
CO4	Develop the skill about physical, chemical and biological lab analysis of soil and crops.	2,4	U, Ap, C
CO5	Have skill in advanced techniques to increase the nutrient use efficiency and soil health improvement.	3,5,6,8	U,R, Ap, An, E, C
CO6	Adopt ideology to conserve soil and water environment.	5,7,8	U, Ap, An, E.C

**Course Title: Commercial Beekeeping**

**Course Code: ELM-424**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop professional skills and get knowledge through hands on experience	11	R, U, Ap, C
CO2	Get knowledge on seasonal management of colonies and extraction of various hive products	11	U, Ap, An,
CO3	Improve their marketing skills to become an entrepreneur.	11	U, An, E

**Course Title: Commercial Horticulture  
426**

**Course Code:ELM-**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Measure agricultural land in appropriate units and utilize tools, equipment and soilless media.	11	R, U, Ap, C
CO2	Produce superior plants adopting various propagation techniques	11	R, U, Ap, An, E, C





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CO3	Identify various cultivars and species of horticultural plants	11	R, U, An, E
CO4	Learn orchard layout, land preparation and planting of horticultural plants.	11	R, U, Ap, C
CO5	Have advanced techniques to increase the farmers income.	11	U, Ap, An, E, C
CO6	Adopt ideology to conserve germplasm, water, soil and the environment	11	U, Ap, An, E.C

**Course Title: Food Processing**

**Course Code: ELM-427**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand various food processing and food preservation techniques.	5,11	R, U, Ap, C
CO2	Develop various skills related to food handling, processing and storage	5,11	R, U, Ap, An, E, C
CO3	Effectively utilize various raw materials into different food products and learn effective utilization of byproducts from the fruits/vegetable industry.	11	R, U, An, E
CO4	Become entrepreneurs in the field of food processing.	11	U, Ap, C

**Course Title: Organic production technology**

**Course Code: ELM-428**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn manufacturing of various organic manures and composts	8,11	R, U, Ap, C
CO2	Learn about the making of different indigenous organic formulation viz. jeevamrit, panchgavya, beejamrit etc.	8,11	R, U, Ap, An, E, C
CO3	Learn about biological control of insect pest and diseases of crop plants.	911	U, An, E

**Course Title: Vegetable production under protected environment Course Code: ELM-429**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study about the high tech poly house, net house and walk in tunnel.	2,11	R, U, Ap, C
CO2	Learn about seasonal and off seasonal nursery of vegetable crops under protected environment.	2	U, Ap, An, E, C
CO3	Learn about the micro climatic modifications.	7,11	U, An, E



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### B. SC. (COMPUTER SCIENCE)

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

##### PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO-1	Understand the fundamental concepts in physics, Computer Science & mathematics and develop ideas based on them.
PSO-2	Possess knowledge on topics in pure physics, computer science & mathematics, empowering her/him to pursue higher degrees at reputed academic institutions.
PSO-3	Demonstrate problem-solving skills, innovative thinking & creativity.
PSO-4	Be motivated towards research in physics, computer science & mathematics and related fields.
PSO-5	Students become eligible to serve in DRDO, defence, public sector and private Sector.

##### COURSE OUTCOMES

##### Semester: I

Course Title: Computer Fundamental & Information Technology  
Course Code: CSC-101

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Study the fundamental concepts of computers	1,2,3,4	R,U,Ap,An,E
CO2	Familiarize themselves with operating systems, peripheral devices, networking and internet.	1,2,3,4	R,U,Ap
CO3	Study the hardware and software concepts, input and output components of a computer system.	1,2,3,4	R,U,Ap,C
CO4	Demonstrate different communication medias.	1,2,4,5	U,Ap,C
CO5	Learn Information systems, system development life cycle, tools and its applications	1,2,3,4	R,U,Ap,C



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## Course Title: Mechanics

## Course Code: Paper A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the laws of motion, reference frames, and its applications	1,2,4	U,R,An,Ap
CO2	Explain the application of central force to the stability of circular orbits, Kepler's laws of planetary motion, Orbital Precession and Rutherford scattering.	1,2,3,4	U,R,An,Ap,E
CO3	Understand the dynamics of rotating objects i.e. rigid bodies, angular velocity, the moment of inertia, parallel axis theorem, the inertia tensor, the motion of rigid bodies. non-inertial frames: pseudo forces and examples involving the centrifugal force and coriolis force	1,2,3,4	U,An,Ap,E
CO4	Develop understanding of special theory of relativity and its applications to understand length contraction, time dilation, and relativistic addition of velocities, conservation of momentum and variation of mass, relativistic momentum, relativistic energy, and mass energy relation.	1,2,3,4	U, An,Ap,E
CO5	Get information of the basics of material properties like, elasticity, elastic constants and their relation, torsion of a cylinder, bending of a beam, cantilever, beam supported at its ends and loaded in the middle.	1,2,3,4	U,An,Ap,E

## Course Title: Electricity & Magnetism

## Course Code: Paper B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply knowledge of electricity and magnetism to explain natural physical processes and related technological advances.	1,2,3,4	Ap,An,E,C
CO2	Understand the use of the Stoke's and Gauss Divergence theorems for solution of different physics problems.	1,2,3,4,5	R, Ap,E,C
CO3	Explain the concepts of electric current and related concepts.	1,2,3	R,An,Ap
CO4	Understand about electric current and related concepts.	1,2,3,4,5	R,AP,E,C
CO5	Explain the phenomenon of magnetism, types of magnetic materials and their properties.	1,2,3,4	U,An,Ap,E,C



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**Course Title:** Physics Practical

**Course Code:** Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Determine low resistance with Carey Fosters Bridge.	1,2,3,4	U, Ap, An, E
CO2	Study the dependence of moment of inertia on distribution of mass (by noting time periods of oscillations using objects of various geometrical shapes but of same mass).	1,2,3,4	U, Ap, An, E
CO3	Find Moment of Inertia and establish relationship between torque and angular acceleration using fly wheel.	1,2,3,4	U, Ap, An, E
CO4	Determine the resistance and specific resistance of copper with the help of Kelvin's double bridge.	1,2,3,4	U, Ap, An, E
CO5	Study the measure of Capacitance, determination of permittivity of a medium air and relative permitivity by de-Sauty's bridge.	1,2,3,4	U, Ap, An, E

**Course Title:** Algebra

**Course Code:** MAT-111A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	solve problems based on matrices, vector spaces, eigen values and eigen vectors.	2	R,U
CO2	Check consistency and inconsistency of linear equations.	3	R, U, An
CO3	Understand the relation between roots and coefficients.	3	U, An

**Course Title:** Calculus and Trigonometry

**Course Code:** MAT-111B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquaint themselves with the limits, functions, derivatives, integrals, and infinite series.	1	R, U, Ap
CO2	Associate Differential equations with the Mathematical modeling.	2,3	U, An
CO3	Solve multifarious differential equation that relates functions with its derivatives.	3	An, E, Ap





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CO4	Know about concavity and convexity of the functions, Asymptotes and multiple points of a curve.	2	R, U, C
CO5	Have knowledge about applications in fields of engineering, physics, economics, and biology	1,4	Ap, U, C, E

<b>Semester: II</b> <b>Course Title: Programming Using C And Practical of C</b> <b>Course Code: CSC-121 ,121P</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use the fundamentals of C programming in trivial problem solving	1,2,3,4	R,U
CO2	Identify solution to a problem and apply control structures and user defined functions for solving the problem	1,2,3,4	Ap,U,An, E
CO3	Demonstrate the use of Strings and string handling functions	1,2,3,4	Ap,An,E, C
CO4	Gain ability to work with array of complex objects.	2,3	An, Ap, E
CO5	Apply skill of identifying appropriate programming constructs for problem solving.	1,2,3	Ap, An, E, C

**Course Title: Relativity & Electromagnetism**

**Course Code: Paper-A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Discuss the key observations and events that led to the development of Einstein's theory of special relativity.	1,2,3,4	R,U,E,C
CO2	Explain the fundamental principles of special relativity and electromagnetism and the far-reaching connections between them.	1,2,3,4	R,U,E,C
CO3	Describe Maxwell equations and its physical consequences.	1,2,3,4,5	R,U,An,Ap,E
CO4	Describe the nature of electromagnetic wave and its propagation through different media and interfaces.	1,2,3,4	U,An,Ap
CO5	Discuss the experimental basis of these fundamental principles and how this contributed to the subsequent development of fundamental physics.	1,2,3,4,5	U,E,C,Ap



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### Semester: II

Course Title: Vibration and Waves

Course Code: Paper-B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand simple harmonic motion and will be able to solve the equations of motions for physical systems that undergo simple harmonic motion.	1,2,3,4	U,An,Ap
CO2	Understand the damped oscillator in the over damped, critically damped and under damped regimes.	1,2,3,4,5	U,An,Ap,E
CO3	Understand, derive and solve the equations for a forced oscillator, the concept of resonance and variation of displacement and velocity with driving force frequency.	1,2,3,4,5	U,An,Ap,E
CO4	Understand the concept of coupled oscillators will be able to derive and solve the equation of motion for simple systems and describe the motion of coupled oscillators in terms of normal mode solutions.	1,2,3,4,5	U,An,Ap,E
CO5	Understand a wave, differences between longitudinal and transverse waves, the concepts of phase and group velocities and be able to calculate these quantities.	1,2,3,4,5	U,An,Ap,E

Course Title: Practical

Course Code: Physics Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the induced e.m.f. as function of the velocity of the magnet.	1,2,3,4	U,An,Ap
CO2	Compare the results of Resonance in a series and parallel LCR circuits for different R-value and calculate Q-value experimentally as well as theoretically.	1,3,4	An,Ap,E,C
CO3	Plot the graph of variation of magnetic field with distance along the axis of current carrying coil carrying.	2,3,4	R,U, An
CO4	Verify the laws of vibrating strings and compare the mass per unit length of string using Melde's experiment.	1,3,4	U,An,Ap, E
CO5	Find the value of acceleration due to gravity (g) by Kater's pendulum.	1,2,3,4	R,U,Ap



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### Course Title: Calculus and Differential equations

Course Code: MAT-121A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquaint themselves with the limits, functions, derivatives, integrals, and infinite series.	1,2	An, E, C
CO2	Associate Differential equations with the Mathematical modeling.	3	Ap, An
CO3	Solve multifarious differential equations that relate functions with its derivatives.	3	U, Ap, E
CO4	Know about concavity and convexity of the functions, Asymptotes and multiple points of a curve.	2	R, U
CO5	Have knowledge about applications in fields of engineering, physics, economics, and biology.	1,4	Ap, E

### Course Title: Calculus

Course Code: MAT-121B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply Calculus in various fields such as computer graphics, physical sciences, economics and engineering.	1,4	Ap, E, C
CO2	Use Calculus in oceanography to calculate the height of tides in oceans.	4,5	An, Ap, E
CO3	Understand the concept of partial derivatives which are used in fields such as computer graphics, physical sciences, vector calculus and engineering.	1,4	R, U, C
CO4	Learn about evaluating double and triple integrals of functions of several variables and apply them in evaluating area and volume of solids.	2,3	R, U, Ap
CO5	Understand the concepts of jacobians, maxima and minima of functions of two variables, envelopes and evolutes.	3	R, U



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<b>Semester: III</b>			
<b>Course Title: COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHOD</b>			
<b>Course Code: CSC-231</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions	1,2,3,4	R, U, E
CO2	Apply various numerical methods to find our solution of algebraic and transcendental non-linear equations and also solve system of linear equations numerically using direct and iterative methods.	1,2,3,4	R, U, An, Ap
CO3	Understand the methods to construct interpolating polynomials and finite difference concepts (forward, backward, divided, and central difference) for prediction and also find integration to find area under curve.	1,2,3,4	R, Ap, An, E, C
CO4	Learn fundamentals concepts of statistical and optimization methods.	1,2,3	U, An, Ap, E, C
CO5	Understand frequency distribution and measures of central tendency (like mean, median and mode), measures of dispersion (range, mean deviation, and standard deviation), correlation, regression, skewness and Kurtosis.	1,2,3,4	E, C, An, Ap

**Course Title:** Statistical Physics and Thermodynamics **Course Code:** Paper-A

<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive levels</b>
CO1	Understand the concept of thermodynamical probability and energy wise distribution of particles in various compartments	2,3	R,U,Ap,An,E
CO2	Learn the concepts of phase space, classical and quantum statistics.	2	R,U,Ap,An,E
CO3	Analyze the statistical concept of entropy.	4	U,Ap,An,E
CO4	Analyze the application of thermodynamics and heat death of universe.	2	U,Ap,E





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# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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CO5	Derive and understand application of Maxwell thermos dynamical relations.	2,4	U,Ap,An,
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**Course Title:** Optics and Lasers**Course Code:** Paper-B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the natural phenomenon of wave nature of light and its experimental proof.	1,2,3,5	U,E,C,Ap
CO2	Understand the effect of interference of light during reflection, transmission and Michelson interferometer.	1,2,3,4	R,U,Ap,E
CO3	Understand the concepts and complete explanation of diffraction and polarization of light and their types.	1,2,3,4	U, An,Ap, C
CO4	Explain the basic theories of laser physics with its applications in different fields.	1,3,4,5,	R,An,U,E
CO5	Explain the stimulated and spontaneous emission studied by Einstein equations.	1,2,3,4,5	An,R,U,C

**Course Title:** Practical**Course Code:** Physics Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use the spectrometer to study various spectra.	1, 2	R,U,Ap,An,E
CO2	Understand the concept of sextant to measure accessible and inaccessible lengths.	1,2	U,Ap,An,E
CO3	Verify the law of probability distribution using coins.	1,4	U,Ap,An,E
CO4	Explain Diffraction through grating using He-Ne laser and sodium light.	1,2	U,Ap,An,E
CO5	Understand the concept of polarimeter.	2,4	U,Ap,An,E



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## Course Title: Analysis

Course Code:MAT-231A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the behaviour of real numbers, sequences and series of real numbers.	3	U, An
CO2	Test the convergence of sequences and series of various types, the convergence of improper integrals.	1,3	An, Ap
CO3	Apply the concept of Riemann integrability, the use of beta and gamma functions in solving various problems of calculus.	3,4	E, C

## Course Title: Analytical Geometry

Course Code:MAT-231B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand and apply the concepts of geometry in the daily life.	1,4	U, Ap
CO2	Analyse the applications of geometry in different fields such as art, robotics, Computer, and video games.	1,2	An, E
CO3	Realize the important role of Analytical Geometry in architecture and also in the construction of stairs by making use of angles.	4,5	E, C
CO4	Comprehend the concepts of change of origin, rotation of axes and invariants for second degree equations in two and three dimensions.	3	U, Ap
CO5	Know about the properties of conics (parabola, ellipse, hyperbola and sphere).	3	R, U

### Semester: IV

Course Title: Data Structures & Programming Language Using C++ And Practical.

Course Code: CSC-241,241P

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level



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CO1	Learn the basic types of data structures their implementation and application.	1,2,3,5	U
CO2	Use linear and non-linear data structure like stacks, queues, linked list etc.	1,2,3,4,5	R, U, An, Ap
CO3	Implement various searching and sorting algorithms	1,2,3,4,5	Ap, An, E, C
CO4	Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.	1,2,3,4,5	U, An, Ap, E, C
CO5	Develop programming skills	1,2,3,4,5	U, An, Ap

**Course Title:** Quantum Mechanics

**Course Code:** Paper-A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the basic formulation of Quantum mechanics developed by de Broglie and Schrodinger.	1, 2	R,U,Ap,An
CO2	Understand to various operators and Schrodinger equation.	3	U,Ap,An,E
CO3	Understand detailed quantum mechanical analysis of few one dimensional potential systems.	3,4	U,Ap,An,E
CO4	Learn the detailed quantum mechanical analysis of three dimensional potential systems.	2,4	U,Ap,An,E
CO5	Analyze Hydrogen atom and Harmonic oscillator.	5,6	R,U,E

**Course Title:** Atomic and Molecular Spectra

**Course Code:** Paper-B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Describe the theories explaining the structure of atom and origin of the observed spectra.	1,2,3,4	U,R,An,Ap
CO2	Explain the experimental proof of different effects like Bohr's theory and Zeeman effect.	3,4,5	An,Ap,E,C



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CO3	Identify the one electron atomic spectra effects and different quantum numbers required for complete explanation	1,2,4,5	R,U,Ap,E
CO4	Interpret the many electron atomic spectra of helium, alkaline atoms with LS couplings and selection rules.	1,3,4	An,Ap,C,E
CO5	Describe the X-ray and molecules spectra and understand the complete Raman effect.	1,2,3,4,5	U,An,Ap,C,E

**Course Title:** Practical

**Course Code:** Physics Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use the spectrometer to study Hydrogen and iodine absorption spectra.	1, 2	R,U,Ap,An,E
CO2	Explain the heating efficiency of electric kettle with varying voltage.	1, 2	R,U,Ap,An,E
CO3	Demonstrate the photoelectric effect, determination of Planck's constant and inverse square law	1, 4	U,Ap,An,E
CO4	Determine Ionization potential of mercury.	1,2	U,Ap,An,E
CO5	Find the Thermo emf and its variation with temperature.	2,4	U,Ap,An,E

**Course Title:** Statics and Vector Calculus

**Course Code:** MAT-241A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the study of system of forces in equilibrium and differentiation and integration of vector functions.	3	U, R, An
CO2	Define the resolution and composition of a number of forces, parallel forces and couples, moments of forces and couples about a point and a line.	2,3	R, U, E





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CO3	Generalise the theory behind the friction and centre of gravity.	1,3	E, C
CO4	Memorize definition of directional derivative and gradient and illustrate geometric meanings with the aid of sketches.	1,2	R, U, Ap
CO5	Apply the concept of a vector integration in a plane and in space.	4	Ap,An

**Course Title: Solid Geometry**

**Course Code:MAT-241B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of 3-D Euclidean geometry.	1,4	R, U
CO2	Generalise the concepts and ideas of plane geometry.	1,4	E, C
CO3	Understand the basic geometric views of shape, size, length, angle, volume, surface area, rotation, translation, location etc. associated with any figure.	2	U, Ap
CO4	Learn about the applications of solid geometry in 3-D modelling, Architectural designing, 3-D Computer graphics.	1,2	R, U, Ap
CO5	Understand the concepts and properties of solids like cone, right circular cone, cylinder, right circular cylinder and sphere.	3	U, Ap

**Semester: V**

**Course Title: Database Management System & Oracle**

**Course Code: CSC-351**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cogniti ve Level
CO1	Gain ability to handle large volumes of structured, semi-structured, and unstructured data using database technologies.	1,2,3,4,5	U, E
CO2	Appreciate the need for DB approach and understand the components and roles of DBMS.	1,2,3,4,5	R, U, An, Ap



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CO3	Apply DB system development life cycle to business problems.	1,2,3,4,5	An, E, C
CO4	Implement a set of relations in the chosen DBMS.	1,2,3,4,5	An, Ap, E, C
CO5	Do development and Administration using MySQL and understand about how to read and write files.	1,2,3,4,5	U, An, Ap

**Course Title:** Condensed Matter Physics

**Course Code:** Paper-A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge on classification of various crystal systems and crystal structures.	1, 2, 4	R, U, Ap
CO2	Understand the basics of X-ray diffraction and crystallography.	1, 3,4	R, U, Ap, An
CO3	Comprehend the concept of Reciprocal lattice and Brillouin zones.	1, 3	U, Ap, An, C
CO4	Get a comprehensive view of Fermi energy through classical and quantum free electron theory.	1, 3	R, U, Ap
CO5	Understand the difference between metals, semiconductors and Insulators on the basis of formation of energy bands.	1,2, 3	U, Ap, An, C

**Course Title:** Nuclear Physics

**Course Code:** Paper-B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain the ground state properties of the nucleus, the detailed nuclear structure and the concept nuclear force existing within the nucleus.	1,2,3,4	R,U,Ap,E
CO2	Understand the process of radioactivity through detailed studies on radioactive decay of elements, the laws governing the decay and the different modes of decay and also gain knowledge of its applications in different fields.	2,3,4	U,Ap,An,E
CO3	Apply the various aspects of nuclear reactions in view of compound nuclear dynamics, the concept of threshold energy and nuclear cross section. They will also	1,2,3,4	R,U,Ap,An



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	understand the concept of Q value and its physical significance.		
CO4	Comprehend the details of liquid drop and shell model to easily expose the structure of the nucleus.	1,2,3,4	R,U,Ap

**Course Title:** Practical

**Course Code:** Physics Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand about Characteristics of PN junction diode and determination of energy band gap.	1,2,4	U, R, Ap, An
CO2	Get the understanding of how a CRO works and how to measure voltage and frequency of AC and DC supply.	1,2,3,4	U, R, An, E
CO3	Study the characteristics of Thermistor, LED, Zener diode and understand their functioning and related concepts.	1,3,4,5	U, Ap, An, E,C
CO4	Understand BH curve tracing for different materials using CRO.	1,2,5	U, Ap, An, E
CO5	Get knowledge of the working of differentiating and integrating circuit.	2,3,4,5	U, Ap, An

**Course Title:** Dynamics

**Course Code:** MAT-351A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Handle the problems based on rectilinear motion.	3	C, E
CO2	Use Newton's laws of motion in numerical problems.	2,3	Ap, E
CO3	Deal with problems based on variable acceleration.	1,3	Ap, An
CO4	Use concepts of work, power and energy to solve practical problems.	3	E, C

**Course Title:** Number Theory

**Course Code:** MAT-351B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Know about some fascinating discoveries related to properties of prime numbers.	1,2	An, E, C
CO2	Interpret the concept of divisibility and fundamental theorem of Arithmetic.	2,3	R, U
CO3	Have knowledge about applications such as security system like in banking securities, coding theory, barcodes and memory management systems.	4,5	Ap, An
CO4	Understand the various types of numbers and their properties, various arithmetic functions.	3	U, E
CO5	Understand the concepts of G.C.D. and L.C.M. of numbers and the relation between linear Diophantine equations and congruencies which will help to solve various arithmetic problems.	3,4	U, Ap

**Semester: VI**

**Course Title: Programming using Python**

**Course Code: CSC-601**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Get knowledge of one of the latest and powerful programming languages – Python.	1,2,3,4	U, E
CO2	Understand about how to read and write files.	1,2,3,5	R, U, An, Ap
CO3	Get a broad view of the concept of Object Oriented Programming (OOP) applied in Python.	1,2,3,4	U, An, E, C
CO4	Learn how to connect Python programs to a database.	1,2,3,4,5	An, Ap, E, C
CO5	To learn how to identify Python object types.	1,2,3,4	U, An, Ap

**Course Title: Electronics**

**Course Code: Paper-A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand and analyze pn junctions in semiconductor devices.	1,2,3,4	U, Ap, An
CO2	Analyze simple rectifiers and voltage regulators using diodes.	1,2,3,4	R, U, Ap, An





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CO3	Describe the behaviour of special purpose diodes.	1,2,3,4	R, U, Ap, An,E
CO4	Study different biasing techniques to operate transistor, FET, MOSFET. Study of amplifier analysis using hybrid parameters.	1,2,3,4	U, Ap, An, E
CO5	Know the concept of feedback in Amplifier and Oscillator, and study of different types of Oscillators.	1,2,3,4	U, Ap, An,E

**Course Title:** Radiation and Particle Physics

**Course Code:** Paper B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the four fundamental forces of nature and their mutual interaction.	1,2,3,4,5	R,U,An
CO2	Understand the fundamental aspects of the structure of nucleus, nuclear reactions, interaction of radiation with matter and the process of energy loss by different radiations.	1,2,3,4,5	R,U,Ap,An
CO3	Gain knowledge about the principle, construction and working of various radiation detectors.	1,2,3,4,5	R,U,Ap,An,E
CO4	Learn about various linear and cyclic accelerators used to accelerate charged particles to high energies for carrying out nuclear reactions and their implementation in different research fields.	1,2,3,4,5	R,U,Ap,An,E
CO5	Understand the basic physics behind elementary particles, their classification according to the associated quantum numbers and the confirmation of unified theory with the discovered elementary particles.	1,2,3,4,5	R,U,Ap,An

**Course Title:** Practical

**Course Code:** Physics Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Describe the nature of electromagnetic wave and its propagation through different media.	1,2,3,4	U,An,Ap,R
CO2	Build and design regulated power supplies and other instruments.	2,3,4,5	R,Ap,An,C
CO3	Develop logic circuits for various applications in real life.	1,2,4	U,Ap,E,C
CO4	Detect the different types of radiations by using G.M. counter.	1,2,3,4	R,U,Ap,E
CO5	Adopt the skills related to research, education, and industry by using electronics.	2,3,4,5	U,An,Ap,E,C



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### Course Title: Linear Algebra

### Course Code: MAT-361A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Handle the problems based on vector spaces, subspaces, basis and dimensions.	3	E, C
CO2	Check the linear independence of vectors.	3	R, U
CO3	Form the linear combination of vectors.	1	An, Ap, C
CO4	Find the matrix corresponding to a linear transformation and vice versa.	3	Ap, E

### Course Title: Numerical Analysis

### Course Code: MAT-361B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the use of Numerical analysis in detecting errors in numerical calculations.	1,2	E, C
CO2	Solve linear and non-linear equations, in numerical differentiation and integration, to solve differential equations.	3	Ap, An, E
CO3	Have the knowledge of the study of algorithms that use numerical approximation for the problems of mathematical analysis.	2,3	R, U, Ap
CO4	Apply numerical analysis in all the fields of engineering, physical sciences, life sciences, social sciences, medicine, business and even the arts have adopted elements of scientific computations.	1,4,5	Ap, An, E, C
CO5	Analyze and evaluate the accuracy of common numerical methods.	1, 3	An, E



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### B.Sc. (Hons) Chemistry

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO1	To acquire knowledge and develop understanding of the basic concepts, scientific theories and principles of different fields of chemistry.
PSO2	To apply the knowledge acquired to write IUPAC names of compounds, interpret data, analyse mathematical derivations and solve qualitative as well as quantitative chemistry problems.
PSO3	To study different types of organic reactions and apply the knowledge to identify reactive intermediates as well as mechanisms of organic reaction..
PSO4	To apply the knowledge of spectroscopic techniques for predicting the structure of the unknown compounds.
PSO5	To synthesize, separate (purify), characterize and study the properties of organic or inorganic compounds and learn the application of chemical reagents used in organic or inorganic synthesis.
PSO6	To learn various laboratory techniques and gain ability to handle various instruments used in chemical analysis.
PSO7	To learn the synthesis, chemical properties and applications of organic as well as inorganic compounds containing elements such as Si, P and S in everyday life.
PSO8	To understand the chemical properties of different elements, compounds (ionic, covalent or coordination compounds) or non-aqueous solvents and their industrial applications. Students are able to find the structure of the complexes using VSPER and MOT theory.
PSO9	To read material safety data sheets and develop skills for the safe-handling of chemical materials, taking into account the specific hazards associated with their use and the ability to conduct risk assessments.
PSO10	To prepare power point presentations and develop presentation skills
PSO11	To apply the knowledge acquired to analyze material chemistry, colligative properties, surface phenomenon, electrochemistry, thermodynamic laws, chemical kinetics, and quantum chemistry as well as quantum mechanics problems.

#### COURSE OUTCOMES



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### Semester I

Course Title: Physical Chemistry I

Course Code: BHC-111

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Visualize the properties of gases, their behavior under different circumstances, Liquification of gases and critical phenomenon. Related laws, velocities, Maxwell distribution and collision properties of gases.	1,2	R, U, Ap, An, E
CO2	Understand molecular forces in liquids, surface tension, refraction and its correlation with molecular structure. Liquid crystal, their types and uses	1,2	R, U, Ap, An, E
CO3	Enhance the knowledge of thermodynamics through its Zeroth and First Law, understand the thermodynamics parameters like U, H, Cp, Cv and along with T-V, T-P and P-T relations for adiabatic processes	1,2	U, Ap, An, E
CO4	Enhance the evaluating skills through interpreting of thermochemical data in terms of U, H and bond energies	1,2	U, Ap, An, E
CO5	Know the next stage of thermodynamics through the second and third law; Carnot cycle and its use for deriving the concept of entropy; Gibb's and Helmholtz free energies	1,2	U, Ap, An, E, C





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Course Title: Inorganic Chemistry-I

Course Code: BHC-112

S. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand quantum mechanical model of atom, quantum numbers, electronic configuration, radial and angular distribution curves, shapes of s, p, and d orbitals, and periodicity in atomic radii, ionic radii, ionization energy and electron affinity of elements	1,	R, U, Ap
CO2	Acquire knowledge on the bonding theories (VBT, MOT & Band theory) used to explain various types of bonds (ionic, covalent and metallic); deduce the shape (geometry) of molecules using VSEPR theory.  MO diagrams for a few homo- & hetero-nuclear diatomic molecules and to calculate the bond order	1,8	R, U, Ap, E
CO3	Understand the concept of periodicity, trends regarding stability of TMC, diagonal relationship, inert pair effect and properties of Transition metal complexes	1,8,5	U, Ap, An, E
CO4	Understand the position and properties of hydrogen	1	U, Ap
CO5	Get knowledge regarding classification of acids and bases according to different concepts. ; HSAB Concept and relationship of hardness and softness with electronegativity	1,8	U, Ap, An, C



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**Course Title:** Organic Chemistry-I

**Course Code:** BHC-113

S. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Evaluate the hybridization and nature of bonding.	1,3	U,Ap, E
CO2	Write the IUPAC naming of alkanes, alkenes, dienes, alkynes and arenes.	1,2,3,7	U,Ap, C
CO3	Solve and infer the final products when alkanes, alkenes and alkynes undergo halogenation, hydrogenation, hydration and halohydrogenation reactions.	1,3	U,An, E
CO4	Draw electron movements with arrows and analyze the reactive intermediates involved in reaction.	1,3	U,An, E
CO5	Analyze the type of isomerisms and draw conformations or configurations of organic compounds.	1,3, 7	U, Ap, An, C
CO6	Understand the mechanism of electrophilic addition, aromatic electrophilic substitution and nucleophilic addition reactions.	1,3	U, Ap, E, C

**Course Title:** Organic Chemistry Lab-I

**Course Code:** BHC 114



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to do calibration of thermometers.	6	U, Ap, C
CO2	Learn the method of determination of melting as well as boiling point	5,6	U, Ap, E, C
CO3	Use techniques such as distillation, crystallization, sublimation, extraction, and steam distillation for purification of compounds.	5,6	U, Ap, C

Name of class: B.Sc. (Hons.) Chemistry

Semester: I

Course Title: Optics

Course code: CHEM-104

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge on wave theory of light.	1,2,4,5,6	U,R,Ap,An
CO2	Acquire an in depth understanding of properties of light like reflection, refraction, interference, diffraction and polarization	1,2,4,5,6	U,R,Ap,An
CO3	Understand the applications of interference in design and working of interferometers.	1,2,4,5,6	U,R,Ap,An
CO4	Comprehend the concept of Polarization through thorough understanding of Electromagnetic waves and their transverse nature.	1,2,4,5,6	U,R,Ap,An
CO5	Understand the applications of diffraction and polarization in various optical instruments.	1,2,4,5,6	U,R,Ap,An



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**Course Title:** Physics lab-I

**Course code:** CHEM-109

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the working of basic optical instruments.	3,5,6	U, Ap, An
CO2	Understand and differentiate between the different phenomenon related to light such as Interference, diffraction and polarization.	3,5,6	U, Ap, An
CO3	Gain precision in handling of optical instruments.	3,5,6	U, Ap, An
CO4	Understand the operating principle of certain optical instruments	3,5,6	U, Ap, An
CO5	Understand the applications of Interference, diffraction and polarization.	3,5,6	U, Ap, An

**Semester:** II

**Course Title:** Modern Physics

**Course code:** CHEM-113

Sr. No.	On completing the course, the student will be able to:	PSOs addressed	Cognitive levels
CO1	Attain a comprehensive knowledge and understanding of the main Physical concepts and theories of the 20 <sup>th</sup> century.	1,2,4,5,6	U,R,Ap,An
CO2	Understand the basic ideas of Quantum Physics through concepts of Blackbody radiation, Photoelectric effect, Compton effect, uncertainty principle and concept of wave packet.	1,2,4,5,6	U,R,Ap,An
CO3	Understand the basics of crystallography and X-ray diffraction.	1,2,4,5,6	U,R,Ap,An
CO4	Gain an in depth understanding about the process of Radioactivity and its biological effects and Applications.	1,2,4,5,6	U,R,Ap,An
CO5	Understand the concepts related to particle Physics and will attain knowledge about the classification and properties of different particles.	1,2,4,5,6	U,R,Ap,An

**Course Title:** Physics lab-II

**Course code:** CHEM-118





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Sr. No.	On completing the course, the student will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic experiments of Modern Physics.	3,5,6	U, Ap, An
CO2	Understand and verify the particle nature of light through experiments on Photoelectric effect.	3,5,6	U, Ap, An
CO3	Gain knowledge on the construction and working of gas filled radiation detectors.	3,5,6	U, Ap, An
CO4	Understand the concept of molecular of spectra.	3,5,6	U, Ap, An
CO5	Learn the working of a PN junction and comprehend the concept of band gap.	3,5,6	U, Ap, An

Course Title: Physical Chemistry-II

Course Code: BHC-121

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of equilibrium, phase equilibria, Phase Rule and its application on a One-component system as well as on binary systems of solid-liquid and liquid-liquid.	1, 8, 11	R, U, Ap, An, E, C
CO2	Understand the crystal morphology, laws related to crystal structure, X-Ray diffraction studies of crystals, crystal structure determination and study of crystal defects/imperfections.	1, 8, 11	U, Ap, An, E, C
CO3	Understand colloidal systems of various types, their preparation, stabilization, purification and mechanical, electrical, optical properties.	1, 8, 11	U, Ap, An, E, C
CO4	Enhance their knowledge about electrical dipole moment, factors affecting it and its measurement.	1, 8, 11	U, Ap
CO5	Understand the concepts related to electrochemistry which involve the laws for strong electrolytes, weak electrolytes, migration of ions under influence of electrical field measurement of electrical conductivity and its applications	1, 8, 11	U, Ap, An, E, C



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Course Title: Inorganic Chemistry-II

Course Code: BHC-122

S. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquire knowledge regarding General properties of representative elements and alkali metals	1,8	U, An, E
CO2	Understand oxidation states with reference to elements in unusual and rare oxidation states like carbides and nitrides	1,8, 7	R, An, Ap
CO3	Gain knowledge about Nitrogen, Oxygen and Halogen family	1,4,8	U, An
CO4	Learn about Clathrate compounds, and preparation, structure and bonding of noble gas compounds	1,4,8	U, An, C
CO5	Understand the terms, ligand, denticity of ligands, chelate, coordination number and use standard rules to name coordination compounds; various types of isomerism possible in such compounds and understand the types of isomerism possible in a metal complex.	1,8	U, Ap, An

Course Title: Organic Chemistry-II

Course Code: BHC 123



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquire knowledge about the nomenclature, general physical properties, synthesis and chemistry of Alcohols, phenols.	1,2,3	R,U,Ap
CO2	Get knowledge about the nomenclature, general physical properties, synthesis and chemistry of ethers, epoxides, alkyl/arylhalides,	1,2,3	U,Ap
CO3	Get knowledge about the nomenclature, general physical properties, synthesis and chemistry of aldehydes and ketones	1,2,3	U,Ap
CO4	Get knowledge about the nomenclature, general physical properties, synthesis and chemistry of carboxylic acids, and carboxylic acid derivatives	1,2,3	U,Ap

**Course Title:** Inorganic Chemistry Lab-I

**Course Code:** BHC 124

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Identify the cations present in the mixture.	1,9	Ap, An
CO2	Identify the anions present in the mixture.	1,9	Ap, An
CO3	Gain hands-on practice on handling different Chemicals in the lab	1,5,9	Ap
CO4	Learn to prepare basic solution required to identify cations and anions in the mixture	1,5,9	U, Ap



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### Semester III

Course Title: Physical Chemistry-III

Course Code: BHC 231

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn colligative properties and various principle of chemical kinetics.	1,11	U, Ap
CO2	Calculate partial molar properties and Fugacity	11	U, Ap
CO3	Learn the thermodynamic properties of simple solutions	11	U, Ap,An
CO4	Understand the surface chemistry and solve laplace and kelvin equations.	11	U, Ap
CO5	Learn Debye huckle theory, and mean ionic activity coefficient.	11	U, Ap,An





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Course Title: Inorganic Chemistry-III

Course Code: BHC 232

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge about general properties of d block elements.	1	R, U
CO2	Understand general chemistry of first transition series like isolation, aqueous chemistry, and stereochemistry of the complexes.	1,5,8	R, Ap
CO3	Do comparison of second and third transition series with first transition series; Zirconium clusters, Mo-Mo and Re-Re quadrupole bonds. Properties of a non-aqueous solvent.	1,5,8	U, An
CO4	Understand Lanthanoids and Actinoids <i>f-block</i> complexes, absorption spectra, magnetic properties and their applications.	5,8	U, An
CO5	Learn basic coordination chemistry; Nomenclature and different ligands with structure.	1,5,8	U, Ap, R



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Course Title: Organic Chemistry-III

Course Code: BHC 233

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge about Chemical synthesis, structure, metabolism, biological importance of Carbohydrates	1,3,5	U , Ap, An , E
CO2	Gain knowledge about Chemical synthesis, structure, metabolism, biological importance of Fatty acid	1,3,5	U , Ap, An , E
CO3	Gain knowledge about Chemical synthesis, structure, metabolism, biological importance of proteins,	1,3,5	RU , Ap, An , E
CO4	Gain knowledge about Chemical synthesis, structure, metabolism, biological importance of amino acids	1,3,5	U , Ap, An , E



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**Course Title: Physical Chemistry Lab-I**

**Course Code: BHC 234**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to determine the relative viscosity, partial molar volume, viscosity average mol. Wt. number average mol. Wt and mean diameter by measuring the internal viscosity of the various molecules.	6,11	U, Ap, An
CO2	Learn to determine the heat of solution, heat of hydration of various salts using calorimeter.	6,11	R, An, Ap
CO3	Learn to determine the partition coefficient of solvent by distribution law.	6,11	U, Ap
CO4	Learn to determine Freundlich and langmuir adsorption isotherms by adsorption of aqueous solution on charcoal.	6,11	R, U, Ap,An
CO5	Verify Lambert-Beer law using calorimeter.	6,11	U, An, Ap

**Course Title: Physics III (Electricity and Magnetism) Course Code: CHEM-206**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the calculus along with physical principles to effectively solve problems encountered in everyday life and further study in science.	2,3,4,5	U,R,Ap,An
CO2	Learn about electric charges and their interactions, electric field,	2,3,4,5	U,R,Ap,An



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	electric potential, Coulomb's law, Gauss's law and their applications.		
CO3	Explain the concept of moving charges, current, capacitors and their energy storage, Ohm's law and polarizability.	2,3,4,5	U,R,Ap,An,E
CO4	Understand magnetic field due to current and their interactions, Biot-Savart's law, Ampere circuital law and their applications.	2,3,4,5	U,R,Ap,An,E
CO5	Understand different types of magnetic materials and Langevin's theory of diamagnetism and paramagnetism.	2,3,4,5	U,R,Ap,An,E

Course Title: Physics Lab III

Course Code: CHEM-207

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand and perform the practical of Carey Foster bridge to find low resistance with and without calibrating it.	2,4,5	U,Ap,An,E
CO2	Understand the working of household energy meter.	2,4,5	U,Ap,An,E
CO3	Verify the faraday's law of electromagnetic induction by simple experiment.	2,4,5	U,Ap,An,E
CO4	Find the efficiency of an electric kettle with varying input voltages.	2,4,5	U,Ap,An,E
CO5	Find the unknown capacitance by using flashing and quenching method. Variation of magnetic field with distance can also be studied.	2,4,5	U,Ap,An,E





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### Semester: IV

**Course Title:** Physics IV (Condensed Matter Physics) **Course Code:** CHEM-214

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Differentiate between different lattice types and Miller indices. They can explain NaCl and diamond structure.	1,2,4,5	U,R,An,E,C
CO2	Explain the concepts of reciprocal lattice, Brillouin zones and crystal diffraction..	1,2,4,5	U,R,An,E,C
CO3	Explain the concept of lattice vibrations and effect of the same on electrical and thermal properties of the solids.	1,2,4,5	U,R,An,E
CO4	Explain Einstein's and Debye's model of specific heat.	1,2,4,5	U,R,Ap,An,E
CO5	Explain band structures and their variation with temperature leading to change in material properties. Semiconductor diodes can also be explained.	1,2,4,5	U,R,An,E

**Course Title:** Physics Lab IV

**Course Code:** CHEM-217

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of energy band gap in semiconductors.	1,2,4,5	U, Ap,An,E



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CO2	Gain knowledge on the working of Zener diode, LED, Germanium and silicon diodes.	1,2,4,5	U, Ap,An,E
CO3	Understand the variation of resistance of a thermistor with temperature.	1,2,4,5	U, Ap,An,E
CO4	Find magnetic parameters from BH curves by working on CRO.	1,2,4,5	U, Ap,An,E
CO5	Easily find out the dielectric constant of various liquids by working on dipole meter.	1,2,4,5	U, Ap,An,E

Course Title: Physical Chemistry-IV

Course Code: BHC 241

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Describe molecular spectroscopy, vibrational spectroscopy, rotational spectroscopy, Raman spectroscopy and its nature, spectra, selection rule, energy; evaluate spectra shown by a species.	1,4	U ,Ap
CO2	Analyse and justify the positioning of peaks in the interpretation of spectral data; elucidate the structure of organic compounds using individual or combination of spectral techniques, viz., UV, IR	1,4	U , An
CO3	Analyse, characterise and identify the unknown compounds	1,5	Ap ,An
CO4	Learn application part of quantum chemistry	1	U
CO5	Understand the molecular particles more efficiently and effectively	1	U



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**Course Title:** Inorganic Chemistry-IV

**Course Code:** BHC 242

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the coordination compounds, theory, their nature of bonding,	1,2,8	U, Ap, E, C
CO2	Learn about the magnetic properties of coordination compounds	1,5,8	U, Ap, E, C
CO3	Learn about inner orbital complex and outer orbital complex	1,2,8	U, Ap, E, C
CO4	Apply the concepts of mathematical group theory on chemical compounds	1	U, Ap, E, C
CO5	Learn about the application of group theory like hybridisation and vibrational modes of the molecules.	1,4	U, Ap, E, C

**Course Title:** Organic Chemistry-IV

**Course Code:** BHC 243

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Have a fundamental theoretical understanding of heterocyclic chemistry	1	U, Ap, E, C
CO2	Know aromatic and non-aromatic heterocycles, particularly their structural and chemical properties and synthesis.	1,7	U, Ap, E, C
CO3	Study the principles of heterocyclic synthesis	1	U, Ap, E, C
CO4	Know biologically the active compounds of related structure type and their medicinal applications.	1	U, Ap, E, C
CO5	Get familiar with particular properties and reactions for the most important heterocycles as well as different systems of nomenclature.	2	U, Ap, E, C



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**Course Title:** Organic Chemistry Lab-II**Course Code:** BHC 244

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Perform qualitative analysis of functional groups.	5, 8,10	R,U, Ap
CO2	Study the estimation of the amount of given organic compound.	5	Ap
CO3	Understand the purity of given organic compounds (tlc) and their separation (Column).	6	U,Ap

**Semester V****Course Title:** Physical Chemistry-V**Course Code:** BHC 351

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply the concepts of activity and activity coefficient to solutions; calculate the mean ionic activity coefficient of the solution; and explain how the behavior of ions in solution contribute to this constant.	1	Ap
CO2	Analyse colligative properties of solutions and correlate these with molar masses of the solutes; decipher abnormal colligative properties exhibited by some solutes in solutions.	2,1	An,Ap
CO3	Qualitatively describe how nanoparticle size affects its morphology, reactivity, and properties; evaluate applications of nanotechnology in sustainable development.	1,2	U
CO4	Interpret the first law of thermodynamics and express it mathematically; calculate energy changes as well as work and heat contributions in chemical systems; explain state functions U and H; correlate $\Delta U$ and $\Delta H$ ; calculate enthalpy changes for various types of reactions; and apply Hess's law of constant heat summation.	2,1	U ,An E
CO5	understand Fick first law and second law	1,2	U





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**Course Title:** Inorganic Chemistry-V

**Course Code:** BHC 352

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the coordination compounds and theory of coordination compounds	1	U, Ap, An, E
CO2	Apply ligand field theory CFT on simple molecules.	1,5	U, Ap, An, E
CO3	Learn about Molecular orbital theory	1,8	U, Ap, An, E
CO4	Learn about bonding in ionic compounds, covalent compounds and metallic compounds.	1,8	U, Ap, An, E
CO5	Learn about types of crystal defect, semiconductor materials	1,8	U, Ap, An, E

**Course Title:** Organic Chemistry-V

**Course Code:** BHC 353

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge about IR spectroscopy, instrumentation and its applications	1,4	R, U, Ap
CO2	Learn about Mass spectrometry	1	U, Ap
CO3	Solve problems related to IR and mass spectrometry	1,4	R, U, Ap
CO4	Understand the factors affecting UV-absorption spectra, Interpret IR spectra on basic values of IR-frequencies	1,4	U, Ap
CO5	Learn about the NMR spectroscopy and its application.	1,4	U, Ap

**Course Title:** Organic Chemistry-VI

**Course Code:** BHC 354



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Classify a given reaction mechanism as Electrophilic, Nucleophilic or free radical.	1,3	R, U, Ap
CO2	Get detailed information on various mechanisms and their evidences	3	U, Ap
CO3	Study the effects of substrate structure, reaction medium, leaving group etc. in all types of mechanisms	1	U, Ap
CO4	Understand the mechanistic and stereochemical viewpoint of addition to carbon- carbon multiple bonds and carbon-hetero multiple bonds.	1, 3	U, Ap
CO5	Understand various types of reaction mechanisms.	3	U, Ap

Course Title: Analytical Chemistry

Course Code: BHC 355

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the electrode potential, standard electrode potential, liquid junction potential, polarization and to calculate electrode potential.	1	U, Ap, An, E
CO2	Know about the construction and working of various types of reference and indicator electrode	1,2,11	R,U,Ap, An
CO3	Learn about the gravimetry and coulometry methods at constant current and constant potential electrolysis and their applications.	1,5,6	U, E,Ap
CO4	Learn about polarography and its applications. Voltametry and various types of voltametric methods and its applications.	1,6, 11	U,An,E
CO5	Learn about conductometry, conductometric titrations and its applications; turbidimetry and nephelometric methods of chemical analysis.	1,2,6, 11	U,Ap,An



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Course Title: Inorganic Lab II

Course Code: BHC 356

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to synthesize various inorganic complexes	1,6,5	R,U, E,Ap
CO2	Learn to synthesize various inorganic complexes with monodentate and bidentate ligands	5,6	R,U, E,Ap
CO3	Learn about color of compounds and types of transition involved	4,5	U, E,Ap
CO4	Learn about the geometry of complexes	1,5	U, E,Ap
CO5	Learn to calculate the percentage yield of complexes	1	U, E,Ap



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**Course Title:** Organic Lab III

**Course Code:** BHC 357

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Have knowledge about various aspects of Organic synthesis such as apparatus handling, to place and observe a particular reaction.	5,6	Ap
CO2	Know the work up of various types of reactions.	5,6	Ap
CO3	Check purity and yield of the product.	5,6	U, Ap

**Course Title:** Physical Chemistry Lab III

**Course Code:** BHC 358

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Determine physical constants and parameters using multiple instruments such as a pH meter, conductometer, Spectrophotometer and Potentiometer.	2	U R An
CO2	Explicate the basic principles and experimental set up of various instrumental methods, i.e., conductometric and potentiometric titration and analyse various titration curves in conductometric titration; discuss different methods to locate the equivalence point in potentiometric titrations	2	U R An
CO3	Understand the basic principles and experimental set up of various instrumental methods such as pH-metry, conductometry, colorimetry and potentiometry; plot graphs to interpret the results obtained.	2	U R An





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**Course Title: Student Power Point Presentation/Seminar on a Subject Topic**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn recent innovations in chemistry	1,10	R,U,Ap, C
CO2	Prepare power point presentations.	10	Ap,C
CO3	Develop confidence to ask questions and answer any question.	10	An, C
CO4	Develop teaching and learning skills.	10	Ap, An,C

**Semester VI**

**Course Title: Physical Chemistry-VI**

**Course Code: BHC 361**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply nuclear chemistry concepts of radioactive decay, radioactive isotopes, radioactive equilibrium etc.	1,2	Ap
CO2	Compare nuclear fission and nuclear fusion.	1,2	An
CO3	Calculate various parameters involved in photochemistry; apply laws governing photochemistry to various photochemical reactions and photochemical transitions.	1,2	U and Ap
CO4	Understand the structure and symmetry of solids	1,2	U
CO5	Differentiate between steady and non-steady diffusion	1,2	U



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**Course Title: Inorganic Chemistry-VI**

**Course Code: BHC 362**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquire knowledge of metal-ligand bonding.	1	R,U,An, E
CO2	Learn about organometallic chemistry, 18 electron rules, and bonding in OMC.	3,5	R,U,An, E
CO3	Learn the various catalytic cycles involved in organometallic compounds.	3,5	U,An, E
CO4	Enhance their knowledge on the role of metal ions in various biological processes and systems and understand the structural features of biological systems involving metal ions and their activities and mechanisms	1,2	U,An, E
CO5	Acquire knowledge on host-guest chemistry and non-covalent interaction	1,2	U,An, E

**Course Title: Organic Chemistry-VAII**

**Course Code: BHC 363**



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about Stereochemical principle, conformation analysis and asymmetric synthesis.	1,3	R,U,An, E
CO2	Learn about the various chemical reagents available for oxidation/reduction reactions and their properties.	1,7	R,U,An, E
CO3	Explain the reactive intermediates for organic synthesis, rearrangement, coupling and name reactions.	1,3	R,U,An, Ap
CO4	Get insight into the utilization of Pd, Ni, Titanium and silicon in coupling of two molecular entities and their vast applications in organic synthesis.	1,3,7	U,An, Ap
CO5	Assign R/S configuration to organic compounds containing one or more chiral centers and to biphenyls, allenes and spiranes	1,3	R,U, E

Course Title: Advanced Physical Chemistry

Course Code: BHC 364

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop the understanding of electrical and magnetic properties of the crystals and related theories.	1, 2,11	R, U, An, E
CO2	Learn reaction thermodynamics through Activated Complex Theory and reaction kinetics with help of Eyring equation	1, 2,11	R, U, An, Ap
CO3	Understand the Approximation methods for solving Schrodinger wave equation for multi-electron systems	1, 2,11	U, An, Ap
CO4	Develop the expertise in to various types of coupling schemes and use of Quantum Mechanics in MOT for Homonuclear, Heteronuclear and Conjugated pi-electron systems	1, 2,11	U, An, Ap, E
CO5	Use the mathematical tools of statistics for deriving partition function and then using this function to deduce the expression for the thermodynamic parameters of the chemical compounds	1, 2,11	U, An, Ap, E



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**Course Title: Advanced Chemistry**

**Course Code: BHC 365**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the concepts of quantum chemistry	1,11	R,U,An, Ap
CO2	Explain Inorganic polymers, silicones and polysiloxanes.	1,7	R,U,Ap
CO3	Learn the biomedical applications of polyphosphazines and elastomers	1,7,8	U, Ap
CO4	Analyze structure features of siloxine resins and block copolymers.	1,7,8	U,An
CO5	Calculate angular and spherical harmonics along with diatomic molecule	1,11	U,An, Ap,C

**Course Title: Inorganic Lab III**

**Course Code: BHC 366**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn Gravimetric methods for estimation of Barium and lead	1,5,6	U,R,An
CO2	Learn Gravimetric methods for estimation of iron , nickel, and silver	1,5,6	U,R,An
CO3	Learn Gravimetric methods for estimation of mercury, cadmium, and cobalt	1,5,6	U,R,An
CO4	Learn Gravimetric methods for estimation of chromium, and copper	1,5,6	U,R,An
CO5	Learn about the physical properties of these compounds.	1,5,6	U,R,An





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Course Title: Physical Lab III

Course Code: BHC 367

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Determine physical constants and parameters using multiple instruments such as a pH meter, conductometer, spectrophotometer and Potentiometer.	2	U,R,An
CO2	Understand the basic principles and experimental set up of various instrumental methods such as pH-metry, conductometry, colorimetry and potentiometry; plot graphs to interpret the results obtained.	2	U,R,An
CO3	Explicate the basic principles and experimental setup of various instrumental methods, i.e., conductometric and potentiometric titration and analyse various titration curves in conductometric titration; discuss different methods to locate the equivalence point in potentiometric titrations.	2	U,R,An



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### B.SC. (HONS.) PHYSICS

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

##### PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO1	To Demonstrate knowledge of classical mechanics, electromagnetism and modern physics and be able to apply this knowledge to analyse a variety of physical phenomena.
PSO2	To demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.
PSO3	To demonstrate the ability to use skills in Physics and its related areas of technology for formulating and tackling Physics-related problems and identifying and applying appropriate physical principles and methodologies to solve a wide range of problems associated with Physics.
PSO4	To analyse scientific reasoning for various things.
PSO5	To enable students to be capable of analyzing the problems through different prospective and hence instill higher order thinking and learning.
PSO6	To find ample career openings both in public as well as private sector enterprises. They can apply for all government jobs and find various opportunities in government organizations like DRDO, ISRO, BARC, IIT etc.

##### COURSE OUTCOMES

##### Semester: I

Course Title: Mechanics- I

Course Code: BHP-111

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic information about co-ordinate system and motion of particles in it.	1,2,4	U, An, E,C
CO2	Understand the conservation laws and also to determine the difference between elastic and inelastic collisions.	1,3,4,5	U, Ap, An



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CO3	Explain the applications of central force to the stability of circular orbits, Kepler's laws of planetary motion, orbital precession and Rutherford scattering.	1,2,4,5,6	U, Ap, An,E
CO4	Understand the dynamics of rotating objects i.e. rigid bodies, angular velocity, the moment of inertia, the motion of rigid bodies and Euler equations.	1,2,3,5	U, Ap, An,E
CO5	Understand the differences between types of forces and also able to explain the inverse square force field.	1,2,3,4,5,6	U, Ap, An,E

**Course Title:** Electricity & Magnetism-I

**Course Code:** BHP-112

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand vectors calculus.	1,2,4,6	U, R, Ap, An
CO2	Understand the fundamental laws and concepts in electricity and magnetism and their applications.	1,2,3,4,6	U, R, Ap, An, E
CO3	Understand electric current and related concepts.	1,3,4,6	U,Ap, An, E,C
CO4	Understand dielectrics, resistors, capacitors, and inductors.	1,2,4,5,6	U,Ap, An, E
CO5	Understand the relativistic approach in electricity and magnetism.	2,3,4,5,6	U,Ap, An, E,C

**Course Title:** Physics Lab I

**Course Code:** BHP-113

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Understand the concept of moment of inertia, torque and angular acceleration with the help of fly wheel.	1,4,5,6	U, Ap, An
CO2	Understand the conservation laws in elastic collision using one dimensional hanging sphere.	1,3,4,6	U, Ap, An
CO3	Determine modulus of rigidity, Young's modulus and Poisson's ratio.	1,2,5,6	U, Ap, An, E
CO4	Find out low resistance with Carey Foster's Bridge.	3,4,5,6	U, Ap, An, E,C
CO5	Find out the capacitance and permittivity of a medium by de-Sauty's bridge.	1,3,4,5,6	U, Ap, An

**Course Title:** Organic Chemistry-I

**Course No:** CHX 111

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about SN1, SN2 and SNi Mechanism and the related stereochemistry.	4,5,6	U, R, Ap
CO2	Understand the concept, principle and applications of UV, IR and NMR Spectroscopy and the problems pertaining to the structure elucidation of simple organic compounds.	4,5,6	U, R
CO3	Solve the elimination reaction problems	4,5,6	U, Ap
CO4	Distinguish between type of addition, elimination and substitution reaction.	4,5,6	U, An
CO5	Learn E and Z nomenclature, Stereo chemical principal, enantiomeric relationship R and S	4,5,6	U, Ap

**Course Title:** Organic Chemistry Practical

**Course No:** CHP 112





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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Perform functional group analysis	4,5,6	R, U, Ap
CO2	Understand the preparation of derivatives of organic compounds	4,5,6	U, Ap
CO3	Study the determination of physical constant: Melting point, Boiling point.	4,5,6	U, R, Ap
CO4	Understand different separation techniques.	4,5,6	U, Ap
CO5	Learn how to perform TLC	4,5,6	U, Ap

Course Title: MATHEMATICS-I

Course Code: MAP-111

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Deal with the problems based on differential calculus.	1	U, An, E
CO2	Understand the concepts of partial differentiation.	2	R,U, Ap, An, E
CO3	Solve the problems related to integration using Reimann integrability and Beta Gamma functions.	3	R, U, Ap, An, E

Semester: II

Course Title: Electricity &amp; Magnetism-II

Course Code: BHP-121

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the magnetic effects of electric current.	1,2,4,5,6	U, Ap, An, E,C
CO2	Understand magnetic properties of matter.	1,2,4,5,6	U, Ap, An, E,C

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CO3	Understand diamagnetism, paramagnetism and ferromagnetism.	1,2,3,4,5,6	U, R, Ap, An
CO4	Understand the concept and applications of electromagnetic induction.	1,2,3,4,5,6	U, Ap, An, E,C
CO5	Understand electromagnetic waves.	1,2,4,5,6	U, Ap, An, E,C

**Course Title:** Waves and Oscillations**Course Code:** BHP-122

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the physical characteristics of SHM and obtaining solution of the oscillator using differential equations.	1,2,4,5,6	U, Ap, An, E,C
CO2	Calculate logarithmic decrement relaxation time and quality factor of a harmonic oscillator.	1,2,4,5,6	U, R, Ap, E,C
CO3	Understand the difference between simple harmonic vibrations of same frequencies and different frequencies.	3,4,5,6	U, An, E
CO4	Solve wave equation and to understand the significance of transverse waves and longitudinal waves.	3,4,5,6	U, Ap, An, E,C
CO5	Explain the concept of coupled mechanical as well as electrical oscillators.	1,2,4,5,6	U, Ap, An

**Course Title:** Physics Lab II**Course Code:** BHP-123

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of resonance in series and parallel LCR circuits.	1,2,3,4,5,6	U, R, Ap, An, E,C
CO2	Study the induced e.m.f. as a function of velocity of a magnet.	1,2,3,4,5,6	U, R, Ap, An, E,C



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CO3	Find out acceleration due to gravity by compound pendulum and by Kater's reversible pendulum.	1,2,3,4,5,6	U, R, Ap, An, E,C
CO4	Measure logarithmic decrement, coefficient of damping, relaxation time and quality factor of a damped simple pendulum.	1,2,3,4,5,6	U, Ap, An, E,C
CO5	Verify the laws of vibrating string by using Melde's apparatus and to show that $\lambda/2$ is constant.	1,2,3,4,5,6	U, E, C, An, Ap

Course Title: Inorganic Chemistry –II

Course No: CHX 121

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the coordination compounds, theory, their nature of bonding,	4,5,6	U, R, Ap
CO2	Gain knowledge to apply ligand field theory CFT on simple molecules.	4,5,6	U, R, Ap
CO3	Learn about Molecular orbital theory	4,5,6	U, R, Ap
CO4	Learn about VSEPR theory, VBT	4,5,6	U, R, Ap
CO5	Understand HSAB principle, Orgel Diagram, Macrocyclic ligands	4,5,6	U, R, Ap



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**Course Title:** Inorganic Chemistry Practical**Course No:** CHP 122

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Identify the anions present in the mixture.	5,6	U, Ap
CO2	Identify the cations present in the mixture.	4,5,6	R, U, Ap
CO3	Gain hands-on practice of handling different Chemicals in the lab	5,6	U, Ap
CO4	Learn to prepare basic solution required to identify cations and anions in the mixture	4,5,6	U, Ap
CO5	Learn about determination of boiling points of various compounds.	5,6	U, Ap

**Course Title:** MATHEMATICS-II**Course Code:** MAP-121

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Solve problems based on ordinary differential equations.	1	U, An, E
CO2	Use partial differential equations in solving practical problems.	1	R,U, Ap, E
CO3	Deal with the problems related to area and volume using double and triple integrals.	2	R, U, Ap, An, E

**Course Title:** MATHEMATICS-III**Course Code:** MAP-231

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Understand the concept of complex numbers, De-Moivre's along with its application.	1,2	U, An, E
CO2	Understand the concepts of co-ordinate geometry which includes problems on straight line, ellipse, parabola, and hyperbola.	2	U, Ap, An, E
CO3	Acquire knowledge regarding convergence and divergence of series using different tests.	3	U, Ap, An, E

**Semester III****Course Title:** Physical Chemistry-III**Course No:** CHX 231

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about ideal and non-ideal solutions, methods of expressing concentrations of solutions, dilute solution, colligative properties and Raoult's law	4,5,6	R, U and Ap
CO2	Understand rate of reaction, rate constant and rate laws, the order of reaction, first, second & third and zero order reactions	4,5,6	R, U and Ap
CO3	Learn about homogeneous catalysis, autocatalysis, oscillation reactions. Enzyme catalysis and heterogeneous catalysis	4,5,6	U and Ap
CO4	Understand the structure of liquids Structural differences between solids, liquids and gases. Liquid crystals	4,5,6	U and Ap
CO5	Understand the classification of colloids. kinetic, optical and electrical, properties, stability of colloids, protective action, Hardy Schulze law, gold number, types of emulsions, Emulsifiers and applications of colloids.	4,5,6	U and Ap



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**Course Title:** Mechanics-II

**Course Code:** BHP-231

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the velocity of light, relative motion.	1,2,3,4,5,6	R, U, Ap, An, E
CO2	Understand the importance of general and special theory of relativity.	1,2,3,4,5,6	R, U, Ap, An, E
CO3	Understand the geometrical representation of relativity.	1,2,3,4,5,6	U, Ap, An, E
CO4	Understand the concepts of frames of references, relativistic dynamics, structure of space time, principle of equivalence, fictitious forces etc.	1,2,3,4,5,6	U, Ap, An, E
CO5	Realize the various phenomenon in terms of relativity and mechanics	1,2,3,4,5,6	U, Ap, An, E

**Course Title:** Statistical and Thermal Physics

**Course Code:** BHP-232

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain the fundamental differences between classical and quantum statistics and learn about quantum statistical distribution laws.	1,3,4	U, An, E
CO2	Analyze important examples of ideal Bose systems and Fermi systems.	1,3,4,5	U, An, E
CO3	Apply the concepts and principles of black body radiations.	1,2,3,4,5	U, Ap, An, E
CO4	Apply the concepts and laws of thermodynamics to solve problems in thermodynamic systems such as gases, heat engines etc.	1,2,3,4,5	U, Ap, An, E



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CO5	Use the statistical physics methods, such as Boltzmann distribution, Gibbs distribution, Fermi Dirac and Bose-Einstein distributions to solve problems in some physical systems.	1,2,3,4,5	U, Ap, An, E
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**Course Title:** Physics Lab-III

**Course Code:** BHP-233

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the applications of sextant in different situations.	1,2,3,4,5,6	R, U, Ap, An, E, C
CO2	Understand the basics of adiabatic expansion and probability.	1,2,3,4,5,6	R, U, Ap, An, E, C
CO3	Understand thermal conductivity.	1,2,3,4,5,6	U, Ap, An, E, C
CO4	Study Stefan's law.	1,2,3,4,5,6	U, Ap, An, E, C
CO5	Study how to find the heating efficiency of electric kettle	1,2,3,4,5,6	U, Ap, An, E, C



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Course Title: Physical Chemistry Lab-III

Course No: CHX 232

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Measure important physical properties like surface tension, viscosity, density, enthalpy, heat of neutralization etc.	4,5,6	R, U , Ap
CO2	Learn to examine various physical parameters by different methods	5,6	R, U, Ap, An, E
CO3	Learn to handle important apparatus like stalagmometer, Ostwalds viscometer and calorimeter.	5,6	U , Ap
CO4	Learn to examine the rate of reactions (hydrolysis of ester)	4,5,6	U, Ap , An
CO5	Learn to perform acid-base titrations	4,5,6	U

Semester: IV

Course Title: Optics

Course Code: BHP-241

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand polarization, interference and diffraction.	1,2,3,4,5,6	R, U, Ap, An, E, C
CO2	Understand the light propagation through lenses, mirrors, prisms, and other optical systems.	1,2,3,4,5,6	R, U, Ap, An, E, C
CO3	Understand different branches of optics with associated experiments.	1,2,3,4,5,6	U, Ap, An, E, C





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CO4	Differentiate between Fraunhofer and Fresnel diffraction.	1,2,3,4,5,6	U, Ap, An, E, C
CO5	Understand the applications and importance of optics in daily life.	1,2,3,4,5,6	U, Ap, An, E, C

**Course Title:** Modern Physics

**Course Code:** BHP-242

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the properties of cathode rays and positive rays.	1,3,4,5	U, Ap, An, E
CO2	Explain the Photoelectric effect, Compton effect, the quantum theory of light, X	1,2,3,4,5	R, U, Ap, An, E
CO3	Understand the wave properties of particles and be knowledgeable about particle diffraction (Davisson Germer Experiment)	1,3,4,5	U, Ap, An
CO4	Know the uncertainty principle, the Atomic structure and its development, Thomson and Rutherford atomic model.	1,3,4,5	U, An, E
CO5	Have information about the Bohr atom model	1,2,3,4,5	U, Ap, An, E

**Course Title:** Physics Lab-IV

**Course Code:** BHP-243

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand spectrometer, telescope, microscope, plane diffraction grating, least count etc.	1,2,3,4,5,6	R, U, Ap, An, E, C
CO2	Understand different sources of light and associated experiments.	1,2,3,4,5,6	U, Ap, An, E, C



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CO3	Understand the light propagation through lenses, mirrors, prisms, and other optical systems.	1,2,3,4,5,6	U, Ap, An, E, C
CO4	Understand design, conduct experiments, analyse and interpret data using optical systems.	1,2,3,4,5,6	U, Ap, An, E, C
CO5	Understand polarization with experiment.	1,2,3,4,5,6	U, Ap, An, E, C

**Semester: V**

**Course Title: Condensed Matter-I**

**Course code: BHP-351**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge on classification of various crystal systems and crystal structures.	3,4	R,U, Ap, An
CO2	Understand the basics of X-ray diffraction and crystallography.	3,4,5,6,	R, U, Ap, An
CO3	Comprehend the concept of Reciprocal lattice and Brillouin zones.	1,3,4,6,	U, Ap, An
CO4	Gain a comprehensive view of Fermi energy through classical and quantum free electron theory.	1,4, 5,6	U, Ap, An
CO5	Understand and Analyze the difference between metals, semiconductors and Insulators on the basis of formation of energy bands.	1,3,4	U, Ap, An

**Course Title: Nuclear Physics**

**Course Code: BHP-352**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Explain the ground state properties of nucleus for the study of nuclear structure behavior.	3,4,5	U, R, Ap, E



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CO2	Express the radioactive decays and find some quantities characterizing the decay such as half-life and decay constant.	3,4,5,6	U, R, Ap, An, E
CO3	Explain of the liquid drop model, shell model and collective model descriptions.	3,4,5,6	U, R, E
CO4	Apply various aspects of nuclear reactions in view of compound nuclear dynamics.	3,4,5	U, Ap, An, E
CO5	Find operating voltage and half-life experiments in the lab.	3,4,5,6	U, Ap, An, E, C

**Course Title:** Atomic Spectroscopy

**Course Code:** BHP-353

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Describe the atomic spectra of one valence electron atoms.	1,3,4,5	U, Ap, An, E
CO2	Explain the change in behavior of atoms in external applied magnetic field.	1,3,4,5	R, U, Ap
CO3	Understand the basic concept of atomic physics and learn about quantum states of one electron atoms	1,2, 3,4,5	R, U, Ap, An, E
CO4	Understand the spectra of alkali elements, fine structure in alkali spectra, penetrating and non-penetrating orbits.	1,3,4,5	R, U, Ap, E, C
CO5	Understand effect of external fields to spectra like, Normal and anomalous Zeeman effect, Paschen back effect	1,2,3,4,5	R, U, Ap, An, E

**Course Title:** Molecular Spectroscopy and Laser

**Course Code:** BHP-354

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Understand basic principles, technique and instrumentation of Microwave, Infra-red and Raman spectroscopy.	1,3,4,5	U, Ap, E
CO2	Explain rotational, vibrational, electronic and Raman spectra of molecules.	1,3,4,5,6	R, U, Ap, An
CO3	Understand the applications of Infrared and Raman spectroscopy.	1,3,4,5,6	U, Ap, An, E
CO4	Grasp the basic principle behind the Laser action and also be able to differentiate between the three and four level lasers.	1,3,4,5	U, Ap, An
CO5	Explain the difference between Stokes and anti-Stokes lines in a Raman spectrum	1,3,4,5	U, Ap, An, E

**Course Title:** Physics Lab-V

**Course Code:** BHP-

**355**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know the concept of Microsoft excel for data analysis and graph plotting.	2,3,5	R, U, Ap, An
CO2	Understand the concept of diffraction using diffraction grating and semiconductor laser.	2,3,5	U, Ap, An, E
CO3	Understand the concept of thermo e.m.f. using copper constantan thermocouple.	2,3,5	U, Ap, An, E
CO4	Understand Geiger Muller Counter, operating voltage, dead time and absorption coefficient.	2,3,5	U, Ap, An
CO5	Understand the determination of photoelectric effect and inverse square law.	2,3,5	U, Ap, An, E

**Course Title:** Seminar & Assignment

**Course Code:** BHP-356





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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop rigorous quantitative understanding of core physical theories.	1,2,3,4,5,6	U,E,An,Ap
CO2	Get organized knowledge of the major branches of physics.	1,2,3,4,5,6	R,U, An,Ap
CO3	Give formal and informal scientific presentations to various audiences, including peers.	1,2,3,4,5,6	U,E,C,An,Ap
CO4	Communicate clearly and concisely in writing.	1,2,3,4,5,6	E,C,An,Ap
CO5	Apply scientific reasoning skills	1,2,3,4,5,6	U,E,C,An,Ap

### Semester: VI

Course Title: Particle Physics

Course Code: BHP-361

.Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about elementary particles and cosmos.	3,4,5	U, Ap, E
CO2	Have detailed knowledge on quarks and their models.	3,4,5	U, Ap
CO3	Learn about four fundamental forces of nature and their mutual interaction.	3,4,5,6	U, Ap, An,
CO4	Learn about various accelerators used to accelerate the charged particles to be carried out in various nuclear physics reactions for various research purposes.	3,4,5,6	U, Ap, An
CO5	Learn about particle detectors like G.M. counter and scintillation detectors etc. to detect the charged particles to be carried out in various research activities	3,4,5,6	U, Ap, An

Course Title: Condensed Matter-II

Course code: BHP-362

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Understand the concept of lattice vibrations and gain an insight into the origin of Different properties of solids.	,3,5,6	R, U, Ap, An
CO2	Understand well the concept of specific heat of solids and its temperature variation through in-depth study of different classical and quantum models.	1,5,6	R, U, Ap, An, E
CO3	Gain an understanding on superconductivity, superconducting materials and properties of superconducting state.	1, 3, 5	U, Ap, C
CO4	Attain detailed knowledge about dielectrics and their properties.	1,3,4,5	U, Ap
CO5	Acquire detailed knowledge on the current status of nanotechnology, different Nanoscale materials and their synthesis and characterization techniques.	3,4,5,6,	U, Ap, An, C

**Course Title:** Electronics

**Course Code:** BHP-363

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Analyze PN junctions in semiconductor devices under various conditions.	1,4,5,6	U, Ap, An
CO2	Design and analyze simple rectifiers and voltage regulators using diodes.	1,3,4,6	U, R, Ap, An
CO3	Easily understand the behavior of special purpose diodes like Zener diode, LED, Tunnel diode and photodiodes.	1,2,5,6	U, R, Ap, An, E
CO4	Design and analyze simple BJT, FET and MOSFET circuits.	3,4,5,6	U, R, Ap, An, E,C
CO5	Understand the concept of basic electronics and applications of digital electronics.	1,3,4,5,6	U, R, Ap, An, E,C



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CO6	Obtain the knowledge on oscillators, amplifiers, transistors and h-parameters	1,2,4,5,6	U, R, Ap, An, E, C
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**Course Title:** Quantum Mechanics**Course Code:** BHP-364

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand and explain the differences between classical and quantum mechanics.	1,3,4,5	U, R, Ap, An
CO2	Understand the idea of wave function, probability density and uncertainty relations.	1,2,3,4,5	U, Ap, An, E
CO3	Understand time independent and time dependent Schrodinger wave equation.	1,3,4,5	U, R, Ap, An, E
CO4	Understand the idea of operators, eigen function, eigen value, quantization and degeneracy.	1,2,3,4,5	U, R, Ap, An, E
CO5	Solve Time independent Schrodinger wave equation for one, three dimensional dynamical systems, spherical harmonics and hydrogen atom.	1,2,3,4,5	U, R, Ap, An, E

**Course Title:** Physics Lab-VI**Course Code:** BHP-365

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain practical knowledge by applying the experimental methods to correlate with the Physics theory.	1,3,4,5	U, Ap, An, E
CO2	Study the characteristics of the Light dependent resistor LDR, photodiode and thermistor.	1,3,4,5	U, Ap, An, E, C
CO3	Measure the energy band gap of a semiconductor using pn junction diode and four probe method.	1,3,4,5	U, Ap, An, E, C
CO4	Measure the phase shift between current and voltage for RC and LR circuit, study the phase shift analysis of the	1,3,4,5	U, Ap, An, E, C



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	LCR circuit, working of RC Circuit as integrating and differentiating circuit and B		
CO5	Study the magnetic susceptibility of $FeCl_3/Mn(SO_4)_2$ by Quinke's method.	1,3,4,5	U, Ap, An, E, C

Course Title: Physics Lab-VII

Course Code: BHP-366

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand and verify the characteristics of PN junction, Zener and Light emitting diodes, the role of PN diode in full and half wave rectification and the working of Zener diode as a voltage regulator.	1,2,3,4,5	R,U,Ap,An,C
CO2	Study to test the resistance of PN junction diode and transistor.	1,2,3,4,5	R,U, Ap, An
CO3	Verify the diode as clipping and clamping element and its role in half and full wave rectification using CRO.	1,2,3,4,5	U,Ap,An
CO4	Understand and verify the characteristics of transistor in common base (CB) and common emitter (CE) configuration and also learn the working of a transistor as an amplifier, its role in the construction of different oscillators such as phase-shift, Hartley and Colpitt.	1,2,3,4,5,6	U,Ap,An
CO5	Verify and design the AND, OR, NOT and NAND gates.	1,2,3,4,5	U,Ap,An





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**Course Title:** MOLECULAR SPECTROSCOPY-IV      **Course No:** CHX 241

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the spectrums, their types and characteristics.	4,5,6	R, U and Ap
CO2	Understand the various aspects of UV-Visible spectroscopy and behaviour of UV-peaks and its shifting under different conditions.	4,5,6	R, U and Ap
CO3	Solve the absorption wavelength of conjugated polyenes and $\alpha,\beta$ -unsaturated carbonyl compounds.	5,6	U and Ap
CO4	Interpret the IR spectrum and relate the spectral peaks with the various types of bonds present in the molecules.	4,5,6	U and Ap
CO5	Interpret the actual NMR spectrum and calculate the chemical shift, coupling constant and correlate the NMR peaks with structure and proton counting.	5,6	U and Ap

**Course Title:** Physical Chemistry-LAB-IV      **Course No:** CHX 242



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to measure refractive index of various solvents using refractometer.	4,5	U, Ap, An,C
CO2	Learn to measure angle of rotation with the help of polarimeter and then calculate the optical activity of various solutions.	4,5,6	U, Ap, An, C
CO3	Learn to calculate the heat of neutralization, heat of solution of acids, bases and salts with the help of a calorimeter..	4,5,6	R, U, Ap,An
CO4	Do experiments on conductometer and learn to measure the cell constant, equivalent conductance, specific conductations and also perform conductometric titrations.	4,6	R, U, Ap
CO5	Perform the experiment of adsorption and learn about the adsorption isotherm.	4,5,6	U, Ap, An

Course Title: MATHEMATICS-IV

Course Code: MAP-241

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Solve problems on matrices and determinants, Eigen values and Eigen vectors.	1	U, An, E
CO2	Solve the system of equations by checking the consistency.	2	R,U, Ap, E
CO3	Understand the concept of probability functions and use Bayes theorem for future events.	3	U, Ap, An, E
CO4	Have knowledge on discrete, continuous distributions and their properties.	3	U, An, E



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### B. SC. (HONS) MATHS

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO-1	To make students understand the concepts of different branches of sciences and their applications to other disciplines.
PSO-2	To train students in communicating mathematical ideas in lucid and effective manner.
PSO-3	To expertise students to apply their knowledge and understanding to solve theoretical and applied problems in mathematics.
PSO-4	The practical work using software/labs in mathematics and inter-disciplinary subjects will enable the students to analyze problems in a systematic and analytical way.
PSO-5	Students will develop proficiency in inter-disciplinary subjects (Physics, Chemistry etc.), which motivates students to use knowledge in different subjects.
PSO-6	To get proficient in computer programming like C, C++, Python, Java, as to get jobs in IT sector.

#### COURSE OUTCOMES

#### SEM-I

Course Title: Calculus -I

Course Code: BHM-111

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the theory and applications of derivatives	1,3	R, U, Ap
CO2	Acquire knowledge on determining stationary points of functions in order to sketch their graphs	2, 3	U, An
CO3	Understand the concepts of limits and continuity of functions.	1, 2	U, C
CO4	Understand the applications of methods of differentiation of functions in predicting the shape of the graph of a function	1, 3, 4	Ap, U, C

Course Title: Algebra -I

Course Code: BHM-112

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Acquire the details of abstractness of mathematics.	1, 2	R,U



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CO2	Learn matrix algebra, vector spaces, eigen values, eigen vectors and basic concepts of number theory.	1, 2,3	R, U, An
CO3	Understand the fundamental properties of real numbers that lead to the formal development of Real Analysis.	1, 3	U, An
CO4	Recognize technical terms and appreciate some of the uses of tools of algebra.	2,3,4	E, C

**Course Title: Physics -I Optics****Course Code: PHX-111**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge about wave theory of light.	1,5	R, U
CO2	Acquire in depth understanding on the properties of light like reflection, refraction, interference, diffraction and polarization.	1,5	R,U, An
CO3	Understand the applications of interference in design and working of interferometers.	1,5	U, Ap
CO4	Comprehend the concept of polarization through understanding of electro- magnetic waves and their transverse nature.	1,5	U, Ap
CO5	Understand the applications of diffraction and polarization in various optical instruments.	1,5	U, An, Ap

**Course Title: Organic Chemistry-I****Course Code : CHX-111**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about SN1, SN2 and SNi Mechanism and the related stereochemistry.	1,5	U,R
CO2	Understand the concept, principle and applications of UV, IR and NMR Spectroscopy and the problems pertaining to the structure elucidation of simple organic compounds.	1,5	U, An
CO3	Solve the elimination reaction problems	1,5	U, R, An
CO4	Distinguish between type of addition, elimination and substitution reaction.	1,5	An, C, U





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CO5	Learn E and Z nomenclature , Stereo chemical principle, enantiomeric relationship between R and S	1,5	Ap, An
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**Course Title: Statistical Methods-I****Course Code: BHM-114**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Solve Statistical problems using various measure of central tendency.	3	U,Ap
CO2	Collect the data and present it diagrammatically.	4	U,An, C
CO3	Use Statistics in research for proper characterization, summarization, presentation and interpretation of the results of research.	2,3	U,Ap, E
CO4	Apply the statistical methods in various fields such as finance, marketing, accounting and business	4,5	E, C

**Course Title: PROBABILITY THEORY****Course Code: BHM-115**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use statistics in engineering and science like disease modeling, climate prediction networks etc.	3	Ap, An
CO2	Quantify the uncertainty and assess the accuracy of inference about the population.	1,2	An, E
CO3	Have good understanding of exploratory data analysis.	4	U
CO4	Learn the concept of random variable, expected value and moment generating function of random variable.	1,2	U

**Course Title: Communicative English****Course Code: BCEN-1123**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Become effective communicators in English language and get better employment opportunities at global level.	5	U, An, C
CO2	Enhance their confidence level and develop their overall personality.	5	An, Ap
CO3	Become familiar with socio-political and cultural issues through the recommended text.	5	Ap



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### Course Title: Physics Lab-I Optics Lab

Course Code: PHB-112

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the working of basic optical instruments.	4,5	U
CO2	Understand and differentiate between the different phenomenon related to light such as Interference, diffraction and polarization.	4,5	U, An
CO3	Gain precision in handling of optical instruments.	4,5	U, Ap
CO4	Understand the operating principle of certain optical instruments	4,5	U, E
CO5	Understand the applications of Interference, diffraction and polarization.	4,5	U,

### Course Title: Organic Chemistry Practical-I

Course Code: CHM-112

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Perform functional group analysis	4,5	Ap, An
CO2	Prepare derivatives of organic compounds	4,5	An
CO3	Determine physical constant: Melting point, Boiling point.	4,5	U, C
CO4	Learn different separation techniques.	4,5	U
CO5	Know how to perform TLC	4,5	U

### Course Title: Practical based on Statistical Methods- I

Course Code: BHM-116

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to solve statistical problems using various measure of central tendency.	3	Ap
CO2	Collect data and present it diagrammatically.	4	An, C
CO3	Use Statistics in research for proper characterization, summarization, presentation and interpretation of	2,3	Ap, E



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	the results of research.		
CO4	Apply the statistical methods in various fields such as finance, marketing, accounting and business.	4,5	E, C

**Course Title: Math Lab-I**

**Course Code : BHM-113**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop a basic understanding of MATLAB for its usage in higher learning.	2,3	U, C
CO2	Have a precise direction from theoretical learning to computational techniques	2	An
CO3	Solve mathematical concepts and sketching of graphs in fraction of seconds.	3	Ap
CO4	Convert the theoretical concepts in matrices to algorithms in MATLAB for their applications in real life.	4,5	E

### Sem-II

**Course Title: Calculus -II**

**Course Code: BHM-121**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of theory and applications of integrals.	1,3,4	R,U,Ap
CO2	Find the area of a region, volume of solids with known cross section, average value of a function, centre of gravity, mass and momentum of bodies.	3,4	U,Ap,
CO43	Get familiar with the properties and geometric interpretation of definite integrals,	1, 2,3	U,An, Ap

**Course Title: Algebra -II**

**Course Code: BHM-122**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Understand the abstract ideas and learn matrix algebra, vector spaces, eigen values and eigen vectors.	1, 3,4	R,U,An
CO2	Recognize consistency and inconsistency of linear equations.	1, 2	U, R
CO3	Understand the fundamental properties of real numbers that lead to the formal development of Real Analysis.	1, 3	An, U
CO4	Apply the abstractness of Algebra.	3,4	Ap, An, E

Course Title: Physics -II Modern Physics

Course Code:PHX-121

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Attain comprehensive knowledge and understanding of the main Physical concepts and theories of the 20 <sup>th</sup> century.	1,5	U, R
CO2	Understand the basics of crystallography and X-ray diffraction.	1,5	U
CO3	Understand the basic ideas of Quantum Physics through concepts of radiation, photoelectric effect, compton effect, uncertainty principle and concept of wave packet.	1,5	U
CO4	Gain an in depth understanding about the process of Radioactivity and its biological effects and applications.	1,5	U, An
CO5	Understand the concepts related to particle Physics and attain knowledge about the classification and properties of different particles.	1,5	U

Course Title: Inorganic Chemistry-II

Course Code : CHX-121

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the coordination compounds and their nature of bonding,	1,5	U,R
CO2	Gain knowledge to apply ligand field theory CFT on simple molecules.	1,5	U, An
CO3	Learn about molecular orbital theory	1,5	U, An





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CO4	Learn about VSEPR theory, VBT	1,5	An, C, U
CO5	Understand HSAB principle, Orgel diagram, Macrocyclic ligands	1,5	Ap, An

**Course Title: Statistical Methods-II****Course Code: BHM-124**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to establish linear association between two variables by using Correlation.	2	E
CO2	Find out the best fit for a set of data points with the help of least square method.	3	An
CO3	Use regression analysis to predict the behavior of dependent variable.	3	Ap
CO4	Use method of association and contingency table to find the independence of the attributes.	1	Ap, C
CO5	Use statistical methods in the future prediction for various observations in different fields like business analysis, artificial intelligence, financial analysis, fraud detection, share market and pharmaceutical sector and other industries.	1,5	E, C

**Course Title: Probability Distributions****Course Code: BHM-125**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	<i>Differentiate between discrete and continuous distributions.</i>	3	E
CO2	<i>Know about distributions to study the behavior of random variables.</i>	2	R, U
CO3	<i>Study the discrete distributions such as Binomial, Poisson etc.</i>	1	An, E
CO4	<i>Learn about Continuous distributions such as Exponential and Normal, uniform etc.</i>	1,2	AN, E

**Course Title: Communicative English****Course Code : BCEN-1223**

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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Become effective communicators in English language	5	U, An, C
CO2	Enhance their confidence level and develop their overall personality.	5	An, Ap
CO3	Become familiar with socio-political and cultural issues through the recommended text.	5	Ap

### Course Title: Physics Lab-II

Course Code:PHM-122

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the basic experiments of Modern Physics.	5	U
CO2	Understand and verify the particle nature of light through experiments on Photoelectric effect.	5	U, R
CO3	Gain knowledge about the construction and working of gas filled radiation detectors.	5	Ap, An
CO4	Understand the concept of molecular spectra.	5	U
CO5	Learn the working of a PN junction and comprehend the concept of band gap.	5	An

### Course Title: Inorganic Chemistry Practical-II

Course Code:CHM-122

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Identify the anions present in the mixture.	4,5	U, An
CO2	Identify the cations present in the mixture.	4,5	U, An
CO3	Gain hands-on practice of handling different Chemicals in the lab	5	Ap
CO4	Learn to prepare basic solution required to identify cations and anions in the mixture	5	U, An



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CO5	Learn about determination of boiling points of various compounds.	5	U, C
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**Course Title: Practical based on Paper Statistical Methods–II And Probability Distributions**

**Course Code : BHM-126**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Find the best fit for a set of data points with the help of method of least square.	2	E
CO2	Use regression analysis to predict the behavior of dependent variable	2	Ap
CO3	Differentiate between discrete and continuous distributions.	3	An
CO4	Know about distributions to study the behavior of two random variables.	1	An
CO5	Study the discrete distributions such as Binomial, Poisson etc.	2	U

**Course Title: Math Lab-II**

**Course Code: BHM-123**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop a basic understanding of MATLAB for its usage in higher learning.	3,4	U,R
CO2	Have a precise direction from theoretical learning to computational techniques.	3,4	U, R,
CO3	Use MATLAB in sketching of 3-dimensional graphs in fraction of seconds.	3,4	U, An
CO4	Convert the theoretical concepts of integrals to algorithms in MATLAB for their applications in real life.	3,4	Ap, An, E

**Sem-III**

**Course Title: Analytical Geometry**

**Course Code: BHM-231**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Understand and apply the concepts of geometry in the daily life.	2	U, Ap
CO2	Analyse the applications of geometry in different fields such as art, robotics, computer, and video games	5	An, C
CO3	Realize the important role of Analytical Geometry in architecture and also in the construction of stairs by making use of angles.	1,5	U, E
CO4	Comprehend the concepts of change of origin, rotation of axes and invariants for second degree equations in two and three dimensions	2	U, E
CO5	Know about the properties of conics (parabola, ellipse and hyperbola).	3	U

**Course Title: Analysis**

**Course Code: BHM-232**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the behavior of real numbers, sequences and series of real numbers and real functions.	2, 3	E, C
CO2	Understand how to work comfortably with completeness of R.	1, 2	U, An
CO3	Test the convergence of sequences and series of various types, the convergence of improper integrals.	1, 3	An, Ap, E
CO4	Apply analysis in science and engineering in the form of Fourier analysis, wavelets and harmonic analysis.	4,5	Ap, An
CO5	Apply the concept of Riemann integrability, the use of beta and gamma functions in solving various problems of calculus.	3,4	Ap, C

**Course Title: Physics -III Electricity and Magnetism**

**Course Code:PHX-231**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the calculus along with physical principles to effectively solve problems encountered in everyday life.	1,5	U, Ap





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CO2	Learn about electric charges and their interactions, electric field, electric potential, Coulomb's law, Gauss's law and their applications.	1,5	R, An, E
CO3	Explain the concept of moving charges, current, capacitors and their energy storage, Ohm's law and polarizability.	1,5	An, Ap
CO4	Understand magnetic field due to current and their interactions, Biot-Savart's law, Ampere circuital law and their applications.	1,5	U
CO5	Understand different types of magnetic materials and Langevin's theory of diamagnetism and paramagnetism.	1,5	U

Course Title: Physical Chemistry-III

Course Code:CHX-231

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about ideal and non-ideal solutions, methods of expressing concentrations of solutions, dilute solution, colligative properties and Raoult's law	5	Ap,E
CO2	Understand rate of reaction, rate constant and rate laws, the order of reaction, first, second, third and zero order reactions	5	U, An
CO3	Learn about homogeneous catalysis, autocatalysis, oscillation reactions, enzyme catalysis and heterogeneous catalysis	5	Ap
CO4	Understand the structure of liquids structural differences between solids, liquids and gases	5	U, An
CO5	Understand the classification of colloids. kinetic, optical and electrical, properties, stability of colloids, protective action, Hardy Schulze law, gold number, types of emulsions, Emulsifiers and applications of colloids.	5	C,E

Course Title: Programming Language -I

Course Code: CS- BHM-231

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use the fundamentals of C programming in trivial problem solving	5	U



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CO2	Identify solution to a problem and apply control structures and user defined functions for solving the problem	5	C
CO3	Demonstrate the use of Strings and string handling functions	5	Ap
CO4	Develop the ability to work with arrays of complex objects.	5	An
CO5	Apply skill of identifying appropriate programming constructs for problem solving.	5	Ap

Course Title: Physics Lab-III

Course Code:PHX-232

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand and perform the practical of Carey Foster bridge to find low resistance with and without calibrating it.	4,5	U, Ap
CO2	Understand the working of household energy meter.	4,5	U
CO3	Verify the Faraday's law of electromagnetic induction by simple experiment.	4,5	Ap, An
CO4	Find the efficiency of an electric kettle with varying input voltages.	4,5	Ap, C
CO5	Find the unknown capacitance by using flashing and quenching method. Variation of magnetic field with distance is also be studied.	4,5	C

Course Title: Physical Chemistry Lab-III

Course Code: CHX-232

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Measure important physical properties like surface tension, viscosity, density, enthalpy, heat of neutralization etc.	4,5	C, Ap



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CO2	Learn to examine various physical parameters by different methods	4,5	An, Ap
CO3	Learn to handle important apparatus like stalagmometer, Ostwalds viscometer and calorimeter.	3,4,5	An, Ap
CO4	Learn to examine the rate of reactions (hydrolysis of ester)	2,4,5	An, Ap
CO5	Learn to perform acid-base titrations	1,4,5	Ap, C

**Sem-IV**

**Course Title: Mathematical Modelling and Differential Equations** Course  
**Code:BHM-241**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases.	2,4	E, C
CO2	Find the complete solution of a non-homogeneous differential equation as a linear combination of the complementary function and a particular solution.	1, 2	R, U, An
CO3	Have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.	1, 3	U, E
CO4	Learn to formulate differential equations for various mathematical models.	1, 3	U Ap

**Course Title: Analytical Geometry-II****Course Code: BHM-242**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concepts of plane geometry.	1, 2, 3	An, E, C
CO2	Understand the concepts and properties of solids like cone, right circular cone, cylinder, right circular cylinder and sphere	1, 3	U, An

**Course Title: Physics –IV****Course Code: PHX-241**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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CO1	Differentiate between different lattice types and Miller indices. They can explain NaCl and diamond structure.	1,5	U, An, c
CO2	Explain the concepts of reciprocal lattice, Brillouin zones and crystal diffraction.	1,5	U, An
CO3	Explain the concept of lattice vibrations and effect of the same on electrical and thermal properties of the solids.	1,5	U, C
CO4	Explain Einstein's and Debye's model of specific heat.	1,5	U, C
CO5	Explain band structures and their variation with temperature leading to change in material properties. Semiconductor diodes are also be explained.	1,5	C, An

**Course Title: Molecular Spectroscopy-IV**

**Course Code: CHX-241**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the spectrums, their types and characteristics.	1,5	An, C
CO2	Understand the various aspects of UV-Visible spectroscopy and behaviour of UV-peaks and its shifting under different conditions.		
CO3	Solve the absorption wavelength of conjugated polyenes and $\alpha,\beta$ -unsaturated carbonyl compounds	1,5	An, C
CO4	Interpret the IR spectrum and relate the spectral peaks with the various types of bonds present in the molecules.	1,5	U
CO5	Interpret the actual NMR spectrum and calculate the chemical shift, coupling constant and correlate the NMR peaks with structure and proton counting.	1,5	U, C

**Course Title: OBJECT ORIENTED PROGRAMMING C++**

**Course Code: BHM-241**





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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the difference between the top-down and bottom-up approach.	4,5	U
CO2	Describe the object-oriented programming approach in connection with C++.	4,5	U, An
CO3	Apply the concepts of object-oriented programming.	4,5	U
CO4	Illustrate the process of data file manipulations using C++.	4,5	Ap, C
CO5	Apply virtual and pure virtual function & complex programming situations.	4,5	Ap, C

Course Title: Physics Lab-IV

Course Code:PHX-242

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of energy band gap in semiconductors.	4,5	U
CO2	Gain the knowledge about working of Zener diode, LED, Germanium and silicon diodes.	4,5	U, An
CO3	Understand the variation of resistance of a thermistor with temperature.	4,5	U
CO4	Find magnetic parameters from BH curves by working on CRO.	4,5	Ap, C
CO5	Find out the dielectric constant of various liquids by working on dipole meter.	4,5	Ap, C

Course Title: Physical Chemistry Lab-IV

Course Code:CHX-242

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to measure refractive index of various solvents using refractometer.	5	U, C



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CO2	Learn to measure angle of rotation with the help of polarimeter and then calculate the optical activity of various solutions.	5	U, An
CO3	Learn to calculate the heat of neutralization, heat of solution of acids, bases and salts with the help of a calorimeter.	5	An, E
CO4	Perform experiments on conductometer which enable students to learn how to measure the cell constant, equivalent conductance, specific conductations and perform conductometric titrations.	5	E,C
CO5	Learn about the adsorption isotherm by performing the experiment of adsorption	5	C

**Sem-V**

**Course Title: Linear Programming**

**Course Code: BHM-351**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply the knowledge of basic optimization techniques in order to get best possible results from a set of several possible solutions of different problems.	1, 2	E, C
CO2	Understand basic assumptions and properties of linear programming	1, 3	U, An
CO3	Understand special situations such as redundancy, infeasibility, unboundedness and alternate optimal solutions in linear programming problems.	1, 3,4	R,U, An
CO4	Understand theoretical foundation and implementation of similar type optimization techniques available in the scientific literature.	2, 3	Ap, An, E
CO5	Extend their knowledge of basic optimization techniques to do research on these types of optimization techniques.	3, 4	Ap, C, E

**Course Title: Group Theory**

**Course Code: BHM-352**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Recognize the mathematical objects that are groups and classify them as abelian, cyclic and permutation groups.	1, 2, 3	R, U, C



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CO2	Link the fundamental concepts of groups and symmetrical figures.	2, 3	U, An, E
CO3	Know about group homomorphisms and isomorphisms.	1, 2	R, E
CO4	Learn the applications of Lagrange's Theorem.	1, 2	Ap, An
CO5	Know the significance of co sets and normal subgroups.	2, 3	E, C

Course Title: Number Theory

Course Code: BHM-353

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about some fascinating discoveries related to properties of prime numbers.	1,2,3	An, E, C
CO2	Understand the study of integers and integer-valued functions.	1, 3	R, U
CO3	Apply number theory in many applications such as security system like in banking securities, coding theory, barcodes and memory management systems.	3,4	Ap, An
CO4	Understand various types of numbers and their properties, various arithmetic functions.	1, 2, 3	U, E
CO5	Understand the concept of G.C.D. and L.C.M. of numbers and the relation between linear Diophantine equations and congruences which help to solve various arithmetic problems.	1, 2	R, U, Ap

Course Title: PDE and System of ODE

Course Code: BHM-354

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the theory of partial differential equations which stems from the intensive and extensive study of a few basic equations of mathematical physics.	1, 3, 5	U, E, C
CO2	Apply partial differential equation (PDE) models for the physiological modeling of the evolution of a biological substance.	3,4	Ap, An



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CO3	Understand different methods to solve linear PDEs.	1, 2	U,An
CO4	Predict the behavior of certain real phenomena by identifying them as models of partial derivatives equations.	2,3	An, E, C
CO5	Apply the method of separation of variables for solving many well- known second order PDEs.	4	Ap

### Course Title: Introduction to Python Course Code: CS-BHM-351

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge of one of the latest and powerful programming languages – Python.	4,5	U
CO2	Understand about to read and write files.	4,5	U
CO3	Get a broader view of concept of Object Oriented Programming (OOP) applied in Python.	4,5	U
CO4	Learn how to connect Python programs to a database.	4,5	Ap, C
CO5	Learn how to identify Python object types.	4,5	Ap, C, An

### Course Title: Seminar and Assignment Course Code:BHM-355

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop presentation skills.	2, 4	C, E
CO2	Enhance discussion abilities, flexibility of thought and effective time management.	2, 3	Ap, E
CO3	Apply theories, methods, and concepts from multiple fields to single concept.	3,4	Ap, An





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CO4	Improve their listening skills and develop persuasive speech, present information in a well-structured and logical sequence.	2, 4	E, C
CO5	Get experience to face a panel in logical way.	2,3,4	An, E, C

### Sem-VI

**Course Title: Statistical Technique**

**Course Code: BHM-361**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Quantify the uncertainty and assess the accuracy of our inference about the population.	2, 3	An, Ap, E
CO2	Learn to establish linear association between two variables by using correlation.	1, 2	U
CO3	Find the best fit for a set of data points with the help of method of least square.	1, 3	U, An, E
CO4	Use regression to predict the behavior of dependent variable.	1, 2, 3	U, Ap

**Course Title: Numerical Methods**

**Course Code: BHM-362**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the use of numerical analysis in detecting errors in numerical calculations.	1, 3	E, C
CO2	Solve linear and non-linear equations, numerical differentiation and integration and differential equations.	1, 3	Ap, An, E
CO3	Have the knowledge of the study of algorithms that use numerical approximation for the problems of mathematical analysis.	1, 2,3	U, Ap
CO4	Apply numerical analysis in all the fields of engineering, physical sciences, life sciences, social sciences, medicine, business.	1, 3, 4	Ap, An, E, C



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**Course Title: Discrete Mathematics and Graph Theory**

**Course Code: BHM-363**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Interpret the results of lattices in various engineering problems.	2, 3	An, Ap
CO2	Acquaint themselves for a wide range of applications in analyzing, designing and simplifying electronic devices including digital computer, dial telephone, switching system and different kind of control devices.	2, 3	E, C
CO3	Understand the graph theory consisting of vertices and edges.	1, 2, 3	U, Ap
CO4	Learn to apply the graphs in finding the travelling routes.	1	U

**Course Title: Dynamics**

**Course Code: BMMH-364**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Handle the problems based on rectilinear motion.	1, 2,3	U, Ap
CO2	Understand the applications in science and engineering like in physics, inertial reference frame, and free body diagram.	1, 4	E, C, An
CO3	Deal with the problems based on variable acceleration.	1, 2, 3	U, An
CO4	Use concepts of work, power and energy to solve practical problems.	2, 3	Ap, An,

**Title: Linear Algebra**

**Course Code: BHM-365**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Handle the problems based on vector spaces, subspaces, basis and dimensions.	1, 2,3	E, C
CO2	Check the linear independence of vectors.	1, 3	R, U
CO3	Form the linear combination of vectors.	2,3	An, Ap, C



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CO4	Find the matrix corresponding to a linear transformation and vice versa.	2, 3, 4	Ap, E
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**Course Title: Seminar and Assignment**

**Course Code: BHM-366**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop presentation skills.	2, 4	C, E
CO2	Develop discussion abilities, flexibility of thought and effective time management	2, 3	Ap, E
CO3	Apply theories, methods, and concepts from multiple fields to single concept.	3,4	Ap, An
CO4	Improve listening skills and develop persuasive speech skills, present information in a well-structured and logical sequence.	2, 4	E, C
CO5	Get experience to face a panel in logical way.	2,3,4	An

**Course Title: R Programming**

**Course Code: CS- BHM-366**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop an R script and execute on R Programming Environment.	2, 4	C, E
CO2	Install, load and deploy the required packages and build new packages for sharing and reusability.	2, 3	Ap, E
CO3	Utilize R Data types for developing programs and learn all the basics of R-Programming (Data types, Variables, and Operators).	3,4	Ap, An
CO4	Join columns and rows in a data frame using bind functions, developing packages, data frames, and string manipulation functions.	2, 4	E, C
CO5	Learn with different file systems and CSV file systems.	2,3,4	An, E, C
CO6	Visualize and summarize the data and design application with database connectivity for data analysis.	2,3	E, C



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### B.Sc. MEDICAL

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

##### PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO-1	To acquire knowledge in the subjects of Botany, Zoology, Chemistry and Biochemistry.
PSO-2	To enable students to define and explain major concepts of biological sciences.
PSO-3	To gain knowledge to correctly use biological and chemical instrumentation and proper laboratory techniques.
PSO-4	To become efficient to communicate biological and chemical knowledge in oral and written form.
PSO-5	To gain knowledge to recognize the relationship between structure and function at molecular and cellular levels.





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### COURSE OUTCOMES

#### Chemistry

#### Semester I

**Course Title:** Inorganic Chemistry–Inorganic Chemistry–I and Practical)

**Course Code:** CHE 111A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge about the atomic structure, Schrodinger wave equation, quantum numbers, shapes of orbitals, rules governing the filling of electrons in orbitals and electronic configuration of elements and ions.	1, 2,3, 4	R, U, Ap
CO2	Get knowledge about positioning of elements in the periodic table, slater's rule, periodic properties such as ionisation energy, electron affinity, electronegativity and its calculations and chemical behaviour of elements.	1,2,3, 4	U,Ap
CO3	Acquire knowledge of valence bond theory, hybridisation, shapes of molecules, VSEPR theory, MO theory, bonding in boranes and determination of percentage ionic character.	1, 2,3, 4	U, An, Ap
CO4	Learn about close packing in solids, ionic structures, coordination number, radius ratio rules, born haber cycle, solvating power and polarising power of ions by Fajan's rule.	1, 2,3, 4	U, An, Ap
CO5	Acquire knowledge of metallic bonding, electron sea model, valence bond, band theories, hydrogen bonding and vander wall interactions.	1, 2,3, 4	U, An, Ap



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Course Title: Organic Chemistry-I

Course Code: CHE 111B

Sr. No.	On completing the course, the students will be able to	PSOs addressed	Cognitive levels
CO1	Learn the basics of Organic chemistry starting from bonding in organic compounds and notations in a reaction/ reaction mechanism	1, 2,3, 4,5	U, Ap
CO2	Identify the type of organic reaction and properties and structures of reactive intermediates involved in mechanisms.	1, 2,3, 4,5	U,Ap
CO3	Know the methods of preparation and chemical as well as physical properties of Alkanes, Alkenes, Alkynes	1, 2,3, 4,5	U, Ap
CO4	Understand the basic nucleophilic substitution mechanisms in case of alkyl halides as well as aryl halides and their relative reactivities.	1, 2,3, 4,5	U, Ap
CO5	Understand the concept of aromaticity and aromatic electrophilic substitution mechanism.	1, 2,3, 4,5	U, Ap



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Course Title: Practical

Course Code: CHE 111P

Sr. No.	On completing the course,	PSOs addressed	Cognitive levels
CO1	Gain knowledge about semi micro analysis.	1, 2,3, 4,5	U, An, Ap
CO2	Learn about cation analysis, separation and identification of ions from groups I, II, III, IV, V, VI.	1, 2,3, 4,5	U, An, Ap
CO3	Learn about anion analysis.	1, 2,3, 4,5	U, An, Ap
CO4	Understand about the technique for determination of melting points of various compounds.	1, 2,3, 4,5	U, An, Ap
CO5	Acquire knowledge on the technique for determination of boiling points of various compounds.	1, 2,3, 4,5	U, An, Ap



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### Semester-II

Course Title: Inorganic Chemistry–II

Course Code: CHE 121A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the physical and chemical properties of s-block, p-block and d-block elements.	1, 4	R, U, An
CO2	Learn the basic similarities and differences between different groups of the periodic table.	4	R, U, An
CO3	Understand the acid-base concepts in inorganic chemistry like Arrhenius concept, Bronsted-lowry and Lewis concepts. Students will also be able to differentiate between acids and bases.	1, 4	R, U, Ap
CO4	Learn about the colour, oxidation states, catalytic and magnetic properties of transition elements.	1,3,4	U, Ap, An
CO5	Acquire knowledge about important topics like inorganic benzene, boranes, silicones and phosphazenes.	1,3,4	U





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**Course Title:** Physical Chemistry I

**Course Code:** CHE 121B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the concepts of gaseous state, kinetic theory, and van der Waals equations to real systems.	1, 2	R, U, An
CO2	Learn about the applications of Liquid crystals in LCDs and Digital Electronics	1,3	R, U, Ap
CO3	Know how the Colloidal solutions, their preparation, and properties would be helpful in understanding various physical parameters.	1, 3	R, U, E
CO4	Understand about preparation of solutions based on different measurement basis and colligative properties	1, 3,4	R, U, An
CO5	Learn to handle and carry out the physical estimation of solutions, and molecular weight determination from colligative properties	1, 3,4	U, Ap, E



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Course Title: Practical

Course Code: CHE 121P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Measure important physical properties like surface tension, viscosity, density, enthalpy, heat of neutralization etc.	1, 2,3, 4,5	R, U, Ap
CO2	Learn to examine various physical parameters by different methods.	1,3,4	R, U, Ap, An, E
CO3	Learn to handle important apparatus like stalagmometer, Ostwalds viscometer and calorimeter.	1,3,4	U, Ap
CO4	Learn how to perform acid-base titrations.	1, 2,3, 4,5	U
CO5	Learn to examine the rate of reactions (hydrolysis of ester).	1, 2,3, 4,5	U, Ap, An



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### Semester III

Course Title: Organic Chemistry–II

Course Code: CHE 231A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the Structure & bonding of organic compounds and mechanism of organic reactions.	1,3,4,5	R, U, Ap, An
CO2	Understand the Stereochemistry of organic compounds.	1,3,4,5	R, U, Ap, An
CO3	Understand the nomenclature, synthesis, physical and chemical properties of alcohols.	1,3,4,5	U, An, Ap
CO4	Understand the nomenclature, synthesis, physical and chemical properties of aldehyde and ketones.	1,3,4,5	U, Ap, An
CO5	Understand the nomenclature, synthesis, physical and chemical properties of phenols.	1,3,4,5	U, Ap, An



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Course Title: Physical Chemistry II

Course Code: CHE 231B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about various thermodynamic terms and processes.	1, 2,3, 4,5	R, U, An
CO2	Understand the first law of thermodynamics and learn to calculate various thermodynamic properties for reversible isothermal and adiabatic expansion of ideal gases. It enable them to solve various numerical problems related to these topics.	1, 2,3, 4,5	U, An, Ap
CO3	Learn the enthalpy of formation, neutralization, solution, reaction, bond dissociation enthalpy, kirchhoff's law and solve various numerical problems related to the topic.	1, 2,3, 4,5	R, U, An
CO4	Learn about the second and third law of thermodynamics, Carnot cycle, concept of entropy and free energy and numerical problems associated with these concepts.	1, 2,3, 4,5	R, U, An, Ap
CO5	Understand the chemical equilibrium and phase equilibrium. They will learn to draw and explain the phase diagrams of one and two component systems, ideal mixtures and non-ideal mixtures in detail with examples.	1, 2,3, 4,5	U, An, Ap, C





Estd. 1892

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Course Title: Practical

Course Code: CHE 231P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the preparation of organic compounds, their purifications and run TLC.	1,3,4	U, Ap, An,E
CO2	Determine the physical constants like Melting point and boiling point.	1,3,4	U, Ap, An
CO3	Understand different purification techniques in organic chemistry like recrystallization.	1,3,4	U, Ap, An,E
CO4	Become aware of safety techniques and handling of chemicals.	1,3,4	U, AP
CO5	Understand how to carry out different types of volumetric titrations.	1,3,4	U, Ap



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### Semester IV

Course Title: Inorganic Chemistry–III

Course Code: CHE 241A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about Werner's theory, effective atomic no., chelation, nomenclature and isomerism in coordination compounds, valence bond theory of transition metal complexes.	1,3,4	U, R, An
CO2	Learn about types of solvents, physical properties of solvents, reactions in liquid ammonia and sulphur dioxide.	1,3,4	U, R, An
CO3	Learn about electronic structures, oxidation states of lanthanides and actinides, electronic and magnetic properties of lanthanides and actinides, lanthanide contraction.	1,3,4	U, An
CO4	Understand oxidation and reduction, redox potential data, frost, latimer and pourbaix diagrams.	1,3,4	U, An
CO5	Learn about different elements in biological processes, metalloporphyrins, haemoglobin, myoglobin, biological role of alkali and alkaline earth metals.	1,3,4,5	U, An



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Course Title: Organic Chemistry III

Course Code: CHE 241B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get knowledge on the nomenclature, general physical properties, synthesis and chemistry of carboxylic acids, and carboxylic acid derivatives	1, 2,3, 4,5	R,U,Ap
CO2	Have fundamental theoretical understanding of heterocyclic chemistry	1, 2,3, 4,5	R,U,Ap
CO3	Know aromatic and non-aromatic heterocycles, their structural and chemical properties and synthesis.	1, 2,3, 4,5	R,U,Ap
CO4	Understand about the structure and chemical Reactions of Organomagnesium, Organolithium, Organozinc and Organocopper compounds	1, 2,3, 4,5	U,Ap
CO5	Study Nomenclature, properties, synthesis and reactions of ethers, epoxides and nitrogen containing compounds	1, 2,3, 4,5	U,Ap



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Course Title: Practical

Course Code: CHE 241P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Perform various functional group tests in identification of organic compounds	1, 2,3, 4,5	U,E, Ap,An
CO2	Understand the systematic qualitative analysis of organic compounds for the detection of elements	1, 2,3, 4,5	U,E, Ap,An
CO3	Learn about the identification of the compound and preparation of derivative and determination of its melting point.	1, 2,3, 4,5	U,E, Ap,An
CO4	Develop the ability to apply the principles of Chemistry.	1, 2,3, 4,5	U,E, Ap,An





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### Semester V

Course Title: Inorganic Chemistry–IV

Course Code: CHE 351A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about crystal field theory and valence bond theory.	1, 2,3, 4,5	R, U
CO2	Understand the magnetic properties of transition metal complexes.	1, 2,3, 4,5	R, U, Ap
CO3	Learn about metal ligand bonding and thermodynamic and kinetic aspects of metal complexes.	1, 2,3, 4,5	U
CO4	Understand the electronic spectra of transition metal complexes.	1, 2,3, 4,5	U, Ap
CO5	Understand the concepts of organometallic chemistry	1, 2,3, 4,5	U, Ap



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**Course Title:** Physical Chemistry III

**Course Code:** CHE 351B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn basic definitions of specific conductance, equivalent conduction ; Kohlrausch law, Arrhenius theory, Oswald's dilution law and Debye Huckel Onsager's equation	1,3,4	R, U, Ap
CO2	Learn different reversible and irreversible electrodes, Nernst equation, Electrolytic and galvanic cells, Conductometric and potentiometric titrations.	1,3,4	R, U, An
CO3	Learn radioactivity, nuclear stability, nuclear forces, nuclear decay processes and their applications.	1,3,4	R, U, Ap
CO4	Understand spectroscopic techniques, electromagnetic radiations such as Microwave, Infra-red, Raman and UV-Visible.	1,3,4	U, Ap



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**Course Title:** Practical

**Course Code:** CHE 351P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to synthesize and analyze different inorganic complexes.	1, 2,3, 4,5	U, R, An, Ap, E
CO2	Determine the strength of solution by conductometric titrations.	1, 2,3, 4,5	U, An, Ap, E
CO3	Learn to determine molecular weight by Rast method and viscosity measurements	1, 2,3, 4,5	U, An, Ap, E
CO4	Learn to determine refractive index by Abbe refractometer.	1, 2,3, 4,5	U, An, Ap, E



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### Semester VI

Course Title: Organic Chemistry–IV

Course Code: CHE 361A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept, principle and applications of UV, IR and NMR Spectroscopy and the problems pertaining to the structure elucidation of simple organic compounds.	1,3,4,5	U, R, Ap
CO2	Learn about structure of carbohydrates	1,3,4,5	U, R
CO3	Understand Organic Synthesis via organometallic compounds and Enolates.	1,3,4,5	U, Ap
CO4	Learn about structure of amino acids, Peptides and Nucleic acids	1,3,4,5	U,
CO5	Learn about synthetic polymers.	1, 2,3, 4,5	U, Ap





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**Course Title:** Physical Chemistry IV

**Course Code:** CHE 361B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about the importance and need of quantum chemistry.	1,3,4	R, U, An,
CO2	Learn about various laws governing quantum chemistry.	1,3,4	R, U, An, Ap
CO3	Understand the derivation of Schrodinger wave equation and its applications to Simple Harmonic oscillator, rigid rotator and hydrogen atom. This will help the students to solve various problems related to quantum chemistry.	1,3,4	U, An, Ap, C
CO4	Learn about the basics of solid state chemistry, laws of crystallography and the methods to determine crystal structure with examples.	1,3,4	U, Ap,C
CO5	Understand the laws of photochemistry Jablonski diagram and various radiative and non-radiative processes.	1,3,4	U, Ap,C



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**Course Title:** Practical

**Course Code:** CHE 361P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the preparation of various organic compounds.	1, 2,3, 4,5	U, R, Ap
CO2	Learn about TLC or the separation of various components in mixture.	1, 2,3, 4,5	U, Ap
CO3	Learn about Column chromatography for the separation of various components in mixture.	1, 2,3, 4,5	U, Ap
CO4	Understand different purification techniques in organic chemistry like recrystallization	1, 2,3, 4,5	U, AP
CO5	Get awareness of safety techniques and handling of chemicals..	1, 2,3, 4,5	U, Ap



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### Botany

Semester: I

Course Title: Diversity of Microbes

Course Code: BOT111A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand diversity in various life forms of plant kingdom.	1	R,U,Ap,An,E,C
CO2	Identify algae and fungi.	1,2	U,Ap,An
CO3	Study the basis of advancements in botany.	3,4	U,Ap,An,E,C
CO4	Understand structural differences.	4,5	U,Ap,An
CO5	Get awareness and appreciation of human friendly viruses, bacteria, algae and their economic importance.	4,5	U,Ap,An,E,C

Course Title: Diversity of Cryptogams

Course Code: BOT111B

CO1	Understand the diversity in various life forms of plant kingdom.	1	R,U,Ap,An,E,C
CO2	Identify bryophytes and pteridophytes.	1,2	U,Ap,An,E,C
CO3	Develop critical understanding on morphology, anatomy and reproduction of Bryophytes & Pteridophytes.	3,4	U,Ap,An
CO4	Understand the evolution of first land plants.	4,5	U,Ap,An



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## Semester: II

**Course Title:** Cell Biology

**Course Code:** BOT121A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about the basic unit of life <i>i.e.</i> Cell.	1	R,U,Ap,An
CO2	Develop understanding on chemical bonding among molecules.	1,2	U,Ap,An,E,C
CO3	Know the differences between prokaryotic and eukaryotic organism on the basis of cellular details.	1,2	U,Ap,An
CO4	Know the structure of genes and chromosomes	3,4	U,Ap,An,E,C
CO5	Understand the functional role of each cell organelles in the cell.	4,5	U,Ap,An

**Course Title:** Genetics

**Course Code:** BOT121B

CO1	Know the concepts of heredity and variation.	1	R,U,Ap,An,E,C
CO2	Develop concept wise understanding of laws of inheritance, genetic basis of loci and alleles and their linkage.	3,4	U,Ap,An
CO3	Differentiate between alleles and non-alleles and allelic and non-allelic interactions.	4,5	U,Ap,An
CO4	Understand the concept of genetic material and various factors responsible for variations in plants.	4,5	U,Ap,An





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**Semester: III**

**Course Title:** Structure, Development, and Reproduction in Flowering Plants - I

**Course Code:** Paper III-A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Differentiate between flowering and Non-flowering plants.	1	R,U,Ap,An
CO2	Understand the biology (life cycle) of plants	1,2	R,U,Ap,An
CO3	Know the types of stems and their modification, phyllotaxy.	3,4	U,Ap,An,E,C
CO4	Understand the types of ovules and embryo sacs.	4,5	U,Ap,An
<b>Course Title:</b> Structure, Development, and Reproduction in Flowering Plants - II			
<b>Course Code:</b> Paper III-B			
	<b>On completing the course, the students will be able to</b>		
CO1	Understand the different types of tissue systems	1	R,U,Ap,An
CO2	Know the differences between the normal and anomalous structures.	3,4	U,Ap,An,E,C
CO3	Understand the concept of plant reproduction.	4,5	U,Ap,An

**Semester: IV**

**Course Title:** Diversity of Seed Plants and their Systematics – I

**Course Code:** Paper IV-A



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Develop the understanding of advanced non-flowering plants with naked seeds <i>i.e.</i> Gymnosperms.	1,2	R,U,Ap,An
CO2	Know the morphology and reproduction of flowering plants (Angiosperms)	1,2	U,Ap,An
CO2	Know the habitat and economic importance of seed plants.	3,4	U,Ap,An
<b>Course Title:</b> Diversity of Seed Plants and their Systematics – II <b>Course Code:</b> Paper IV-B			
CO1	Understand the systematics of seed (higher plants)	1,2	R,U,Ap,An
CO2	Acquire the skill of identifying and naming of plants.	3,4	U,Ap,An

**Semester:** V

**Course Title:** Plant Physiology

**Course Code:** Paper V-A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the Water relation of plants with respect to various physiological processes.	1	R,U,Ap,An
CO2	Learn the role of micro and macro nutrients in plant development.	1,2	U,Ap,An,E,C
CO3	Learn various proteins, their structure and interaction in plants.	3,4	U,Ap,An



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CO4	Learn about different enzymes their role and their importance.	4,5	R,U,Ap,An
<b>Course Title:</b> Biochemistry and Biotechnology		<b>Course Code:</b> Paper V-B	
CO1	Learn how seeds germinate, seedlings grow, plants reproduce and die.	1	R,U,Ap,An,E,C
CO2	Learn various physiological processes necessary for plants.	1,2,3	U,Ap,An
CO3	Learn the basics of photosynthesis and respiration.	4,5	U,Ap,An,E,C
CO4	Learn the basic aspects of plant tissue culture.	1,4,5	U,Ap,An

### Semester: VI

**Course Title:** Ecology

**Course Code:** Paper VI-A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the environment and core concepts of biotic and abiotic factors.	1,2	R,U,Ap,An
CO2	Learn the concept of ecosystem.	3,4	R,U,Ap,An,E,C
CO3	Learn the concept of population, community and biome.	1,4,5	U,Ap,An
CO4	Learn the concept of ecological succession.	3,4,5	U,Ap,An,E,C
<b>Course Title:</b> Economic Botany		<b>Course Code:</b> Paper VI-B	



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CO1	Understand the core concepts of Economic Botany.	1,2	R,U,Ap,An
CO2	Develop the basic knowledge on plant wealth such as medicinal plants, crop plants and beverages.	1,2,4	U,Ap,An

### Zoology

#### SEMESTER I

Course Title: CELL BIOLOGY

Course Code: Zoo-111A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Understand the cell theory and cell principle.	1,2,3,4,5	R, U, An, E
CO-2.	Understand properties of cell like cell size, shape, number, life span and death	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Know the structure and importance of prokaryotic (Mycoplasma, Bacteria, Cyanobacteria) and eukaryotic cell.	1,2,3,4,5	R, U, Ap, An, E
CO-4.	Study the theories of evolution of eukaryotic cell from prokaryotic cell.	1,2,3,4,5	R, U, An, E
CO-5.	Study the structure and functions of the cell organelles like Golgi complex, Endoplasmic reticulum, Mitochondrion, Ribosomes, Peroxisomes and glyoxysomes.	1,2,3,4,5	U, An, E
CO-6	Develop understanding about various cell surface modifications: Glycocalyx, Microvilli and Caveolae	1,2,3,4,5	U, An, E
CO-7	Study the cytoskeleton including microtubules, actin, myosin, intermediate filaments and their role in muscle contraction	1,2,3,4,5	U, Ap, An, E
CO-8	Understand the phases of cell cycle including Mitosis and Meiosis.	1,2,3,4,5	U, An, E
CO-9			

Course Title: BIODIVERSITY-I (Protozoa to Annelida) Course Code: Zoo-111B





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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Know about the structural aspects of different animals	1,2,4,5	U, Ap, An, E
CO-2.	Gain knowledge about the taxonomies and evolutionary aspects of Zoology.	1,2,4,5	U, Ap, An, E
CO-3.	Study faunal diversity and learn to implement conservation measures to save biodiversity	1,2,4,5	U, Ap, An, E

### Course Title: Practical-I (Related to Zoo-111A &B) Course Code: Zoo-111P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Have knowledge about all the different phyla of invertebrates	1,2,3,4,5	U, Ap, An, E
CO-2.	Understand the comparative structure of invertebrates	1,2,3,4,5	U, Ap, An, E
CO-3.	Have an insight on the microscopic life	1,2,3,4,5	U, Ap, An, E
CO-4.	Differentiate invertebrates on the basis of morphological characteristics	1,2,3,4,5	U, Ap, An, E

## SEMESTER II

### Course Title: ECOLOGY

### Course Code: Zoo-121A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Have knowledge about the biodiversity	1,2,3,4,5	U, Ap, An, E
CO-2.	Study the effects of human activities on biosphere	1,2,3,4,5	U, Ap, An, E
CO-3.	Pursue various courses like M.Sc. Environmental studies etc. in future and opt for carrier in academics.	1,2,3,4,5	U, Ap, An, E

### Course Title: BIODIVERSITY-II (Arthropoda to Hemichordata)

### Course Code: Zoo-121B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Know about the structural aspects of different animals.	1,2,3,4,5	R, U, An, E



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CO-2.	Gain knowledge about the taxonomies and evolutionary aspects of Zoology.	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Study faunal diversity and learn to implement conservation measures to save biodiversity	1,2,3,4,5	U, An, E
CO-4.	Get in depth knowledge about various animal phyla (Arthropoda to Hemichordata)	1,2,3,4,5	U, Ap, An, E
CO-5.	Do detailed type studies of representative organisms of each phyla.	1,2,3,4,5	U, An, E
CO-6.	Get detailed knowledge about evolutionary relationships between Non-Chordates, Hemichordates & Chordates.	1,2,3,4,5	U, An, E

**Course Title: Practical-II (Related to Zoo-121A &B) Course Code: Zoo-121P**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Differentiate invertebrates on the basis of morphological characteristics	1,2,3,4,5	U, Ap, An, E
CO-2.	Understand the comparative structure of invertebrates	1,2,3,4,5	U, Ap, An, E
CO-3.	Have an insight into the internal systems of different invertebrates	1,2,3,4,5	U, Ap, An, E
CO-4.	Have a knowledge about different phyla of invertebrates	1,2,3,4,5	U, Ap, An, E



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### SEMESTER III

Course Title: EVOLUTION

Course Code: Zoo-131A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Develop an understanding about the concept of evolution & different proposed theories of evolution	1,2,3,4,5	R, U, An, E
CO-2.	Develop understanding about the origin of life and concept of species and speciation	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Become familiarized with topics related to fossils, reptile origin & extinction, origin of man	1,2,3,4,5	U, An, E
CO-4.	Get knowledge about poisonous and non-poisonous snakes & poison apparatus in snakes	1,2,3,4,5	U, Ap, An, E
CO-5.	Develop basic knowledge of migratory and parental investment in fishes	1,2,3,4,5	U, An, E

Course Title: BIODIVERSITY-III (Chordates)

Course Code: Zoo-131 B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Understand the internal system of chordates	1,2,3,4,5	R, U, Ap, An, E
CO-2.	Understand of interrelationships of chordates; their characteristics and affinities	1,2,3,4,5	R, U, Ap, An, E
CO-3.	Understand the basis of their relationship to other animals by body structure, external characters	1,2,3,4,5	R, U, Ap, An, E
CO-4.	Get knowledge of all anatomical features and working of various body organs	1,2,3,4,5	U, Ap, An, E
CO-5.	Understand the underlying principles of classification of animals	1,2,3,4,5	U, Ap, An, E
CO-6.	Understand the differences and similarities in the various aspects of anatomical features of chordates	1,2,3,4,5	U, Ap, An, E
CO-7.	Understand Protochordates- Urochordates and cephalochordates	1,2,3,4,5	U, Ap, An, E



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### Course Title: Practical-III (Related to Zoo-131A &B) Course Code: Zoo-131P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Understand the use of various levels of classification of animals and significance of effective use the six levels of classification	1,2,3,4,5	R, U, An, E
CO-2.	Classify animals on the basis of their relation to other animals by body structure, external characters	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Get In-depth knowledge of museology- placement and arrangement of animals depicting their classification and interrelationships	1,2,3,4,5	R, U, An, Ap, E
CO-4.	Understand various concepts relevant to classification	1,2,3,4,5	U, An, E
CO-5.	Understand the anatomy of vertebrates	1,2,3,4,5	U, Ap, An, E
CO-6.	Gain knowledge to identify various animals based on morphological features	1,2,3,4,5	U, Ap, An, E
CO-7.	Gain knowledge to distinguish between poisonous and non-poisonous snakes	1,2,3,4,5	U, Ap, An, E
CO-8.	Describe the morphology, habit and habitat, Systematic position and various systems	1,2,3,4,5	U, An, E
CO-9.	Identify the taxonomic status of the entire chordates and discuss the evolutionary model of the group.	1,2,3,4,5	U, Ap, An, E

### SEMESTER IV

### Course Title: BIOCHEMISTRY

### Course Code: Zoo-141A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Understand the mechanisms that work to keep the animal alive and functioning	1,2,3,4,5	R, U, Ap, An, E
CO-2.	Knowledge of basic terms in biochemistry and define basic terminologies of metabolic pathways.	1,2,3,4,5	R, U, Ap, An, E





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CO-3.	Get biochemical understanding through scientific enquiry into the nature of mechanical physical, and biochemical functions of animals	1,2,3,4,5	R, U, Ap, An, E
CO-4.	Understand and have in-depth knowledge of intermediate biochemical pathways and cycles	1,2,3,4,5	R, U, Ap, An, E
CO-5.	Comprehend interactions and interdependence of biochemical processes	1,2,3,4,5	R, U, Ap, An, E
CO-6.	Comprehend the energy source, chemical bonds and the principles of thermodynamic	1,2,3,4,5	R, U, Ap, An, E
CO-7.	Understand macromolecule such as carbohydrates, protein and fat, their types and significance, draw the structures of various carbohydrates, lipids and amino acids.	1,2,3,4,5	R, U, Ap, An, E
CO-8.	Classify enzymes with examples	1,2,3,4,5	R, U, Ap, An, E
CO-9.	Understand mechanism of enzyme action and factors affecting the enzyme activity	1,2,3,4,5	R, U, Ap, An, E
CO-10.	Understand the oxidation of fatty acids and its significance	1,2,3,4,5	R, U, Ap, An, E
CO-11.	Illustrate the electron transport chain and oxidative phosphorylation	1,2,3,4,5	R, U, Ap, An, E
CO-12.	Illustrate the reactions, energetics and regulation of glycolysis, glycogen biosynthesis, TCA cycle etc.	1,2,3,4,5	R, U, Ap, An, E

**Course Title: ANIMAL PHYSIOLOGY**

**Course Code: Zoo-141B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Develop understanding of the various fundamental concepts related to physiology of digestion & absorption	1,2,3,4,5	R, U, An, E
CO-2.	Develop understanding of circulatory system and blood components	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Get familiar with topics related to nervous and muscular system and their working	1,2,3,4,5	R, U, An, Ap, E
CO-4.	Study various aspects of respiratory system and exchange of respiratory gases	1,2,3,4,5	R, U, Ap, An, E



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CO-5.	Develop basic knowledge of innate and acquired behaviours	1,2,3,4,5	U, An, E
CO-6.	Develop an understanding of endocrine glands, their functioning and associated disorders	1,2,3,4,5	U, Ap, An, E

**Course Title: Practical-IV (Related to Zoo-141A & B)**

**Course Code: Zoo-141P**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Analyse vertebrate skeletal system	1,2,3,4,5	R, U, An, Ap, E
CO-2	Compare and contrast the skeletons of fish, frog, lizard, bird and a mammal	1,2,3,4,5	R, U, Ap, An, E
CO-3	Develop skill for the observation of blood cells and haematin crystals.	1,2,3,4,5	R, U, An, Ap, E, C
CO-4	Attain knowledge of qualitative analysis of macromolecules, excretory products, blood glucose and cholesterol	1,2,3,4,5	U, Ap, An, E
CO-5	Illustrate the enzyme activity from suitable material.	1,2,3,4,5	U, An, E, C
CO-6	Demonstrate the effect of various physical and chemical factors on enzyme activity	1,2,3,4,5	U, Ap, An, E
CO-7	Get basic understanding of the experimental methods and designs that can be used for further study and research.	1,2,3,4,5	U, An, E, C



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### SEMESTER V

Course Title: DEVELOPMENT BIOLOGY

Course Code: Zoo-151A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Learn the concepts of developmental biology	1,2,3,4,5	R, U, Ap, An, E
CO-2.	Understand gametogenesis process, process of differentiation of eggs and sperms before fertilization and vitellogenesis	1,2,3,4,5	R, U, Ap, An, E
CO-3.	Understand the events that led up to and comprise the process of fertilization	1,2,3,4,5	R, U, Ap, An, E
CO-4.	Know about the cleavage, gastrulation and differentiation	1,2,3,4,5	R, U, Ap, An, E
CO-5.	know about the macro-, meso- and micromeres which form into specific cells in the embryo	1,2,3,4,5	R, U, Ap, An, E
CO-6.	Understand the significance of regeneration and metamorphosis	1,2,3,4,5	U, Ap, An, E
CO-7.	Know about the embryonic development of <i>Herdmania</i> , frog, chick and rabbit	1,2,3,4,5	U, Ap, An, E
CO-8.	Know about mammalian placenta, its formation, types and function	1,2,3,4,5	U, Ap, An, E
CO-9.	Understand the process of regeneration, ageing and finally death	1,2,3,4,5	U, Ap, An, E

Course Title: GENETICS

Course Code: Zoo-151B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Acquire a broad understanding of Genetics including the physical and chemical basis of heredity.	1,2,3,4,5	R, U, An, E
CO-2.	Understand the basic organization and chemical composition of prokaryotic and eukaryotic genomes.	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Understand genetic phenomenon like linkage, crossing over and chromosomal mapping	1,2,3,4,5	R, U, An, E
CO-4.	Understand gene expression and regulation mechanisms among prokaryotes and eukaryotes & basic aspects of flow of genetic information from DNA to Protein	1,2,3,4,5	R, U, Ap, An, E
CO-5.	Distinguish between maternal effect, sex-linked, and extra nuclear modes of inheritance.	1,2,3,4,5	R, U, An, E



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CO-6.	Have a better understanding of bacterial genetics and means of genetic recombination	1,2,3,4,5	R, U, An, E
CO-7.	Understand the role of genetic technologies in industry related to pharmaceuticals, biotechnology, and diagnostic clinics.	1,2,3,4,5	R, U, An, E

**Course Title: Practical-V (Related to Zoo-151A & B) Course Code: Zoo-151P**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Understand the law of segregation and independent assortment and solve numerical problems related to them.	1,2,3,4,5	R, U, Ap, An, E
CO-2.	Solve numerical problems related to Epistasis and blood group inheritance	1,2,3,4,5	R, U, Ap, An, E
CO-3	Demonstrate the segregation in preserved material: Maize	1,2,3,4,5	R, U, Ap, An, E
CO-4.	Understand cytoplasmic inheritance in snail.	1,2,3,4,5	U, Ap, An, E
CO-5.	Prepare permanent slide of polytene chromosome and Barr body.	1,2,3,4,5	U, Ap, An, E
CO-6.	Identify different developmental stages of fresh water snail, frog and chick.	1,2,3,4,5	U, Ap, An, E
CO-6.	Understand and calculate gene frequencies and random mating analysis	1,2,3,4,5	U, Ap, An, E
CO-7	Analyze variance in pea pod	1,2,3,4,5	U, Ap, An, E





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### SEMESTER VI

#### Option-i

**Course Title: Medical Zoology**

**Course Code: ZooC-161A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Learn about human defense mechanism, Humoral & Cell mediated immune responses.	1,2,3,4,5	R, U, An, E
CO-2.	Study of Pathogenic protozoans, helminthes, their pathogenicity, prophylaxis & treatment.	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Learn about Pathogenic viruses, Rickettsiae, Spirochaetes, Bacteria etc.	1,2,3,4,5	R, U, An, E
CO-4.	Have insight into physiology, biochemistry, reproduction and control measures of insect vectors.	1,2,3,4,5	U, Ap, An, E
CO-5.	Know about epidemic diseases like influenza, chickenpox, small pox etc. their prevention and control measures	1,2,3,4,5	U, An, E

**Course Title: Medical laboratory Technology**

**Course Code: Zoo-161B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Know the techniques involved in the detection of various diseases and its associated pathology.	1,2,3,4,5	R, U, An, E
CO-2.	Have practical skills of conducting basic clinical lab experiments.	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Apply knowledge of clinical science and pathology to day to day life.	1,2,3,4,5	U, An, E
CO-4.	Understand the impact of diseases and endo-parasites on human health	1,2,3,4,5	U, Ap, An, E
CO-5.	Learn about Physiology of Human Immune response.	1,2,3,4,5	U, An, E

**Course Title: Practical VI (Related to Zoo-161A & B)**

**Course Code: Zoo-161P**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Know about laboratory safety rules like proper handling of patients, specimens, needles etc.	1,2,3,4,5	R, U, An, E



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CO-2.	Get technical knowhow regarding estimation of Heamoglobin level, ESR, blood sugar, protein, cholesterol etc.	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Prepare thick and thin blood films and counting of WBC, RBC and DLC	1,2,3,4,5	R, U, An, E
CO-4.	Study the protozoans, parasitic helminthes , arthropods vectors of various diseases through permanent slides	1,2,3,4,5	U, Ap, An, E
CO-5.	Perform physic-chemical examination of urine	1,2,3,4,5	U, An, E
CO-5.	Examine stool for intestinal parasite	1,2,3,4,5	U, An, E

### Option-ii

**Course Title: Economic Entomology-I**

**Course Code: Zoo-161A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Acquaint themselves with the common pests of major crops and the damage caused.	1,2,3,4,5	R, U, Ap, An, E
CO-2.	Study the attack of various insect pests on stored grain and their control.	1,2,3,4,5	R, U, Ap, An, E
CO-3.	Learn how insects become pests.	1,2,3,4,5	U, Ap, An, E
CO-4.	Learn various methods to control the pests and acquire skills to control them.	1,2,3,4,5	An, E
CO-5.	Learn the importance of apiculture, sericulture and Lac culture.	1,2,3,4,5	U, Ap, An, E
CO-6.	Gain knowledge to define the concepts of the applied subjects like Apiculture, Sericulture and lac culture.	1,2,3,4,5	U, Ap, An, E
CO-7.	Understand the important pests of apiculture, sericulture and lac culture.	1,2,3,4,5	U, Ap, An, E

**Course Title: Economic Entomology-II**

**Course Code: Zoo-161B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Get themselves acquainted with the common pests of medical and veterinary importance and the damage caused by them.	1,2,3,4,5	R, U, Ap, An, E



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CO-2.	Learn various methods to control the pests and acquire skills to control them.	1,2,3,4,5	R, U, Ap, An, E
CO-3.	Learn about different types of the mouth parts of insects	1,2,3,4,5	R, U, Ap, An, E
CO-4.	Learn about Insect pest-Management strategies and tools of biological control and other recent methods of insect control	1,2,3,4,5	R, U, Ap, An, E
CO-5.	Understand the underlying concepts of Integrated pest management and its importance	1,2,3,4,5	U, Ap, An, E
CO-6.	Learn about the most commonly used insect control method i.e., chemical control.	1,2,3,4,5	U, Ap, An, E
CO-7.	Know about the principle, categories and important pesticide of each category	1,2,3,4,5	U, Ap, An, E
CO-8.	Get acquainted with various repellents and attractants used to control pest.	1,2,3,4,5	U, Ap, An, E

**Course Title: Practical-VI (Related to Zoo-161A &B)**

**Course Code: Zoo-161P**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Identify the feeding apparatus (mouth parts) and its modifications	1,2,3,4,5	R, U, Ap, An, E
CO-2.	Identify and differentiate between different larvae and pupae of insects	1,2,3,4,5	R, U, Ap, An, E
CO-3.	Morphologically identify important insect-pests of various crops, stored grains and of medical and veterinary importance	1,2,3,4,5	R, U, Ap, An, E
CO-4.	Observe life stages of silkworm and honey bee	1,2,3,4,5	U, Ap, An, E
CO-5.	Understand techniques and equipment for collection and preservation of insects.	1,2,3,4,5	U, Ap, An, E
CO-6.	Use and understand the working commonly used sprayers	1,2,3,4,5	U, Ap, An, E

### Option-iii

**Course Title: Inland Fisheries-I**

**Course Code: Zoo-161A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Observe various tools, crafts and gears used in Fishery.	1,2,3,4,5	R, U, Ap, An, E
CO-2.	Describe the morphology, habit and habitat, systematic position and various systems of fishes of Punjab, Haryana and Himachal.	1,2,3,4,5	R, U, Ap, An, E



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CO-3.	Understand external features and economic importance of fresh water and marine water fishes and other aqua culture organisms	1,2,3,4,5	R, U, Ap, An, E
CO-4.	Differentiate between different structure of mouth related to feeding habits	1,2,3,4,5	R, U, Ap, An, E
CO-5.	Get insight on exotic fishes	1,2,3,4,5	R, U, Ap, An, E
CO-6.	Understand induced breeding techniques and their impact on fish culture	1,2,3,4,5	U, Ap, An, E
CO-7.	Construct and maintain different types of ponds for fish culture	1,2,3,4,5	U, Ap, An, E
CO-8.	Understand the role of aquatic weeds and their control	1,2,3,4,5	U, Ap, An, E

**Course Title: Inland Fisheries-II**

**Course Code: Zoo-161B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Understand riverine fisheries of Sutlej and Beas	1,2,3,4,5	R, U, Ap, An, E
CO-2.	Get insight on reservoir fisheries	1,2,3,4,5	U, Ap, An, E
CO-3.	Understand various fish culture systems and integrate fish farming along with sewage fed fisheries	1,2,3,4,5	U, Ap, An, E
CO-4.	Have Know-how of cold water fisheries like Mhaseer and trout	1,2,3,4,5	R, U, Ap, An, E
CO-5.	Have In-depth knowledge about fish diseases and their control	1,2,3,4,5	U, Ap, An, E
CO-6.	Study the marketing of fish and fish by-products	1,2,3,4,5	U, Ap, An, E

**Course Title: Practical VI (Related to ZooC-161A & B)**

**Course Code: Zoo-161P**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1.	Identify fishes based on the morphological characters	1,2,3,4,5	R, U, An, E
CO-2.	Analyze morphometric and meristic character of typical fish using identification keys	1,2,3,4,5	R,U, Ap, An, E
CO-3.	Determine food and feeding habits of fishes and their maturity stages	1,2,3,4,5	U, An, E
CO-4.	Identify and differentiate between important phytoplanktons and zooplanktons using permanent slides	1,2,3,4,5	U, Ap, An, E
CO-5.	Estimate chemical parameters of pond waters	1,2,3,4,5	U, An, E





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### B.SC. NON-MEDICAL

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO-1	To understand the fundamental concepts in physics, chemistry & mathematics and develop ideas based on them.
PSO-2	To possess knowledge on the topics in pure physics, chemistry & mathematics, empowering students to pursue higher degrees at reputed academic institutions.
PSO-3	To demonstrate problem-solving skills, innovative thinking and creativity.
PSO-4	To be motivated towards research in physics, chemistry, mathematics and related fields.
PSO-5	To enable students to become eligible to serve in DRDO, defense, public sector and private Sector.

#### COURSE OUTCOMES

##### Semester-I

Course Title: Algebra

Course Code: MAT-111A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Solve problems based on matrices, vector spaces, eigen values and eigen vectors,	2	R,U
CO2	Recognize consistency and inconsistency of linear equations.	3	R, U, An
CO3	Understand the relation between roots and coefficients.	3	U, An

Course Title: Calculus and Trigonometry

Course Code: MAT-111B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get acquainted with the limits, functions, derivatives, integrals, and infinite series.	1	R, U, Ap



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CO2	Associate Differential equations with the Mathematical modeling.	2,3	U, An
CO3	Solve multifarious differential equation that relates functions with its derivatives.	3	An, E, Ap
CO4	Know about concavity and convexity of the functions, Asymptotes and multiple points of a curve.	2	R, U, C
CO5	Have knowledge about applications in fields of engineering, physics, economics, and biology	1,4	Ap, U, C, E

**Course Title:** Inorganic Chemistry–Inorganic Chemistry–I and Practical) **Course Code:** CHE 111A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	ain knowledge about the atomic structure, Schrodinger wave equation, quantum numbers, shapes of orbitals, rules governing the filling of electrons in orbitals and electronic configuration of elements and ions.	1, 2,3, 4	R, U, Ap
CO2	Gain knowledge about positioning of elements in the periodic table, slater's rule, periodic properties such as ionisation energy, electron affinity, electronegativity and its calculations and chemical behaviour of elements.	1,2,3, 4	R,U,Ap
CO3	Acquire knowledge on valence bond theory, hybridisation, shapes of molecules, VSEPR theory, MO theory, bonding in boranes and determination of percentage ionic character.	1, 2,3, 4	U, An, Ap
CO4	Learn about close packing in solids, ionic structures, coordination number, radius ratio rules, born haber cycle, solvating power and polarising power of ions by Fajan's rule.	1, 2,3, 4	U, An, Ap
CO5	Acquire knowledge on metallic bonding, electron sea model, valence bond, band theories, hydrogen bonding and vander wall interactions.	1, 2,3, 4	U, An, Ap



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**Course Title:** Organic Chemistry–I

**Course Code:** CHE 111B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn basics of Organic chemistry starting from bonding in organic compounds and notations in a reaction/ reaction mechanism	1, 2,3, 4,5	U, Ap
CO2	Identify the type of organic reaction and properties and structures of reactive intermediates involved in mechanisms.	1, 2,3, 4,5	R, U,Ap
CO3	Understand the physical properties of Alkanes, Alkenes, Alkynes	1, 2,3, 4,5	U, Ap
CO4	Understand the basic nucleophilic substitution mechanisms in case of alkyl halides as well as aryl halides and their relative reactivities.	1, 2,3, 4,5	U, Ap
CO5	Understand the concept of aromaticity and aromatic electrophilic substitution mechanism	1, 2,3, 4,5	U, Ap

**Course Title:** Practical

**Course Code:** CHE 111P



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge about semi micro analysis.	1, 2,3, 4,5	U, An, Ap
CO2	Learn about cation analysis, separation and identification of ions from groups I, II, III, IV, V, VI.	1, 2,3, 4,5	U, An, Ap
CO3	Learn about anion analysis.	1, 2,3, 4,5	U, An, Ap
CO4	Understand the technique for determination of melting points of various compounds.	1, 2,3, 4,5	U, An, Ap
CO5	Learn about the technique for determination of boiling points of various compounds.	1, 2,3, 4,5	U, An, Ap

Course Title: Mechanics

Course Code: Paper A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the laws of motion reference frames, and its applications	1,2,4	U,R,An,Ap
CO2	Understand the application of central force to the stability of circular orbits, Kepler's laws of planetary motion, Orbital Precession and Rutherford scattering.	1,2,3,4	U,An,Ap,E





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CO3	Understand the dynamics of rotating objects i.e. rigid bodies, angular velocity, the moment of inertia, parallel axis theorem, the inertia tensor, the motion of rigid bodies. non-inertial frames: pseudo forces, examples involving the centrifugal force and coriolis force	1,2,3,4	U,An,Ap,E
CO4	Develop understanding of special theory of relativity and its applications to understand length contraction, time dilation, and relativistic addition of velocities, conservation of momentum and variation of mass, relativistic momentum, relativistic energy, and mass energy relation.	1,2,3,4	U, An,Ap,E
CO5	Get information about the basics of material properties like, elasticity, elastic constants and their relation, torsion of a cylinder, bending of a beam, cantilever, beam supported at its ends and loaded in the middle.	1,2,3,4	U,R,An,Ap,E

**Course Title:** Electricity & Magnetism

**Course Code:** Paper B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply knowledge on electricity and magnetism to explain natural physical processes and related technological advances.	1,2,3,4	Ap,An,E,C



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CO2	Understand the use of the Stoke's and Gauss Divergence theorems for solution of different physics problems.	1,2,3,4,5	R, Ap,E,C
CO3	Explain the concept of electric current and related concepts.	1,2,3	R,An,Ap
CO4	Understand about electric current and related concepts.	1,2,3,4,5	R,AP,E,C
CO5	Explain the phenomenon of magnetism, types of magnetic materials and their properties.	1,2,3,4	U,R,An,Ap,E,C

**Course Title:** Physics Practical

**Course Code:** Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Determine low resistance with Carey Fosters Bridge.	1,2,3,4	U, Ap, An, E
CO2	Study the dependence of moment of inertia on distribution of mass (by noting time periods of oscillations using objects of various geometrical shapes but of same mass).	1,2,3,4	U, Ap, An, E
CO3	Find Moment of Inertia and establish relationship between torque and angular acceleration using fly wheel.	1,2,3,4	U, Ap, An, E
CO4	Determine the resistance and specific resistance of copper with the help of Kelvin's double bridge.	1,2,3,4	U, Ap, An, E



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CO5	Understand the measure of Capacitance, determination of permittivity of a medium air and relative permittivity by de-Sauty's bridge.	1,2,3,4	U, Ap, An, E
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### Semester-II

**Course Title: Calculus and Differential equations 121A**

**Course Code:MAT-**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Get acquainted with the limits, functions, derivatives, integrals, and infinite series.	1,2	An, E, C
CO2	Associate differential equations with the Mathematical modeling.	3	Ap, An
CO3	Solve multifarious differential equation that relates functions with its derivatives.	3	U, Ap, E
CO4	Know about concavity and convexity of the functions, Asymptotes and multiple points of a curve.	2	R, U
CO5	Have knowledge about applications in fields of engineering, physics, economics, and biology.	1,4	Ap, E

**Course Title: Calculus**

**Course Code:MAT-121B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Apply Calculus in various fields such as computer graphics, physical sciences, economics and engineering.	1,4	Ap, E, C
CO2	Use Calculus in oceanography to calculate the height of tides in oceans.	4,5	An, Ap, E
CO3	Understand the concept of partial derivatives which are used in fields such as computer graphics, physical sciences, vector calculus and engineering.	1,4	U,Ap, C



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CO4	Learn about evaluating double and triple integrals of functions of several variables and apply them in evaluating area and volume of solids.	2,3	U, Ap
CO5	Understand the concepts of jacobians, maxima and minima of functions of two variables, envelopes and evolutes.	3	U,Ap

**Course Title:** Inorganic Chemistry–II**Course Code:** CHE 121A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the physical and chemical properties of s-block, p-block and d-block elements.	1, 4	R, U, An
CO2	Learn the basic similarities and differences between different groups of the periodic table.	4	R, U, An
CO3	Understand the acid-base concepts in inorganic chemistry like Arrhenius concept, Bronsted-lowry and Lewis concepts. Students will be able to differentiate acids and bases.	1, 4	U, Ap
CO4	Learn about the colour, oxidation states, catalytic and magnetic properties of transition elements.	1,3,4	U, Ap, An
CO5	Acquire knowledge about important topics like inorganic benzene, boranes, silicones and phosphazenes.	1,3,4	U,An

**Course Title:** Physical Chemistry I**Course Code:** CHE 121B

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# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to implicate the concepts of gaseous state, kinetic theory, and van der Waals equations to real systems.	1, 2	R, U, An
CO2	Learn about applications of Liquid crystals in LCDs and Digital Electronics	1,3	R, U, Ap
CO3	Get knowledge on colloidal solutions, their preparation, and properties to understand various physical parameters.	1, 3	R, U, E
CO4	Understand the preparation of solutions based on different measurement basis and colligative properties	1, 3,4	U, An
CO5	Learn to handle and carry out the physical estimation of solutions, and molecular weight determination from colligative properties	1, 3,4	U, Ap, E



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Course Title: Practical

Course Code: CHE 121P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Measure important physical properties like surface tension, viscosity, density, enthalpy, heat of neutralization etc.	1, 2,3, 4,5	R, U, Ap
CO2	Learn to examine various physical parameters by different methods.	1,3,4	R, U, Ap, An, E
CO3	Learn to handle important apparatus like stalagmometer, Ostwalds viscometer and calorimeter.	1,3,4	U, Ap
CO4	Learn to perform acid-base titrations.	1, 2,3, 4,5	U,Ap
CO5	Learn to examine the rate of reactions (hydrolysis of ester).	1, 2,3, 4,5	U, Ap, An

Course Title: Relativity &amp; Electromagnetism

Course Code: Paper-A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Discuss the key observations and events that led to the development of Einstein's theory of special relativity.	1,2,3,4	R,U,E,C
CO2	Explain the fundamental principles of special relativity and electromagnetism	1,2,3,4	R,U,E,C



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	and the far-reaching connections between them.		
CO3	Describe Maxwell equations and its physical consequences.	1,2,3,4,5	U,An,Ap,E
CO4	Describe the nature of electromagnetic wave and its propagation through different media and interfaces.	1,2,3,4	U,An,Ap
CO5	Discuss the experimental basis of these fundamental principles and how this contributed to the subsequent development of fundamental physics.	1,2,3,4,5	U,E,C,Ap

**Course Title:** Vibration and Waves

**Course Code:** Paper-B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand simple harmonic motion and will be able to solve the equations of motions for physical systems that undergo simple harmonic motion.	1,2,3,4	U,An,Ap
CO2	Understand the damped oscillator in the over damped, critically damped and under damped regimes.	1,2,3,4,5	U,An,Ap,E
CO3	Understand, derive and solve the equations for a forced oscillator, the concept of resonance and variation of displacement and velocity with driving force frequency.	1,2,3,4,5	R,U,An,Ap,E
CO4	Understand the concept of coupled oscillators will be able to derive and solve the equation	1,2,3,4,5	U,An,Ap,E



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	of motion for simple systems and describe the motion of coupled oscillators in terms of normal mode solutions.		
CO5	Understand about wave, differences between longitudinal and transverse waves, the concepts of phase and group velocities and be able to calculate these quantities.	1,2,3,4,5	U,An,Ap,E

**Course Title:** Practical

**Course Code:** Physics Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the induced e.m.f. as function of the velocity of the magnet.	1,2,3,4	U,An,Ap
CO2	Compare the results of Resonance in a series and parallel LCR circuits for different R-value and calculate Q-value experimentally as well as theoretically.	1,3,4	An,Ap,E,C
CO3	Plot the graph of variation of magnetic field with distance along the axis of current carrying coil carrying.	2,3,4	R,U, An
CO4	Verify the laws of vibrating strings and compare the mass per unit length of string using Melde's experiment.	1,3,4	U,An,Ap, E





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CO5	Find the value of acceleration due to gravity (g) by Kater's pendulum.	1,2,3,4	R,U,Ap
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### Semester-III

Course Title: Analysis

Course Code:MAT-231A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Study the behavior of real numbers, sequences and series of real numbers.	3	U, An
CO2	Test the convergence of sequences and series of various types, the convergence of improper integrals.	1,3	An, Ap
CO3	Apply the concept of Riemann integrability, the use of beta and gamma functions in solving various problems of calculus.	3,4	Ap, C

Course Title: Analytical Geometry

Course Code:MAT-231B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand and apply the concepts of geometry in the daily life.	1,4	U, Ap
CO2	Analyse the applications of geometry in different fields such as art, robotics, Computer, and video games.	1,2	An, E
CO3	Understand the important role of Analytical Geometry in architecture and also in the construction of stairs by making use of angles.	4,5	U,E, C
CO4	Comprehend the concepts of change of origin, rotation of axes and invariants for second degree equations in two and three dimensions.	3	U, Ap
CO5	Know about the properties of conics (parabola, ellipse, hyperbola and sphere).	3	U,An,Ap



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**Course Title:** Organic Chemistry–II

**Course Code:** CHE 231A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the Structure & bonding of organic compounds and mechanism of organic reactions.	1,3,4,5	R, U, Ap, An
CO2	Understand the Stereochemistry of organic compounds.	1,3,4,5	R, U, Ap, An
CO3	Understand nomenclature, synthesis, Physical and chemical properties of alcohols.	1,3,4,5	U, An, Ap
CO4	Understand nomenclature, synthesis, physical and chemical properties of aldehyde and ketones.	1,3,4,5	U, Ap, An
CO5	Understand nomenclature, synthesis, physical and chemical properties of phenols.	1,3,4,5	U, Ap, An



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**Course Title:** Physical Chemistry II

**Course Code:** CHE 231B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Students will learn about the various thermodynamic terms and processes.	1, 2,3, 4,5	R, U, An
CO2	Understand the first law of thermodynamics and learn to calculate the various thermodynamic properties for reversible isothermal and adiabatic expansion of ideal gases and also solve various numerical problems related to these topics.	1, 2,3, 4,5	R, U, An, Ap
CO3	Learn the enthalpy of formation, neutralization, solution, reaction, bond dissociation enthalpy, kirchhoff's law and solve numerical problems related to these topics.	1, 2,3, 4,5	R, U, An
CO4	Learn about the second and third law of thermodynamics. Carnot cycle, concept of entropy and free energy and numerical problems associated with these concepts.	1, 2,3, 4,5	R, U, An, Ap
CO5	Learn about the chemical equilibrium and phase equilibrium. They will learn to draw and explain the phase diagrams of one and two component systems, ideal mixtures and non ideal mixtures in detail with examples.	1, 2,3, 4,5	U, An, Ap, C



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**Course Title:** Practical**Course Code:** CHE 231P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the preparation of organic compounds, their purifications and run TLC.	1,3,4	U, Ap, An,E
CO2	Determine the physical constants like Melting point, Boiling point.	1,3,4	U, R, Ap, An
CO3	Understand different purification techniques in organic chemistry like recrystallization.	1,3,4	U, Ap, An,E
CO4	Become aware of safety techniques and handling of chemicals.	1,3,4	U, AP
CO5	Understand how to carry out different types of volumetric titrations.	1,3,4	U, Ap

**Course Title:** Statistical Physics and Thermodynamics**Course Code:** Paper-A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of thermo dynamical probability and energy wise distribution of particles in various compartments	2,3	R,U,Ap,An,E
CO2	Learn the concept of phase space, classical and quantum statistics.	2	R,U,Ap,An,E
CO3	Analyze the statistical concept of entropy.	4	U,Ap,An,E





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CO4	Analyze the application of thermodynamics, heat death of universe.	2	U,Ap,E
CO5	Derive and understand application of Maxwell thermodynamical relations.	2,4	U,Ap,An,

**Course Title:** Optics and Lasers

**Course Code:** Paper-B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the natural phenomenon of wave nature of light and its experimental proof.	1,2,3,5	U,E,C,Ap
CO2	Understand the effect of interference of light during reflection, transmission and Michelson interferometer.	1,2,3,4	R,U,Ap,E
CO3	Understand the concepts and complete explanation of diffraction and polarization of light and their types.	1,2,3,4	U, An,Ap, C
CO4	Explain the basic theories of laser physics with its applications in different fields.	1,3,4,5,	R,An,U,E
CO5	Explain the stimulated and spontaneous emission studied by Einstein equations.	1,2,3,4,5	U,An,C

**Course Title:** Practical

**Course Code:** Physics Practical



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use the spectrometer to study various spectra.	1, 2	R,U,Ap,An,E
CO2	Understand the concept of sextant to measure accessible and inaccessible lengths.	1,2	R,U,Ap,An,E
CO3	Verify the law of probability distribution using coins.	1,4	U,Ap,An,E
CO4	Explain Diffraction through grating using He-Ne laser and sodium light.	1,2	U,Ap,An,E
CO5	Understand the concept of polarimeter.	2,4	U,Ap,An,E

### Semester-IV

Course Title: Statics and Vector Calculus

Course Code:MAT-241A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of system of forces in equilibrium and differentiation and integration of vector functions.	3	U, R, An
CO2	Define the resolution and composition of a number of forces, parallel forces and couples, moments of forces and couples about a point and a line.	2,3	R, U, E
CO3	Generalise the theory behind the friction and centre of gravity.	1,3	An,E
CO4	Understand the definition of directional derivative and gradient and illustrate geometric meanings with the aid of sketches.	1,2	U,An, Ap
CO5	Apply concept of a vector integration in a plane and in space.	4	Ap,An

Course Title: Solid Geometry

Course Code:MAT-241B



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept of 3-D Euclidean geometry.	1,4	R, U
CO2	Generalise the concepts and ideas of plane geometry.	1,4	E, C
CO3	Understand the basic geometric views of shape, size, length, angle, volume, surface area, rotation, translation, location etc. associated with any figure.	2	U, Ap
CO4	Learn about the applications of solid geometry in 3-D modelling, Architectural designing, 3-D Computer graphics.	1,2	R, U, Ap
CO5	Understand the concepts and properties of solids like cone, right circular cone, cylinder, right circular cylinder and sphere.	3	U, Ap

**Course Title:** Inorganic Chemistry–III**Course Code:** CHE 241A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about werner's theory, effective atomic no., chelation, nomenclature and isomerism in coordination compounds, valence bond theory of transition metal complexes.	1,3,4	U, R, An
CO2	Learn about types of solvents, physical properties of solvents, reactions in liquid ammonia and sulphur dioxide.	1,3,4	U, R, An
CO3	Learn about electronic structures, oxidation states of lanthanides and actinides, electronic and magnetic properties of lanthanides and actinides, lanthanide contraction.	1,3,4	U, R, An
CO4	Learn about oxidation and reduction, redox potential data, frost, latimer and pourbaix diagrams.	1,3,4	U, R, An
CO5	Learn about different elements in biological processes, metalloporphyrins, Haemoglobin, myoglobin, biological role of alkali and alkaline earth metals.	1,3,4,5	U, R, An



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Course Title: Organic Chemistry III

Course Code: CHE 241B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Have knowledge about the nomenclature, general physical properties, synthesis and chemistry of carboxylic acids, and carboxylic acid derivatives	1, 2,3, 4,5	R,U,Ap
CO2	Have a fundamental theoretical understanding of heterocyclic chemistry	1, 2,3, 4,5	R,U,Ap
CO3	Know aromatic and non aromatic heterocycles, in particular their structural and chemical properties and synthesis.	1, 2,3, 4,5	R,U,Ap
CO4	Understand the structure and chemical reactions of Organomagnesium, Organolithium, Organozinc and Organocopper compounds	1, 2,3, 4,5	R,U,Ap
CO5	Understand the nomenclature, properties, synthesis and reactions of ethers, epoxides and nitrogen containing compounds	1, 2,3, 4,5	R,U,Ap





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Course Title: Practical

Course Code: CHE 241P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Perform various functional group tests in identification of organic compounds	1, 2,3, 4,5	U,Ev, Ap,An
CO2	Understand the systematic qualitative analysis of organic compounds for the detection of elements	1, 2,3, 4,5	U, Ap,An,E
CO3	Learn the identification of the compound and preparation of derivative and determination of its melting point.	1, 2,3, 4,5	U, Ap,An,E
CO4	Develop the ability to apply the principles of Chemistry.	1, 2,3, 4,5	U, Ap,An,E

Course Title: Quantum Mechanics

Course Code: Paper-A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn the basic formulation of Quantum mechanics developed by de Broglie and Schrodinger.	1, 2	R,U,Ap,An
CO2	Understand various operators and Schrodinger equation.	3	U,Ap,An,E



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CO3	Understand detailed quantum mechanical analysis of few one dimensional potential systems.	3,4	U,Ap,An,E
CO4	Learn the detailed quantum mechanical analysis of few three dimensional potential systems.	2,4	U,Ap,An,E
CO5	Analyze Hydrogen atom and Harmonic oscillator.	5,6	U,E

**Course Title:** Atomic and Molecular Spectra

**Course Code:** Paper-B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Describe the theories explaining the structure of atom and origin of the observed spectra.	1,2,3,4	U,R,An,Ap
CO2	Explain the experimental proof of different effects like Bohr's theory and Zeeman effect.	3,4,5	An,Ap,E,C
CO3	Identify the one electron atomic spectra effects and different quantum numbers required for complete explanation	1,2,4,5	R,U,Ap,E
CO4	Interpret the many electron atomic spectra of helium, alkaline atoms with LS couplings and selection rules.	1,3,4	An,Ap,C,E



Estd. 1892

# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

## Khalsa College Amritsar

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UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

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CO5	Describe the X-ray and molecules spectra and understand the complete Raman effect.	1,2,3,4,5	U,An,Ap,C,E
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**Course Title:** Practical

**Course Code:** Physics Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Use the spectrometer to study Hydrogen and iodine absorption spectra.	1, 2	R,U,Ap,An,E
CO2	Explain the heating efficiency of electric kettle with varying voltage.	1, 2	R,U,Ap,An,E
CO3	Demonstrate the photoelectric effect, determination of Planck's constant and inverse square law	1, 4	R,U,Ap,An,E
CO4	Determine Ionization potential of mercury.	1,2	R,U,Ap,An,E
CO5	Find the Thermo emf and its variation with temperature.	2,4	R,U,Ap,An,E

### Semester-V

**Course Title:** Dynamics      **Course Code:** MAT-351A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Handle the problems based on rectilinear motion.	3	C, E
CO2	Use Newton's laws of motion in numerical problems.	2,3	Ap, E
CO3	Deal with problems based on variable acceleration.	1,3	Ap, An



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CO4	Use concepts of work, power and energy to solve practical problems.	3	E, C
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**Course Title: Number Theory****Course Code: MAT-351B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Know about some fascinating discoveries related to properties of prime numbers.	1,2	An, E, C
CO2	Interpret the concept of divisibility and fundamental theorem of Arithmetic.	2,3	R, U
CO3	Have knowledge on the applications such as security system used in banking securities, coding theory, barcodes and memory management systems.	4,5	Ap, An
CO4	Understand the various types of numbers and their properties, various arithmetic functions.	3	U, E
CO5	Understand the concept of G.C.D. and L.C.M. of numbers and the relation of linear Diophantine equations and congruences, helpful in solving various arithmetic problems.	3,4	U, Ap

**Course Title: Inorganic Chemistry–IV****Course Code: CHE 351A**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about crystal field theory and valence bond theory.	1, 2,3, 4,5	R, U
CO2	Understand the magnetic properties of transition metal complexes.	1, 2,3, 4,5	R, U, Ap
CO3	Learn about metal ligand bonding and thermodynamic and kinetic aspects of metal complexes.	1, 2,3, 4,5	R, U
CO4	Understand the electronic spectra of transition metal complexes.	1, 2,3, 4,5	R, U, Ap
CO5	Understand the concepts of organometallic chemistry	1, 2,3, 4,5	R, U, Ap





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**Course Title:** Physical Chemistry III

**Course Code:** CHE 351B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn basic definitions of specific conductance, equivalent conduction, Kohlrausch law, Arrhenius theory, Oswald's dilution law and Debye Huckel Onsager's equation	1,3,4	R, U, Ap
CO2	Learn different reversible and irreversible electrodes, Nernst equation, Electrolytic and galvanic cells, Conductometric and potentiometric titrations.	1,3,4	R, U, An
CO3	Learn radioactivity, nuclear stability, nuclear forces, nuclear decay processes and their applications.	1,3,4	R, U, Ap
CO4	Learn about spectroscopic techniques, electromagnetic radiations such as Microwave, Infra red, Raman and UV- Visible.	1,3,4	U, Ap



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**Course Title:** Practical

**Course Code:** CHE 351P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn to synthesize and analyze different inorganic complexes.	1, 2,3, 4,5	U, R, An, Ap, Ev
CO2	Determine the strength of solution by conductometric titrations.	1, 2,3, 4,5	U, R, An, Ap, Ev
CO3	Learn to determine molecular weight by Rast method and viscosity measurements	1, 2,3, 4,5	U, R, An, Ap, Ev
CO4	Learn to determine refractive index by Abbe refractometer.	1, 2,3, 4,5	U, R, An, Ap, Ev

**Course Title:** Condensed Matter Physics

**Course Code:** Paper-A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain knowledge on classification of various crystal systems and crystal structures.	1, 2, 4	R, U, Ap
CO2	Understand the basics of X-ray diffraction and crystallography.	1, 3,4	R, U, Ap, An
CO3	Comprehend the concept of Reciprocal lattice and Brillouin zones.	1, 3	U, Ap, An, C



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CO4	Gain a comprehensive view of Fermi energy through classical and quantum free electron theory.	1, 3	R, U, Ap
CO5	Understand the difference between metals, semiconductors and Insulators on the basis of formation of energy bands.	1,2, 3	U, Ap, An, C

**Course Title:** Nuclear Physics**Course Code:** Paper-B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Gain the ability to explain the ground state properties of the nucleus, the detailed nuclear structure and the concept nuclear force existing within the nucleus.	1,2,3,4	R,U,Ap,E
CO2	Understand the process of radioactivity through detailed studies on radioactive decay of elements, the laws governing the decay and the different modes of decay. They will also gain knowledge on its applications in different fields.	2,3,4	R,U,Ap,An,E
CO3	Apply the various aspects of nuclear reactions in view of compound nuclear dynamics, the concept of threshold energy and nuclear cross section. They will also understand the concept of Q value and its physical significance.	1,2,3,4	R,U,Ap,An



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CO4	Comprehend the details of liquid drop and shell model to easily expose the structure of the nucleus.	1,2,3,4	R,U,Ap
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Course Title: Practical

Course Code: Physics Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand about the characteristics of PN junction diode and determination of energy band gap .	1,2,4	U, R, Ap, An
CO2	Understand how a CRO works and how to measure voltage and frequency of AC and DC supply.	1,2,3,4	U, R, An, E
CO3	Understand the characteristics of Thermistor, LED, Zener diode , their functioning and other related concepts.	1,3,4,5	U, Ap, An, E,C
CO4	Understand BH curve tracing for different materials using CRO.	1,2,5	U, Ap, An, E
CO5	Undersatnd the working of differentiating and integrating circuit.	2,3,4,5	U, Ap, An

**Semester-VI**

Course Title: Linear Algebra

Course Code:MAT-361A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Handle the problems based on vector spaces, subspaces, basis and dimensions.	3	E, C





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CO2	Check the linear independence of vectors.	3	R, U
CO3	Form the linear combination of vectors.	1	An, Ap, C
CO4	Find the matrix corresponding to a linear transformation and vice versa.	3	Ap, E

**Course Title: Numerical Analysis**

**Course Code: MAT-361B**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the use of Numerical analysis in detecting errors in numerical calculations.	1,2	E, C
CO2	Solve linear and non-linear equations, in numerical differentiation and integration, to solve differential equations.	3	Ap, An, E
CO3	Have the knowledge on the study of algorithms that use numerical approximation for the problems of mathematical analysis.	2,3	R, U, Ap
CO4	Apply numerical analysis in all the fields of engineering, physical sciences, life sciences, social sciences, medicine, business and Economics.	1,4,5	Ap, An, E, C
CO5	Analyze and evaluate the accuracy of common numerical methods.	1, 3	An, E

**Course Title: Organic Chemistry–IV**

**Course Code: CHE 361A**



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the concept, principle and applications of UV, IR and NMR Spectroscopy and the problems pertaining to the structure elucidation of simple organic compounds.	1,3,4,5	U, R, Ap
CO2	Learn about structure of carbohydrates	1,3,4,5	U, R
CO3	Understand organic Synthesis via organometallic compounds and Enolates.	1,3,4,5	U, R, Ap
CO4	Learn about structure of amino acids, Peptides and Nucleic acids	1,3,4,5	U, R
CO5	Learn about synthetic polymers.	1, 2,3, 4,5	U, R, Ap



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**Course Title:** Physical Chemistry IV

**Course Code:** CHE 361B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the importance and need of quantum chemistry.	1,3,4	R, U, An,
CO2	Understand various laws governing quantum chemistry.	1,3,4	R, U, An, Ap
CO3	Understand the derivation of Schrodinger wave equation and its applications to Simple Harmonic oscillator, rigid rotator and hydrogen atom. It will help them to solve various problems related to quantum chemistry.	1,3,4	R,U, An, Ap, C
CO4	Learn about the basics of solid state chemistry, laws of crystallography and the methods to determine crystal structure with examples.	1,3,4	R, U, Ap,C
CO5	Understand the laws of photochemistry Jablonski diagram and various radiative and non radiative processes.	1,3,4	R, U, Ap,C



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**Course Title:** Practical

**Course Code:** CHE 361P

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand the preparation of various of organic compounds.	1, 2,3, 4,5	U, R, Ap
CO2	Learn about TLC or the separation of various components in mixture.	1, 2,3, 4,5	U, Ap
CO3	Learn about Column chromatography for the separation of various components in mixture.	1, 2,3, 4,5	U, Ap
CO4	Understand different purification techniques in organic chemistry like recrystallization	1, 2,3, 4,5	U, AP
CO5	Get awareness of safety techniques and handling of chemicals..	1, 2,3, 4,5	U, Ap

**Course Title:** Electronics

**Course Code:** Paper-A

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Understand and analyze pn junctions in semiconductor devices.	1,2,3,4	U, Ap, An
CO2	Analyze simple rectifiers and voltage regulators using diodes.	1,2,3,4	R, U, Ap, An





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CO3	Describe the behaviour of special purpose diodes.	1,2,3,4	R, U, Ap, An,E
CO4	Study different biasing techniques to operate transistor, FET, MOSFET. Study of amplifier analysis using hybrid parameters.	1,2,3,4	U, Ap, An, E
CO5	Know the concept of feedback in Amplifier and Oscillator, and study of different types of Oscillators.	1,2,3,4	U, Ap, An,E

Course Title: Radiation and Particle Physics

Course Code: Paper B

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Learn about the four fundamental forces of nature and their mutual interaction.	1,2,3,4,5	R,U,An
CO2	Understand the fundamental aspects of the structure of nucleus, nuclear reactions, interaction of radiation with matter and the process of energy loss by different radiations.	1,2,3,4,5	R,U,Ap,An
CO3	Gain knowledge on the principle, construction and working of various radiation detectors.	1,2,3,4,5	R,U,Ap,An,E
CO4	Learn about various linear and cyclic accelerators used to accelerate charged particles to high energies for carrying out nuclear reactions and their implementation in different research fields.	1,2,3,4,5	R,U,Ap,An,E



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CO5	Understand the basic physics behind elementary particles, their classification according to the associated quantum numbers and the confirmation of unified theory with the discovered elementary particles.	1,2,3,4,5	R,U,Ap,An
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**Course Title:** Practical

**Course Code:** Physics Practical

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO1	Describe the nature of electromagnetic wave and its propagation through different media.	1,2,3,4	R,U,An,Ap
CO2	Build and design regulated power supplies and other instruments.	2,3,4,5	R,Ap,An,C
CO3	Develop logic circuits for various applications in real life.	1,2,4	U,Ap,E,C
CO4	Detect the different types of radiations by using G.M. counter.	1,2,3,4	U,Ap,E
CO5	Develop the skills related to research, education, and industry by using electronics.	2,3,4,5	U,An,Ap,E,C



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### BACHELOR OF VOCATION (B.VOC.) FOOD PROCESSING

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1	To make students aware of food composition, analysis and technological aspects of food processing and preservation.
PSO-2	To understand post-harvest analysis of food that helps them to build entrepreneurship techniques along with the environmental challenges.
PSO-3	To make students confident enough to handle various challenges that might come at technological and qualitative aspect in food industry.
PSO4	To make students build their careers in food business by managing various entrepreneurship ventures
PSO5	To Gain knowledge on the basic concepts of computer applications

#### SEMESTER – I

#### COMMUNICATION SKILLS IN ENGLISH-I Code: BCSV-1129

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Develop competence in written communication.	3,4	R, U, An
CO2	Develop innovative and critical thinking skills.	2,3,4	U, Ap, C
CO3	Grasp the application of communication theories.	1,3,4	U,An
CO4	Acquire knowledge on latest technology related to communication skills.	1,2,3	U,An

#### COURSE CODE: BVFP11-104 COURSE TITLE: FOOD PROCESSING AND PRESERVATION

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about the basic concept of food preservation.	1,2	R, U
CO2	Understand factors affecting the shelf lives of commodities and different preservation techniques.	2,3	U, Ap, C
CO3	Be aware of the role of modern packaging techniques in food preservation.	2,4	U,An,Ap, C



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CO4	Use novel technologies for food preservation.	2,4	U,Ap, C
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COURSE CODE: BVFP11-105			
COURSE TITLE: FOOD AND NUTRITION			
Sr. No.	On completing the course, the students will be able to know:	PSOs Addressed	Cognitive levels
CO1	Study various aspects of food and nutrition	1,2,3	R, U, An
CO2	Understand the functions of food and nutrients.	1,2	U, Ap
CO3	Understand the dietary requirements to be fulfilled from the consumption of food	3,4	U, An, C
CO4	Understand the concept behind the development of balance diet	4	U, An, C

COURSE CODE: BVFP11-106			
COURSE TITLE: FRUITS AND VEGETABLE PROCESSING			
Sr. No.	On completing the course, the students will be able to understand:	PSOs Addressed	Cognitive levels
CO1	Study chemical composition and nutritive value of fruits and vegetables.	1,2	R, U, An
CO2	Understand the primary unit operations involved in the processing of fruits and vegetable products.	1,2,3	U, An,Ap, C
CO3	Understand the technology behind processing of fruits and vegetable products	2,3,4	U,An
CO4	Study the problems involved in processed fruits and vegetable products line and methods to solve the related problems.	2,3	U,An,E

COURSE CODE: BVFP11-107			
COURSE TITLE: EXPERIMENTS IN FOOD PROCESSING AND PRESERVATION			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Demonstrate the use of various machineries used in food processing.	3,4	R, U, Ap
CO2	Study the blanching of selected food items and the effect of browning on raw fruits and vegetables.	1,3,4	U,An, Ap
CO3	Understand about the preservation of food by concentration and chemical preservatives	2,3,4	U,An, Ap
CO4	Study different methods of food processing i.e. by heat and drying in tray drier on a given food sample.	2,3,4	U, Ap

COURSE CODE: BVFP11-108			
COURSE TITLE: EXPERIMENTS IN FOOD AND NUTRITION			





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Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Get basic understanding about the identification of food sources and five-food groups.	1,2	R, U, Ap
CO2	Perform the calculation of BMI and BMR	3,4	U, Ap, C
CO3	Plan the diet of a normal adult obese, underweight and overweight people	3,4	U,An, Ap, C

### SEMESTER – II

COURSE CODE: BCSV-1229			
COURSE TITLE: COMMUNICATION SKILLS IN ENGLISH-II			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Develop competence in oral and visual communication.	3,4	R, Ap
CO2	Develop innovative and critical thinking and understand the application of communication theories.	3,4	U,An, Ap
CO3	Acquire knowledge on latest technology related to communication skills	3,4	U, Ap

COURSE CODE: BVFP12-204			
COURSE TITLE: Food Chemistry			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the chemistry underlying the properties and reactions of various food components.	1,2	R, An,Ap
CO2	Understand the structure, classification and functional properties of food components.	2,3	U, An,Ap
CO3	Understand the chemical changes that take place in food components during processing and storage and their effects on sensory and nutritional quality and functional properties of foods.	1,4	U,An, Ap,C
CO4	Understand the chemistry underlying the properties and reactions of various food components.	1,4	U,An, Ap

COURSE CODE: BVFP12-205			
COURSE TITLE: FOOD HYGIENE AND SANITATION			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels



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CO1	Understand the basic principles and types of cleaning and disinfection in food processing plant.	1,2,3,4	R,An, Ap
CO2	Understand the concept of waste product handling and its management.	1,2	U, An,Ap
CO3	Understand the basic principles of safe and hygienic storage of foods	1,2	U, Ap,C
CO4	Get basic knowledge on solid and liquid waste management and treatment	1,4	U,An, Ap

COURSE CODE: BVFP12-206			
COURSE TITLE: CEREAL MILLING TECHNOLOGY			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the structure and composition of cereals and pulses.	1,2,4	R, An
CO2	Understand the methods of milling for cereals and pulses	1,2	U, Ap
CO3	Understand the manufacturing of various products from cereals and pulses	3,4	U, Ap
CO4	Study the effect of anti-nutritional factors present in pulses.	2	U, Ap

COURSE CODE: BVFP12-207			
COURSE TITLE: Experiments in Food Chemistry			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the analytical and experimental methods used in the study of the food components.	1,2	R,An, Ap
CO2	Study the applications of enzymes in fruit juice clarification.	1,2	U, Ap
CO3	Learn the quantitative analysis of various food components	1,2	U, An,Ap, C

COURSE CODE: BVFP12-208			
COURSE TITLE: EXPERIMENTS IN FOOD HYGIENE AND SANITATION			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the analysis of water used in food industries	1,2	R, An,Ap
CO2	Study the rapid adulteration tests for food products.	1,2	U, Ap
CO3	Understand the case study of food hygiene and sanitation (GMP/GHP) of a food industry.	3,4	U,An, Ap
CO4	Check the effectiveness of sterilisation	2,3,4	U,An, Ap,E



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### COURSE CODE: BVFP12-209

### COURSE TITLE: EXPERIMENTS IN CEREAL MILLING TECHNOLOGY

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the physical characteristics of cereals and pulses.	1,2	R, Ap,C
CO2	Understand the methods of milling for cereals and pulses	1,2	U, Ap,C
CO3	Study the physic-chemical analysis of cereals and pulses	1,2,3,4	U,An, Ap,C
CO4	Understand the qualitative analysis of different cereals	2,3,4	U,An, Ap

### SEMESTER – III

### COURSE CODE: BVFP21- 304

### COURSE TITLE: CEREALS AND PULSES TECHNOLOGY

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Gain basic understanding on cereals, pulses and oilseeds after harvesting.	1,2,3,4	R, Ap,C
CO2	Study various types of processing methods of cereals, pulses and oilseeds	1,2	U, Ap,C
CO3	Study about various products and by-products of cereals, pulses and oilseeds	1,3,4	U,An, Ap
CO4	Gain knowledge on manufacturing technologies of cereals, pulses and oilseeds	2,3,4	U,An, Ap,C

### COURSE CODE: BVFP21- 305

### COURSE TITLE: FOOD MICROBIOLOGY

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the important genera of microorganisms associated with food and their characteristics.	1,3	R,U, An
CO2	Study the role of microbes in fermentation and food borne diseases.	2,3	U, An
CO3	Understand the importance of food quality control by avoiding pathogenic microbial attack.	2,3	U, An, Ap, C
CO4	Study factors affecting food spoilage	3,4	U, An,Ap

### COURSE CODE: BVFP21- 306

### COURSE TITLE: DAIRY TECHNOLOGY-I

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the composition of milk and factors affecting composition.	1,2	R, An, Ap



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CO2	Study the physic-chemical properties of milk	1,2	U, An,Ap
CO3	Understand the specifications and processing of special milks.	1,2,3	U, An, Ap, C
CO4	Study the standardisation, pasteurization, homogenization, bactofugation etc. of milk	1,3,4	R, U,An, Ap,E

COURSE CODE: BVFP21- 307			
COURSE TITLE: EXPERIMENTS IN CEREALS AND PULSES TECHNOLOGY			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the physical characteristics of cereals and pulses	1,2	R, An,Ap
CO2	Study the physic-chemical properties of cereals and pulses	2,3	U, An, Ap
CO3	Understand the milling of cereals	1,2	U, An, Ap, C
CO4	Understand the cooking quality evaluation of pulses	3,4	R, U, Ap,E

COURSE CODE: BVFP21- 308			
COURSE TITLE: EXPERIMENTS IN FOOD MICROBIOLOGY			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the growth of the microorganisms in different culture systems.	1,2	R, An, Ap
CO2	Understand the media formulation and sterilization techniques used.	2,3	U, An, Ap
CO3	Study the different microorganism.	1,2,3	U, An, Ap, C
CO4	Understand the different food born diseases and spoilage of food.	1,2,3	U,An, Ap

COURSE CODE: BVFP21- 309			
COURSE TITLE: EXPERIMENTS IN DAIRY TECHNOLOGY-I			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the physic -chemical analysis of milk.	1,2	R, An,Ap
CO2	Understand the detection of adulterants and neutralizers in milk.	2,3	U, An,Ap, C
CO3	Study the organoleptic tests of milk	1,2	U, An, Ap, C
CO4	Understand the quality control of milk.	3,4	U, An,Ap, C





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<b>Semester:III</b>			
<b>Course Title:Computer Applications</b>			
<b>Course Code: CS-BVGC231</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Understand the computer terminology.	5	R, U
CO2	Gain insight on the working of input and output devices.	5	R, U
CO3	Develop skills of working with MS-Word, MS-PowerPoint.	5	U,Ap
CO4	Understand the importance of operating system in computer.	5	U,Ap
CO5	Understand the concept of storing of data in memory and its types.	5	U,Ap

### SEMESTER – IV

<b>COURSE CODE:BVGC22- 401</b>			
<b>COURSE TITLE:FOOD SAFETY AND LAWS</b>			
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
CO1	Study the food quality being affected by the adulterants, hazards etc. and its safety.	1,2,3,4	R, An, C
CO2	Study food safety management tools: GHP, GMP etc.	3,4	U, An, AP
CO3	Study different food laws and standards in India and their requirements and importance in controlling	2,3,4	U, An, Ap
CO4	Study food safety regulations and their implementation in food industry to ensure the quality and safety of the food products.	3,4	R, U,An, Ap

<b>COURSE CODE:BVGC22- 402</b>			
<b>COURSE TITLE:EXPERIMENTS IN FOOD SAFETY AND LAWS</b>			
<b>Sr. No.</b>	<b>On completing the course, the students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive levels</b>
CO1	Understand the identification of different hazards in food materials.	1,3,4	R,U, An
CO2	Study various factors affecting food safety.	1,2	U, An



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CO3	Understand the implementation of HACCP chart in food processing laboratory while cooking.	3,4	U, An, Ap, C
CO4	Inspect the intentionally added adulterants in spices and milk	2,3	R, U,An, Ap

COURSE CODE: BVFP22- 404			
COURSE TITLE: BAKERY AND CONFECTIONERY TECHNOLOGY			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the role of ingredients in baking and principles of baking technology.	1,2,3	R,U, An,C
CO2	Study preparation methods of bakery and confectionery products.	1,2,3	U,An,C
CO3	Understand the basic steps involved in sugar manufacturing and storage	1,2,3	U,An, Ap, C
CO4	Study the utilization of its bi-products.	1,2,3	U, An,Ap

COURSE CODE: BVFP22- 405			
COURSE TITLE: DAIRY TECHNOLOGY-II			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study about milk composition, its various properties and different adulterants.	1,2	R,U, An
CO2	Understand the working of equipments and process technology for various milk products.	2,3	U,An, Ap, C
CO3	Study the process technology for condensed milk and fermented milk products	3,4	An, Ap, C
CO4	Gain knowledge on indigenous milk products ,their specifications and manufacturing	3,4	U,An,Ap

COURSE CODE: BVFP22- 406			
COURSE TITLE: FOOD PACKAGING			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the functions of packaging, different types of food packaging materials and their properties.	1,2,4	R, An, Ap
CO2	Study different food packaging equipment and machinery.	1,2,3	An, Ap, C
CO3	Select and finalize different types of packaging materials based on the composition and requirements of foods.	2,3	An, Ap, C
CO4	Gain knowledge on new technology involved in food packaging	1,2,3,4	U,An, Ap, C



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COURSE CODE: BVFP22- 407			
COURSE TITLE: EXPERIMENTS IN BAKERY AND CONFECTIONARY TECHNOLOGY			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the selection of the raw material used for the preparation of various bakery and confectionary products.	1,2,3,4	R, An, Ap, C
CO2	Study basics principles behind baking.	2,3,4	An, Ap, C
CO3	Study the basic steps and operation involved in the preparation of bread, biscuits and cakes	2,3,4	An, Ap, C
CO4	Understand the baking process of different confectionary products	2,3,4	U,An,Ap, C

COURSE CODE: BVFP22- 408			
COURSE TITLE: EXPERIMENTS IN DAIRY TECHNOLOGY-II			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the physic-chemical analysis milk products.	1,2	An, Ap, C
CO2	Understand the unit operation/working of different milk processing equipments.	2,3,4	Ap, C
CO3	Understand the preparation of various milk products.	1,2	U,Ap, C
CO4	Learn the working of cream separator	2,3,4	U,An,Ap, C

COURSE CODE: BVFP22- 409			
COURSE TITLE: EXPERIMENTS IN FOOD PACKAGING			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the identification of packaging materials used in food packaging.	1,2	An, Ap
CO2	Study different tests performed on packaging materials and filled packages.	2,3,4	An, Ap, C
CO3	Calculate the shelf life of foods inside packaging materials	1,2	An, Ap, C
CO4	Understand the selection of suitable packaging materials	1,2	U,Ap, C

COURSE CODE: BVFP22- 410			
COURSE TITLE: INDUSTRIAL TRAINING			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels



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CO1	Get exposure to industrial set-up	1,2,3,4	An, Ap, C
CO2	Observe the work flow and processes in food industries and associated enterprises	1,2,3,4	U,An, Ap, C

### SEMESTER – V

COURSE TITLE: BVGC31-501 COURSE CODE: SPICES & FLAVOUR TECHNOLOGY			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about various spices, their classification, chemistry involved and processing methods	1.2.3	U, An, Ap
CO2	Handle the microbial infestation during storage of spices	2,3	Ap, C
CO3	Be aware about various food flavorings and their stability against processing conditions	1,2,3	U,An, Ap, C
CO4	Know the manufacture of coffee from cocoa beans	1,2,4	U,Ap, C

COURSE CODE: BVGC31-502 COURSE TITLE: GENERAL FOOD PROCESSING EQUIPMENTS			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study various equipments used in food industries.	1,4	U, An, Ap
CO2	Understand the working and principles of equipments used in processing, drying, freezing etc.	2,3,4	An, Ap, C
CO3	Gain knowledge on equipments used for drying of foods	1,2,3	U, Ap, C
CO4	Understand the working of different heat exchangers	1,2,3,4	U,Ap, C

COURSE CODE: BVGC31-503 COURSE TITLE: FUNDAMENTAL HACCP			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the quality, quality control and its applications in food industry.	1,2,3	U, An, Ap
CO2	Study the instrumental aspects of colour and texture measuring instruments.	1,3	U,An, Ap





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CO3	Study the sensory quality of fruits and vegetables.	1,2,4	U,An, Ap
CO4	Do quality evaluation of fresh produce, milk and milk products.	1,2,3	Ap,E, C

COURSE CODE: BVFP31-504			
COURSE TITLE: EGG, POULTRY AND MEAT TECHNOLOGY			
Sr. No.	On completing the course, the students will be able to understand:	PSOs Addressed	Cognitive levels
CO1	Understand the technology for handling, processing, preservation of egg, poultry and meat.	1,2,3	U, An, Ap, C
CO2	Study the important biochemical and ultra-structural changes that take place during post-mortem during conversion of muscle to meat.	2,3	U,An,Ap
CO3	Study the factors that affect the safety and quality of meat products.	3,4	An, Ap
CO4	Learn various slaughtering techniques.	1,2,4	U,Ap, C

COURSE CODE: BVFP31-505			
COURSE TITLE: FOOD PLANT LAYOUT			
Sr. No.	On completing the course, the students will be able to understand:	PSOs Addressed	Cognitive levels
CO1	Study various factors involved in the site selection and design of food plant.	1,3,4	U, An, Ap, C
CO2	Understand the processes involved in layout design.	1,2,3,4	U,An, Ap, C
CO3	Understand the concept of preparing cost estimates	1,2,3	U,An, Ap, C
CO4	Understand the development and design consideration in preparing layout of different food industries.	1,2,3,4	U,An,Ap, C

COURSE CODE: BVFP31-506			
COURSE TITLE: QUALITY ASSURANCE			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Study the quality, quality control and its applications in food industry.	1.3.4	U, An, Ap, C
CO2	Study the instrumental aspects of colour and texture measuring instruments.	1,2,3,4	U,An, Ap, C
CO3	Understand the non-destructive methods to check the quality of food.	1,2,3	U,Ap, C
CO4	Study various food standards and regulations in food industry as quality control.	4	U,An, Ap, C



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COURSE CODE: BVFP31-507			
COURSE TITLE: EXPERIMENTS IN EGG, POULTRY AND MEAT TECHNOLOGY			
Sr. No.	On completing the course, the students will be able to understand:	PSOs Addressed	Cognitive levels
CO1	Understand the preservation methods of eggs.	1,3,4	Ap, C
CO2	Study the processing of eggs into different products.	1,2,3	U, Ap, C
CO3	Study the principle behind preservation techniques used for poultry and meat preservation.	2,3	U, Ap, C
CO4	Study the development of various meat products.	3,4	U,An, Ap, C

COURSE CODE: BVFP31-508			
COURSE TITLE: EXPERIMENTS IN FOOD PLANT LAYOUT			
Sr. No.	On completing the course, the students will be able to make:	PSOs Addressed	Cognitive levels
CO1	Understand the layout and design of cold storage	3,4	U, Ap, C
CO2	Understand the layout of milk and milk product plant	3,4	U,Ap, C
CO3	Understand the layout and design of bakery and related product plant	3,4	U, Ap, C
CO4	Understand the layout and design of fruits and vegetables processing plant	3,4	U,Ap, C

COURSE CODE: BVFP31-509			
COURSE TITLE: EXPERIMENTS IN QUALITY ASSURANCE			
Sr. No.	On completing the course, the students will be able to make:	PSOs Addressed	Cognitive levels
CO1	Study the quality, quality control and their applications in food industry.	1.3.4	U,An, Ap, C
CO2	Understand the instrumental aspects of colour and texture measuring instruments.	1,2,4	U,An, Ap, C
CO3	Understand the quality of fruits and vegetables.	1,2	U,Ap, C
CO4	Do quality evaluation of milk and milk products.	4	An, Ap, C



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### SEMESTER – VI

COURSE CODE: BVGC32-601 COURSE TITLE: FOOD ADDITIVES			
Sr. No.	On completing the course, the students will be able to make:	PSOs Addressed	Cognitive levels
CO1	Gain knowledge on the types of food additives currently used in the food industry and the functions of these chemical compounds.	1,2	U,An
CO2	Study the types, classifications, functions, chemical structures, physicochemical characteristics of different additives	1,2	U,An,
CO3	Study the mechanisms of reactions of different food additives.	1,2,3	U,An,Ap
CO4	Study the applications of food additives and processing aids in food processing	1,2,3,4	U,An, Ap, C

COURSE CODE: BVGC32-602 COURSE TITLE: FOOD TOXICOLOGY			
Sr. No.	On completing the course, the students will be able to make:	PSOs Addressed	Cognitive levels
CO1	Gain knowledge on toxicants that are associated with both plants and animals	1,2	U,An, Ap
CO2	Study foodstuffs that occur as natural constituents and contaminants	1,2,4	U,An
CO3	Understand various methods for evaluating different levels of toxicity in foodstuffs.	1,2	U,Ap, E
CO4	Understand the use food as medicine	1,2,3	U,An, Ap

COURSE CODE: BVGC32-603 COURSE TITLE: SEMINAR			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Develop scientific aptitude and presentation skills which are needed to present credited seminars on a relevant subject specific topic	1,2,3,4	U, An, C
CO2	Make presentation and understand data arrangement	1,2,3,4	U, Ap, C
CO3	Improve communication skill	1,2,3,4	U, Ap, C
CO4	Build confidence to deliver in front of audience	1,2,3,4	U, Ap, C



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COURSE CODE: BVFP32-604			
COURSE TITLE: FOOD INDUSTRY WASTE MANAGEMENT			
Sr. No.	On completing the course, the students will be able to :	PSOs Addressed	Cognitive levels
CO1	Understand the basics of waste water treatment, solid waste disposal and management.	1,3,4	An, Ap, C
CO2	Understand cleaning and sanitation procedure in dairy and meat industry.	1,2,3,4	U, An, Ap
CO3	Understand how to monitor food plant sanitation and HACCP.	1,2	U,Ap, C
CO4	Understand the ways for effective utilization of the by -products obtained after food processing.	3,4	U,An, Ap, C

COURSE CODE: BVFP32-605			
COURSE TITLE: FOOD ANALYSIS			
Sr. No.	On completing the course, the students will be able to :	PSOs Addressed	Cognitive levels
CO1	Know the instrumental aspects of colour and texture measuring instruments.	1,2,3,4	An, Ap, C
CO2	Study the non-destructive methods applied as quality control.	1,2,3,4	U, An, Ap, C
CO3	Study various food standards and regulations applicable in food industry as quality control.	1,2,3,4	U, An,Ap, C
CO4	Study the textural analysis of different food	2,3	U,An, C

COURSE CODE: BVFP32-606			
COURSE TITLE: TECHNOLOGY OF FERMENTED FOODS			
Sr. No.	On completing the course, the students will be able:	PSOs Addressed	Cognitive levels
CO1	Study about the different growing conditions of micro organisms in the preparation of different fermented products	1,2,3,4	An, C
CO2	Study the manufacturing process of different fermented products	1,2,3	An, Ap, C
CO3	Know various changes that take place during the manufacturing of different fermented products	2,3	U,Ap, C
CO4	Know about the microbiology of different fermented products	1,2,4	U,An, C

COURSE CODE: BVFP32-607			
COURSE TITLE: EXPERIMENTS IN FOOD INDUSTRY WASTE MANAGEMENT			





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Sr. No.	On completing the course, the students will be able to make:	PSOs Addressed	Cognitive levels
CO1	Understand the testing of water.	1,3,4	An, C
CO2	Study the quality parameters for water	1,2	U,An, Ap
CO3	Study methods to utilize waste from food industry	1,2	U,Ap, C
CO4	Understand the presence of solids present in water	1.3	U,An, C

### COURSE CODE: BVFP32-609

#### COURSE TITLE: EXPERIMENTS IN TECHNOLOGY OF FERMENTED FOODS

Sr. No.	On completing the course, the students will be able to :	PSOs Addressed	Cognitive levels
CO1	Study the manufacturing process of different fermented products	1,2,4	U, An, C
CO2	Know various changes that take place during manufacturing of different fermented products	1,2	An, Ap, C
CO3	Know about the microbiology of different fermented products	1,2,3	U, Ap, C
CO4	Understand the preparation of different fermented foods	1,2	U,An, Ap, C

### COURSE CODE: BVFP32-610

#### COURSE TITLE: INDUSTRIAL TRAINING

Sr. No.	On completing the course, the students will be able to :	PSOs Addressed	Cognitive levels
CO1	Get exposure to industrial set-up	1,3,4	U, An, Ap, C
CO2	Observe the work flow and processes in food industries and associated enterprises	1,3,4	U, An, Ap, C



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### B.VOC (SOFTWARE DEVELOPMENT) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAM SPECIFIC OUTCOMES (PSOs):

- PSO-1.** To get awareness about latest technologies and working of Software industry.
- PSO-2.** To create new ideas in the field of software development and resolving problems related to this field
- PSO-3.** To learn, design and perform programs and projects in labs
- PSO-4.** To gain understanding by analysing and developing computer programs in the areas related to mobile application design and web design.
- PSO-5.** To deliver a quality product by applying standard software engineering processes and strategies in software project development using open source programming environment.
- PSO-6.** To find jobs or self-career in various fields like Software/Website Development, Graphic Designing etc.

COURSE OUTCOMES (COs)			
Semester-I			
Course Title: Fundamentals of Information Technology		Course Code: BVSD-114	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Operate computer independently and professionally.	1,2	R,U, Ap
CO2	Use various programming and development tools.	1	U,Ap,An, C
CO3	Understand binary, hexadecimal and octal number systems and their arithmetic.	1,3	U,Ap
CO4	Understand basic computer network technology.	1,3,4	U,Ap
CO5	Understand and explain Data communications system and its components.	4,5	U,An,Ap



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Course Title: Web Technology		Course Code: BVSD-115	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain knowledge on HTML and CSS code to create websites.	1,3,4	R,U,Ap,C
CO2	Learn to write code using javascript.	3,4	U,Ap
CO3	Create online forms.	2,3	U,Ap
CO4	Learn how to publish website to the web.	2,3	UAp,,C

Course Title:: Programming using C Language		Course Code: BVSD-116	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain the programming ability in C Language.	1,3,5	U,Ap
CO2	Develop various applications to solve real world problems.	2,3,4	U,Ap,C
CO3	Understand concept of object thinking within the framework of functional model.	3,4	U,An
CO4	Make system as well as application software.	3,4	Ap,C
CO5	Handle errors occurred during program execution	3,4	Ap,An

Course Title:: Lab – I: Office Automation and Web Technology		Course Code: BVSD-117P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level



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CO1	Create word documents and mail merge.	2,3	U,C
CO2	Acquire the presentations skills and learn to perform accounting operations by using formulas.	1,2,3,4	U,Ap
CO3	Learn how to create and insert tables.	3,4	U,Ap,C
CO4	Learn to apply various formatting schemes.	5	U,Ap
CO5	Get hands on practice to develop web pages using HTML and DHTML, and publish website using Dreamweaver.	3	U,Ap,C

Course Title: Lab – II: Programming in C Language		Course Code: BVSD-118P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use the fundamentals of C programming in trivial problem solving.	4	U,Ap
CO2	Identify solution to a problem and apply control structures and user defined functions for solving the problems.	3,4	Ap,An
CO3	Understand the concept of arrays and their different types.	2,3,4	U
CO4	Read, understand and trace the execution of programs.	1,2,3,4	U,Ap
CO5	Gain ability to handle possible syntax and run time errors at the time of program execution.	2,4,5	U,Ap

Semester: II			
Course Title: Internet Applications		Course Code: BVSD-124	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Know how to use internet effectively such as internet surfing, browsing etc.	1,3	U,Ap





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CO2	Use all features of email facilities such as creating, sending, receiving, attachments, replying emails etc.	2,3,5	U,Ap
CO3	Opt website development field after studying this course.	5,4	U,E,Ap
CO4	Get knowledge on network topologies which enables them to make career in networking field.	2,5	U,Ap,E
CO5	Design basic to moderate web-sites in HTML.	1,4	U,Ap,An, E

Course Title: Data Structure		Course Code: BVSD-125	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use data structures to solve practical problems.	1,3	U,Ap
CO2	Implement effective programs that employ efficient algorithms.	2,3,5	Ap
CO3	Choose basic data structures and algorithms for realization of simple programs or program parts.	5,4	U,E,Ap
CO4	Debug the programs, recognize needed basic operations with data structures.	4	Ap,E,C

Course Title: Object Oriented Programming		Course Code: BVSD-126	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Describe the procedural and object oriented paradigm with the concepts of streams, classes, functions, data and objects.	1,2	U,An
CO2	Understand dynamic memory management techniques using pointers, constructors, destructors, etc.	3,4	U,Ap
CO3	Understand the concept of function overloading, operator overloading, virtual functions and polymorphism.	1,3,4	U,An



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CO4	Classify inheritance with the understanding of early and late binding, usage of exception handling and generic programming.	3,4	An,Ap,E
CO5	Demonstrate the use of various OOPs concepts with the help of programs.	6	An,Ap,E

Course Title: Lab1: Programming in C++		Course Code: BVSD-127P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Enhance skills on Problem Solving by constructing algorithms.	1,4	U,An
CO2	Demonstrate the use of Strings and String Handling Functions.	1,2,3,4,5	U,Ap
CO3	Gain ability to work with textual information, characters and strings.	4	An U,Ap
CO4	Gain ability to work with arrays.	4	U,An,Ap
CO5	Gain ability to write diversified solutions using C language.	4,6	An,Ap,E

Course Title: Lab II: Practical based on Data Structure		Course Code: BVSD-128P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Learn the basic types of data structures, their implementation and application.	1,3,4	U,An
CO2	Use linear and non-linear data structure like stacks, queues, linked list etc.	1,2,3,4,5	U,Ap
CO3	Implement various searching and sorting algorithms	2,5	An,Ap



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CO4	Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.	3	An,Ap
CO5	Develop programming skill.	2,6	An,Ap

### Semester: III

**Course Title: Database System**

**Course Code: BVSD 231**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Have the knowledge on databases and their designs.	1,3,4	R,U
CO2	Develop various concepts of relational data model.	1,2,3,4,5	U,Ap,C
CO3	Understand the concept of database design.	5	U
CO4	Learn to make Views, Queries and Sub-queries.	3,4	U,Ap
CO5	Handle various forms of Normalization.	3,6	U,E,Ap,C

**Course Title: Programming in Python**

**Course Code: BVSD-232**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand Python Programming Language.	1,3,4	R,U
CO2	Handle computational and data science problems efficiently.	1,2,3,4,5,6	U,Ap,C
CO3	Know theoretical as well as practical concepts of programming thoroughly.	1,4	R,U,An
CO4	Develop capability to make successful career in Data analysis and Data sciences.	4,6	Ap,C
CO5	Become freelancer software developer in python.	3,6	Ap,C

**Course Title: Software Engineering Methodology**

**Course Code: BVSD-233**



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Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Decompose the given project into various phases of a lifecycle.	1,3,4,5	U,An,Ap
CO2	Choose appropriate process model depending on the user requirements.	4	An,E
CO3	Perform various life cycle activities like analysis, design, Implementation, testing and maintenance.	2,4	Ap,C
CO4	Know various processes used in all the phases of the product.	2,3,4	U,An
CO5	Apply the knowledge, techniques, and skills in the development of a software product.	3,4	Ap

Course Title:: Lab I: Lab based on SQL & PL/SQL		Course Code: BVSD-234P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Get practical knowledge on databases and their designs.	1,3,4,5	U,Ap
CO2	Develop various concepts of relational data model, ER model and relational database designs.	4	Ap,E,C
CO3	Understand the concept of database design.	1,4	R,U
CO4	Learn practically to make Views, Queries and Sub-queries.	1,3	U,Ap,C
CO5	Handle various forms of Normalization.	1,4	Ap
Course Title:: Lab-II: Lab Based on Programming in Python		Course Code: BVSD-235P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level





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## Khalsa College Amritsar

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UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

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CO1	Understand in-depth applications of python programming language concepts.	1,3,4,5	R,U,Ap
CO2	Solve computational and data science problems efficiently.	4,5	U,An,E
CO3	Understand how to apply theoretical concept to design solution of any problem.	1,4,5	U,Ap
CO4	Develop capability to make successful career in data analysis and Data sciences.	1,3,6	Ap,C
CO5	Get placement in any IT company or become freelancer software developer in python.	6	Ap

**Course Title: Minor Project: Software Module based on Web Technology/Database/  
Programming Language** **Course Code: BVSD- 236P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Integrate frontend and backend web technologies in distributed systems.	1,2,4,5	U,Ap
CO2	Facilitate interface between frontend and backend of a web application	1	An,Ap
CO3	Debug, test and deploy web applications on different web servers.	3,4,5	Ap, An
CO4	Migrate the web applications to the other platforms like .Net technologies.	5	Ap,C
CO5	Develop and deploy real time web applications in web servers and in the cloud and extend this knowledge to .Net platforms.	4	Ap, C

**Semester: IV**

**Course Title:Open Source Software**

**Course Code: BVSD -241**



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Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Install and run open-source operating systems.	1,2,3,4	R,U,An
CO2	Gather information about free and open source software projects from software releases and from sites on the internet.	3,4,5	R,U, Ap, An, E
CO3	Build and modify one or more free and open source software packages.	1,2,4,6	Ap, C
CO4	Use a version control system and interface with version control systems used by development communities.	2,3,4,5	U, Ap
CO5	Contribute software to and interact with free and open source Software development projects.	3,4,5,6	U, Ap,C

**Course Title: Information Security****Course Code: BVSD-242**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the concepts such as, security, attacks, vulnerability, exploits, and methods of defence.	1,2,3,4	R,U
CO2	Acquire required information about different encryption methods that help to securely transmit the sensitive information over the internet.	4,5	R,U, Ap, An
CO3	Get knowledge on the needs of operating system and database security along with the techniques ensuring the security of these systems.	3,4,6	Ap, C
CO4	Identify and examine advanced network attacks and also identify different methods and techniques helpful in preventing these attacks.	1,2,3	R, U, Ap
CO5	Get idea about different tools and techniques which are commonly used by hackers to collect the sensitive information.	3,4,5,6	U, E, Ap, An

**Course Title: Operating System****Course Code: BVSD-243**



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Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand different services provided by operating system at different level.	1,3,4	R, U, E
CO2	Describe the general architecture of computers, also contrast and compare different structures for operating systems	4,5,6	R, U, Ap, An
CO3	Learn real life applications of Operating System in every field.	3,4,6	U, Ap, C
CO4	Understand the use of different process scheduling algorithm and synchronization techniques to avoid deadlock.	1,2,3,4	U, Ap
CO5	Learn different memory management techniques like paging, segmentation and demand paging etc.	5,6	Ap, An

**Course Title: LAB I: Practical Based on Android Development**      **Course Code:**  
**BVSD-244P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Write simple GUI applications	1,3,4,5	R,U, An
CO2	Design and develop user Interfaces for the Android platform.	4,5	R,U, Ap, An, E
CO3	Use different layouts, sound and picture effects.	4,6	U, An, Ap, C
CO4	Use the professional, managerial, interdisciplinary skill set, and domain specific tools in development processes.	2,4	U, Ap
CO5	Handle different codes of different blocks.	3,4,6	U, E, Ap, An

**Course Title: LAB II: Open-Source Software Tool**      **Course Code: BVSD-245P**



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Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Implement various applications using build systems like Python, Perl, PHP etc.	2,4,5	U, An
CO2	Understand the installation of various packages in open source operating systems.	4,5	U, Ap, An
CO3	Understand to build a simple application/software using Python.	4,6	U, An, Ap, C
CO4	Create simple Website applications using PHP Language.	1,2,4	U, Ap, C
CO5	Execute programs related to PERL Language.	3,4,6	U, Ap, An

**Course Title: Lab – III: Practical based on ASP.Net using C# Course Code: BVSD-246P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain knowledge on the architecture of .Net platform.	1,2,4,5	U, An
CO2	Learn to apply different validation controls in a web page.	2,4,5	C,U, Ap, An
CO3	Create database connectivity.	3,4,6	U, An, Ap, C
CO4	Gain knowledge to create simple web forms and implement the concept of master page.	1,2,4,5	U, Ap,C
CO5	Understand the creation of user interactive web pages using combination of client side and server side applications	3,4,6	U,E,Ap,An,C

**Semester: V**

**Course Title :Software Project Management and Business Solution Course Code: BVSD-351**





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Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Develop a plan, which is cost effective, and ensures the success of a project.	3,4,5	R,U, Ap, An, E
CO2	Identify the types of risk related to project.	3,4,6	U, An, Ap, C
CO3	Estimate the cost of the human and physical resources required, and make plans to obtain the necessary resources.	1,2,4	Ap
CO4	Break down the work into tasks and allocate roles with clear lines of responsibility and accountability.	3,4,6	U, Ap, An

Course Title: Software Re-engineering		Course Code: BVSD-352	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Identify the different software reengineering models and tools.	1,3,4,5	U, Ap, An, E
CO2	Understand the importance of reengineering in case of legacy systems.	2,3,4,6	U, An, Ap, C
CO3	Understand the importance of reverse engineering methods and the utilization of these methods in understanding data and user interfaces.	1,2,4	U, Ap
CO4	Explain the activities involved in software re-engineering, such as restructuring, refactoring, and Forward engineering.	2,3,4,6	U, E, Ap, An
CO5	Understand the concepts related to software reuse.	1,2,4,5	U

Course Title: Software Testing & Quality Assurance	Course Code: BVSD-353
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Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Apply software testing knowledge and engineering methods.	4,5	Ap, An, E
CO2	Understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.	2,3,6	U, An, Ap, C
CO3	Analyze and understand the use of software testing methods and modern software testing tools for their testing projects.	1,2,4,5	U,An, Ap
CO4	Learn to design SQA activities, SQA strategy, formal technical review report for software quality control and assurance.	2,3,4,6	U, E, Ap, An
CO5	Follow the process related activity and testing techniques to work as team members.	1,2,4,5	U,Ap

Course Title: Lab I: Soft Skills in IT		Course Code: BVSD-354P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Effectively communicate through verbal/oral communication and improve their listening skills.	2,3,4,5	Ap, An, E
CO2	Demonstrate clear briefing and listening skills, not being afraid to ask for help and support whenever it is required.	1,3,6	U, An, Ap, C
CO3	Write precise briefs or reports and technical documents.	1,2,4,5	U, Ap,C
CO4	Actively participate in group discussion / meetings / interviews and prepare and deliver presentations.	1,2,3,4,6	U, Ap, An,C
CO5	Become more effective in team building, conflict management, critical thinking, reflective thinking and	1,2,4,5	U,An,Ap



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decision-making, problem solving skills and time management.		
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Course Title: Lab:I System and Network Administration Course Code: BVSD-355P			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Execute and evaluate network administration commands and demonstrate their use.	1,2,3,4,5	R, Ap, An,C
CO2	Install the network cable.	1,6	U, An, Ap, C
CO3	Perform the system maintenance.	1,4,5	U, Ap, An
CO4	Evaluate and implement security solutions.	3,4,6	Ap, An,E
CO5	Upgrade the hardware and software of system.	1,2,4,5	U, An

Course Title: Lab III: Software Testing (Case Tools) Course Code: BVSD-356P			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Deploy the advanced technologies in software testing	2,3,4,5	U, R, E
CO2	Get hands-on practice on the CASE tools for testing purposes.	1,3,6	U, An, Ap, C
CO3	Enhance skills in software test automation and management.	4,5	E, U, Ap
CO4	Describe and compute the mutation score.	4,5,6	U, Ap, An
CO5	Calculate the coverage analysis of programs.	1,2,4,5	U, An, Ap

**Semester: VI**



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Course Title: Software Project Management and Business Solution Course Code: BVSD-361			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain understanding on specialized technology.	1,2,3	U, Ap, An, E
CO2	Become multi-skilled with good technical knowledge, management, leadership and entrepreneurship skills.	4,5,6	U, An, Ap, C
CO3	Communicate efficiently.	3,4,5	U, Ap, An
CO4	Identify, formulate and model problems and find different solutions to these problems.	2,3,4,6	Ap, An
CO5	Get updated with all the latest changes in technological world.	1,2,4,5	U, An, Ap





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### **B.VOC TEXTILE DESIGN AND APPAREL TECHNOLOGY Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)**

#### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

<b>PSO-1</b>	To attain successful career options globally, by effective communication of ideas and implementation of creative inputs, not only as fashion designers but also as merchandiser, art director, film and theatre costume designer, fashion photographer and stylist.
<b>PSO-2</b>	To learn creative approach, innovative solutions and study consumer behaviour through traditional and latest digital technologies to develop entrepreneurial skills to generate employment for others.
<b>PSO-3</b>	To gain ability to explore jobs in various subfields of apparel, fashion and allied industries like e-commerce, retail, branding and marketing, luxury and high value product markets.
<b>PSO-4</b>	To understand the applicability of new technologies related to design development, material choices, manufacturing and distribution of fashion in global market
<b>PSO-5</b>	To gain ability to articulate ideas to contribute to different sectors of society like information technology, hotel management and film industry.
<b>PSO-6.</b>	To gain knowledge on the environmental aspects of textiles and fashion industry and provide sustainable competitive edge in meeting industrial demands.
<b>PSO-7</b>	To be able to work ethically in all areas of industry related to fashion, textile and apparel.
<b>PSO-8</b>	To gain ability to work in a team with a forward thinking to promote the inventive personal design vision through creative work and research.



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<b>PSO-9</b>	To learn to communicate the ideas and creative inputs to global fashion industry by creating fashion images, using multimedia and digital technologies, and explore illustration potential in branding, editorial platforms, advertising and graphic design.
<b>PSO-10</b>	To develop entrepreneurial opportunities by developing products related to health, welfare, and safety to serve the society effectively.
<b>PSO-11</b>	To enable students to continue with the learning process by upgrading themselves with new technologies and requirements related to ever growing design and fashion industry.

## COURSE OUTCOMES (COs)

### Semester-I

Course title: Sewing Techniques

Course Code: BVTD 11105

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Understand various components of garment construction and their application.	1,2,3,8	U,Ap,An,C
CO2	Gain knowledge on seams and seam finishing	1,2,3	U,Ap,An,C
CO3	Learn basic garment construction in detail.	1,2,3,4	U,Ap,An,E,C

Course title: Design Foundation & Basics of Textiles-I

Course Code: BVTD11106

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Develop an understanding about fashion, fashion terminologies and fashion forecasting.	1,2,3	R,U,Ap,An
CO2	Learn about factors affecting fashion	1,2,3,10	U,Ap,An



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CO3	Understand the roll of social and psychological aspects.	1,2,3,9	U,E,Ap,An
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**Course title: Introduction to Entrepreneurship**

**Course Code: BVTD 11107**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Understand entrepreneurship concept in detail.	1,2,3,10	R,U,Ap,An
CO2	Understand the role and importance of the small and medium sized enterprises in the economy.	1,2,3,10	U,Ap,An,E
CO3	Apply various concepts to understand new business creation and growth	1,2,3,10,9	U,Ap,An
CO4	Understand the concept of business planning.	1,3,9,10	U,Ap,An,E

**Semester: II**

**Course title: Garment Sewing**

**Course Code: BVTD 12105**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Gain basic understanding on garments, machines and their use in apparel and fashion industry	1,2,3,4,6,11	U,Ap,An,C
CO2	Know about the different size charts and how to take measurements of the person.	1,2,3,6,11	U,Ap,An,C
CO3	Develop an understanding on how different constructional tools help to make a perfect garment.	1,2,3,6,11,8	U,Ap,An,C
CO4	Describe garments in a more professional manner, by using the correct terminology.	1,3,6,8,11	U,Ap,An,C

**Course title: Introduction to Fashion**

**Course Code: BVTD 12106**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
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CO 1	Understand fashion terminology, fashion designers and fashion centres.	1,2,3,6,8,11	U,Ap,An,R
CO2	Understand about fashion industry.	1,2,3,6,8,10,11	U,Ap,E,An

**Course title: Enterprise Planning**

**Course Code: BVTD 12107**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Learn about foundation of entrepreneurship development and its theories.	1,2,3,10,11	R,U,An
CO2	Explore entrepreneurial skills and management function of a company with special reference to SME sector	1,2,3,10,11	U,An,
CO3	Identify the types of entrepreneur and the steps involved in an entrepreneurial venture	1,2,3,10,11	U,An
CO4	Understand various steps involved in starting a venture and explore marketing methods and new trends in entrepreneurship	1,310,11	An,Ap,E

**Course title: Design Foundation & Basics of Textiles-II Course Code: BVTD 12108**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Learn designs through the application of elements of design.	1,2,3,4,7,11	R,U,Ap,An,E,C
CO2	Create compositions using various colour schemes.	1,2,3,4,7,11	U,Ap,An,C
CO3	Learn to differentiate among different yarns and fabrics	1,2,3,4,7,11	U,Ap,An,E

**Semester: III**

**Course title : Basics of Sewing Printing & Dyeing**

**Course Code: BVTD 23102**





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# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

## Khalsa College Amritsar

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UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

☎ (O) : +91-183-2258097  
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Fax : +91-183-2255619  
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Web : www.khalsacollege.edu.in

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SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Learn about basics of stitching	1,2,3,4,11	R,U,Ap,An,C
CO2	Understand darts and dart manipulation techniques	1,2,3,4,11	U,Ap,An,C,E
CO3	Understand different methods of dyeing and printing	1,2,3,4,11	U,Ap,An,E,C

**Course title: Pattern Making and Grading**

**Course Code: BVTD 23103**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Understand pattern making technique as it is a vital tool in creating garments.	1,2,3,4,11	U,An,Ap
CO2	Develop understanding regarding garment pattern blocks and how do they relate to human body.	1,2,3,4,11	U,Ap,An,C
CO3	Understand the terms and symbols used for development of any pattern.	1,2,3,4,11	U,Ap,An

**Course title: History of Costumes**

**Course Code: BVTD 23104**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Develop understanding about ancient Indian civilization costumes.	8,11	U,Ap,An
CO2	Gain brief knowledge about traditional costumes of India.	8,11	U,An,C,E



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CO3	Get knowledge on global costumes	8,11	U,An,E
CO4	Evaluate and identify costumes of various periods for authenticity, fit, and appearance on a body in motion while viewing historic/period videos.	7,8,11	U,An,Ap

**Course title: CAD-I**

**Course Code: BVTD23105**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Understand and apply common design patterns to incremental development	3,5,11,4	U,Ap,An,C
CO2	Understand about pattern making digitally and with pattern software (JDPDS).	3,5,11,4	U,Ap,An,C
CO3	Work on patterns for grading as pattern marker for layout.	3,5,11,4	U,E,C,Ap,An

**Course title: Design Development-I**

**Course Code: BVTD23106**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Enhance their drawing skills and illustrate their ideas in different styles with rendering skills and detailing	8,09,11	U,Ap,C,An,R
CO2	Gain knowledge on rendering textures of fabrics	8,09,11	U,Ap,C,An
CO3	Draw fashion figures by understanding body proportions	8,09,11	U,Ap,An,C
CO4	Develop approach towards ideations and gain confidence in presenting work creatively	8,09,11	U,Ap,C

**Course title: Garment Construction-I**

**Course Code: BVTD23107**



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SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Gain understanding on different garment components and their construction.	3,6,7,11	R,U,Ap,C,An
CO2	Stitch sleeves, necklines and other parts of garments	3,6,7,11	U,Ap,An,C

### Semester: IV

Course title: Traditional Textiles

Course Code: BVTD 24102

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Get knowledge on traditional design and motifs of textiles	6,7	U,Ap,C,An
CO2	Explore their ideas through embroidery techniques	6,7	U,Ap,C,An
CO3	Differentiate between embroidery works of different states	6,7	U,E,Ap,An

Course title: Draping

Course Code: BVTD 24103

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Apply the techniques of draping to develop a product	6,7,11	U,Ap,C,An
CO2	Understand the formation of design in Three-dimensional way	6,7,11	U,Ap,C,An
CO3	Transform draping pattern into dress.	6,7,11	U,C,Ap,An



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Course title : Quality Control

Course Code: BVTD 24104

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Learn steps to ensure the quality of products before supplying	4,9,10	U,Ap,C,An,R
CO2	Understand how customer needs and expectations are met	9	U,Ap,C,E,
CO3	Get knowledge about different funds and costing	9,10	U,E,C,Ap
CO4	Understand different quality control strategies.	9,10	Ap,C,E,

Course title : CAD-II

Course Code: BVTD24105

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Understand the fashion design concepts on computer.	3,7,9,11	U,Ap,C,An
CO2	Gain knowledge on different themes required in the field of fashion.	3,7,9,11	U,Ap,C,An
CO3	Make designs digitally in Coral Draw and Adobe Photoshop	3,7,9,11	U,C,Ap,An
CO4	Develop and conceptualize their designs and creations.	3,7,9,11	U,C,An,Ap

Course title : Design Development-II

Course Code: BVTD24106





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SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Enhance their drawing skills and illustrate their ideas in different styles with rendering skills and detailing	8,9,11	U,Ap,C,An,R
CO2	Gain knowledge on rendering textures of fabrics.	8,9,11	U,Ap,C,An
CO3	Learn sketching of accessories for different age groups	8,9,11	U,C,Ap,An
CO4	Develop and conceptualize their designs and creations.	8,9,11	U,Ap,C,An

Course title : Garment Construction-II

Course Code: BVTD 24107

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Understand different garment components and their construction.	3,6,7,11	U,Ap,C,An,R
CO2	Stitch sleeves, necklines and other parts of garments.	3,6,7,11	U,Ap,C,An
CO3	Construct complete garment.	3,6,7,11	U,C,Ap,An

Semester: V

Course title : Enterprise Management

Course Code: BVTD 35101

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Learn about the foundation of entrepreneurial development and its theories	1,2,3,10,11	U,An,R
CO2	Explore entrepreneurial skills and management function of a company with special reference to SME sector	1,2,3,10,11	U,An,R,E



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CO3	Identify the type of entrepreneur and the steps involved in an entrepreneurial venture	1,2,3,10,11	R,U,E,,An
CO4	Understand various steps involved in starting a venture and explore marketing methods and new trends in entrepreneurship	2,3,10,11	,Ap,E,An,U

**Course title : Introduction Knitting Skills**

**Course Code: BVTD 35102**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Get comprehensive knowledge on textile manufacturing processes and quality assurance aspects necessary for successful career in industry and higher studies	4,7,11	U,Ap,C,An
CO2	Develop leadership and problem solving skills required for industry	1,7,11	U,Ap,C,
CO3	Get encouragement for innovation and entrepreneurship in textile engineering	4,7,11	R,U,E,C,Ap,An
CO4	Learn professional, ethical and sustainable practices of textile engineering	6,7,11	U,Ap,C,E,An

**Course title: Technical Surface Designing-I**

**Course Code: BVTD 35103**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Explore and bring into practice their ideas through embroidery techniques	7,8,11	U,Ap,C,An
CO2	Understand the application of different embroidery techniques to create 2D and 3D effects.	7,8,11	U,Ap,C,An
CO3	Create innovative designs by combining number of stitches and by using creative raw material	7,8,11	U,C,Ap



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CO4	Develop utility articles with the help of basic embroidery stitches	7,8,11	U,Ap,C,An
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Course title : E- Designing

Course Code: BVTD 35104

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Discover how does web site work	3,4,9,11	R,U,Ap,C,An
CO2	Understand the application of different embroidery techniques to create 2D and 3D effects.	3,4,9,11	U,Ap,C,An
CO3	Create innovative designs by combining number of stitches and by using creative raw material	3,4,9,11	U,Ap,An,C
CO4	Develop utility articles with the help of basic embroidery stitches	3,4,9,11	U,Ap,An,C

Course title : Advance Draping & Garment Construction Course Code: BVTD 35105

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Learn the basic draping techniques.	6,7,11	U,Ap,C,An
CO2	Familiarize themselves with draping method for different kinds of garments.	6,7,11	U,Ap,C,An
CO3	Develop different patterns through Pattern Making	6,7,11	R,U,E,C,An
CO4	Gain practical knowledge of different Skirts, Sleeves and collars.	6,7,11	,U,C,Ap,An
CO5	Learn about tools and equipment of Draping	6,7,11	U,An,Ap,C,E

Course title : Advance Rendering & Stylization

Course Code: BVTD 35106

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Develop an approach towards ideation.	7,8,11	U,Ap,C,An



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CO2	Learn to draw fashion figures by understanding body proportions.	7,8,11	U,Ap,C
CO3	Drape the desired idea of their design onto the fashion figure.	7,8,11	U,C,Ap
CO4	Enhance their rendering skills using different colour mediums	7,8,11	Ap,C,E,An

**Course title: Survey & Project Report**

**Course Code: BVTD 35107**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Know the role of museums in their life and appreciate their existence in our society.	6,8,11	U,Ap,An,C
CO2	Conduct research on crafts of India and present their research in a practical industry accepted format	6,8,11	U,Ap,An,C
CO3	Build an understanding and confidence to give design solutions to the artisans for further evolution of the crafts.	6,8,11	U,C,Ap,An
CO4	Use handicraft techniques and apply the same to their collections	6,8,11	U,Ap,An,C

**Semester: VI**

**Course title : Fashion Merchandising**

**Course Code: BVTD 36101**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Learn about Fashion merchandising	6,7,9	U,An,R
CO2	Know the role and responsibilities of fashion merchandising	6,7,9	U,E,R
CO3	Learn about the types of merchandising	6,7,9	R,U,C
CO4	Know about fashion show, exhibitions and displays.	6,7,9	R,U,Ap,C





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CO5	Know about sales promotion and advertising	6,7,9	R,Ap,C
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**Course title : Eco Textiles and Sustainable Clothing**

**Course Code: BVTD 36102**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Learn about the development and maintenance of healthy and safe work environment.	2,3,4	U,Ap,C,An,R
CO2	Provide education on work health and safety.	2,3	U,Ap,C,E,
CO3	Get awareness about health and safety at workplace.	2,3,4	R,U,E,C,Ap
CO4	Learn how to set effective safety goals for an organization.	2,3,4	U,Ap,C,E,
CO5	Learn various prevention measures for safe work environment	2,3,4	E,C,Ap

**Course title: Custom made Sewing**

**Course Code: BVTD 36103**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Gain knowledge on the client profile	1,8,11	U,Ap,C,R
CO2	Get knowledge about customers on order stitching	1,8,11	U,Ap,C
CO3	Deal with customers	1,8	R,U,C,Ap
CO4	Learn how to manage the boutique	1,8,11	R,U,C,
CO5	Gain knowledge on the measurement charts, specification sheets and cost sheet	1,8	U,Ap,C



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Course title : Portfolio Development

Course Code: BVTD 36104

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Develop portfolio for different type of audiences	1,7,8	U,C,An,R
CO2	Understand rendering of different garments on the model with emphasis on the fabric, texture, color and style details	7,8	U,C,
CO3	Learn drapability of various garment styles in a variety of fabrics stitched	1,7,8	R,U,C,
CO4	Exhibit their inclination towards particular segment of the industry by identifying target customers, design requirements and pricing.	1,7,8	U,C

Course title : Technical Surface Designing-II

Course Code: BVTD 36105

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Know about the different printing methods.	7	U,Ap,C,R
CO2	Get knowledge on various techniques of tie and dye.	7	U,Ap,C
CO3	Learn various methods of fabric painting	7	R,U,C,Ap
CO4	Learn the quilting process	7	U,Ap,C,
CO5	Get knowledge on embroidery stitches	7	U,Ap,C

Course title: Design and Display

Course Code: BVTD 36106

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
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CO 1	Organize exhibitions	9,5	U,Ap,C
CO2	Learn how to prepare displays.	9,5	U,Ap,C
CO3	Set up fashion boutiques	9,5	R,U,C,Ap

**Course title: Internship Report**

**Course Code: BVTD 36107**

SR.NO	On Completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO 1	Enhance their industrial experience during training	6,7,11	U,Ap,C,An,R
CO2	Understand, develop and enhance professional awareness and communication skills.	6,7	U,Ap,C,E,
CO3	Learn how to work in formal working environment and study the benefits of team work.	6,7,3	R,U,E,C,Ap
CO4	Experience to understand, discuss and evaluate the professional issues relating to textile.	6,7,11	U,Ap,C,E,

**Course Title: Computer Application I**

**Course Code: CS-BVTD111**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the computer terminology.	1,2	R, U
CO2	Gain insight on the working of input and output devices.	1,2	R,U
CO3	Develop skills of working with MS-Word, MS-PowerPoint, MS-excel.	1,2	Ap
CO4	Gain knowledge on the importance of operating system in computer.	1,2	U
CO5	Understand the concept of storing of data in memory and its types.	1,2	U



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### **BACHELOR OF COMPUTER APPLICATIONS** **Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)**

#### **PROGRAM SPECIFIC OUTCOMES (PSOs):**

<b>PSO-1</b>	To enable students to get jobs in IT sector
<b>PSO-2</b>	To demonstrate advanced skills in the effective analysis design and realization of business system utilizing contemporary information technology.
<b>PSO-3</b>	To gain knowledge to become proficient in computer programming like C, C++, Python, Java and apply standard software engineering process and strategies in software project development using open source programming environment to deliver quality products for business success.
<b>PSO-4</b>	To possess the knowledge of web designing and networking.





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COURSE OUTCOMES (COs)			
Semester-I			
Course Title: Introduction to Programming - C			Course Code: BCA-111
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use the fundamentals of C programming in trivial problem solving	1,2	R,U
CO2	Identify solution to a problem and apply control structures and user defined functions for solving the problem	1,2	Ap,U,An,E
CO3	Demonstrate the use of Strings and string handling functions	3,4	Ap,An,E,C
CO4	Gain ability to work with arrays of complex objects.	1,2,3	An, Ap, E
CO5	Apply skill of identifying appropriate programming constructs for problem solving.	1,2,3	Ap, An, E, C

Course Title: Introduction to Computers and Information Technology Course Code: BCA -112			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	understand the computer terminology	2,3,4	R, U, C
CO2	Gain insight on the working of input and output devices.	1,2,3	Ap, E
CO3	Develop skills of working with MS-Word, MS-Power point, MS-excel.	3,4	An, R, U



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CO4	Possess the knowledge on the importance of operating system in computer.	1,2	R, U, E
CO5	Understand the concept of storing of data in memory and its types.	1,2,3,4	U,R, Ap

Course Title: Applied and Discrete Mathematics		Course Code: BCA-113	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Simplify and evaluate basic logic statements using compound statements, implications, inverses, converses, and contrapositives using truth tables and the properties of logic.	1,2,3	R, U, E
CO2	Develop ability of conversion of logic sentence in terms of predicates, quantifiers, and logical connectives.	3,4	Ap, An
CO3	Understand the use of various matrix operations such as matrix addition, multiplication, transpose, inverse and the calculation of the rank of matrix.	1,3,4	R, U, C
CO4	Apply the operations of sets, relations and use Venn diagrams to solve real life mathematical problems.	2,4	U, C, An
CO5	Get in-depth knowledge on the graph theory from the point of view of problem solving strategy used in game design and assignment problems.	2,4	U,Ap

**Course Title: Practical –I (MS Office 2010/Open Office and C Programming)**  
**Course Code: BCA-114P**



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Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use the fundamentals of C programming in trivial problem solving.	1,2,3	U,R, An
CO2	Apply skill of identifying appropriate programming constructs for problem solving.	3,6	E,C
CO3	Gain ability to work with arrays of complex objects.	2,4,6,7	R, U
CO4	Develop skills of working with MS Word, MS Power point, MS excel.	1,4,5	R, Ap
CO5	Understand the concept of storing of data in memory and its types.	4,5,6,7	U, E, C

### SEM-II

Course Title: Introduction to Programming–C++		Course Code: BCA-121	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the difference between the top-down and bottom-up approach.	2,3,4	R,U,C
CO2	Describe the object-oriented programming approach in connection with C++.	1,2,3	U,Ap, E
CO3	Apply the concepts of object-oriented programming.	3,4	Ap, An, E,C
CO4	Illustrate the process of data file manipulations using C++.	1,2	Ap, An, E,C
CO5	Apply virtual and pure virtual function & complex programming situations.	2,3,4	Ap, An, C

Course Title: Principles of digital electronics		Course Code: BCA-122	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain knowledge on different types of number systems and their conversions in digital electronics.	2,3	U, An, E,C
CO2	Use Boolean algebra to minimize and simplify Boolean expressions.	1,2,3	U,Ap, E



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CO3	Illustrate realization of SOP and POS forms.	3,4	U, An, E,C
CO4	Understand the design of various combinational circuits using logic gates.	1,2,3	U,Ap, An, E, C
CO5	Design and develop sequential circuits using flip flops.	1,2,3,4	Ap, An, C

<b>Course Title: Numerical Methods &amp; Statistical Techniques</b>			
<b>Course Code: BCA-123</b>			
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions.	2,3	U, An, E,C
CO2	Apply various numerical methods to find out solution of algebraic and transcendental non-linear equations and also solve system of linear equations numerically using direct and iterative methods.	1,2,3	U,Ap, E
CO3	Understand the methods to construct interpolating polynomials and finite difference concepts (forward, backward, divided and central difference) for prediction and also find integration to find area under curve.	3,4	U, R, E,C
CO4	Learn fundamental concepts of statistical and optimization methods.	1,2,3	U, E,C
CO5	Understand various measures of central tendency (like mean, median and mode), measures of dispersion(range, mean deviation ,standard deviation), Correlation, and Curve fit.	1,2,3,4	U,Ap, E

<b>Course Title: Practical–C++ Programming Language</b>		<b>Course Code: BCA-124P</b>	
<b>Sr. No.</b>	<b>On Completing the course, the students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Level</b>
CO1	Apply the concepts of object-oriented programming.	1,2,3,4	U,Ap





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CO2	Understand the process of data file manipulations using C++.	3,4	U, An, Ap, C
CO3	Understand and implement various concepts of numerical and statistical methods to solve real life problems and describe the object-oriented programming approach in connection with C++.	3,4	U, E, C
CO4	Apply virtual and pure virtual function and complex programming situations.	1,2,3	U, An, E

### SEM-III

Course Title: Computer Architecture		Course Code: BCA-231	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the basic organization of computer.	1,2,3,4	R,U,E
CO2	Demonstrate control unit operations and conceptualize instruction level parallelism.	1,3	U, R, E, C
CO3	Demonstrate and perform computer arithmetic operations.	3,4	U, E, C
CO4	Categorize memory organization and explain the function of each element of a memory hierarchy.	1,2,3	U, An, E
CO5	Identify and compare different methods for computer I/O mechanisms.	2,3,4	An, E, C

Course Title: Database Management System		Course Code: BCA-232	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand Databases , their design and development	1, 2, 3, 4	R, U, An, E
CO2	Develop intellectual Cognitive/ analytical skills: Normalization of Databases.	3,4	R, E, C
CO3	Gain practical Skills Using SQL and PL/SQL.	1, 2, 4	U, R, E



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CO4	Gain transferable skills: Usage of DBMS design and administration.	1, 2, 3	U, R, E
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Course Title: Computational Problem Solving Using Python		Course Code: BCA-233	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Build basic programs using fundamental programming constructs like variables, conditional logic, looping, and functions.	1,2,3	R, U, An, E
CO2	Work with user input to create fun and interactive programs	2,3	U, E,C
CO3	Define and demonstrate the use of built-in data structures “lists” and “dictionary”	1,2,4	U, R, E, Ap
CO4	Design and implement program to solve real world problem.	1,2,3	Ap, An, E
CO5	Design and implement GUI application and learn how to handle exceptions and files.	1,2,3	Ap,E,C
CO6	Make database connectivity in python programming language.	1,2,4	An, Ap, C

Course Title: Programming Lab1 – Python		Course Code: BCA-234P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Build basic programs using fundamental programming constructs like variables, conditional logic, looping, and functions.	3, 4	U, R, E
CO2	Work with user input to create fun and interactive programs	2, 3, 4	E, C
CO3	Define and demonstrate the use of built-in data structures “lists” and “dictionary”	1,2,4	U, R, E
CO4	Design and implement program to solve real world problem.	1,2,3	Ap, R, E
CO5	Design and implement GUI application and how to handle exceptions and files.	3,4	E,C, An



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CO6	Make database connectivity in python programming language.	2,3,4	Ap, An, E
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Course Title: Programming Lab II - Oracle		Course Code: BCA-235P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use the Relational model and learn how it is supported by SQL and PL/SQL.	1,2,3	U, An, E
CO2	Use the PL/SQL code constructs of IF-THEN-ELSE and LOOP types as well as syntax and command functions.	3,4	U, E, C
CO3	Solve database problems using Oracle: SQL and PL/SQL and understand the use of procedures, functions, packages, and triggers.	1,2,3	U, An, E

### SEM-IV

Course Title: Data Structure & File Processing 241		Course Code: BCA-	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the concept of algorithm complexity and acquire knowledge on the mathematical notations which can be used to measure the algorithm's complexity.	1, 2, 3, 4	U, R, E
CO2	Comprehend different data structure techniques such as array, stacks and queue.	2, 3,	E, C
CO3	Apply linear search and binary search techniques in real word applications to identify the particular element.	1,2,4,	U, R, E
CO4	Get knowledge on different sorting algorithms along with their time complexities.	1,2,3	Ap, R, E
CO5	Understand the list, trees, and graphs along with the operations performed on them.	3,4	E,C, An
CO6	Understand the memory representation of the above mentioned data structures.	1,2,3,4	An, Ap, E, C



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Course Title: Information Technology		Course Code: BCA-242	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the Software Development Life Cycle (SDLC) development.	1,2,4	U, R, E
CO2	Gain intellectual Cognitive/analytical skills: System Analysis and Design	1,2,3	Ap, R, E
CO3	Gain transferable skills: Software requirement specification, S/W Design Tools, SDLC skills Knowledge and Understanding, Intellectual Skills, practical Skills, Transferable skills).	2,3,4	E,C, An
CO4	Know how to define internet, www, various protocols and understand the working of internet	1, 2, 3, 4	R, U, E
CO5	Gain intellectual (Cognitive/Analytical) skills which enable them to identify which medium and topology should be used for networking.	2, 3, 4	E, C
CO6	Gain practical skills which enable them to create HTML based web pages and create e-mail ids.	1,2,3,4	An, Ap, E

Course Title: Distributed Computing		Course Code: BCA-243	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the design principles in distributed systems and the architectures for distributed systems.	1,2,3	U, An, E
CO2	Apply various distributed algorithms related to clock synchronization, concurrency control, deadlock detection, load balancing, voting.	4	E, C
CO3	Analyze fault tolerance and recovery in distributed systems and algorithms for the same.	1,2,3	U, An, E





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CO4	Analyze the design and functioning of existing distributed systems and file systems and implement different distributed algorithms over currently distributed platforms	1,2,3,4	R, U, E
CO5	Identify the core concepts of distributed systems: how several machines orchestrate to solve problems efficiently, reliable and scalable way correctly.	1,2,3,4	U, E,C

Course Title: System Software		Course Code: BCA-244	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the basics of system programs like editors, compiler, assembler, linker, loader, interpreter and debugger.	1,2,4,	U, R, E
CO2	Describe the various concepts of assemblers and macro processors.	1,2,3	Ap, R, E
CO3	Understand various phases of compiler and compare its working with assembler.	3,4	E,C, An
CO4	Understand how linker and loader create an executable program from an object module created by assembler and compiler.	1, 2, 3, 4	U, R, E
CO5	Know various editors and debugging techniques.	2, 3, 4	E, C

Course Title: Programming Lab – I (Data Structure implementation using C++)			
Course Code: BCA-245P			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Implement the real world applications by making use of linear data structure, such as, arrays, stacks, queues, linked lists, trees and graphs, to handle the data stored in computer's memory.	1,2,4,	U, Ap, E



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CO2	Perform the implementation using non-linear data structure, such as, trees and graphs.	1,2,3	Ap, R, E
CO3	Perform traversing, insertion, and deletion operations on the above mentioned data structures.	3,4	E,C, An
CO4	Perform the search operations by making use of suitable search technique.	1, 2, 3, 4	U, R, E
CO5	Sort the data by using different sorting techniques and can also assess the time requirement of the available sorting techniques.	2, 3, 4	E, C

Course Title: Lab II- (Distributing Computing)		Course Code: BCA-246P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Practically implement the client-server architecture.	1,2,3	U, An, E
CO2	Understand the implementation of Remote Method Invocation.	4	E, C
CO3	Explain the design and development of distributed systems and distributed systems applications.	1,2,3	U, An, E
CO4	Implementation of Chat Server.	1,2,3,4	R, U, E
CO5	Implementation of Ping, trace routing, and IP-configuration commands.	3,4	U, R, E,C



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### SEM-V

Course Title: COMPUTER NETWORKS		Course Code: BCA-351	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Identify the available internet access technologies and for each of these access technologies, provide a range of transmission rates and networking devices.	1,2,4	U, R, E
CO2	Recognize the technological trends of Computer Networking.	1,2,3	Ap, R, E
CO3	Discuss the process of Multiplexing, Switching and Transmission media in networks.	3,4	E,C, An
CO4	Describe the component and working of wireless networks.	4	U,R,An,Ap,C
CO5	Outline a suitable routing protocol for interconnected networks.	1,2,3	Ap, An

Course Title: Programming in Java		Course Code: BCA-352	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.	1,2,3	Ap, U, An, E
CO2	Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem	3,4	E, C
CO3	Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.	2,3, 4	U, An, E, C
CO4	Demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.	3,4	Ap, R, U, E



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CO5	Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events.	1,2,3,4	U, Ap, An, C
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Course Title: Software Engineering		Course Code: BCA-353	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Decompose the given project in various phases of a lifecycle.	1,2,3	Ap, U, An, E
CO2	Choose appropriate process model depending on the user requirements.	3,4	E, C
CO3	Perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance.	2,3, 4	U, An, E, C
CO4	Know various processes used in all the phases of the product.	3,4	Ap, R, U, E
CO5	Apply the knowledge, techniques, and skills in the development of a software product.	1,2,3	U, Ap, An, C

Course Title: Advanced Web Technologies (ASP.NET)		Course Code: BCA-354	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use the features of Dot Net Framework along with the features of ASP. NET & C#.	1,2,3,4	R, U, E
CO2	Design web applications using ASP.NET.	1,2,3	U, An, E
CO3	Learn ASP.NET controls in web applications.	4	E, C
CO4	Debug and deploy ASP.NET web applications.	1,2,3	U, An, E
CO5	Learn to create database driven ASP.NET web applications and web services.	1,2,3,4	R, U, E





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Course Title: Lab I: Programming and Web Development in ASP.NET		Course Code: BCA-355P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use the features of Dot Net Framework along with the features of ASP. NET & C#.	1,2,3,4	R, U, E
CO2	Design web applications using ASP.NET.	1,2,3	U, An, E
CO3	Learn ASP.NET controls in web applications.	3,4	R, U, E
CO4	Debug and deploy ASP.NET web applications.	2,3,4	U, R, E,C
CO5	Learn to create database driven ASP.NET web applications and web services.	1,2,3	U, An, E

Course Title: Lab II: Programming in Java Lab		Course Code: BCA-356P	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.	1,2,3	U, An, E
CO2	Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem.	1,2,3	U, An, E
CO3	Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.	1,2,3,4	R, U, E
CO4	Demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.	3,4	U, R, E,C



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CO5	Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events.	1,2,3	U, An, E
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### SEM-VI

Course Title: Computer Graphics		Code:BCA-361	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the basics of computer graphics, different graphics systems and applications of computer graphics.	1,2,3,4	R, U, E
CO2	Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.	2,3,4	U, R, E,C
CO3	Use of geometric transformations on graphics objects and their application in composite form.	2,3	U, R, E
CO4	Extract scene with different clipping methods and its transformation to graphics display device.	3,4	U, An, E,C
CO5	Explore projections for display of 3D scene on 2D screen.	1,2,3,4	U, Ap, C

Course Title: Operating System		Course Code: BCA-362	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	To understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.	1,2,3,4	R, U, Ap
CO2	To understand the main components of an OS & their functions.	1,2,3	U, An, E
CO3	Describe the important computer system resources and the role of operating system in the management policies and algorithms.	3,4	R, U, C
CO4	Evaluate the requirement for process synchronization and coordination handled by operating system.	2,3	U, An, E,C



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CO5	Students will be able to implement advance features of object-oriented approach in other various language(s).	1,2,3	U, An, E
CO6	Describe and analyze the memory management and its allocation policies.	2,3,4	Ap, R, E,C
CO7	Identify use and evaluate the storage management policies with respect to different storage management technologies.	1,2,3,4	E,C, An
CO8	Identify the need to create the special purpose operating system.	2,3,4	Ap, An
CO9	To understand the concepts and implementation Memory management policies and virtual Memory.	3,4	U, Ap, An

**Course Title: Lab. Implementation of Applications of Computer Graphics in C++/C**

**Course Code: BCA-363P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the basic concepts of computer graphics.	1, 2	U, R, E
CO2	Understand how to generate line, circle and ellipse also how to create 2D object.	1,2,3,4	U, E
CO3	Implement basic transformations on objects.	3,4	Ap, R, E,C
CO4	Implement clipping algorithm on lines.	2,3	U, R, E
CO5	Understand various 3D Transformation techniques.	3,4	U, An, E,C

**Course Title: Project**

**Course Code: BCA-364P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	To carry out time planning for the project.	1,2,3,4	U, R
CO2	To follow correct grounding and shielding practices	1, 2,3	U, R, E, Ap



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CO3	To do effective trouble-shooting of the mini project.	3,4	U, Ap, An, C
CO4	Demonstrate a through and systematic understanding of project contents.	2,3,4	U, Ap, E
CO5	Understand methodologies and professional way of documentation and communication.	2,3,4	Ap, An, E, C
CO6	Know the key stages in development of the project.	1,2,3,4	Ap, An, E, C





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### BACHELOR OF FOOD SCIENCE & TECHNOLOGY [HONOURS]

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

	processing techniques used in the processing and preservation of foods.
<b>PSO-2</b>	To make students understand various handling storage, processing, packaging, and entrepreneurship techniques along with the environmental challenges.
<b>PSO-3</b>	To enhance the capability of students to identify, analyze and solve to problem arising in food industries in the process of preparation & preservation of foods.
<b>PSO-4</b>	To strengthen the foundation of students to build up their career in food industry or to pursue career in food as well as interdisciplinary areas or to establish their entrepreneurship ventures.

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

#### COURSE OUTCOMES (COs)

##### Semester-I

**COURSE TITLE: CROP SCIENCE**

**COURSE CODE: BFST11-103**

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about classification of major crop plants	1,2	R, U, An
CO2	Evaluate and adapt various practices in the production of different food crops.	2,4	U, Ap, C
CO3	Understand the role of various factors affecting growth of farm produce.	2,3	R, U, Ap
CO4	Learn about horticultural practices involved in food crops	2,4	U, Ap, C

**COURSE TITLE: FUNDAMENTALS OF FOOD NUTRITION COURSE CODE: BFST11-104**

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand nutrition and use that knowledge to improve health	2,3	R, U, Ap



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CO2	Learn the nutrient needs of people belonging to socially, economically and culturally diverse environment	3,4	U, Ap, C
CO3	Learn the use of food as medicine for better health	1,2,4	R, U, C
CO4	Design diet plans for various health conditions	1,3	U, An, Ap, C

COURSE TITLE: INTRODUCTORY BIOCHEMISTRY		COURSE CODE: BFST11-105	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about importance of Biochemistry	1,3	R, U, An, E
CO2	Learn different structural properties of food components	2,4	U, Ap, C
CO3	Understand metabolism of major food components	2,3	R, U, Ap
CO4	Know about daily requirements and deficiency diseases	3,4	An, Ap, C

COURSE TITLE: PRINCIPLES OF FOOD PRESERVATION		COURSE CODE: BFST11-106	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Learn the techniques and principles involved in food preservation.	1,2,3	R, U, An
CO2	Know about various methods of preservation	1,2	U, Ap, C
CO3	Learn about different techniques involved in food preservation	1,3	R, U, Ap
CO4	Understand non-thermal methods of food preservation	2,3,4	An, Ap, C

### Semester-II

COURSE TITLE: INTRODUCTION TO COMPUTERS		COURSE CODE: CS-FST-121	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels



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CO1	Learn computer concepts including their fundamental functions and operations	1	U, An, Ap
CO2	Identify hardware components and learn basic computer operations	1,2	U, Ap, An
CO3	Use MS-Word efficiently	1,4	R, U, Ap
CO4	Do formatting, make power point presentations using Microsoft excel	3,4	U, Ap, C

COURSE TITLE: GENERAL MICROBIOLOGY		COURSE CODE: BFST12-204	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Learn about the scope of food microbiology , characteristics of microorganisms, their types and nutritional requirements	1,3	U, R, Ap
CO2	Become aware of various techniques for enumeration and the role of microorganisms in food spoilage	1,2	U, An, Ap, C
CO3	Study the reproduction of micro organisms	2,3	An, Ap
CO4	Understand factors affecting microbial growth in food	1,4	U, An, Ap

COURSE TITLE: FOOD CHEMISTRY		COURSE CODE: BFST12-205	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand how food components contribute to overall quality of foods	1, 3	U, R, Ap
CO2	Evaluate various reactions involved in different foods.	2,3	U,Ap, An, C
CO3	Learn about properties and functions of major food components.	2,3	R, An
CO4	Know about various reactions of food components which affect the quality of food	3,4	An, Ap



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COURSE TITLE: FOOD ADDITIVES		COURSE CODE: BFST12 – 206	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about various food additives used in food industry	1,3	U, R, Ap
CO2	Understand classes, functions and properties of different additives	2,3	U, R, Ap
CO3	Learn the working mechanisms of different food additives.	1,2	U, An, Ap
CO4	Utilize additives in food processing	3,4	U, Ap

### Semester-III

COURSE TITLE: FOOD MICROBIOLOGY		COURSE CODE: BFST21-301	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know the origin of food microbiology and factors causing food spoilage	1,3	R, U
CO2	Study the role of microorganisms in causing spoilage of different food products.	2,3	U, An, Ap
CO3	Understand qualitative and quantitative analysis of food for microbial growth	3,4	U, An, Ap, C
CO4	Become aware of the role of microorganisms in causing food borne diseases	1,3	U, Ap

COURSE TITLE: FLUID MILK PROCESSING		COURSE CODE: BFST21–302	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about milk composition and its various physico-chemical properties.	1,3	R, An
CO2	Learn about various dairy processing unit operations.	2,3	U, R, Ap, C
CO3	Assess quality of different milks available in market and milk products.	3,4	U, An, Ap, C
CO4	Standardize different types of milks according to food laws	2,3	U, Ap, C





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<b>COURSE TITLE: PROCESSING OF MEAT &amp; MEAT PRODUCTS COURSE CODE: BFST21-303</b>			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the structural composition, types and quality of meat	1,2,4	U, R, Ap
CO2	Know about various techniques of slaughtering animals	2,3	U, Ap, C
CO3	Learn about different preservation techniques of meat	1,3	U, Ap
CO4	Know novel products available in meat industry.	3,4	U, An, Ap, C

<b>COURSE TITLE: POST HARVEST MANAGEMENT OF FRUITS &amp; VEGETABLES COURSE CODE: BFST21-304</b>			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Familiarize themselves with different aspects of post-harvest technology and recent developments	1,2	U, Ap
CO2	Understand the correlation of physiology and biochemistry of fresh produce with storage issues	3,4	U, R, C
CO3	Measure respiration rate of fresh produce quantitatively	2,3	U, An, Ap
CO4	Know about extension of shelf life for fresh produce	2,3	U, An, Ap, C

<b>COURSE TITLE: CEREAL MILLING AND LEGUMES COURSE CODE: BFST21 - 305</b>			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand structure, composition and processing of major cereals	1,2,3	U, An, Ap
CO2	Get knowledge about milling of different grains	1,3,4	U, An, Ap



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CO3	Learn about processing of pulses	2,3	U, R, Ap
CO4	Assess quality of different cereal grains	1,3	U, An, Ap

### Semester-IV

COURSE TITLE: PROCESSING OF MILK PRODUCTS-I		COURSE CODE: BFST 22-401	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about manufacturing process of different milk products.	1,2	U, R, Ap, C
CO2	Learn about composition of various milk products	2,3	R, U, An
CO3	Understand various changes related to cream ripening	1,4	U, An, Ap
CO4	Know about various physicochemical properties of different milk products	2,3	U, An

COURSE TITLE: EGG, POULTRY AND FISH TECHNOLOGY COURSE CODE: BFST 22 - 402			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about all commercial aspects of egg processing	1,2,3,4	U, An, Ap
CO2	Learn about Types and breeds of poultry important for industrial production, ante and post mortem changes	2,3	U, An, C
CO3	Understand Waste utilization and disposal of poultry by-products	3,4	U, Ap
CO4	Know about commercial processing of fish and fish products	1,2,4	U, An, Ap

COURSE TITLE: FRUITS & VEGETABLE PROCESSING COURSE CODE: BFST 22 - 403			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand various steps involved in processing of different products	1,2,3	U, Ap, C



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CO2	Learn about standardization and formulation of different products	1,2,3,4	U, An, Ap, C
CO3	Know about available commercial products	1,3,4	Ap, C
CO4	Learn processing of tomatoes in the form of different products	1,2,3	An, Ap, C

### COURSE TITLE: PROCESSING OF CEREALS AND LEGUMES COURSE CODE: BFST 22-404

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Evaluate quality of wheat flour	1,2,3	U, An, Ap
CO2	Learn manufacturing processes of different bakery products, corn products and rice bran oil	1,3	An, C
CO3	Know about parboiling of rice and its benefits	1,2,3	U, Ap
CO4	Learn about high protein products available in market	1,3	U, Ap,C

### COURSE TITLE: FOOD PLANT HYGIENE AND SANITATION COURSE CODE: BFST 22-405

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand importance of personal hygiene and safety rules.	1,2,3,4	U, Ap
CO2	Know about various cleaning and sanitation methods implemented in plant	1,2	U, An, Ap
CO3	Study role of food sanitation at commercial level	1,2,3	An, Ap, C
CO4	Tackle pest infestation in a food plant	2,4	Ap, C

### Semester-V

### COURSE TITLE: PRINCIPLES OF FERMENTATION TECHNOLOGY COURSE CODE: BFST31 - 501

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
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CO1	Know various concepts and history of fermentation	2,3,4	R, An
CO2	Know types of fermentation and the classification of microorganisms	1,2,3	U, An, Ap
CO3	Understand about growth of microorganisms	1,3,4	U, R, An, Ap
CO4	Know the utilization of a fermentor at commercial level	1,2,3	U, Ap, C

### COURSE TITLE: FOOD PACKAGING – I

COURSE CODE: BFST31 – 502

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	understand role of packaging in food industry	1,2,4	U, R
CO2	Understand about different packaging materials used in food industry	1,2,3	U, Ap, C
CO3	Learn how different packaging material are manufactured for food industry	2,3,4	U, Ap, C
CO4	Know about specific packaging material requirement according to the food	1,2,3,4	U, An, Ap, C

### COURSE TITLE: CONFECTIONERY & SUGAR TECHNOLOGY COURSE CODE: BFST31 – 503

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about composition and properties of cane juice	1,2,3	U, Ap
CO2	Understand manufacturing process of sugar	1,2	U, Ap, C
CO3	Learn about problems encountered during the use of by products from sugar industry	1,3	U, An, C
CO4	Identify various confectionary products available in market	1,3	Ap, C

### COURSE TITLE: OIL & FAT TECHNOLOGY – I

COURSE CODE: BFST31 – 504





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Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand nomenclature and physicochemical properties of oils & fats	1,3	U, Ap
CO2	Know about nutrition involve in oils and fats	2,3	U, R
CO3	Learn different extraction methods of oils and fats	1,3	U, An, Ap
CO4	Get aware of various storage issues of oils and fats	1,2,3,4	U, Ap

### COURSE TITLE: PROCESSING OF MILK PRODUCTS – II COURSE CODE: BFST31 – 505

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about varieties of milk products available in the market	1,2	U, Ap
CO2	Learn about manufacturing methods of different milk products	2,3	U, An, Ap,C
CO3	Know about various standards of milk products	1,3,4	U, Ap, C
CO4	Identify various defects that may occur in milk products	1,3	U, Ap,

### Semester-VI

### COURSE TITLE: QUALITY ASSURANCE

### COURSE CODE: BFST32 – 601

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Familiarize with concept of food quality and significance in life	1,3,4	U, R, Ap
CO2	Understand food quality characteristics and instrumentation involved	1,2,3,4	U, Ap, C
CO3	Know about sampling and sampling methods in food	1,2,3	U, An, Ap, C



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CO4	Learn about sensory analysis	1,3	U, Ap, C
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COURSE TITLE: GRAIN STORAGE		COURSE CODE: BFST32 – 602	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand storage problems of food grains	1,2,3	U, An
CO2	Learn about the toxicity of food grains and insect infestation	1,2,3,4	An. Ap
CO3	Be aware of sanitation, cleaning and hygiene in food storage	2,3	U, An, Ap, C
CO4	Know about legal regulations for usage of pesticides	1,2,3	Ap, C

COURSE TITLE: FOOD PACKAGING-II		COURSE CODE: BFST32 – 603	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about different types of plastics and suitable properties used for foods	1,2,3	U, An, Ap
CO2	Learn about the technological aspect of packaging material in food industry	1,2,3,4	U, Ap, C
CO3	Get knowledge about various advanced packaging techniques	2,4	U, Ap, C
CO4	Understand eco friendly disposal of packaging materials generated from food industry.	2,3	U, Ap

COURSE TITLE: SPICES & FLAVOUR TECHNOLOGY		COURSE CODE: BFST32 – 604	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about various spices, classification, chemistry and processing methods	1,2,3	R, U, Ap



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CO2	Handle the microbial infestation during storage of spices	1,2	R, Ap
CO3	Understand various food flavorings and their stability	1,3,4	R, Ap
CO4	Learn manufacture of coffee from cocoa beans	1,3	U, An,Ap

### COURSE TITLE: TECHNOLOGY OF FERMENTED FOODS COURSE CODE: BFST32 – 605

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about microflora important in preparation of different fermented products	1,2,3,4	R, U, Ap
CO2	Learn about manufacturing process of different fermented products	1,2,3	R, An, Ap
CO3	Understand changes take place during manufacture of different fermented products	2,3	R, Ap, C
CO4	Be aware of microbiology in different fermented products	1,4	An,Ap

### Semester-VII

### COURSE TITLE: FOOD SAFETY & FOOD LAWS

### COURSE CODE: BFST41-701

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Implement concept of food safety at home and commercial level	1,2,3	R, U, Ap
CO2	Identify different risks associated with food that may compromise food safety	1,3	U, An, Ap
CO3	Learn about safety management tools associated with food	1,2,4	U, Ap
CO4	Be aware of legal regulations involved in food safety	1,2,3	U, Ap



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COURSE TITLE: INDUSTRIAL MICROBIOLOGY		COURSE CODE: BFST41-702	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand the use of microorganisms for making different food products	1,3,4	U, An, Ap
CO2	Know about various types of fermentation techniques	1,2,3,4	U, Ap, C
CO3	Utilize waste material to make useful products using microorganisms	1,2	An, Ap, C
CO4	Be aware of various methods of isolating products and microorganisms for further utilization	3,4	An, Ap

COURSE TITLE: OIL & FAT TECHNOLOGY-II		COURSE CODE: BFST41-703	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand different refining techniques used in oils and fats industry	1,2,3,4	U, Ap, C
CO2	Know about advanced technology in refining process	1,2,3,4	U, An, Ap
CO3	Quality assessment of fats and oils	2,4	An, Ap
CO4	Be aware about packaging requirements of oils and byproducts obtained from oil and fats	1,3,4	U, An, Ap

COURSE TITLE: FOOD ENGINEERING-I		COURSE CODE: BFST41-704	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Understand engineering mechanisms involved in food industry	1,4	U, An, Ap
CO2	Apply physical principles to understand food components are processed	2,3	U, Ap, An
CO3	Application of basic mathematical and principles to food processing issues.	1,2,3	U, An, Ap
CO4	Describe theories of various techniques: Heat exchange, Dehydration, filtration etc.	1,2,3,4	An, Ap, C





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COURSE TITLE: MALTING & BREWING TECHNOLOGY COURSE CODE: BFST41-705			
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about role of raw material in affecting quality of finished beer	1,2,3	U, An, Ap
CO2	Understand various operations involved in malt making and beer making	1,2,3	Ap, C
CO3	Learn different modern techniques involved in beer manufacturing	1,3	An, Ap, C
CO4	Know about various biochemical changes that happens during beer manufacture	2,3,4	An, Ap

### Semester-VIII

COURSE TITLE: FOOD BIOTECHNOLOGY		COURSE CODE: BFST42-801	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Learn basic knowledge about the applications of Biotechnology in the food industry.	1,2,3	U, R, Ap
CO2	Learn about Components of biotechnology and types of chain reactions	1,2,3	R, U, Ap
CO3	Be aware of new biotechnological strategies for processing of food products.	1,2,3,4	U, An, Ap, C
CO4	Understand GMP and technology involved, Health risks and environment concern	1,3	U, Ap, C

COURSE TITLE: ENZYMES IN FOOD PROCESSING		COURSE CODE: BFST42-802	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know the mechanism and classification of enzymes	1,2,3	U, R, Ap
CO2	Study chemical reactions in different kind of food products.	1,2,3	U, An, Ap



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CO3	Utilize different enzymes in different food industries commercially.	1,2,3,4	U, Ap, C
CO4	In vivo production of enzymes	1,3	U, Ap, C

COURSE TITLE: FOOD ENGINEERING -II		COURSE CODE: BFST42-803	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about refrigeration system and calculation of freezing at industrial level	1,3,4	U, An, Ap
CO2	Learn about rheology of food products	1,2,3	U, Ap, C
CO3	Understand size reduction using different types of mills used in food industry.	1,2,3	U, Ap, C
CO4	Know working of various equipments used in food industry	1,2,3,4	U, Ap, C

COURSE TITLE: FOOD PLANT LAYOUT		COURSE CODE: BFST42-804	
Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Know about various factors that help design a food plant	3,4	U, Ap, C
CO2	Learn about different types of layouts according to desirability	1,3	U, An, Ap
CO3	Select appropriate machines, process or operations according to food plant desirability	1,2,3	R, An, Ap, C
CO4	Understand different managerial set ups for a food plant	1,2,3,4	U, Ap



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### COURSE TITLE: FOOD ANALYSIS & INSTRUMENTATION COURSE CODE: BFST42-805

Sr. No.	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO1	Learn about advanced technologies used for analysis of food	1,2,3,4	U, Ap
CO2	Know the working and applications of different instruments	1,3	U, An, Ap
CO3	Interpret data obtained from instruments quality assessment	1,3,4	An, Ap, C
CO4	Understand various changes that take place in food during processing using instruments	1,2,3	U, Ap



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### **BACHELOR OF PHYSIOTHERAPY** **Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)**

#### **PROGRAM SPECIFIC OUTCOMES (PSOs)**

<b>PSO-1</b>	To acquire, assess, apply and integrate new knowledge, learn to adapt to changing circumstances and ensure that patients receive the highest level of professional care.
<b>PSO-2</b>	To establish the foundation for lifelong learning and continuing professional development through attending various seminars, CMEs and conferences.
<b>PSO-3</b>	To function effectively as a mentor and teacher contributing to the appraisal, assessment and review of colleagues, providing effective feedback, and taking advantage of opportunities to develop these skills.
<b>PSO-4</b>	To analyze the roles and expertise of health care professionals and social workers in the context of working and functioning as a multidisciplinary team for the delivery of safe and high-quality care.
<b>PSO-5</b>	To explain the scientific basis for common musculoskeletal, neurological, cardio-respiratory, women's health related, geriatric and sports related disorders, compare and contrast Physiotherapy treatment techniques applicable in relevant case scenarios.
<b>PSO-6</b>	To justify the selection of appropriate clinical examination techniques or tools and investigation procedure for common clinical conditions and critically analyze clinical findings and plan appropriate rehabilitation goals for common disorders and design management protocols
<b>PSO-7</b>	To examine the role of environmental and occupational hazards in ill-health and discuss ways to mitigate their effects.
<b>PSO-8</b>	To critically appraise the results of relevant qualitative and quantitative studies as reported in scientific literature and outline the ethical issues involved in clinical research.





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<b>PSO-9</b>	To communicate clearly, sensitively and effectively with patients, caregivers, and colleagues from the medical and other professions, by listening, sharing and responding.
<b>PSO-10</b>	To demonstrate confidentiality, use data protection legislation and codes of practice in all dealings with information.

COURSE OUTCOMES (COs)			
1 <sup>st</sup> Year			
Course Title: Anatomy		Course Code: BPT-101	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Understand the importance of learning human anatomy in physiotherapy.	1	R, U, An
CO-2	Understand the application of anatomy in medical field and communicate effectively using correct terminology.	3, 5, 6	U, An, Ap, E
CO-3	Identify different bones, muscles and their attachments.	1	R, U, Ap
CO-4	Correlate theoretical anatomy in various clinical conditions.	5	U, Ap, An, E
CO-5	Easily do assessment of human body during physical examination	6	U, Ap, An, E, C

Course Title: Physiology		Course Code: BPT-102	
Sr. No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Correlate theoretical and clinical physiology.	5	R, U, Ap, An, E
CO-2	Understand the physiological functioning of different systems and look for any abnormality or restriction in its normal functioning example gastrointestinal disorders.	1	R, U, An
CO-3	Outline the physiology involved in different metabolic processes taking place inside the body and resulting in energy production and usage by body function with aging	1, 2	U, Ap, An, E
CO-4	Know about physiology and chemical processes involved in muscle contraction.	1, 2	U, An



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Course Title: Biochemistry		Course Code: BPT-103	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Learn about various biomolecules (carbohydrates, proteins, fats, minerals and vitamins) present in human body and why they are essential and their function.	1, 2	R, U, An
CO-2	Understand about normal levels of body fluids required for proper functioning and their abnormal levels to understand the disease process.	1, 2	R, U, Ap, An, E
CO-3	Understand what cause increase or fall in the amount of biomolecules, what are its effects on body and ways to correct it.	1, 2	U, An, Ap, E, C
CO-4	Understand and describe in detail the biochemical aspect of muscle contraction.	1, 2	U, An
CO-5	Understand and describe basal metabolic rate and the factors affecting it.	1, 2	U, An
Course Title: Electrotherapy – I		Course Code: BPT-104	
Sr. No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Get knowledge about various types of therapeutic currents and its physiological and therapeutic effects	1, 2	R, U, An
CO-2	Gain knowledge about pain and pain modulation mechanism	1, 2	R, U, An
CO-3	Get knowledge about different types of low and medium frequency currents, Its indication, contraindication and method of application	1, 2	U, An, Ap, E
CO-4	Study practical applications of electrotherapy modalities for various conditions	1, 2, 6	U, An, Ap, E, C

Course Title: Exercise Therapy – I		Course Code: BPT-105	
Sr. No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels



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CO-1	Have knowledge on the fundamentals of muscle and joint function.	1, 2	R, U, An
CO-2	Have knowledge regarding basic mechanical principles of exercising and effect of different types of exercise on overall health and body and on particular target organ.	1,2	R, U, An
CO-3	Demonstrate and describe the changes taking place in major organs of the body while exercising i.e. changes to heart rate, breathing and alike.	1,2, 5	U, An
CO-4	Have knowledge and skills for overcoming, controlling or reducing the physical strain of exercise on different organs.	1, 2	U, An, Ap, E
CO-5	Have knowledge and skills for operating therapeutic modalities required in restoration of physical function.	1,2	U, An, Ap, E
CO-6	Describe the physiological and therapeutic effect of various movements and demonstrate various anatomical planes and axes.	1,2	U, An

2 <sup>nd</sup> Year			
Course Title: Pathology & Microbiology		Course Code: BPT-201	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Study different infections and their causative organism with treatment of that infection and how to reduce the risk and spread of infection.	1,2	R, U, An, Ap, E, C
CO-2	Study the signs and symptoms of various pathologies and any of the red flags for an ailment.	1,2	U, An
CO-3	Study immunological and deficiency disorders, their effect on body, when to seek help of other health provider and investigations required for diagnosis	1,2	U, An, Ap, E



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CO-4	Correlate normal and disturbed morphology of different organ systems in different diseases and their clinical significance and understand how a pathology affects the concerned tissue/organ and its effect on other major systems of the body and how the repair occurs and normal function is restored	1,2	U, An
CO-5	Study aetiology and pathogenesis of infectious and non-infectious diseases and their clinical relevance.	1,2, 5, 6	U, An, Ap, E
CO-6	Understand how to protect themselves and their patients from infections during interactions and therapy sessions	4, 5, 6	U, An

Course Title: Pharmacology		Course Code: BPT-202	
Sr. No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Become well aware about the pharmacological effects, route of administration, formulations, indications, contra-indications, adverse reactions and precautions if any about different drugs used by patients.	1,2	R, U, An
CO-2	Understand the contribution of both drug and physiotherapy protocol in the outcome of physiotherapy treatment.	1,2, 4,5, 6	R, U, An, Ap, E, C
CO-3	Identify if the pharmacological effect of a drug interferes with therapeutic effect of physiotherapy and vice-versa.	1,2, 4, 5, 6	U, An
CO-4	Get clarity about the action and effect of drug while reading patient files in hospital environment, which enable them to understand why a particular drug is being used	1,2, 4, 5, 6	U, An, Ap, E, C

Course Title: Electrotherapy – II		Course Code: BPT-203	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Easily apply different electrotherapy modalities because of knowledge of their working, techniques of application, patient preparation, in	1,2	R, U, An, Ap, E, C





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	what conditions to apply and when to avoid, safety measure to be followed and any dangers involved.		
CO-2	Acquire the skill of application of electrotherapeutic modalities for assessment and treatment	1,2, 6	U, An, Ap, E, C
CO-3	Understand how to develop a patient-therapist relationship and handle patients well.	9	Ap, E, C
CO-4	Know the importance of following various standards and safety guidelines while applying electrical modalities and the outcomes for failing to do so.	1,2, 11	U, An
CO-5	Understand the importance of patient's positioning before the beginning of any treatment, his own as well as patient's comfort and the range of movement and limitation of movement that a wrong positioning may provide.	6	U, An
CO-6	Plan treatment protocol recommending exercises and modalities through the knowledge gained so far.	1,2, 5, 6	U, An, Ap, E, C

Course Title: Exercise Therapy – II		Course Code: BPT-204	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Become aware of therapeutic movement, its effects and know how and when not to apply to enable better function.	1,2, 6	R, U, An, Ap, E
CO-2	Have basic understanding of patient-centred care and its importance in physiotherapy.	9	R, U, An
CO-3	Be able to movement understand the complexity of human.	1,2	R, U, An
CO-4	Demonstrate and apply various types of exercise to restore physical function on self and peers keeping in mind the principles of exercise.	1,2,5,6	R, U, An, Ap, E
CO-5	Practice different techniques of varied exercise therapies and gain confidence in performing these skills before implementing them on patients so that high quality patient-care is ensured.	1,2,4,5, 6	R, U, An, Ap, E, C
CO-6	Recall the effect of exercise on different body systems when designing a treatment protocol.	1,2,6	R, U, An



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Course Title: Biomechanics		Course Code: BPT-205	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Analyze human movement from a global perspective, integrating biomechanics, muscle mechanics and motor control theory.	1,2	R, U, An
CO-2	Analyze restriction in muscle movement, trick movement, use of another muscle to do a desired movement.	1,2	R, U, An
CO-3	Understand and demonstrate open and closed kinetic chains and their importance which will help him to incorporate these into his practice.	1,2, 6	R, U, An, Ap, E
CO-4	Assess gait pattern, any deviations from normal and their correction.	1,2,4,5,6	An, Ap, E
CO-5	Understand and demonstrate qualitative and quantitative methods of movement analysis.	1,2,6	R, U, An
CO-6	Acquire knowledge of joint and muscle response to varied movements for efficacy in therapeutic application.	1,2,5,6	U, An, Ap

Course Title: Psychology		Course Code: BPT-206	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Recognize and help with the psychological factors involved in disability, pain, disfigurement, unconsciousness, chronic illness, death, bereavement and medical surgical conditions.	1,2,3,6,9	U, An, Ap, E
CO-2	Perform psychosocial assessment of patients in various developmental stages.	1,2,3,9	U, An, Ap, E
CO-3	Understand the concept of stress and its relationship to health, sickness and one's profession.	1,2,3,6,9	R, U, An
CO-4	Find reasons for non-compliance among patients and improving compliance behaviour.	9	An, Ap, E

Course Title: Sociology & Community Health		Course Code: BPT-207	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels



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CO-1	Demonstrate an understanding of the role of socio-cultural factors as determinants of health and behaviour in health and sickness.	1,2,7	R, U, An, Ap, E
CO-2	Understand the role of family and community in the development of behaviours.	7,9	R, U, An,
CO-3	Develop a holistic outlook toward the structure of society and community resources.	7,9	R, U, An, Ap
CO-4	Identify the subtle influence of culture in the development of human personality, the role of beliefs and values as determinants of individual and group behaviour	7,9	R, U, An, Ap
CO-5	Understand the social and economical aspects of a community that influence the health of the people.	7,9	R, U, An
CO-6	Learn to assess social problems and participate in social planning.	6,7,9	U, An, Ap, E

3 <sup>rd</sup> Year			
Course Title: : Orthopaedics		Course Code: BPT-301	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Examine and assess an orthopaedic patient.	1,2,5,6	R, U, An
CO-2	Read and interpret investigations, radiological tests of spine and extremities and other imaging tests.	1,2,4,5,6	R, U, An, Ap, E
CO-3	Correlate the radiological findings with clinical findings.	1,2,6	An, Ap, E
CO-4	Understand and clinically apply principles of management in various deformity cases along with the related splinting and techniques of splinting.	1,2,5	R, U, An
CO-5	Understand and demonstrate traction application in fracture cases.	1,2,5	R, U, An
CO-6	Understand and apply orthopaedic management in geriatric patients suffering from any musculoskeletal or orthopaedic condition.	1,2,5,6	U, An, Ap, E, C

Course Title: General Medicine		Course Code: BPT-302	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Communicate with medical personnel and others using medical terminology.	9	R, U, An



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CO-2	Know about causative organisms involved in various infections and steps to limit their spread.	6	R, U, An, E
CO-3	Understand the underlying etiology, pathology, clinical features and management of various diseases and disorders of different systems of human body.	1,2	R, U, An, Ap, E, C
CO-4	Become well-versed with chart reviewing, documentation and formulating appropriate intervention as per the medical condition.	4,5	U, An, Ap
CO-5	Have overall knowledge of the use and effects of various drugs in each medical condition and effects of drugs ingestion just before therapy.	4,5,6	U, An, Ap, E, C

Course Title : Physiotherapy in Orthopaedic Conditions		Course Code: BPT-303	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Prepare a day wise physiotherapy progression treatment/protocol and efficiently implement it on affected patient.	5, 6	R, U, An, Ap, E, C
CO-2	Plan and execute short and long term goals with emphasis on relief of pain.	5,6	R, U, An, Ap, E, C
CO-3	Assess, identify and analyze neuro-motor and psychosomatic dysfunction in terms of alteration in tone, power, co-ordination, involuntary movements and sensations.	4,5,6	R, U, An, Ap, E, C
CO-4	Prepare and implement pre and post-operative management of common corrective procedures.	1,2,5,6	U, An, Ap, E, C
CO-5	Incorporate their knowledge of anatomy, biomechanics and orthopedics while assessing a patient.	1,2,6	U, An, Ap, E, C
CO-6	Confidently plan and implement physiotherapy protocol in soft tissue injuries such as ligament tear and repair.	1,2,5,6	U, An, Ap, E, C

Course Title : Physiotherapy in Medical Condition-I		Course Code: BPT-304	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Effectively prepare, plan and implement a physiotherapy treatment protocol.	1,2,5,6	An, Ap, E, C





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CO-2	Easily measure patient vitals, chart his recovery and plan day-wise physiotherapy progression.	6	U, An, Ap, E
CO-3	Perform chest examination, auscultation and interpret the findings.	1,2	R,U, An, Ap, E
CO-4	Read and interpret report of invasive and non-invasive investigations for various medical conditions.	1,2,5,6	R, U, An, Ap, E
CO-5	Perform chest physiotherapy competently.	5,6	U, An, Ap, E, C
CO-6	Apply physiotherapy management in patients suffering from any form of the arthritis, conditions affecting vertebral column and complications of deficiency disorders and make progression in exercise difficulty level as per patient cooperation and recovery.	1,2,5,6	U, An, Ap, E, C

Course Title: : Research Methodology and Biostatistics		Course Code: BPT-305	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Decide according to need and objective about which types of test or statistical measure to be applied to a given data.	1,2,6	R, U, An, Ap, E
CO-2	Describe the importance of research work in the field of physiotherapy and use of biostatistics.	1,2,8	U, An, Ap, E, C
CO-3	Acquire the skills for reviewing literature, formulating a hypothesis, study design, collecting data and writing a research proposal.	1,2,8	U, An, Ap, E, C
CO-4	Understand the steps involved in physiotherapy research process.	1,2	U, An, Ap, E, C
CO-5	Plan a study choosing appropriate design for a given problem according to objective.	1,2,8	U,An, Ap, E
CO-6	Follow the ethical guidelines for a researchers and maintain ethical standards while subject examination, tests, statistical analysis and research publication.	1,2,3,4	An, Ap, E, C

Course Title: : Neurology		Course Code: BPT-306	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels



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CO-1	Assess and examine procedure and performance of a neurological patient.	1,2,5,6	R, U, An, Ap, E
CO-2	Understand neurological conditions occurring in different age groups because of trauma, toxins, hypo or hyper-production/secretion of essential chemicals and other causes, clinical features and their management.	1,2,5,6	R, U, An, Ap, E
CO-3	Get knowledge of different types of management of neurological conditions – operative, non-operative and physiotherapy management and apply the physiotherapy treatment on patients with neurological dysfunction.	1,2,5,6	U, An
CO-4	Integrate the knowledge of neuro-anatomy, neuro-physiology, electrotherapy, exercise-therapy and neurology to efficiently practise in clinical neurology.	1,2,5,6	U, An, Ap, E
CO-5	Interpret nerve function tests, radiological and other lab tests.	1,2,3	An, Ap, E
CO-6	Restore neurological function through planning and implementation of skills gained through vast knowledge of exercise-therapy, electrotherapy and treatment goals.	1,2,6	R, U, An, Ap, E

Course Title: : Clinicals		Course Code: BPT-307	
Sr. No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Become fully equipped with handling patients practically in viewpoint of approaching them and make a provisional diagnosis and plan a physiotherapy treatment protocol.	5,6	R, U, An, Ap, E, C
CO-2	Have skills about how to present case studies, scientific papers and journals in front of experts in related fields.	5,6	An, Ap, E, C
CO-3	Leave their valuable work done during their postings in various hospitals and leave the subject matter for new entrants and act as mentors for their juniors.	3,5,6	Ap, E, C



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4 <sup>th</sup> Year			
Course Title: : General Surgery		Course Code: BPT-401	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Describe the effects of surgical trauma and anaesthesia.	1,2	R, U, An
CO-2	Describe surgical procedures for various diseases of different organs and clinically evaluate the patient's condition.	1,2,5,6	R, U, An, Ap, E
CO-3	Interpret test reports for various invasive and non-invasive procedures done for investigations.	1,2,3,4	R, U, An
CO-4	Understand the mental condition of a post-operative patient, co-operate with him and help in alleviating pain on priority basis.	9	An, Ap, E
CO-5	Communicate patiently and softly along with counselling the patient regarding positive aspect of surgical procedure and role of physiotherapy in overall recovery.	5,6,9	An, Ap, E, C
CO-6	Understand the role of physiotherapist as a member of multi-disciplinary team for promotion of health and recovery of a patient.	3,4,5	U, An, Ap, E, C

Course Title: : Community Physiotherapy & Rehabilitation		Course Code: BPT-402	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Understand the concept of health care and management issues in health services.	1,2,7	An, Ap, E, C
CO-2	Inculcate leadership qualities in their profession and take responsibility for guiding people regarding social and health issues.	1,2,3,4,9	U, An, Ap
CO-3	Improve their performance as a physiotherapist and as human being through better understanding of human emotions, feelings and behaviour and health services at different levels of community.	1,2,5,6,9	U, An, Ap, E
CO-4	Develop behavioural skills and humanitarian approach while communicating with patients, patient caregivers, society and co-workers to promote individual and community health.	7,9	U, An, Ap, E, C



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CO-5	Learn, understand and implement ethical guidelines regarding patient privacy in the clinical settings.	1,2,5,6	R, U, An, Ap
CO-6	Make people aware about family planning and different policies and schemes of Indian government related to it.	5,6,7,9	R, U, An, Ap

Course Title : Paediatrics & Geriatrics		Course Code: BPT-403	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Describe normal development and growth of a child through explanation and assessment of milestones at various months and years of age.	1,2	R, U, An
CO-2	Explain to parents or care takers of a child about importance of immunisation, breast feeding and mental growth of a child.	1,2,7,9	R, U, An, Ap
CO-3	Acquires the skill of clinical examination/assessment of a neonate/child with respect to neurological, musculoskeletal, cardiac and respiratory function.	1,2,5,6	An, Ap, E
CO-4	Check the signs and symptoms for nutritional deficiencies in paediatric as well as geriatric patients.	1,2,5,6	U, An, Ap
CO-5	Describe surgical interventions done for various anomalies in paediatric patient and their post-operative management.	1,2,6	U, An
CO-6	Acquire the skill of clinical assessment of elderly people.	1,2,5,6	U, An, Ap

Course Title : Physiotherapy in Medical Conditions - II		Course Code: BPT-404	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Acquire skills for assessment and evaluation of a neurologic patient, paediatric patient and geriatric patient.	5,6	U, An, Ap, E
CO-2	Develop ability to plan realistic goals based on knowledge of prognosis of the disease and prescribe appropriate, safe evidence based physiotherapy intervention with clinical reasoning.	1,2,5,6	Ap, E, C





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CO-3	Get knowledge of the importance of infection control and risk while treating neurological, paediatric and geriatric patients.	1,2,5	R, U, An, Ap, E
CO-4	Develop psychomotor skills to implement timely and appropriate physiotherapy assessment tools/techniques to ensure a holistic approach to patient evaluation and prioritize his problems.	1,2,5,6,9	U, An, Ap, E
CO-5	Develop ability to select timely physiotherapy intervention to reduce morbidity that suits patient's problems and is based on best available evidence.	5,6,8	An, Ap, E, C

Course Title: Physiotherapy in Surgical Conditions		Course Code: BPT-405	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Develop skills for the assessment and evaluation of a post-operative patient.	5,6	U, An, Ap
CO-2	Have knowledge about the importance of infection control and risk while treating post-operative patients.	1,2,5,6	R, U, An, Ap
CO-3	Plan and execute short and long term goals for physiotherapy management based on patient's health, co-operation and assessment.	5,6,9	An, Ap, E, C
CO-4	Plan realistic goals based on knowledge of prognosis of the disease and prescribe appropriate, safe evidence based physiotherapy intervention with clinical reasoning.	5,6,7,9	R, U, An, Ap, E, C
CO-5	Prepare and execute day-wise post-operative physiotherapy intervention after surgical procedures.	5,6	An, Ap, E, C

Course Title: Rehabilitation, Organization and Administration		Course Code: BPT-406	
Sr.No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Understand their role in the management of the disability within the rehabilitation team	3,4	U, An, Ap



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	and also understand the concept of team approach to rehabilitation.		
CO-2	Observe and identify the diagnostic features in physical conditions.	5,6	R, U, An
CO-3	Understand the medical and surgical aspects of disabling conditions	1,2	U, An
CO-4	Identify the residual potentials in patients with partial or total disability (temporary or permanent).	5,6,9	U, An
CO-5	Formulate appropriate goals (long & short term) in treatment & rehabilitation	5,6	U, An
CO-6	Prescribe, check - out and train the uses of various rehabilitation aids.	5,6	An, Ap, E

Course Title: Clinical		Course Code: BPT-407	
Sr. No	On completing the course, the students will be able to:	PSOs Addressed	Cognitive levels
CO-1	Equipped with handling patients practically from the viewpoint of approaching them and make a provisional diagnosis and plan a physiotherapy treatment protocol.	5,6,9	R, U, An, Ap, E, C
CO-2	Have skills about how to present case studies, scientific papers and journals in front of experts in the field.	5,6,9	An, Ap, E, C
CO-3	Leave their valuable work done during their postings in hospitals and leave subject matter for new entrants as they work as mentors for their juniors.	3,4,5,6,9	U, An, Ap, E, C

Course Title: Practical: Computer Applications		Course Code: CS-PYSIO 411	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Gain insight on the working of input and output devices.	1,2	U
CO2	Develop skills of working with spreadsheets.	1,2	R,U
CO3	Get knowledge on the importance of operating system in computer.	1,2	U
CO4	Understand the concept of storing of data in memory and its types.	1,2	U



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# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

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UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

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### B.A JOURNALISM & MASS COMMUNICATION Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### Programme Specific Outcomes (PSOs):

PSO-1	To get in depth knowledge about the communication, Punjabi language, reporting, media politics, computer and drug abuse.
PSO-2	To get thorough information about the mass communication, design and graphics and print media
PSO-3	To develop skills of photo journalism, broadcasting media, news feature, communication development and environmental studies
PSO-4	To get thorough knowledge on business communication, programme formats, video production, folk media and advertising
PSO-5	To prepare the students for event management, current affairs, research, cyber journalism and public relations
PSO-6	To develop understanding about film projects, research projects and current affairs
PSO-7	To learn about how to work in the industry with the help of training

#### COURSE OUTCOMES (Cos)

Course Title :Principles of Communication		Course Code: BAJMC1101	
Sr. No.	On Completing the Course, the students will be able to :	PSOs Addressed	Cognitive Level
CO1	Apply knowledge of human communication and language process as they occur across various contexts ; interpersonal , intrapersonal , small group , organizational , media, gender, family , intercultural communication from multiple prospective.	1	U,Ap,An,E,C
CO2	Learn about the media as an information provider.	1	U,Ap,An,E
CO3	Understand how to communicate effectively, orally as well as in writing.	1	U,Ap,An,E,C



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<b>Course Title: Reporting and Editing-I</b>		<b>Course Code: BAJMC1102</b>	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Learn about news types, sources and elements of news; role, functions, responsibilities and duties of the chief editor and sub-editor.	1	U,Ap,An,E,C
CO2	Understand reporter's duties, responsibilities, and qualities.	1	U,Ap,An,E
CO3	Learn about various kinds of reporting and how to write a news story and how to write on various beats.	1	U,Ap,An,E,C
<b>Course Title: Media and Politics</b>		<b>Course Code: BAJMC1103</b>	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Understand the relation between media and politics, function and structure of state, Legislature, Executive and Judiciary.	1	U,Ap,An,E
CO2	Know about forms of government, coalitions and alliances and how to analyze political issues, various tools of political parties strengths and shortcomings.	1	U,Ap,An,E
CO3	Gain knowledge on election commission, election manifesto, electoral reforms	1	U,Ap,An,E
<b>Course Title: Print Media Lab</b>		<b>Course Code: BAJMC1104</b>	
<b>Sr. No.</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Get information regarding discussions and analysis of newspapers and magazines.	2	U,Ap,An,E,C
CO2	Learn about camera shorts and lens etc.	2	U,Ap,An,E,C
CO3	Understand the photo editing and photo feature.	2	U,Ap,An,E,C





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SEM-II			
Course Title: Press Laws and Media Ethics		Course Code: BAJMC1205	
Sr. No.	On Completing the Course, the students will be able to :	PSOs Addressed	Cognitive Level
CO1	Define the fundamental rights enjoyed by the citizens of India and the fundamental principles of mass media law	1	U,Ap,An,E
CO2	Define the essential features of media laws of India.	1	U,Ap,An,E
CO3	Know about defamation law and its types.	1	U,Ap,An,E
CO4	Demonstrate an understanding on the privileges regarding the freedom of speech and expression and also reasonable restrictions imposed on it.	1	U,Ap,An,E
Course Title: History of Print Media		Course Code: BAJMC1206	
S.No	On Completing the Course, The students will be able to :	PSOs Addressed	Cognitive Level
CO1	Understand the role played by the pioneers of journalism	1	U,Ap,An,E
CO2	Understand the role and contribution of pioneers of Punjabi journalism	1	U,Ap,An,E
CO3	Understand the role of print media in Indian's independence.	1	U,Ap,An,E
Course Title: Mass Communication: Concepts and Processes		Course Code: BAJMC1207	
S.No	On Completing the Course, the students will be able to :	PSOs Addressed	Cognitive Level
CO1	Understand the process of communication, including different forms, levels and barriers	1,2	R,U,Ap,An,E
CO2	Gain knowledge on the communication models and their applications	1,2	R,U,Ap,An,E
CO3	Understand Media systems and Communication theories	1,2	U,Ap,An,E



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CO4	Understand various tools of mass communication	1,2	U,Ap,An,E
<b>Course Title:</b> Design and Graphics		<b>Course Code:</b> BAJMC1028	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Demonstrate an understanding on design principles by applying design theory and process from an artistic perspective.	2	U,Ap,An,E,C
CO2	Understand adobe premier video editing principles	2	U,Ap,An,E,C
CO3	Learn the usage of multimedia and various printing methods.	2	U,Ap,An,E,C
<b>Course Title:</b> Communication Lab		<b>Course Code:</b> BAJMC1209	
<b>S.No</b>	<b>On Completing the Course, The students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Understand the micro communication lab on communication dynamics.	1	U,Ap,An,E,C
CO2	Learn various communication skills.	1	R,U,Ap,An,E,C
CO3	Get prepared for the presentation skills.	1	R,U,Ap,An,E,C
<b>Course Title:</b> Design and Graphics Lab		<b>Course Code:</b> BAJMC1010	
<b>S.No</b>	<b>On Completing the Course, The students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Understand picture composition	2	U,Ap,An,E,C
CO2	Learn about designing of various magazines and newspapers.	2	U,Ap,An,E,C
CO3	Learn about video editing.	2	U,Ap,An,E,C
<b>SEMESTER: III</b>			
<b>Course Title:</b> Photo Journalism		<b>Course Code:</b> BAJMC2301	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Understand the camera, its various components, types of shots, angles and movements.	3	R,U,Ap,An,E,C
CO2	Know the difference between depth of field and depth of focus	3	U,Ap,An,E,C



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CO3	Gain knowledge about different types of cameras and what are the requirements for good photography.	3	U,Ap,An,E,C
<b>Course Title:</b> Reporting and Editing-II		<b>Course Code:</b> BAJMC2302	
<b>Sr. No.</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Understand the importance and functions of news bureau.	1	U,Ap,An,E
CO2	Know the difference between various types of reporting, difference between columns, feature and letters to editors	1	R,U,Ap,An,E,C
CO3	Learn about purpose and structure of Op-ed.	1	U,Ap,An,E,C
CO4	Learn how to write reviews of films and books.	1	U,Ap,An,E,C
<b>Course Title:</b> Broadcasting in India: Policies and Principles		<b>Course Code:</b> BAJMC2303	
<b>Sr. No.</b>	<b>On Completing the Course, The students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Know how radio act as a mass medium ,its strengths and weaknesses.	3	U,Ap,An,E
CO2	Understand the history of broadcasting and various radio broadcasting systems.	3	U,Ap,An,E
CO3	Study the role of radio in nation building, commercialization and public broadcast.	3	U,Ap,An,E,C
CO4	Gain knowledge on various media policies ,Prasar Bharti and other relevance of radio	3	U,Ap,An,E
<b>Course Title:</b> News Feature Writing		<b>Course Code:</b> BAJMC2304	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Understand feature, news feature and how to write a feature, they also gain knowledge regarding structure of feature, writing feature from facts to narratives	3	U,Ap,An,E,C



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CO2	Learn about primary and secondary sources of information	3	U,Ap,An,E
CO3	Gain knowledge about various types of features.	3	U,Ap,An,E,C
CO4	Understand how to conduct research for writing a feature article	3	U,Ap,An,E,C
<b>Course Title:</b> Development Communication		<b>Course Code:</b> BAJMC2305	
<b>Sr. No.</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Learn about different approaches to development , barriers and issues in development , characteristics of developing societies and the gap between developed and developing societies.	3	U,Ap,An,E
CO2	Understand the paradigms and its various types.	3	U,Ap,An,E,C
CO3	Understand the role of developmental and rural extension agencies in development	3	U,Ap,An,E
CO4	Gain knowledge on the use of different media in development communication	3	U,Ap,An,E,C
<b>Course Title:</b> Reporting and Editing Lab		<b>Course Code:</b> BAJMC 2306	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Sets their mind in terms of news one can become chief in news editor or one can become a reporter based on various types of reporting.	1	R,U,Ap,An,E,C
CO2	Understand how to differentiate between columns, features, communication.	1	R,U,Ap,An,E,C
CO3	Know how to use language and how to write letter to editors.	1	U,Ap,An,E,C
<b>Course Title:</b> Photography lab		<b>Course Code:</b> BAJMC 2307	
<b>S.No</b>	<b>On Completing the Course, The students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>





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CO1	Understand the camera, its various components, and different types of shots, angles and movements.	3	U,Ap,An,E,C
CO2	Know the difference between depth of field and depth of focus	3	U,Ap,An,E,C
CO3	Gain knowledge about different types of cameras and what are the requirements for good photography.	3	U,Ap,An,E,C
<b>Course Title: Feature Writing Lab</b>		<b>Course Code: BAJMC 2308</b>	
<b>S.No</b>	<b>On Completing the Course, The students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Understand feature, news feature and how to write a feature, they also gain knowledge regarding structure of feature, writing feature from facts to narratives.	3	R,U,Ap,An,E,C
CO2	Learn about primary and secondary sources of information.	3	U,Ap,An,E
CO3	Gain knowledge about various types of features.	3	R,U,Ap,An,E,C
CO4	Understand how to do research for writing a feature article	3	R,U,Ap,An,E,C
<b>Semester-IV</b>			
<b>Course Title: Media: Business Communication</b>		<b>Course Code: BAJMC 2409</b>	
<b>Sr. No.</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Acquire knowledge on business communication and its principles in relation to better decision-making in business Communication.	4	U,Ap,An,E,C
CO2	Learn about various problems are generated during communication.	4	U,Ap,An,E
CO3	Know about various business correspondences used in media organizations.	4	U,Ap,An,E



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CO4	Understand various business letters used in media organizations and conflict management.	4	U,Ap,An,E,C
CO5	Know about various forms of business communication and cross cultural communication.	4	U,Ap,An,Es
<b>Course Title:</b> Programme Formats: Radio and TV		<b>Course Code:</b> BAJMC 2410	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Learn how to write for Radio, News, Slogans and interviews.	4	U,Ap,An,E,C
CO2	Understand concept of good presentation and gain knowledge regarding TV scope	4	U,Ap,An,E,C
CO3	Learn programme production, Packaging for a channel, Packaging stories.	4	U,Ap,An,E,C
CO4	Understand how to manage and perform reporting, interviews and Live Shows.	4	U,Ap,An,E,C
<b>Course Title:</b> Video Production: Idea to Screen		<b>Course Code:</b> BAJMC 2411	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Know about various types of cameras and the applications for video camera.	4	U,Ap,An,E,C
CO2	Understand lighting, its techniques and basics of lighting.	4	U,Ap,An,E,C
CO3	Understand phases of production and various kinds of editing.	4	U,Ap,An,E,C
CO4	Understand the VFX, dubbing and sound effects.	4	U,Ap,An,E,C
<b>Course Title:</b> Folk Media		<b>Course Code:</b> BAJMC 2412	
<b>Sr. No.</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Know the various types of cameras and applications for video camera.	4	U,Ap,An,E,C



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CO2	Understand lighting, its techniques and basics of lighting	4	U,Ap,An,E,C
CO3	Learn phases of production and various kinds of editing.	4	U,Ap,An,E,C
CO4	Understand the VFX, dubbing and sound effects.	4	U,Ap,An,E,C
<b>Course Title:</b> Advertising: Concepts and Principles		<b>Course Code:</b> BAJMC 2413	
<b>Sr. No.</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Gain knowledge about folk media, categorization of folk media and various types of folk forms of Punjab	4	U,Ap,An,E,C
CO2	Get information about various units of Information and broadcasting	4	U,Ap,An,E
CO3	Learn folk channels of communication.	4	U,Ap,An,E,C
CO4	Understand the integrated use of folk media and mass media.	4	U,Ap,An,E,C
<b>Course Title:</b> Radio and TV Production Lab		<b>Course Code:</b> BAJMC2414	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Learn how to write for radio, news, slogans and interviews.	4	U,Ap,An,E,C
CO2	Understand the concept of good presentation also gain knowledge regarding TV scope.	4	U,Ap,An,E,C
CO3	Learn programme production, packaging for a channel and packaging stories	4	U,Ap,An,E,C
CO4	Understand how to manage and perform reporting, interviews and live shows.	4	U,Ap,An,E,C
<b>Course Title:</b> Operation and Handling of Video Equipments		<b>Course Code:</b> BAJMC2415	
<b>S.No</b>	<b>On Completing the Course, The students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>



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CO1	Gain knowledge on the phases of production and various kinds of editing.	4	U,Ap,An,E,C
CO2	Know the various types of camera and applications for video camera.	4	U,Ap,An,E,C
CO3	Understand lighting, its techniques and basics of lighting.	4	U,Ap,An,E,C
CO4	Understand the VFX, dubbing and sound effects.	4	U,Ap,An,E,C
<b>Course Title:</b> Advertising Lab		<b>Course Code:</b> BAJMC2416	
<b>S.No</b>	<b>On Completing the Course, The students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Write tag lines for both television and radio advertisement.	4	U,Ap,An,E,C
CO2	Write good content for newspaper advertisement	4	U,Ap,An,E,C
CO3	Understand different types of Advertising.	4	U,Ap,An,E,C
<b>Semester: V</b>			
<b>Course Title:</b> Event Management: Principles and Method		<b>Course Code:</b> BAJMC3501	
<b>S.No</b>	<b>On Completing the Course, The students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Learn about the event managements and its scope.	5	U,Ap,An,E,C
CO2	Understand the role and importance of exhibitions.	5	U,Ap,An,E,C
CO3	Learn about the role of press in promotion of an event.	5	U,Ap,An,E,C
CO4	Understand various stand designs and trade fairs advantages and risks	5	U,Ap,An,E,C
<b>Course Title:</b> Current Affairs: Contemporary issues In Media-I		<b>Course Code:</b> BAJMC3502	
<b>S.No</b>	<b>On Completing the Course, The students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Learn about current affairs.	5,6	U,Ap,An,E





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CO2	Gain knowledge on various aspects of the society	5,6	U,Ap,An,E
CO3	Learn about politics , economic and social issues	5,6	U,Ap,An,E
<b>Course Title:</b> Research Methodology for Media		<b>Course Code:</b> BAJMC3503	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Learn about mass communication research techniques which involves various steps of research methodology. This course also gives students exposure to communication research areas.	5	U,Ap,An,E,C
CO2	Understand the theoretical, conceptual and operational framework of research.	5	U,Ap,An,E,C
CO3	Understand the various research process steps like literature review, data collection, data interpretation, etc.	5	U,Ap,An,E,C
<b>Course Title:</b> Cyber Journalism		<b>Course Code:</b> BAJMC3504	
<b>Sr. No.</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Understand regarding cyber journalism and its fundamentals.	5	U,Ap,An,E,C
CO2	Know about the advantages and disadvantages of cyber journalism.	5	U,Ap,An,E,C
CO3	Gain information about how to write for web.	5	U,Ap,An,E,C
CO4	Understand the presentation and layout of web newspaper and magazines.	5	U,Ap,An,E,C
CO5	Learn about trends in cyber journalism.	5	U,Ap,An,E
<b>Course Title:</b> Public Relations		<b>Course Code:</b> BAJMC3505	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Understand the role of PR.	5	U,Ap,An,E



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CO2	Get knowledge about sales promotion and advertising	5	R,U,Ap,An,E,C
CO3	Gain knowledge about role of photography in PR.	5	R,U,Ap,An,E,C
CO4	Gain information about responsibilities and duties of PRO.	5	U,Ap,An,E
<b>Course Title:</b> Event Management Lab		<b>Course Code:</b> BAJMC3506	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Learn about the event management.	5	U,Ap,An,E,C
CO2	Know how to design material for promotion of an event.	5	U,Ap,An,E,C
CO3	Learn that how to organize an event.	5	U,Ap,An,E,C
<b>Course Title:</b> Cyber Lab		<b>Course Code:</b> BAJMC3507	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Understand different social networking sites and their relevance in media.	5	U,Ap,An,E
CO2	Learn about e-papers and online newspaper.	5	U,Ap,An,E,C
CO3	Understand blogs, Micro blogs, Vlog, Podcast, WebTV and contents	5	U,Ap,An,E,C
CO4	Know how to create online pages and Twitter account.	5	U,Ap,An,E,C
<b>Course Title:</b> Pilot Study		<b>Course Code:</b> BAJMC3508	
<b>Sr. No.</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Learn about research and preparing report on Media	6	U,Ap,An,E,C
CO2	Prepare a report on media studies.	6	U,Ap,An,E,C
CO3	Learn about how to do research.	6	U,Ap,An,E,C
<b>Course Title:</b> Training 3 Months		<b>Course Code:</b> BAJMC3509	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Learn how to work in the industry	1	U,Ap,An,E,C
CO2	Understand how to tackle the pressure.	1	U,Ap,An,E



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CO3	Submit the reports on time and also be able to explore their interests and passion	1	U,Ap,An,E,C
<b>Semester-VI</b>			
<b>Course Title:</b> Current Affairs		<b>Course Code:</b> BAJMC3610	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Stay in touch with what's happening in the world.	5,6	U,Ap,An,E
CO2	Develop newspaper reading habits.	5,6	U,Ap,An,E
CO3	Generate awareness amongst them.	5,6	U,Ap,An,E
CO4	Stay connected to the world.	5,6	U,Ap,An,E
<b>Course Title:</b> Film Project		<b>Course Code:</b> BAJMC3611	
<b>S.No</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Know about what happens behind the scenes while shooting.	6	U,Ap,An,E,C
CO2	Learn the loopholes while making good documentary	6	U,Ap,An,E,C
CO3	Understand the role of lights, props, costumes etc.	6	U,Ap,An,E,C
<b>Course Title:</b> Research Project		<b>Course Code:</b> BAJMC3612	
<b>Sr. No.</b>	<b>On Completing the Course, the students will be able to :</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO1	Collect data about particular topic and do research on it.	6	R,U,Ap,An,E,C
CO2	Have detailed information about the topic they choose.	6	R,U,Ap,An,E,C
CO3	Understand the whole process of research methodology.	6	R,U,Ap,An,E,C



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Semester-I			
Course Title: Practical: Computer Lab JMC112		Course Code: CS-	
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Acquire the computer terminology.	1	R,U
CO2	Gain insight on working of input and output devices.	1	R,U
CO3	Develop skills of working with MS-Word, MS-PowerPoint.	1,2	U,Ap
CO4	Possess the knowledge on the importance of operating system in computer.	1,2	U
CO5	Understand the concept of storing of data in memory and its types.	1,2	U





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### Semester-I

**Course Title: Computer Applications for Journalism**

**Course Code: CS-JMC111**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the computer terminology.	1	R,U
CO2	Gain insight on working of input and output devices.	1	R,U
CO3	Develop skills on working with MS-Word, MS-PowerPoint.	1,2	U,Ap
CO4	Gain knowledge about the importance of operating system in computer.	1,2	U
CO5	Understand the concept of storing of data in memory and its types.	1,2	U
CO6	Be comfortable with the CorelDraw work area, tools, boards, and fundamental methods and understand the strategies of making and controlling vector (plan) articles, shapes and variety fill.	1,2	Ap,U,An
CO7	Work with imaginative text for the making of logos, marks and any other one-page print plan material	1,2	E,C



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## B.Sc. (Artificial Intelligence & Data Science) Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

### PROGRAM SPECIFIC OUTCOMES (PSOs)

<b>PSO-1</b>	Students will gain knowledge in the areas like Soft Computing, Artificial Intelligence, Data Science, Paradigm of Programming language, Design and Analysis of Algorithms, Database Technologies core computing subjects.
<b>PSO-2</b>	Students will understand all dimensions of the concepts of software application and projects.
<b>PSO-3</b>	It will make students employable according to current demand of Data Science & Artificial Intelligence Industry.
<b>PSO-4</b>	Students will Work in a collaborative manner with others in a team, contributing to the management, planning and implementation of a computer system.

### COURSE OUTCOMES

Semester: I			
Course Title: Basics of AI & Data Science			
Course Code: BAIDS-111			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Get familiar with the concept of artificial intelligence, intelligent agents and different searching techniques.	1,2,3	U,R,An
CO2	Understand the basic areas of artificial intelligence including knowledge representation, reasoning, learning, natural language processing, and robotics.	2,,4	U,R,Ap,C



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CO3	Understand the different needs and benefits of data science.	1,3	U,An,E
CO4	Acquire the knowledge of preprocessing techniques which are required for the conversion of raw data to the form helpful for further analysis.	1,3,4	C,U,Ap
CO5	Acquire in-depth knowledge about the different methods of data representation and data visualization	2,3,4	Ap,C,An

**Course Title: Computational Problem-Solving Using Python**

**Course Code: BAIDS-112**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Describe the core syntax and semantics of Python programming language.	1,2,3	U,Ap,E
CO2	Understand the basic areas of artificial intelligence including knowledge representation, reasoning, learning, natural language processing, and robotics.	2,4	U,R,Ap,C
CO3	Understand the different needs and benefits of data science.	1,3	U,R,An,E
CO4	Acquire the knowledge of preprocessing techniques which are required for the conversion of raw data to the form helpful for further analysis.	1,3,4	C,U,Ap,E
CO5	Acquire in-depth knowledge about the different methods of data representation and data visualization.	2,4	Ap,C,An

**Course Title: Big Data Analytics**

**Course Code: BAIDS-113**



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Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand Big Data and its analytics in the real world	1,2	U,R,An
CO2	Access and Process Data on Distributed File System using various jobs in Hadoop.	3,4	U,R,Ap,C
CO3	Design of Algorithms to solve Data Intensive Problems using Map Reduce Paradigm.	1,3	U,An,E,Ap
CO4	Implement Big Data Activities using Hive.	1,3,4	C,U,Ap,E
CO5	Use R-programming language for implementing Machine Learning Techniques.	2,3,4	Ap,C,An,E

**Course Title: Lab II: MS Office 2010/Open Office**

**Course Code: BAIDS-115P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Use word processors, spreadsheets, presentation software.	1,2,3	U,R,An
CO2	Describe the features and functions of the categories of application software.	2,4	U,R,Ap,C
CO3	Understand the dynamics of an office environment.	1,3	U,An,E
CO4	Demonstrate the ability to apply application software in an office environment.	1,3,4	C,U,Ap

**Course Title: LAB I: Computational Problem-Solving Using Python**

**Course Code: BAIDS- 114P**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
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CO1	Describe the Control statement, String, List, and Dictionaries in Python.	1,3	U,Ap,E
CO2	Understand the different types of function and File handling operations.	2,,4	U,R,Ap,C
CO3	Interpret Object oriented programming in Python	1,2	U,An,E
CO4	Build the interactive python application using GUI	2,4	C,U,Ap
CO5	Develop a multithreading and network application.	1,4	Ap,C,An,E

### Semester: II

**Course Title: AI & Machine Learning**

**Course Code: BAIDS-121**

Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Obtain the knowledge of different areas where artificial intelligence has acquired an important place.	1,2,3	U,R,An
CO2	Understand the different methods involved in knowledge representation and game playing.	2,,4	U,R,Ap,C
CO3	Understand the concept of expert system which are capable of emulating the decision-making ability of a human expert.	1,3	U,An,E
CO4	Understand the various supervised and non-supervised techniques helpful in the construction of learning models.	1,3,4	C,U,Ap
CO5	Understand the different performance evaluation measures helpful in appraising the developed learning models	2,3,4	Ap,C,An



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Course Title: Data Warehousing & Data Mining			
Course Code: BAIDS-122			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the functionality of the various data mining and data warehousing component Knowledge.	1,2,3	U,R,An
CO2	Understand and Appreciate the strengths and limitations of various data mining and data warehousing models.	2,,4	U,R,Ap,C
CO3	Apply, Create and Explain the analyzing techniques of various data.	1,3	U,An,E
CO4	Analyze and describe different methodologies used in data mining and data ware housing.	1,3,4	C,U,Ap
CO5	Evaluate, Analyze and Compare different approaches of data ware housing and data mining with various technologies.	2,3,4	Ap,C,An

Course Title: Data Structures			
Course Code: BAIDS-123			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the concept of algorithm complexity and will acquire knowledge about mathematical notations which can be used to measure the algorithm's complexity.	1,2	U,R,An
CO2	Comprehend different data structure techniques, such as array, stacks, queue, linked.	3,4	U,R,Ap,C
CO3	Apply linear search and binary search techniques in real word applications to identify the particular element.	2,4	An,Ap,E



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CO4	Get knowledge about different sorting algorithms along with their time complexities.	1,3,4	C,U,Ap,E
CO5	List trees, and graphs, along with the operations performed on them.	1,2,3	Ap,C,An,E
CO6	Understand the memory representation of the above-mentioned data structures.	2,3	U,R,An
<b>Course Title: LAB I: Data Structures Implementation using Python</b>			
<b>Course Code: BAIDS-124P</b>			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Implement the real world applications by making use of linear data structure, such as, arrays, stacks, queues, linked lists, trees and graphs, to handle the data stored in computer's memory.	1,4	U,An,Ap,E
CO2	Perform the implementation using non-linear data structure, such as, trees and graphs.	2,4	U,Ap,C
CO3	Perform traversing, insertion, and deletion operations on the abovementioned data structures.	1,2	U,Ap,E
CO4	Perform the search operations by making use of suitable search technique.	1,3,4	C,U,Ap,E
CO5	Sort the data by using different sorting techniques and can also assess the time requirement of the available sorting techniques.	2,3,4	Ap,C,An



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Course Title: Lab II: Data Mining Algorithms implementation			
Course Code: BAIDS-125P			
Sr. No.	On Completing the course, the students will be able to:	PSOs addressed	Cognitive Level
CO1	Understand the functionality of the various data mining and data warehousing languages.	1,4	U,An,Ap,E
CO2	Understand the strengths and limitations of various data mining and data warehousing models & their implementations.	2,3	U,Ap,C
CO3	Apply, create and explain the analyzing techniques of various data in SQL, PL/SQL.	1,2	U,Ap,E
CO4	Analyze and Describe different methodologies used in data mining and data ware housing in various software.	1,2,3	C,U,Ap,E





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### B.VOC. (THEATRE AND STAGE CRAFT)

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

Sr. No.	On completion of B.Voc, the students will be able to:
PSO 1	To get knowledge on different theatre styles, forms, tradition of theatre and develop skills about character making through imagination, observation, imitation and improvisation.
PSO 2	To get knowledge about the uses and implementation of sound systems, lighting, costume, makeup, stage management and audio visual effects according to a production.
PSO 3	To get knowledge on basic techniques of stage designing through lighting, makeup and theatrical costume.
PSO 4	To learn how to relate music and dance to theatre and understand their role in theatre.
PSO 5	To get practical knowledge on production management and event management about T.V. and film production related activities like camera operation, camera accessories, lenses, shot division and audio and visual editing.
PSO 6	To get practical knowledge on the fundamental of direction techniques and the methods of acting.
PSO 7	To get knowledge on Hindi cinema and Indian cinema and learn the techniques of film processing(story, script, screenplay, cinematography, sound track etc.)

#### COURSE OUTCOMES (COs)

##### SEMESTER 1

#### COURSE TITLE-INTRODUCTION TO THEATRE AND DRAMA

#### COUSE CODE-BVTS-104

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of theatre and its elements	1	U,An
CO2	Get knowledge on Natyashastra and the style of theatre	1	U,An



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CO3	Understand the concept of drama and its elements	1	U,AN
CO4	Understand the style of theatre : comedy , tragedy , melodrama and Parsi theatre	1	U,An

### COURSE TITLE-THEATRE TECHNIQUES AND DESIGNING-1

#### COUSE CODE-BVTS-105

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of basics of light designing	2	U,An,Ap
CO2	Get knowledge on costume designing	2	U,An,Ap
CO3	Develop their Aesthetic skills through the use of light , costume and makeup	2	U,An

### COURSE TITLE-STAGE CRAFT-1

#### COUSE CODE-BVTS-106

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of stage craft , types of stages	3	U,An,Ap,C
CO2	Get the knowledge on the basics of set designing ; realistic and non-realistic set designing	3	U,An,Ap,C
CO3	Learn to organise programmes	3,5	U,An,Ap,C

### COURSE TITLE-PERFORMING ARTS-1 (MUSIC VOCAL)

#### COUSE CODE-BVTS-107



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SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the use of music in theatre	4	U,An,Ap
CO2	Understand and explain Drutkhyal in raag yaman and practice of playing alankars on harmonium	4	U,An,AP
CO3	Understand and analyse individual and group singing	4	U,An

### SEMESTER-2

#### COURSE TITLE-TRADITION OF THEATRE IN INDIA

#### COUSE CODE-BVTS-204

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of Indian theatre , regional and folk theatre	1	U,An
CO2	Understand and apply the folk theatre as : yatra , Terukkuth tamasha and puppet theatre	1	U,An,Ap
CO3	Analyse the moments of IPTA (Indian progressive theatre association)	1	U,An

#### COURSE TITLE-THEATRE TECHNIQUES AND DESIGNING-2

#### COUSE CODE-BVTS-205

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Explain abhinaya according to Natyashastra , rasa and bhava	4,5	U,An
CO2	Understand the concept of blocking in any scenes	4,5	U,An,AP



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CO3	Analyse and understand the process of play development	4,5	U,An,Ap
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### COURSE TITLE-STAGE CRAFT-2

#### COUSE CODE-BVTS-206

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of ground plans of the theatre stage , stage types and areas	2,3	U,An,Ap
CO2	Explain stage properties: Trim properties , Set properties and Hard properties	2,3	U,An,Ap
CO3	Analyse scenic construction , set decoration , stage safety and scenic drawing stage craft tools and materials	2,3	U,An,Ap

### COURSE TITLE-PERFORMING ARTS – 2 (MUSIC INSTRUMENTS)

#### COUSE CODE-BVTS-207

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the playing techniques of selected instruments and shudh and Vikrit swaras	4	U,An
CO2	Understand the concept of Razakhani gat in rag yaman and cinematic songs or dhun to be played on any musical instrument	4	U,An,AP
CO3	Understand the concept of simple instrumental compositions or rhythms in theatre	4	U,An,Ap





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### SEMESTER-3

#### COURSE TITLE-FORMS OF DRAMA AND THEATRE

##### COUSE CODE-BVTS-301

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Explain the forms of theatre: Tragedy , Comedy , Melodrama and Farce	1,7	U,An
CO2	Understand and analysis realistic theatre and epic theatre	1,7	U,An
CO3	Analyse realistic play: Court Martial by Swadesh Deepak and Poetic play: Loona by Shiv Kumar Batalavi	1,7	U,An

#### COURSE TITLE-STAGE CRAFT-3

##### COUSE CODE-BVTS-302

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of stage lighting , types of lighting and Importance of lighting cue sheet	2,3	U,An,Ap
CO2	Applying the technique of light designing according to a play production	2,3	U,An,Ap
CO3	Understand and analyse special effect lights , demonstration of light , apparatus and cross section of the theatre	2,3	U,An

#### COURSE TITLE-STUDY OF THEATRICAL SCRIPT AND PLAY

##### COUSE CODE-BVTS-303

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels



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CO1	Understand the principles of script analysis on a given situation and the basics of character analysis	1,2	U,An
CO2	Understand the subtext and interpretation of play using internal and external aids	1,2	U,An
CO3	Read and analyse play 'Aashad ka ek din' by Mohan Rakesh and Punjabi play ' Subadhra' by I.C Nanda	1,2,7	U,AN

### COURSE TITLE-PERFORMING ARTS-3 (DANCE)

#### COUSE CODE-BVTS-304

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Remember teen taal and ek taal on Handin EKgun & Dogun and understand the concept of dance presentation	4,6	R,An
CO2	Learn flexibility through dance and gain knowledge on hand movement , eye movement and facial expressions	4,6	U,An,Ap
CO3	Apply the technique of dance: Contemporary dance and Folk dance ( Bhangra , Jhummar , Sami , Ludi and Gidha)	4,6	U,Ap

### COURSE TITLE-PRODUCTION MANAGEMENT

#### COUSE CODE-BVTS-306

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of production management: pre-production , production phase and post-production phase	5	U,An,Ap
CO2	Understand and apply the techniques of production management	5	U,Ap
CO3	Explain and analyse the production management according to play production	5	U,An

### SEMESTER-4



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### COURSE TITLE-FUNDAMENTALS OF DIRECTION-1

#### COUSE CODE-BVTS-401

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Study the production process from directorial point of view and use of different elements in achieving the ultimate goal in play production	6	U,Ap
CO2	Understand the techniques of interpretation and blocking the scenes	6	U,An,Ap
CO3	Understand and analyse the role of director , actor and production designer	6	U,An,Ap

### COURSE TITLE-STAGE CRAFT-4

#### COUSE CODE-BVTS-402

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of handling sound system , varieties of microphones and public addressing system	2,3	U,An,Ap
CO2	Understand the working of Audio Mixer: Analogue and digital mixer and graphic equalizers	2,3	U,An,Ap
CO3	Understand the technique of sound system and understand the concept of powered speakers , amplifies and audio processors	2,3	U,An,Ap

### COURSE TITLE-FUNDAMENTAL OF ACTING-1

#### COUSE CODE-BVTS-403

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the art of acting and tools of an actor	6	U,Ap



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CO2	Explain expressions , gesture , posture , movement , voice and language on a given theme	6	U,An,Ap
CO3	Understand and analyse modern techniques of acting and analyse different characters from an actor's point of view	6	U,An,Ap

### COURSE TITLE-AUDIO PRODUCTION

#### COUSE CODE-BVTS-404

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand digital audio and working of various audio file formats	2	U,An,Ap
CO2	Understand the basic of sound editing techniques and sound processes	2	U,An,Ap
CO3	Understand and analyse the aesthetics and techniques of multi-track sounds	2	U,An,Ap,C

### SEMESTER-4

#### COURSE TITLE-PRODUCTION DESIGN WORKSHOP

#### COUSE CODE-BVTS-406

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the basics of camera operations and camera accessories	5	U,Ap
CO2	Understand and analyse shot division , shot composition , camera movements , camera shot and camera angles	5	U,An,Ap
CO3	Understand and analyse the concept of video editing: NLF software interphase and its basic operations	5	U,An,Ap

### SEMESTER-5





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### COURSE TITLE-HINDI THEATRE

#### COUSE CODE-BVTS-501

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the history of Hindi theatre and contribution of some prominent contemporary directors of Hindi theatre	1,7	U,An
CO2	Understand and analyse theatrical study of realistic play and poetic play	1,7	U,An
CO3	Analyse "Aashad ka ek din" by Dharamvir Bharti and "Sadgati" BY Munshi Premchand	1,7	U,An

### COURSE TITLE-CREATIVITY AND ENOVATION IN THEATRE

#### COUSE CODE-BVTS-502

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand and explain the imagination , observation , Creativity and Imitations in theatre	1	U,An
CO2	Explain the concept of experimental theatre and its evaluation and development	1	U,An
CO3	Analyse the different aspects of theatrical activities: social , political and religious	1	U,An

### COURSE TITLE-STAGE CRAFT MAKEUP

#### COUSE CODE-BVTS-503

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels



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CO1	Understand the concept of makeup and its need in theatre	2	U,An
CO2	Explain the technique of applying theatre makeup and uses of mask and wigs	2	U,An,AP
CO3	Apply and analyse the application techniques according to facial shapes and according character	2	An,Ap

### COURSE TITLE-FILM APPRECIATION

#### COUSE CODE-BVTS-504

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the history of Indian cinema ; Hindi cinema and Punjabi cinema	7	U,An
CO2	Understand the concept of feature films and documentary films	6,7	U,An
CO3	Analyse story , Scripts , Screenplay and Dialogues	6,7	U,An

#### COURSE TITLE-PERFORMING ARTS (STEET PLAY AND MIME)

#### COUSE CODE-BVTS-505

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of short plays and their techniques	1,3	U,An
CO2	Understand and analyse street play and mimes according to a particular theme	1,3	U,An
CO3	Analyse and Understand the musical Nukkad Natak performances	1,3	U,Ap,An

### SEMESTER-6



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### COURSE TITLE-PUNJABI THEATRE

#### COUSE CODE-BVTS-601

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the history of Punjabi theatre: origin , development and morden period	1,7	U,An
CO2	Explain the contribution of contemporary directors of Punjabi theatre: Ajmer singh Aulakh , Kewal Dhaliwal , Neelam Maan singh	1,7	U,An
CO3	Understand and analyse the dramatization of a Punjabi story and analyse the play 'Dhamak nagare di' by Gursharan singh chani	1,7	U,An

### COURSE TITLE-THEATRICAL COSTUMES

#### COUSE CODE-BVTS-602

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of costume designing according to a historical play	2	U,An,Ap
CO2	Explain and analyse the role of costume designer and contemporary costumes trends in theatre	2	U,An,Ap
CO3	Understand and analyse the basic features of man and women character costumes	2	U,An,Ap

### COURSE TITLE-CRITICAL STYUDY OF INDIAN AND WESTERN THEATRE

#### COUSE CODE-BVTS-603

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the study of Indian and western theatre directors: Abraham alkazi and William Shakespeare	1,7	U,An



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CO2	Understand the acting techniques of Indian and western theatre directors: Bertolt breth	1,7	U,An
CO3	Understand and analyse the structure of classical Indian play and western play	1,7	U,An

### COURSE TITLE-STAGE CRAFT (SPECIAL EFFECTS AUDIO VISUAL)

#### COUSE CODE-BVTS-604

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the special effects apparatus: its usage and demonstration	2,3	U,Ap
CO2	understand the projection and software sound effects	2,3	U,Ap
CO3	Understand and analyse sources of sound effects , vintage effects and projection Morden effects	2,3	U,An,Ap

### COURSE TITLE-EVENT MANAGEMENT

#### COUSE CODE-BVTS-605

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Explain the concept of event management and its process	2,5	U,An
CO2	Understand the concept of social awareness through the event management process	2,5	U,An
CO3	Understand and analyse the advertisement of an event: Poster , Broacher , Flex board , Social media and Invitation	2,5	U,An





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### SEMESTER-6

#### COURSE TITLE-ONE PRODUCTION

#### COUSE CODE-BVTS-607

SR. NO	On completing the course, the student will be able to:	PSOs addressed	Cognitive Levels
CO1	Understand the concept of theatrical production	1,5	U,An
CO2	Understand and apply the technique of play production	1,5	U,An
CO3	Understand and analyse play production according to theme	1,5	U,An,Ap



Estd. 1892

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### B.SC. BIOTECHNOLOGY

#### Program Specific Outcomes (PSOs) & COURSE OUTCOMES (COs)

<b>PSO-1</b>	To gain knowledge through theory and practical.
<b>PSO-2</b>	To establish a solid foundation at the cellular, molecular, genetic, and metabolic levels.
<b>PSO-3</b>	To make agricultural practices more efficient through the use of plant tissue culture and recombinant DNA technology.
<b>PSO-4</b>	To gain understanding of biomolecules, including their formation and interaction.
<b>PSO-5</b>	To do research on microorganisms and strain improvement for industrial applications.
<b>PSO-6</b>	To instill safe laboratory practices and procedures.
<b>PSO-7</b>	To get knowledge on different techniques and the usage of laboratory instruments.



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### COURSE OUTCOMES (COs)

Course Title: Cell Biology

Course code: BTL101

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about the Cell and the projections about the origin of the cell along with the key features of The Cell theory. Students will be able to differentiate prokaryotic and eukaryotic cells in details	1, 3,4,5	R, U
CO-2	Learn about the structural details and the functional organization of the cell; ultrastructure of cell membranes	1,3,4	R, U
CO-3	Learn about the structure and function of cell organelles (cytosol, Golgi bodies, endoplasmic reticulum (rough and smooth), ribosomes, cytoskeletal structures (actin, microtubules etc.), Mitochondria, chloroplasts, lysosomes, peroxysomes, nucleus (nuclear membrane, nucleoplasm, nucleolus, chromatin).	1,3,5	U
CO-4	Understand the concept of Cell Division and Cell Cycle, Cell-cell interaction Cell locomotion (amoeboid, flagellar and ciliar)	1,2,5	U
CO-5	Gain knowledge about biological Membranes, supramolecular architecture and solute transport across membranes; Model membranes and Liposomes.	1,2,5	U



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Course Title: Cell Biology lab

Course code: BTP121

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Define the characteristics and differentiate Prokaryotic cells (Lactobacillus, E. coli. Blue green algae) from Eukaryotic cells; Testicular material (for studies of spermatogenesis)	1,3,5	R, U, Ap, An
CO-2	Identify the electron micrographs of various cell organelles like plasma membrane, Mitochondria, Golgi complex, Lysosomes, Endoplasmic Reticulum (smooth and granular), Cilia, Centrioles, inclusions like glycogen, lipids, etc.	1,3,5,7	R, U, Ap, An
CO-3	Perform section cutting of tissues and learn staining methods (Haematoxylin/eosin method) of tissues for the preparation of permanent slides, identify permanent slides of various tissues (gut region, liver, lung, spleen, kidney, pancreas, testis, ovary, tongue, skin etc.).	1,3,4,7	U, Ap, An
CO-4	Handle the preparation and microscopic examination of Buccal Smear, observe Barr body in human squamous epithelial cells.	1,3,4,7	U, Ap, An
CO-5	Perform microtomy of Plant Tissue specimens	1,3,4,7	U, Ap, An





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Course Title: Cell Biology

Course code: BTL101

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about the Cell and the projections about the origin of the cell along with the key features of The Cell theory. Students will be able to differentiate prokaryotic and eukaryotic cells in details	1, 3,4,5	R, U
CO-2	Learn about the structural details and the functional organization of the cell; ultrastructure of cell membranes	1,3,4	R, U
CO-3	Learn about the structure and function of cell organelles (cytosol, Golgi bodies, endoplasmic reticulum (rough and smooth), ribosomes, cytoskeletal structures (actin, microtubules etc.), Mitochondria, chloroplasts, lysosomes, peroxysomes, nucleus (nuclear membrane, nucleoplasm, nucleolus, chromatin).	1,3,5	U
CO-4	Understand the concept of Cell Division and Cell Cycle, Cell-cell interaction Cell locomotion (amoeboid, flagellar and ciliar)	1,2,5	U
CO-5	Gain knowledge about biological Membranes, supramolecular architecture and solute transport across membranes; Model membranes and Liposomes.	1,2,5	U

Course Title: Botany-1

Course code: BTL102

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Understand the diversity of plant kingdom	1,2,5	R, U
CO-2	Learn morphology and anatomy of plants	1,5	R, U



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CO-3	Understand the process of reproduction and the development of reproductive organs in flowering plants	1,3,5	U
CO-4	Learn different systems of classification of plants	1,2,3	U
CO-5	Learn different terminologies pertaining to floral description	1,2,3	U
CO-6	Understand the economic importance of plants belonging to different families	1,2,5	U

Course Title: Botany-1 Lab

Course code: BTP-122

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn different terminologies pertaining to description of flowers	1,2,3	R,U
CO-2	Learn anatomy of plants	1,2,5	R,U
CO-3	Understand the process of micro and megaspore genesis and female gametophytes and endosperms	1,2,3,5	R,U

Course Title: Biochemistry-I (Biomolecules)

Course code: BTL-103

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn water- a unique element in this universe along with its utility and its role as an elixir of life on the earth.	1,2,5	R, U
CO-2	Get knowledge on 'Hydrates of Carbon' as most important energy producing molecules with in the living cell along with their diverse roles	2,4,5	U



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<b>CO-3</b>	Understand the compositional related role of Lipids as group of diverse molecules compiles under single term, present as the most prominent components of the biological membranes along with their physiological roles.	1,2,3,4,5	U
<b>CO-4</b>	Study apprehension about the composition and roles of proteins as biological macromolecular functional units of living cell along with their structural hierarchy.	1,2,5	U

Course Title: Biochemistry-I (Biomolecules) lab

Course code: BTP123

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Study Spectrophotometric analysis viz. (Ultra violet and Visible) using spectrophotometer and colorimeter.	1,2,3,4,7	U,Ap,An
<b>CO-2</b>	Understand quantitative estimations of Protein by different methods based upon the amino acid composition.	3,4,7	U,Ap,An,E
<b>CO-3</b>	Study the carbohydrate content estimations and sample analysis for different types of sugars.	3,4,7	U,Ap,An,E
<b>CO-4</b>	Study quality characteristics analysis for fats viz. acid and saponification value.	1,2,3,4,7	U,Ap,An,E
<b>CO-5</b>	Study acid-base volumetric titrations along with PK determination.	2,3,4,7	U,Ap,An,E

Course Title : General Microbiology-I

Course code: BTL104

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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<b>CO-1</b>	Study the concepts of microbial biotechnology and general features of various micro-organisms, antibiotics.	1,2,5	R,U,Ap,An
<b>CO-2</b>	Study bacterial growth curves and batch cultures	1.2.4.5	U,Ap
<b>CO-3</b>	Learn the principle, working and design of various microscopes.	1,2,3,4,5	U, An
<b>CO-4</b>	Gain knowledge on role of microbes in food industry.	1,5	U,Ap,An
<b>CO-5</b>	Get themselves acquainted with microbes and know about fruits and fines coming from microbes.	1,2,5	U, An

**Course Title : General Microbiology-I Lab**

**Course code: BTP124**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Become aware of role of microbes in daily life.	1,2,5,7	U,Ap,An
<b>CO-2</b>	Learn to maintain proper hygiene in day to day life.	2,3,5,7	U,Ap,An
<b>CO-3</b>	Have hands on experience of quality control testing in food, feed, diagnostic and water testing industry.	3,4,7	U,Ap,An
<b>CO-4</b>	Learn planning and execution of the procedure involved in a systematic way.	2,3,4,7	U,Ap,An
<b>CO-5</b>	Learn ethics of working and team spirit.	3,4,7	U,Ap,An

**Course Title : Chemistry-I (Inorganic Chemistry)**  
**BTL105**

**Course code:**





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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about Werner's theory, isomerism in coordination compounds, valence bond theory of transition metal complexes.	1,5	U
CO-2	Learn about various theories like VBT, CFT for explain the bonding in coordination complexes.	1,2,3,5	U
CO-3	Understand the splitting pattern of d-orbitals under different geometries and factor effecting splitting of orbitals.	1,2,3,5	U
CO-4	Derive spectroscopic terms of various configurations	2,4	U,Ap,An
CO-5	Learn about crown ethers, cryptands, macrocyclic ligands and their applications	1,3,4,5	U,Ap

Course Title : Chemistry-I (Inorganic Chemistry) Lab  
BTP125

Course code:

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Perform volumetric analysis through iodometric, iodometric and redox titrations and study their utility.	1,3,4	U,Ap,An
CO-2	Carry out water analysis for its hardness and amount of dipositive ion present.	1,3,4	U,Ap,An
CO-3	Perform the preliminary analysis on the mixture of two salts.	2,3,4	U,Ap,An
CO-4	Learn to identify cations and anions in the mixture	3,4	U,Ap,An

Semester-II

Course Title: Zoology-I

Course code: BTP171



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Develop understanding on various fundamental concepts related to physiology of digestion & absorption	1,2,5	U
CO-2	Develop understanding on circulatory system and blood components		U
CO-3	Get familiar with the topics related to nervous and muscular system and their working	1,5	U
CO-4	Learn various aspects of respiratory system and exchange of respiratory gases	1,2	U
CO-5	Develop an understanding of endocrine glands, their functioning and associated disorders	1,2,5	U

Course Title : Zoology-I Lab

Course code: BTP171

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Develop skill for the observation of blood cells.	1,3,4	U
CO-2	Attain knowledge on qualitative analysis of Macro molecules.	1,2	R,U, Ap,An,E
CO-3	Understand the structure and function of various systems of human.	1,2,3	U



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<b>CO-4</b>	Get basic understanding about the experimental methods and designs that can be used for further study and research.	1,2,3,4,5	U, Ap,An
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Course Title : (Genetics)

Course code: BTL-152

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Understand the chemical basis of heredity	1,5	U
<b>CO-2</b>	Gain knowledge on genetic methodology and how quantification of heritable traits in families and populations provide insight on the cellular and molecular mechanisms.	2,3,5	U, Ap,An
<b>CO-3</b>	Gain ability to evaluate conclusions that are based on genetic data.	2,3,4	U, Ap,An,E
<b>CO-4</b>	Understand the role of genetic technologies in industries related to biotechnology, pharmaceuticals, energy, and other fields.	2,3,5	U, An,E
<b>CO-5</b>	Learn teamwork and leadership skills including group analysis of data, working together in the research laboratory, joint compositions of written reports, substantive participation in research group meetings etc.	1,2,3,4,5	U, Ap,An,E,C

Course Title : (Genetics) Lab

Course code: BTL172



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Study the structural and numerical chromosomal aberrations and their consequences.	1,2,5	U,Ap,An,E
CO-2	Solve numerical problem related to mendelism, paternity disputes & multiple allelism.	1,2,3,4	R,U, Ap,An,E
CO-3	Know about various syndromes in humans.	1,2,5	U, Ap,An,E
CO-4	Understand the sex linked inherited characters and diseases.	1,2,5	R,U, Ap,An,E
CO-5	Get in depth knowledge about gene interaction, penetrance and expressivity	2,5	R,U,Ap,An,E
CO-6	Demonstrate proficiency in understanding the basic structure of atom and interpret the inheritance of characters by using linkage and crossing over.	2,3,4	R,U, Ap,An,E

Course Title :Biochemistry-II (Bioenergetics and Enzymology) Course code: BTL153

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about types of biochemical reactions involved in the cellular metabolism along with their regulatory mechanisms as well as evolutionary aspects of metabolic pathways	1,2	R,U





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CO-2	Understand the overall bioenergetics involved in coupled metabolic pathways along with involvement of energy rich compounds.	1,2,5	R,U
CO-3	Acquire understanding on basic enzymology of cellular metabolism along with catalytic reactions.	1,2,5	U,An
CO-4	Learn about kinetics of the enzymatic reactions along with different types of regulation and inhibition mechanisms.	1,2,5	U,An

**Course Title: Biochemistry-II (Bioenergetics and Enzymology) Lab**

**Course code: BTP173**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Study hydrolysis of glycosidic linkage in polysaccharides.	1,2,3	R,U
CO-2	Study pH dependent phosphate esters hydrolysis by the action of phosphomonoesterase enzyme.	1,3,4	R,U,Ap,An,E
CO-3	Study the determination of the temperature as well as pH <sub>optima</sub> of enzymatic reactions.	2,3,5	U, Ap,An,E
CO-4	Study the significance of substrate concentration in estimating the velocity of the enzyme catalyzed reactions.	1,2,3,4	U, Ap,An,E



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<b>CO-5</b>	Demonstrate major types of the enzyme inhibitions	1,2,3,4,5	U, Ap,An,
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Course Title : General Microbiology-II

Course code: BTL154

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Understand the concepts of industrial, medical, environmental microbiology	1,2,5	R,U
<b>CO-2</b>	Be aware of etiology of disease can know live a healthy and disease-free life	1,2,5	R,U,
<b>CO-3</b>	Learn the higher and complex principles of all fields of microbiology.	1,2,3	U,An
<b>CO-4</b>	Gain knowledge on the role of microbes in food industry.	1,2,5	U,An
<b>CO-5</b>	Become fully acquainted with the microbes as part of our daily life and know about fruits and fines coming from microbes.	1,2	U,An

Course Title :General Microbiology-II Lab

Course code: BTP174

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Become aware of procedures to evaluate various types of microbes and quantify them according to various standards.	1,2,3,5,7	R,U
<b>CO-2</b>	Have first - hand knowledge on quality control testing and analytical micro biology as is applicable to various industries.	1,2,3,4,5,7	U,Ap,An,E



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# ਖਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

## Khalsa College Amritsar

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UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

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<b>CO-3</b>	Have hands-on training on sterilization techniques, media preparation, and isolation of micro-organisms, bacterial/fungus staining and mounting methods.	1,2,3,4,7	U,Ap,An,E
<b>CO-4</b>	Apply their knowledge to get suitable job after completion of their degree.	1,2,3,4,5,7	U,Ap,An,E

Course Title : Biomathematics and Biostatistics  
Course code: BTL155

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Learn to solve Statistical problems using various measures of central tendency.	1,3,4	U,Ap,An,E
<b>CO-2</b>	Learn how to collect the data and present it diagrammatically.	1,2,5	U,Ap,An,E
<b>CO-3</b>	Learn to establish linear association between two variables by using correlation technique.	1,3,4,5	U,Ap,An,E
<b>CO-4</b>	Understand various sampling techniques.	1,2,3,4,5	U,Ap,An,E
<b>CO-5</b>	Apply various techniques of testing of hypothesis.	2,3,4	U,Ap,An,E

Course Title : Fundamentals of Biotechnology

Course code: BTL201

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Learn about the use of biotechnological applications in healthcare and society welfare.	1,2,5,6,7	R,U



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<b>CO-2</b>	Explore new biotechnological tools and their uses to discover new drugs and techniques .	2,3,4,6,7	R,U
<b>CO-3</b>	Learn the application of bioinformatic tool- BLAST and its applications in determining the structure and function of different biomolecules.	1,2,3,4,5	U, Ap
<b>CO-4</b>	Examine the recent discoveries related to structure and functioning of biomolecules through the use of different bioinformatics tools.	1,2,3,4,5	U, Ap,An
<b>CO-5</b>	Learn about fundamentals of bioinformatics and use this knowledge to explore recent discoveries in the field of biotechnology.	1,2,3,4,5,7	U, Ap,An

Course Title : Fundamentals of Biotechnology Lab

Course code: BTP 221

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Gain information about the different steps to clean and maintain the bio technological laboratory.	1,2,3,4	R,U
<b>CO-2</b>	Get hands on training on the working of different instruments , which will help them to conduct biochemical testing of bio-molecules.	1,3,4	R,U, Ap,An,E
<b>CO-3</b>	Get information about the procedure to dispose the harmful and toxic biomedical waste to avoid the spread of infectious diseases.	1,2,5	U, Ap,An,E
<b>CO-4</b>	Get information regarding the protocol to patent thebiotechnological products. It will boost students to develop useful products and safeguard them from illegal practices.	1,2,5	U, Ap,An,E,C
<b>CO-5</b>	Explore different areas of biotechnology in useful manner.	1,2,3,4,5	U, Ap,An,E,C





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Course Title : Immunology-I

Course code: BTL 202

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Understand and demonstrate basic knowledge on immunological processes at the cellular and molecular levels.	1,2,5	U
CO-2	Distinguish between innate and adaptive immunity, humoral and cell mediated responses.	1,2,5	R,U
CO-3	Understand the cell types and organs involved in the immune response.	1,2,5	U,An
CO-4	Acquire knowledge about the antigens, different types of Immunoglobulins, and the complement system	1,2,5	U,An
CO-5	Describe the immune system's roles in identification, presentation and processing of the antigens.	1,2,5	U

Course Title : Chemistry-II (Organic)

Course code: BTL203

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Get basic knowledge on the nomenclature, structure, stability and method of preparation of various reaction intermediates.	1,2,5	R,U
CO-2	Get knowledge on various field effects like Inductive, Electromeric, Resonance and Hyperconjugation along with some interactive forces.	1,2,5	U
CO-3	Practice on the electrophilic substitution on the aromatic systems and get information on the directive influence of various groups on these reactions.	1,2,3,4	U



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<b>CO-4</b>	Get knowledge on some aspects of stereochemistry, Chirality, Prochirality, R-S and related topics.	1,2,4	U
<b>CO-5</b>	Get detailed knowledge on the Nucleophilic Substitution reactions SN1 and SN2 and the factors effecting these reactions.	1,2,5	U

Course Title : Chemistry-II (Organic) Lab  
Course code: BTP223

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Perform various functional group tests in the identification of organic compounds such as phenols, carboxylic acids, carbonyl compounds, carbohydrates etc.	1,2,3,5,6,7	R,U,Ap,An,E
<b>CO-2</b>	Perform systematic qualitative analysis of organic compounds for the detection of elements	1,3,5	U, Ap,An,E
<b>CO-3</b>	Study the identification of the compounds and preparation of derivative and determination of its melting point.	1,3,4,5	U, Ap,An,E

Course Title : Immunology-I Lab  
Course code: BTP222

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Learn about the diagnostic methods like TLC, DLC.	1,3,4,7	R,U,Ap,An,E
<b>CO-2</b>	Differentiate between different types of white blood cells.	1,3,4,5,7	U, Ap,An,E
<b>CO-3</b>	Understand the difference between blood plasma and serum and also about their role in clinical field.	1,2,5,7	U, Ap,An,E



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<b>CO-4</b>	Perform different immunological techniques such as hemagglutination	1,2,3,4,5,7	U, Ap,An,E
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Course Title :Botany-II

Course code: BTL204

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	To understand the role of water and water related processes in plants	1,5	R,U
<b>CO-2</b>	To deeply learn the process of plant adaptation under stressed environment (cold, heat, drought and salt)	1,2,5	R,U
<b>CO-3</b>	To gain knowledge about role of stress induced proteins and osmolytes in plants under the influence of abiotic stressors	1,2,5	R,U
<b>CO-4</b>	To understand the disease cycle of the pathogens causing diseases in plants, the symptoms it causes and the epidemiology of the disease	1,2,3,5	R,U
<b>CO-5</b>	To learn the importance of biodiversity and population growth and its characteristics.	1,2,5	R,U

Course Title :Botany-II Lab

Course code: BTP224

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Learn about water content, osmotic potential and transpiration in plants	1,2,5	R,U
<b>CO-2</b>	Learn about separation of pigments and process of photosynthesis.	1,3,5	R,U
<b>CO-3</b>	Study different plant pathogens	1,2,5	R,U



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**Course Title : Biochemistry-III (Metabolism of Carbohydrates and Lipids)**

**Course code: BTL205**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about the carbohydrates and lipids anabolic and catabolic processes.	1,2,5	R,U
CO-2	Learn about the carbohydrate and lipid metabolism regulatory processes and pathways at molecular level	1,3,4	R,U

**Course Title : Biochemistry-III (Metabolism of Carbohydrates and Lipids) Lab**

**Course code: BTP225**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about the basic concept of molarity, normality & prepare reagents and buffers.	1,3,5	R,U,Ap
CO-2	Be aware of the clinical significance of oral glucose tolerance test and HbA1c	1,2,3	U
CO-3	Handle microscopes, spectrophotometer and other lab equipments.	1,2,3,4,5	U, Ap

Course Title :Molecular Biology  
BTL206

Course code:





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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Get knowledge on the basic structure and functions of nucleic along with replication of genetic material in prokaryotes and eukaryotes.	1,2,5	R,U
CO-2	Understand molecular events of Transcription and processing of transcripts, RNA editing.	1,2,5	U
CO-3	Study molecular Events of Translation leading to protein synthesis and Post translational modification.	1,2,5	U
CO-4	Get insight into the process of recombination and mutations.	1,2,5	U
CO-5	Understand and apply the principles and techniques of molecular biology which prepare them for further education, basic and applied research	1,2,3,4,5	U

course Title : Molecular Biology Lab

Course code: BTP226

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Understand the terminology of the main techniques of molecular biology.	1,2,5,7	R,U
CO-2	Understand the Isolation of genomic DNA from plants and Gel casting and Setting up of gel apparatus.	1,2,5,7	U,Ap
CO-3	Learn about the preparation of Agarose gel for agarose gel electrophoresis.	1,3,4,7	U,Ap, An
CO-4	Gain knowledge on the quantification of DNA by spectrophotometric and fluorometric (Ethidium bromide) analysis.	1,2,3,4,5,7	U,Ap,An



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Course Title : Industrial Biotechnology-I  
BTL251

Course code:

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Apply biotechnology to industrial processes and gain knowledge on the basic fermentation process.	1,3,4,5,6,7	R,U,Ap
CO-2	Identify suitable methods of isolation, identification and preservation of microbes and the inoculum development and media formulation process.	1,2,3,4,7	U,Ap
CO-3	Understand how bacteria and other microbes can be manipulated by recombinant DNA technology or selective isolation for the use in industrial processes to generate products of interest.	1,2,3,4,7	R,U
CO-4	Learn the basic steps involved in production of curd, yoghurt, cheese, bread, primary and secondary metabolites. Students will also get familiarized with the role of proteases in leather processing industries.	1,2,3,4	U,Ap

Course Title : Industrial Biotechnology-I Lab

Course code: BTP271

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Perform the serial dilution, spread plate and pour plate method of bacterial isolation.	1,2,3,4,5,7	U,Ap
CO-2	Measure the dimensions of microorganisms under microscope by a technique known as micrometry.	1,3,4,5,7	R,U,Ap,An



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CO-3	Differentiate between coliforms i.e., bacteria of the genera Escherichia and Enterobacter, into species and varieties.	1,3,4,5	R,U,Ap,An
CO-4	Prepare starter cultures for the fermentation process.	1,3,4,7	U,Ap
CO-5	Determine whether the microorganism can reduce nitrate or not.	2,3,4,7	U,Ap,An

Course Title : Immunology-II

Course code: BTL252

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about T-cell subsets and surface markers and Hybridoma Technology	1,3,4	U,Ap
CO-2	Identify antigen-antibody interactions using techniques such as precipitation, immune-electrophoresis, agglutination, ELISA, and RIA	1,2,3	R,U,Ap
CO-3	Investigate the mechanisms underlying the immune response to various infectious agents such as bacteria, viruses, and parasites.	1,2,3,5	U
CO-4	Elucidate the reasons for immunisation and be aware of the various vaccinations.	1,2,3,4,5	U

Course Title : Immunology-II LAB

Course code: BTP272

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Understand the importance of vaccination.	1,2,5,6,7	U



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<b>CO-2</b>	Perform single and double immunodiffusion technique for the detection, identification and quantification of antibodies and antigens.	1,2,3,5,7	R,U
<b>CO-3</b>	Determine whether a patient had any infection, for e.g., Salmonella typhi infection by using agglutination reactions.	1,2,3,4,5,7	U,Ap
<b>CO-4</b>	Apply immunological techniques such as direct and indirect ELISA as a diagnostic tool.	1,2,3,4,5,7	U,Ap

Course Title : (Metabolism of Proteins and Nucleic acid)

Course code: BTL253

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Study complete catabolism of essential Amino Acids and Nucleotides.	1,2,5	U
<b>CO-2</b>	Get themselves acquainted with the Biosynthesis of essential Amino Acids and Nucleotides.	1,2,5	R,U
<b>CO-3</b>	Understand the abnormalities in the metabolism of Amino Acids and Nucleotides and their relationship to various diseases.	1,2,5	U,An
<b>CO-4</b>	Understand biological processes and acquire information about the regulation of these pathways.	1,2,5	U,An

Course Title : Biochemistry-IV lab (Metabolism of Proteins and Nucleic Acid)

Course code: BTP273

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Gain experimental and quantitative skills encompassing preparation of laboratory reagents, conducting experiments, analysis of data and the interpretation of results.	1,2,3,4,5	R,U,Ap
<b>CO-2</b>	Get awareness of resources, and their conservation.	1,2,5,6	U,Ap





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<b>CO-3</b>	Develop a conceptual and practical understanding of protein isolation using protein isoelectric point and salt precipitation.	1,2,3,4,5	U,An
<b>CO-4</b>	Understand the estimation of biomolecules , Amino Acids ,cholesterol and fat content of a sample.	1,2,3,4,5,6	U,Ap

Course Title : Skill Development in Biotechnology  
Course code: BTL254

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Learn about the strategies of mass production, packing and registration of biofertilizers.	1,3,5,7	U,Ap
<b>CO-2</b>	Learn different methods to collect blood samples from different body parts of humans in order to perform clinical diagnostic tests.	1,2,3,4,6,7	R,U,Ap,An
<b>CO-3</b>	Learn to estimate CBC, TLC, DLC, bleeding count, clotting time, ESR, X-ray, MRI, CT scan, ECG, ECHO, ultrasonography and PCB.	1,2,3,4,5,7	U,Ap,An,E
<b>CO-4</b>	Understand the life cycles of various bacterial, viral and fungal diseases like Dengue, Chickengunia, Covid-19, Swine flu, Tuberculosis and Candidiasis.	1,2,3,4,5,7	U,An
<b>CO-5</b>	Learn about bio entrepreneurship in order to perform business and learn market strategy of healthcare products.	1,2,3,4,5	U,Ap

Course Title : Skill Development in Biotechnology Lab  
Course code: BTL274



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Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about the strategies of mass production, packing and registration of biofertilizers.	1,2,3,4,5	R,U
CO-2	Learn different methods to collect blood samples from different body parts of humans in order to perform clinical diagnostic tests.	1,2,3,4,5	R,U,Ap
CO-3	Learn to estimate CBC, TLC, DLC, bleeding count, clotting time, ESR, X-ray, MRI, CT scan, ECG, ECHO, ultrasonography and PCB	1,2,3,4,5	U,Ap
CO-4	Understand the life cycles of various bacterial, viral and fungal diseases like Dengue, chickengunia, Covid-19, Swine flu, Tuberculosis and Candidiasis.	1,2,3,4,5	U,An
CO-5	Learn about bio entrepreneurship in order to perform business and the market strategy of healthcare products.	1,2,3,4,5	U,An

Course Title : Fundamental of Bioinformatics  
Course code: BTL255

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about the general introduction to computers and the organization of different parts of computers.	1,2,3,4,5	R,U,Ap
CO-2	Understand about the history, milestones and applications of bioinformatics.	1,2,5	R,U,Ap



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<b>CO-3</b>	Learn the application of bioinformatic tool-BLAST and its applications in determining the structure and function of different biomolecules.	1,2,3,4,5	U,Ap,An
<b>CO-4</b>	Examine the recent discoveries related to the structure and functioning of biomolecules through the use of different bioinformatics tools.	1,2,5	U,Ap,An
<b>CO-5</b>	Learn about fundamentals of bioinformatics and use this knowledge to explore recent discoveries in the field of biotechnology.	1,2,5	U,Ap

Course Title : Fundamental of Bioinformatics Lab

Course code: BTP275

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Learn about the general introduction to computers and the organization of different parts of computers.	1,2,5	R,U,Ap
<b>CO-2</b>	Learn the applications of bioinformatics.	1,2,5	R,U,Ap
<b>CO-3</b>	Learn the application of bioinformatic tool-BLAST and its applications in determining the structure and function of different biomolecules.	1,2,3,5	U,Ap
<b>CO-4</b>	Examine the recent discoveries related to the structure and functioning of biomolecules through the use of different bioinformatic tools.	1,2,3	U,Ap
<b>CO-5</b>	Learn about fundamentals of bioinformatics and use this knowledge to explore recent discoveries in the field of biotechnology.	1,2,3,4,5	U,Ap



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Course Title :Zoology-II

Course code: BTL256

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Develop understanding of concept, evolution & different proposed theories of evolution	1,2,5	R,U
CO-2	Develop understanding of origin of life and the concept of species and speciation	1,2,5	R,U
CO-3	Study Pathogenic protozoans, helminthes, their pathogenicity, prophylaxis & treatment.	1,2,3,5	U
CO-4	Have insight into physiology, biochemistry, reproduction and control measures of insect vectors.	1,2,5	U

Course Title :Zoology-II Lab

Course code: BTP276

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Understand various evolutionary phenomenon.	1,2,5	R,U
CO-2	Study the skeleton of man.	1,2,5	R,U
CO-3	Study the histology of man through permanent stained slides.	1,2,5,7	U
CO-4	Study the protozoans, parasitic helminthes , arthropods vectors of various diseases through permanent slides	1,2,3,4,5,7	U





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Course Title : rDNA Technology A

Course code: BT-501

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Become competent to perform genetic manipulation experiments by learning basic and advanced techniques.	1,2,3, 4,5	R,U,Ap
CO-2	Understand the recombinant DNA technology and become familiar with molecular biology in the context of the application of recombinant DNA technology to basic and applied research.	1,2,3,5	R,U,Ap
CO-3	Learn the key concepts of recombinant technology both from academic and industrial point of view.	1,2,3, 4,5	U,Ap
CO-4	Learn about DNA-modifying enzymes, vectors, blotting methodologies and labelling of probes.	1,2,3, 4,5	U,Ap

Course Title : rDNA Technology practical

Course code: BT-502

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Learn about nutrients required in the culture media and various factors influencing the growth of explant in plant tissue culture.	1,2,5,7	U,Ap
CO-2	Learn about sterilization techniques in plant tissue culture laboratory.	2,3,4,5,7	U,Ap
CO-3	Learn about physiological functions and biosynthesis of major growth regulators in plants.	1,2,5,7	U



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<b>CO-4</b>	Learn the concept of totipotency, cell differentiation, dedifferentiation and redifferentiation.	1,2,5	U
<b>CO-5</b>	Learn the procedure for the preparation of plant tissue culture media.	1,2,3,4,5,7	U,Ap
<b>CO-6</b>	Gain knowledge on different methods of gene transfer - Direct (Biolistics) and Indirect (agrobacterium mediated) gene transfer methods.	1,2,3,4,5,7	U,Ap

Course Title : Concepts of Plant Tissue Culture (Practical)  
Course code: BT-502

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Know the functions and operations of various instruments in plant tissue culture laboratory.	1,2,3,4,5	U,Ap,An
<b>CO-2</b>	Know the design set up for a plant tissue culture laboratory.	1,2,3,4,5	R,U,Ap
<b>CO-3</b>	Learn cleaning of glassware, plasticware and contaminated cultures.	1,2,5	R,U,Ap
<b>CO-4</b>	Learn about different types of enclosure used in plant tissue cultures.	1,2,3,4,5	U,Ap
<b>CO-5</b>	Learn different sterilization processes for instruments, glassware, thermolabile and thermostable components.	1,2,3,4,5	U,Ap
<b>CO-6</b>	Learn about the preparation of stock solutions and media for plant tissue culture.	1,2,3,4,5	U,Ap



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Course Title : Animal Tissue Culture  
Course code: BT-503

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Develop basic aseptic skills for mammalian cell culture and their applications.	1,2,3,5	U,Ap
CO-2	Understand the types of contamination and their effects	1,2,5	U
CO-3	Understand media constituents and media formulation strategies for mammalian cell culture.	1,2,3,,5	U
CO-4	Develop proficiency in establishment of primary cellculture.	1,2,3,5	U

Course Title : Animal Tissue Culture (Practical)  
code: BT-503

Course

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Focus on practical aspects of cell culture, like design and layout of the laboratory, aseptic technique, contamination, methods for measuring viability.	1,2,3,4,5,6,7	U,Ap
CO-2	Get hands on training on design and learn how to use the cell culture facilities.	1,2,3,4,5,7	R,U,Ap
CO-3	Get practical hands on experience on how to determine viability count of cultured cells.	1,2,3,4,5,7	U,An



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<b>CO-4</b>	Study and isolate lymphocytes for cell culture	1,2,3,4,5,7	U,Ap
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Course Title : PATENT LAWS IN BIOTECHNOLOGY

Course code: BT-504

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Understand the importance of intellectual property rights, patents laws, regulations and ethical issues.	1,2,3,4,5	R,U
<b>CO-2</b>	Get familiarized with the principles, objectives and agreements of international Organizations- WTO, WIPO	1,2,3,4,5	U,An
<b>CO-3</b>	Understand the significance of international policies and relations	1,2,3,4,5	U,An

Course Title : BIOPROCESS ENGINEERING – A

Course code: BT-505

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Apply engineering principles in determining and solving contemporary and complex problems related to bioprocessing.	1,2,3,4,5	U,Ap,An
<b>CO-2</b>	Apply mass and energy balances to calculate the concentration of different gases in the fermenter off-gas, amount of reactant used, amount of oxygen etc.	1,2,3,4,5	R,U,Ap,An
<b>CO-3</b>	Understand the mathematical modelling/kinetics of microbial growth, product synthesis and oxygen transfer.	1,2,3,4,5	U,An





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<b>CO-4</b>	Learn about the sterilization cycles for batch and continuous processes.	1,2,3,4,5	U,An
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Course Title : BIOPROCESS ENGINEERING – A (Practical)  
code: BT-505

Course

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Study the bacterial growth curve, specific growth rate and doubling time of bacteria	1,2,3,4,5,7	U,An
<b>CO-2</b>	Gain knowledge about the ex–situ and in–situ methods of sterilization.	1,2,3,4,5,7	U,An
<b>CO-3</b>	Analyze various parameters such as temperature and pH for the optimum growth of bacterial cultures.	1,2,3,4,5,7	U,An
<b>CO-4</b>	Learn about the production process of enzymes at industrial scale including the type of substrate, pH, temperature and dissolved oxygen concentration, required for the enzyme production.	1,2,3,4,5,7	U,An

Course Title : BT-506 Biophysical and Biochemical Techniques-ABIOPROCESS  
ENGINEERING – A (Practical)

Course code: BT-506

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Identify and differentiate working principle, instrumentation and applications of different bio-analytical instruments.	1,2,5	U,Ap,An
<b>CO-2</b>	Understand the principle and working of different centrifugation techniques and will be able to apply this process in various analytical examinations related to biotechnology and Health care.	1,2,5	R,U,Ap,An



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<b>CO-3</b>	Understand the basic concepts of spectroscopy and its applications in healthcare and drug discovery.	1,2,5	U,An
<b>CO-4</b>	Observe the biological behavior and physical properties of single protein or DNA molecules within a living cell and determine how the behavior of the single molecule influences the biological function of the organism.	1,2,3,5	U,Ap

**Course Title : Biophysical and Biochemical Techniques (Practical)**

**Course code: BT-506**

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Get good knowledge about the different types of rotors and also learn about how and when to use particular types of rotors during centrifugation process	1,2,3,4	U,Ap,An
<b>CO-2</b>	Study the separation of bio-molecules through paper chromatography and the presence of various molecules in given sample	1,2,3,5	U,Ap,An
<b>CO-3</b>	Separate mixture of proteins in very less time through the use of ion-exchange chromatography	1,2,3	U,Ap,An
<b>CO-4</b>	Separate protein from given sample mixture through the use of affinity column chromatography	1,2,3,4	U,Ap
<b>CO-5</b>	Understand the biophysical and biochemical properties of different types of bio-molecules	1,2,3	U,An

**Course Title : Physical, Organic & Inorganic Aspects of Spectroscopy-A**

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Course code: BT-507

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Analyze and interpret spectroscopic data collected by the methods discussed in the course.	1,2,3,4,7	U,Ap,An,E
CO-2	Solve problems related to the structure, purity and concentration of chemicals and study molecular interactions by choosing suitable spectroscopic methods.	2,3,4	U,Ap,An
CO-3	Pursue further research in synthetic chemistry.	1,2,3,4	U,Ap,An,E

Course Title : Physical, Organic & Inorganic Aspects of Spectroscopy-A (Practical)  
Course code: BT-507

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Solve problems related to the structure, purity and concentration of chemicals and study molecular interactions by choosing suitable spectroscopic methods.	1,2,3,4	U,Ap,An
CO-2	Pursue further research in synthetic chemistry.	2,3,4	R,U,Ap,An,E,C
CO-3	Analyze and interpret spectroscopic data collected by the methods discussed in the course.	2,3,4	R,U,Ap,An,E,C

Course Title : rDNA Technology-B



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Course code: BT-601

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Acquire knowledge about Eukaryotic Cloning, expression vectors and the construction of genomic and cDNA libraries.	1,2,3,4,5	R,U
CO-2	Understand techniques like PCR and microarray in relation to their application in medical and other fields.	1,2,3,4,5	U,An
CO-3	Study DNA sequencing technique, phage and plasmid display	1,2,3,4,5	U,An
CO-4	Get knowledge on the modern approaches used in genetic engineering.	1,2,3,4,5	U,An

Course Title :rDNA Technology (Practical)

Course code: BT-601

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Practically learn technique Plasmid isolation and agarose gel electrophoresis	1,2,3,4,5	U,Ap,An
CO-2	Practice technique in recombinant DNA technology like restriction digestion.	1,2,3,4,5	U,Ap,An,
CO-3	Get idea about transformation in bacterial cells and screening of transformants.	1,2,3,4,5	U,Ap,An,E
CO-4	Get hands-on training to perform Southern Blotting.	1,2,3,4,5	U,Ap,An

Course Title : Applications of Plant Tissue Culture (Practical)

Course code: BT-602

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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<b>CO-1</b>	Select, prepare, sterilize and inoculate the explants on culture medium.	1,2,3,4,5	U,Ap,An
<b>CO-2</b>	Micro-propagate plants from different explants.	1,2,3,4,5	U,Ap,An
<b>CO-3</b>	Know the significance and role of growth hormones in plant tissue culture medium.	1,2,3,4,5	U,Ap,An
<b>CO-4</b>	Induce callus from different explants.	1,2,3,4,5	U,Ap,An
<b>CO-5</b>	Culture anther, ovary and embryos in laboratory.	1,2,3,4,5	U,Ap

Course Title : Animal Biotechnology  
code: BT-603

Course

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Get prepared for the advance animal tissue culture and its applications.	1,2,3,4,5	U,Ap
<b>CO-2</b>	Get knowledge on commonly employed cell lines.	1,2,3,4,5	U,Ap
<b>CO-3</b>	Study the variety of transfection methods including important vectors are thought.	1,2,3,4,5	U,Ap
<b>CO-4</b>	Study genetic engineering of animal cells and techniques of animal cloning.	1,2,3,4,5	U

Course Title : Animal Biotechnology (Practical)  
Course code: BT-603

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Get hands-on experience in the isolation of DNA and RNA from animal cells.	1,2,3,4,5,7	U,Ap,An



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CO-2	Study the quantification of the DNA using spectrophotometer	1,2,3,4,5,7	U,Ap,An,
CO-3	Study the concept of affinity chromatograph through purification of IgG using protein A column.	1,2,3,4,5,7	U,Ap,An,E
CO-4	Learn the establishment, sub culturing and checking doubling time of a cell line.	1,2,3,4,5,7	U,Ap,An

Course Title : Intellectual Property Rights and Entrepreneurship  
Course code: BT-604

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Describe the different types of IPR.	1,2,3,4,5	R,U
CO-2	Explain the conditions of patentability for an invention.	1,2,3,4,5	R,U,Ap,E,C
CO-3	Describe various stages involved in a patent application	1,2,3,4,5	U,Ap,C
CO-4	Deal with the bio-entrepreneurship patentability of Biotech inventions.	1,2,3,4,5	U,Ap,C

Course Title : Biophysical and Biochemical Techniques- B  
Course code: BT-606

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
CO-1	Run different electrophoretic gels such as native, SDS- PAGE, agarose gel and two dimensional gel electrophoresis.	1,2,3,4,5	R,U,Ap,An



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## Khalsa College Amritsar

An Autonomous College affiliated to G.N.D.U., Amritsar  
UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

(O) : +91-183-2258097  
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Fax : +91-183-2255619  
Pin : 143002 (Pb.) India

e-mail : khalsacollegeamritsar@yahoo.com

Web : www.khalsacollege.edu.in

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<b>CO-2</b>	Understand the importance of solubilizers in electrophoretic processes.	1,2,3,4,5	R,U,Ap,An
<b>CO-3</b>	Understand the various safety rules for radioisotopic studies.	1,2,3,4,5	U,Ap,An
<b>CO-4</b>	Recall and relate the various concepts of radioactivity and their applications	1,2,3,4,5	U,Ap,An,E
<b>CO-5</b>	Apply the practical applications of electrophoresis at industrial set up.	1,2,3,4,5	U,Ap,An,E

Course Title : Biophysical and Biochemical Techniques- B (Practical) Course code: BT-606

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Quantify DNA using gel electrophoresis.	1,2,3,4,7	R,U,Ap,An
<b>CO-2</b>	Perform protein estimation through Lowry's method and Bradford's method.	1,2,3,4,7	R,U,Ap,An
<b>CO-3</b>	Understand the various safety rules for radioisotopic studies.	1,2,3,4,7	U,An
<b>CO-4</b>	Recall and relate various concepts of radioactivity and their applications.	1,2,3,4,5	R,U
<b>CO-5</b>	Get knowledge about the properties of various types of bio-molecules and their uses in different areas of biotechnology.	1,2,3,4,5	U,An

Course Title : Physical, Organic & Inorganic Aspects of Spectroscopy-B  
Course code: BT-607

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
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<b>CO-1</b>	Learn basic concepts of NMR spectroscopy.	1,2,3,4,5	R,U
<b>CO-2</b>	Solve the problems related to <sup>1</sup> H-NMR spectroscopy and interpret the <sup>1</sup> H-NMR spectrum.	1,2,3,4,5	U,An
<b>CO-3</b>	Learn basic concepts of Mass spectrometry	1,2,3,4,5	U,An

Course Title : Physical, Organic & Inorganic Aspects of Spectroscopy-B (Practical)

Course code: BT-607

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Learn basic concepts of column chromatography	1,2,3,4,5,7	U,Ap,An,E
<b>CO-2</b>	Learn basic concepts of spectroscopy techniques.	1,2,3,4,5,7	U,Ap,An
<b>CO-3</b>	Solve the problems related to <sup>1</sup> H-NMR spectroscopy and interpret the <sup>1</sup> H-NMR spectrum.	1,2,3,4,5,7	U,Ap,An

Course Title: Physical, Organic & Inorganic Aspects of Spectroscopy-B (Practical)

Course code: BT-607

Sr. No.	On completing the course, the students will be able to:	PSOs addressed	Cognitive levels
<b>CO-1</b>	Learn to solve Statistical problems using various measure of central tendency.	1,2,3,4,5	R,U,Ap,An,E





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<b>CO-2</b>	Collect the data and present it diagrammatically.	1,2,3,4,5	U,Ap,An
<b>CO-3</b>	Learn to establish linear association between two variables by using Correlation.	1,2,3,4,5	R,U,Ap
<b>CO-4</b>	Use regression to predict the behavior of dependent variable.	1,2,3,4,5	U,Ap,An,E
<b>CO-5</b>	Learn to use t, chi square, F and Z tests to solve problems related to different types of data.	1,2,3,4,5	U,Ap,An,E



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## COURSE OUTCOMES (COs) FOR COMPULSORY COURSES

**The Course Outcomes (COs) are mapped to the revised Bloom's Taxonomy using the following abbreviations:**

**R- Remembering**

**U – Understanding**

**Ap- Applying**

**An- Analyzing**

**E- Evaluating**

**C- Creating**



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### Compulsory Courses (Applicable for UG Programmes) PROGRAM SPECIFIC OUTCOMES (PSOs) & COURSE OUTCOMES (COs)

Name of Programme: B.A. / B.Com/B.Sc. (Med/N.Med /Comp.Sc./Eco)/BBA/B.A (Social Sciences)/B.Com (Hons)

#### PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO-1	To build up proficiency in English Language.
PSO-2	To understand the basic and advanced grammar of English.
PSO-3	To develop critical and analytical skills within students.
PSO-4	To build up knowledge in the usage of English language, its structures, pronunciation and other features of connected speech, better equipping students to pursue higher degrees or jobs in corporate/management sector or any other area.
PSO-5	To provide knowledge of multifarious opportunities in the field of this programme.
PSO-6	To acquire the knowledge of latest technology related with communication skills.
PSO-7	To display better skills of speaking and writing in the language.
PSO-8	To enhance knowledge of the usage of various linguistic structures at the level of speech and writing and develop better language proficiency and fluency.

#### COURSE OUTCOMES (COs)

#### Semester: I

Course Title: English Compulsory

Course Code: BENC-1105

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Appreciate the writings of various Indian and foreign story and prose writers and relate them to their socio-cultural milieu	1,2,3,4,5,6	U,Ap,An
2.	Comprehend the meaning of texts and answer questions related to situations, episodes, themes and characters depicted in them	1,2,4,5	U,Ap,An



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3.	Understand fundamental grammatical rules governing tenses and make correct usage in their language	2,3,4	U,Ap,An
4.	Write independently the paragraphs on any given topic	2,3,4	R,U,Ap,An

### Semester: II

Course Title: English Compulsory

Course Code: BENC-1205

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Appreciate the writings of various Indian and foreign story and prose writers and relate them to their socio-cultural milieu	1,2,3,4,5	U,Ap,An
2.	Comprehend the meaning of texts and answer questions related to situations, episodes, themes and characters depicted in them	1,2,4,5	U,Ap,An
3.	Make correct usage of tenses, articles and nouns	2,3,4	U,Ap,An
4.	Enrich their vocabulary and use new words in their spoken and written language	2,3,4	U,Ap,An
5.	Write personal letters to their family and friends on various issues	2,3,4	U,Ap,An

### Semester: III

Course Title: English Compulsory

Course Code: BENC-2305

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Develop an understanding of the poems taught, relate to the socio-cultural background of the prescribed texts and be able to answer questions regarding tone, style and central idea	1,2,3,4,5,6	U,Ap,An
2.	Comprehend the basics of grammatical rules governing prepositions in detail	2,3,4	U,Ap,An





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3.	Enhance their reading and analysing power of texts through guided reading	2,3,4	U,Ap,An
4.	Enrich their vocabulary and use new words in their spoken and written language	2,3,4,5	U,Ap,An
5.	Develop skills to write a report on a given topic	2,3,4	U,Ap,E

### Semester: IV

Course Title: English Compulsory

Course Code: BENC-2405

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Develop an understanding of the poems taught and be able to answer questions regarding situations, themes and characters depicted in them	1,2,3,4,5,6	U,Ap,An
2.	Comprehend the basics of grammatical rules governing adjectives, adverbs, conjunctions and prepositions	1,2,3,4	U,Ap,An
3.	Enhance their reading and analysing skills of texts through guided reading	2,3,4	An,E,C
4.	Enrich their vocabulary and use newly learnt words in both spoken and written language	2,3,4,5	U,Ap,An
5.	Develop skills to write essay on a given topic	2,3,4	U,Ap,An

### Semester: V

Course Title: English Compulsory

Course Code: BENC-3505

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Widen their knowledge about various literary devices used in poetry such as	1,2,4,5	U,Ap,An



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	tone, style, imagery, figures of speech, symbolism, etc.		
2.	Develop power of imagination and appreciate the beauty, rhyme, and style of a poem	1,2,4,5	U,Ap
3.	Analyze and appreciate the dramatic technique, plot development and art of characterization in the prescribed play	1,2,4,5	U,Ap
4.	Develop an understanding of the insights, genres, conventions and experimentations associated with English Drama	1,2,4,5	U,Ap,An
5.	Develop the knowledge, skills and capabilities for effective business writing	2,3,4	U,Ap,An

### Semester: VI

Course Title: English Compulsory

Course Code: BENC-3605

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Analyze and appreciate the dramatic technique, plot development and art of characterization in the prescribed plays	1,2,4,5	U,Ap,An
2.	Comprehend, appreciate and critically analyze the novel <i>The Guide</i>	1,2,3,4,5	U,Ap,An
3.	Enhance their reading and analysing power of texts through guided reading	1,2,3,4,5	U,Ap,An
4.	Develop skills for resume writing	2,3,4	U,Ap,An



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**Name of Programme: B.A**

**Programme Specific Outcomes of B.A (Elective English)**

<b>PSO-1</b>	To build up proficiency in English Language
<b>PSO-2</b>	To understand the basic and advanced grammar of English
<b>PSO-3</b>	To develop critical and analytical skills within students
<b>PSO-4</b>	To build up knowledge in the usage of English language, its structures, pronunciation and other features of connected speech, better equipping students to pursue higher degrees or jobs in corporate/management sector or any other area
<b>PSO-5</b>	To provide knowledge of multifarious opportunities in the field of this programme
<b>PSO-6</b>	To acquire the knowledge of latest technology related with communication skills
<b>PSO-7</b>	To display better skills of speaking and writing in the language
<b>PSO-8</b>	To enhance the knowledge of the usage of various linguistic structures at the level of speech and writing and develop better language proficiency and fluency
<b>COURSE OUTCOMES</b>	

**Semester: I**

**Course Title: Elective English**

**Course Code: BEEN-1106**

<b>Sr. No.</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
1.	Develop interest in reading and appreciation of literature.	1,2,3,5	U,Ap
2.	Familiarise themselves with socio-political and cultural issues related to prescribed text.	4,5,6	U,Ap,An
3.	Acquire pronunciation skills in English.	2	U,Ap
4.	Enroll for Post Graduation course in English.		Ap
5.	Become creative writers to get jobs in media / journalism.	2,3,4,5	Ap



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### Semester: II

Course Title: Elective English

Course Code: BEEN-1206

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Develop interpretative skills.	1,2,4,5,6	U,An
2.	Acquire knowledge about the basic concepts of Literary writings.	1,5,6	U,An,E
3.	Learn to situate literary works in their larger cultural contexts.	5,6	U,An
4.	Prepare for higher studies in literature	1,2,3,4,5,6	U,Ap
5.	Find jobs in teaching literature after acquiring the degree.	1,2,3,5,6	Ap

### Semester: III

Course Title: Elective English

Course Code: BEEN-2306

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Acquire an understanding of sustained allegory and the basic tenets of Marxism, Capitalism and their social implications	1,5,6	U,An
2.	Understand various figures of speech and literary devices in the poetry of different poets prescribed	2,3,4,5	U,Ap,An,
3.	Understand various literary terms and their significance	1,4,5,6	U,Ap,An
4.	Enhance their reading and analyzing power of texts through guided reading	1,2,3,4,5,6	U,Ap,An

### Semester: IV

Course Title: Elective English

Course Code: BEEN-2406

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Acquire an understanding of various international issues in an I.T. savvy world.	4,5,6	U,Ap,An





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2.	Have a glimpse of different cultures of the world by reading stories from Commonwealth countries.	1,4,5,6	U,An
3.	Sensitize themselves on current issues faced by humanity globally.	1,4,5,6	U,Ap,An
4.	Enhance their reading and analyzing power of texts through guided reading	1,2,3,4,5,6	U,Ap,An

**Semester: V**

**Course Title: Elective English**

**Course Code: BEEN-3506**

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Get understanding of American, African, Indian Canadian and Multicultural sensibilities by getting introduced to the literary works representing them.	1,4,5,6	U,Ap,An
2.	Introduce the learners of the literature to the background study of English Literature.	1,2,5,6	U,An
3.	Demonstrate the effective use of literary theory.	1,4,5,6	U,An
4.	Enhance their reading and analyzing power of texts through guided reading	2,3,4	U,Ap,An

**Semester: VI**

**Course Title: Elective English**

**Course Code: BEEN-3606**

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Facilitate the understanding of American, African, Indian Canadian and Multicultural sensibilities by getting introduced to the literary works representing them.	1,4,5,6	U,Ap,An



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2.	Introduce the learners of the literature to the background study of English Literature.	1,2,4,5,6	U,Ap,An
3.	Demonstrate the effective use of literary theory.	1,4,5,6	U,An
4.	Enhance their reading and analyzing power of texts through guided reading	2,3,4,5,6	R,U,Ap,An



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**Name of Programme: B.A**

**Programme Specific Outcomes of B.A (Social Sciences)**

<b>PSO-1</b>	To build up proficiency in English Language
<b>PSO-2</b>	To understand the basic and advanced grammar of English
<b>PSO-3</b>	To develop critical and analytical skills within students
<b>PSO-4</b>	To build up knowledge in the usage of English language, its structures, pronunciation and other features of connected speech, better equipping students to pursue higher degrees or jobs in corporate/management sector or any other area
<b>PSO-5</b>	To provide knowledge of multifarious opportunities in the field of this programme
<b>PSO-6</b>	To acquire the knowledge of latest technology related with communication skills
<b>PSO-7</b>	To display better skills of speaking and writing in the language
<b>PSO-8</b>	To enhance their knowledge of the usage of various linguistic structures at the level of speech and writing and develop better language proficiency and fluency.
<b>COURSE OUTCOMES</b>	

**Semester: I**

**Course Title: Major (Languages- English)**

**Course Code: BENM-1101**

<b>Sr. No.</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
1.	be acquainted with the major features of poetry and short Story	1,2,4,5,6	U,Ap,An,
2.	Comprehend the themes, styles and language in the prescribed poetry and story	1,2,4,5,6	U,Ap,An
3.	Relate the prescribed works to their social, historical and cultural contexts in order to gain a richer understanding of both text as well as context	1,3,4,5	U,Ap,An
4.	Make inferences based on comprehension of a prescribed text	3,4,5	U,Ap,An,E,C



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## Khalsa College Amritsar

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### Semester: II

Course Title: Major (Languages- English)

Course Code: BENM-1201

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Be acquainted with the major features of Poetry and Short Story	1,2,4,5	U,Ap,An
2.	comprehend the themes, styles and language in the prescribed poetry and story	1,2,4,5	U,Ap,An
3.	Relate the prescribed works to their social, historical and cultural contexts in order to gain a richer understanding of both text as well as context	1,3,4,5	U,Ap,An
4.	Make inferences based on comprehension of a prescribed text	3,4,5	U,Ap,An,E,C

### Semester: III

Course Title: Major (Languages- English)

Course Code: BENM-2301

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Relate the prescribed works to their social, historical and cultural contexts in order to gain a richer understanding of both text as well as context	1,5,6	U,Ap
2.	Make inferences based on comprehension of a prescribed text	2,3,4	U,Ap,An
3.	Be trained to discern ethical principles and personal values in light of academic experience	4,5	U,Ap
4.	Be equipped with social science knowledge as to seek jobs in public service.	2,4,6	U,Ap,An





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### Semester: IV

Course Title: Major (Languages- English)

Course Code: BENM-2401

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Be able to relate the prescribed works to their social, historical and cultural contexts in order to gain a richer understanding of both text as well as context	1,5,6	U,Ap
2.	Make inferences based on comprehension of a prescribed text	2,3,4	U,Ap,An
3.	Be trained to discern ethical principles and personal values in light of academic experience	4,5	U,Ap
4.	Be equipped with social science knowledge as to seek jobs in public service	2,4,6	U,Ap,An

### Semester: V

Course Title: Major (Languages- English)

Course Code: BENM-3501

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Develop interpretative skills.	4,5,6	U,Ap
2.	Acquire knowledge about the basic concepts of Literary writings.	1,2,4,5	U,Ap,An
3.	Learn to situate literary works in their larger cultural contexts.	1,2,4,5	U,Ap,An
4.	Prepare for higher studies in literature	1,2,4,5	U,Ap,An
5.	Find jobs in teaching literature after acquiring the degree.	2,3,4	U,Ap,An



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Semester: VI

Course Title: Major (Languages- English)

Course Code: BENM-3601

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Develop interpretative skills.	4,5,6	U,Ap
2.	Acquire knowledge about the basic concepts of Literary writings.	1,2,4,5	U,Ap,An
3.	Learn to situate literary works in their larger cultural contexts.	1,2,4,5	U,Ap,An
4.	Prepare for higher studies in literature	1,2,4,5	U,Ap,An
5.	Find jobs in teaching literature after acquiring the degree.	2,3,4	U,Ap,An



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**Name of Programme: Undergraduate**

**Programme Specific Outcomes of BCA/ B.Sc.(I.T)/Bio Tech/  
BFST/BJMC/B.Sc.(Fashion Designing)/BMm/ BIMT/B.Sc. (Artificial Intelligence and  
Data Science)**

<b>PSO-1</b>	To build up proficiency in English Language
<b>PSO-2</b>	To understand the basic and advanced grammar of English
<b>PSO-3</b>	To develop critical and analytical skills within students
<b>PSO-4</b>	To build up knowledge in the usage of English language, its structures, pronunciation and other features of connected speech, better equipping students to pursue higher degrees or jobs in corporate/management sector or any other area
<b>PSO-5</b>	To provide knowledge of multifarious opportunities in the field of this programme
<b>PSO-6</b>	To acquire the knowledge of latest technology related with communication skills
<b>PSO-7</b>	To display better skills of speaking and writing in the language
<b>PSO-8</b>	To enhance knowledge of the usage of various linguistic structures at the level of speech and writing and develop better language proficiency and fluency
<b>COURSE OUTCOMES</b>	

**Semester: I**

**Course Title: Communication Skills in English**

**Course Code: BCSE-1122**

<b>Sr. No.</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
1.	Identify common errors in language and rectify them.	1,2,4,7	U,Ap,An,E
2.	Develop and expand writing skills through controlled and guided activities.	1,2,7,8	U,Ap,An
3.	Develop coherence, cohesion and competence in written discourse through intelligible pronunciation.	1,3,4,6,7,8	U,Ap,An
4.	Develop the ability to handle the interview process confidently and learn the subtle nuances of an effective group discourse.	1,2,4,5,7,8	U,Ap,An



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5.	Communicate contextually in specific and professional situations with courtesy.	3,4,5,6,7	U,Ap,An
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### Semester: II

Course Title: Communication Skills in English

Course Code: BCSE-1222

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	Identify common errors in language and rectify them.	1,2,3,4,7	U,Ap,An
2.	Develop and expand Oral skills through controlled and guided activities.	1,2,7,8	U,Ap
3.	Develop coherence, cohesion and competence in oral discourse through intelligible pronunciation.	1,2,3,4,8	U,Ap,An
4.	Develop the ability to handle the interview process confidently and learn the subtle nuances of an effective group discourse.	1,2,5,6	U,Ap,An
5.	Communicate contextually in specific and professional situations with courtesy.	1,2,6,7,8	U,Ap,An





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**Name of Programme: B.Sc.**

**Programme Specific Outcomes of B.Sc. (Hons.) Physics, Chemistry, Zoology, Botany, Maths and Computational Statistics and Data Analytics**

<b>PSO-1</b>	To build up proficiency in English Language
<b>PSO-2</b>	To understand the basic and advanced grammar of English
<b>PSO-3</b>	To develop critical and analytical skills within students
<b>PSO-4</b>	To build up knowledge in the usage of English language, its structures, pronunciation and other features of connected speech, better equipping students to pursue higher degrees or jobs in corporate/management sector or any other area
<b>PSO-5</b>	To provide knowledge of multifarious opportunities in the field of this programme
<b>PSO-6</b>	To acquire the knowledge of latest technology related with communication skills
<b>PSO-7</b>	To display better skills of speaking and writing in the language
<b>PSO-8</b>	To enhance knowledge of the usage of various linguistic structures at the level of speech and writing and develop better language proficiency and fluency.
<b>COURSE OUTCOMES</b>	

**Semester: I**

**Course Title: Communicative English**

**Course Code: BCEN-1123**

<b>Sr. No.</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs Addressed</b>	<b>Cognitive Levels</b>
1.	Identify common errors in language and rectify them.	1,2,3,8	U,Ap,An,E
2.	Develop and expand writing skills through controlled and guided activities.	1,2,4,7,8	Ap,An
3.	Develop coherence, cohesion and competence in written discourse through intelligible pronunciation.	1,2,3,4,8	U,Ap,An
4.	Develop the ability to handle the interview process confidently and learn the subtle nuances of an effective group discourse.	1,2,5,6	U,Ap,An
5.	Communicate contextually in specific and professional situations with courtesy	1,2,6,7,8	U,Ap,An



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### Semester: II

Course Title: Communicative English

Course Code: BCEN-1223

Sr. No.	On Completing the Course, the Students will be able to:	PSOs Addressed	Cognitive Levels
1.	1. Identify common errors in language and rectify them.	1,2,3,8	U,Ap,An,E
2.	Develop and expand writing skills through controlled and guided activities.	1,2,7,8	U,Ap,E
3.	Develop coherence, cohesion and competence in oral discourse through intelligible pronunciation.	1,2,3,4,8	U,Ap,An
4.	Develop the ability to handle the interview process confidently and learn the subtle nuances of an effective group discourse.	1,2,5,6	U,Ap,An
5.	Communicate contextually in specific and professional situations with courtesy.	1,2,6,7,8	U,Ap,An



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### Punjabi Compulsory/Basic Punjabi/Punjab History and Culture

Program Specific Outcomes (PSO) of B.A., B.A. Social Science, B.Sc. Non-Med./Med./Eco./Comp. Sci., B.Com. B.B.A, B. Com. (Hons.)

PSO-1	The skill of exposing the subject matter of any literary works related levels developed.
PSO-2	Acquire knowledge about Punjabi literature and its genres like poetry, short story, novel, drama, one act play and prose etc.
PSO-3	Learn to highlight the Thematic and formative levels by the study of different nuances of literature.
PSO-4	Get knowledge about Punjabi language and linguistics, Gurmukhi script and translation, official and domestic letters and essay writing techniques.
<b>COURSE OUTCOMES</b>	

Course Title:	General Punjabi (Sem-I)	Course Code:	BPBI-1101
SR. NO	On Completing the Course the Students will be able to	PSO's Addressed	Cognitive Levels.
CO1	Develop Literary thinking and understanding.	1,2	U,C
CO2	Develop Literary interest	1,2	U,C
CO3	Increase the Possibility of literary creation.	1,2,3	U,C
CO4	Study the related subjects deeply.	1,2,3,4	U,C
CO5	Make special contribution in the development of mother tongue.	4	U,AN,E
Course Title:	General Punjabi (Sem-II)	Course Code:	BPBI-1201
SR. NO	On Completing the Course the Students will be able to	PSO's Addressed	Cognitive Levels.
CO1	Develop Critical thinking.	1,2,3	U,AN,C
CO2	Develop literary interest.	1,2,3	U,AN,C
CO3	Increase the possibility of literary work.	1,2,3	U,AN,C
CO4	Study the related subjects deeply.	1,2,3	R,AN,C
CO5	Know about the structure of language.	4	R,U



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Course Title:	General Punjabi (Sem-III)	Course Code	BPBI-2301
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Increase interest in literature.	1,2,3	U,AN,C
CO2	Develop the understanding of literature.	1,2,3	U,AN,C
CO3	Study the related subjects in depth.	1,2,3,4	R,U,E
CO4	Understand the linguistic structure.	4	R,U,AN
Course Title:	General Punjabi (Sem-IV)	Course Code	BPBI-2401
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Increase interest in prose.	2	U,AN,C
CO2	Develop the understanding of prose.	2	U,AN,C
CO3	Develop the art of writing pure Punjabi.	4	R,U,AN
CO4	Be familiar with Gurmukhi Script.	4	R,U
Course Title:	General Punjabi (Sem-V)	Course Code	BPBI-3501
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Increase the literary interest	1,2,3	R,U,C
CO2	Know about the thematic concerns of modern story	1,2,3	R,U,C
CO3	Develop the art of translation.	4	U,C
CO4	Develop the linguistic knowledge.	4	R,U
Course Title:	General Punjabi (Sem-III)	Course Code	BPBI-3601
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Increase literary understanding.	1,2,3	U,AN,C
CO2	Develop an understanding of new forms of literature.	1,2,3	R,U,C
CO3	Increase Knowledge about grammar.	4	R,U
CO4	Develop the understanding of essay writing.	4	U,C





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<b>Course Title:</b>	<b>General Punjabi (Sem-I)</b>	<b>Course Code</b>	<b>BHPB-1101</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Develop Literary thinking & understanding.	1,2	U,C
CO2	Develop the literary interest.	1,2	U,C
CO3	Increase the possibility of literary creation.	1,2,3	U,C
CO4	Study any related subject deeply.	1,2,3,4	U,C
CO5	Make special contribution in the development of mother tongue.	4	R,U,AN,E
<b>Course Title:</b>	<b>General Punjabi (Sem-II)</b>	<b>Course Code</b>	<b>BHPB-1201</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Develop critical thinking and literary interest.	1,2,3	U,AN,C
CO2	Increase the possibility of literary work.	1,2,3	U,AN,C
CO3	Study the related subject deeply.	1,2,3,4	R,AN,C
CO4	Know about the structure of language.	4	R,U
<b>Course Outcomes (COs)</b>			
<b>Course Title:</b>	<b>General Punjabi (Sem-I)</b>	<b>Course Code</b>	<b>BEPB-1101</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Develop the literary understanding	1,2	U,C
CO2	Increase the possibility of creating literature.	1,2	U,C
CO3	Increase the knowledge of grammar.	3,4	R,U
CO4	Develop the knowledge of Punjabi language.	4	U
<b>Course Title:</b>	<b>General Punjabi (Sem-II)</b>	<b>Course Code</b>	<b>BEPB-1201</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Develop the literary understanding.	1,2,3,4	U,AN,C



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CO2	Write creative literature.	1,2	U,AN,C
CO3	Gain knowledge of the inner structure of language.	1,2	U,AN,C
CO4	Increase information about word categories.	1,2,3	U,AN,C
CO5	Develop knowledge about Gurmukhi Script	3	R,U
<b>Course Title:</b>	<b>General Punjabi (Sem-III)</b>	<b>Course Code</b>	<b>BEPB-2301</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Develop the literary understanding.	1,2	U,AN,C
CO2	Write creative literature.	1,2	U,AN,C
CO3	Gain knowledge about writing Skills	4	R,U
CO4	Develop linguistic knowledge.	3,4	R,U
CO5	Increase the alertness towards word addition.	3	R,U
<b>Course Title:</b>	<b>General Punjabi (Sem-IV)</b>	<b>Course Code</b>	<b>BEPB-2401</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Develop the literary understanding.	1,2	U,AN,C
CO2	Write creative literature.	1,2	U,AN,C
CO3	Gain knowledge of the inner structure of language.	4	R,U
CO4	Gain Knowledge about article composition and commercial art.	3	U,C
<b>Course Title:</b>	<b>General Punjabi (Sem-I)</b>	<b>Course Code</b>	<b>GPB-1110</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Develop the literary understanding.	1,2	U,C
CO2	Increase the possibility of creating literature.	1,2,3	U,C
CO3	Develop the skill of criticism.	1,2,3,4	R,U,C
CO4	Increase the linguistic knowledge.	4	R,U
<b>Course Title:</b>	<b>General Punjabi (Sem-II)</b>	<b>Course Code</b>	<b>GPB-1210</b>



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SR. NO	On Completing the Course the Students will be able to	PSO's Addressed	Cognitive Levels.
CO1	Develop the literary understanding.	1,2,3	U,AN,C
CO2	Write creative literature.	1,2,3	U,AN,C
CO3	Gain knowledge of the inner structure of language.	4	U,AN,C
CO4	Increase information about word categories.	4	U,AN,C
CO5	Develop knowledge about Gurmukhi Script	4	R,U
<b>Course Title :</b>	<b>General Punjabi</b>	<b>Course Code</b>	<b>BPPB-1101</b>
SR. NO	On Completing the Course the Students will be able to	PSO's Addressed	Cognitive Levels.
CO1	Develop literacy interests	1,2	U,An,,C
CO2	Develop the skill of criticism.	1,2	U,An,,C
CO3	Improve the writing skills.	1,2,3	R,U,C
CO4	Increase the linguistic knowledge.	4	R,U



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### Basic Punjabi

**Program Specific Outcomes (PSO) of B.A., B.A. Social Science, B.Sc. Non-Med./ Med./Eco../Comp. Sci., B. Com., B.B.A, B. Com. (Hons.) , B. Com. (Hons.).B. Sc. Hons. (Physics, Chemistry, Maths), B. Sc. Bio Tech./ IT/ Fashion Designing/ Food Sci., B.A. JMC, BCA, B.Sc. in Computational Statistics and Data Analytics, B.Sc. Artificial Intelligence and Data Science, Bachelor of Vocational (B.Voc.) (Software Development, Theatre and Stage Craft, Food Processing, Textile Design & Apparel Technology)**

<b>PSO-1</b>	Get understanding of Punjabi language
<b>PSO-2</b>	Gain knowledge about the reading and writing skills of Punjabi
<b>PSO-3</b>	Acquire knowledge about Punjabi grammar
<b>PSO-4</b>	Gain knowledge about the nuances of Pehra Rachna (Paragraph writing), Precis writing, letter writing skills, Idioms and Proverbs
<b>COURSE OUTCOMES</b>	

Course Title :	BASIC PUNJABI (Sem-I)	Course Code:	BPBI-1102
SR. NO	On Completing the Course the Students will be able to	PSO's Addressed	Cognitive Levels.
CO1	Gain basic knowledge of Punjabi language.	1,2	U
CO2	Develop their understanding through the functioning of vowels and consonants in Punjabi language.	1,2,3	U
CO3	Learn to read and write Punjabi.	3	U
CO4	Know about the grammatical system of Punjabi language.	1,3	U
Course Title :	BASIC PUNJABI (Sem-II)	Course Code	BPBI-1202
SR. NO	On Completing the Course the Students will be able to	PSO's Addressed	Cognitive Levels.
CO1	Develop an understanding about the daily use of Punjabi vocabulary.	1,2,3	U,C
CO2	Develop linguistic knowledge by acquiring knowledge of Punjabi word structure.	1,2	U
CO3	Get information about creation of Punjabi words	1,2	U





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<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-III)</b>	<b>Course Code:</b>	<b>BPBI-2302</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Gain knowledge of Punjabi language.	1,2,3	U
CO2	Gain linguistic knowledge.	1,2,3	U
CO3	Read and write Punjabi.	1,2,3	U,C
CO4	Gain knowledge of idioms and proverbs.	4	U,C
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-IV)</b>	<b>Course Code:</b>	<b>BPBI-2402</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Improve linguistic knowledge by the usage of grammatical concepts.	1,2,3	R,U
CO2	Improve knowledge about the nuances of para rachna (Paragraph writing) ans sankhep rachna .	1,2,3	R,U
CO3	Improve letter-writing skills.	4	U
CO4	Improve the knowledge and skills of Punjabi language	1,2,3	U,C
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-V)</b>	<b>Course Code</b>	<b>BPBI-3502</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Enhance understanding of language.	1,3	R,U
CO2	Develop knowledge about Punjabi grammar.	1,3	R,U
CO3	Improve reading and writing skills.	2	R,U,C
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-VI)</b>	<b>Course Code</b>	<b>BPBI-3602</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Gain knowledge about Punjabi grammar.	1,3	R,U,C
CO2	Gain knowledge about Punjabi literature.	1	R,U,C





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CO3	Improve reading and writing skills.	2	R,U,C
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-I)</b>	<b>Course Code</b>	<b>BPBI-1102</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Gain knowledge of Punjabi language.	1,2	R,U
CO2	Develop their understanding through the functioning of vowels and consonants in Punjabi language.	1,2,3	R,U
CO3	Learn to read and write Punjabi.	3	R,U
CO4	Know about the grammatical concepts of Punjabi language.	1,3	R,U
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-II)</b>	<b>Course Code</b>	<b>BPBI-1202</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Develop an understanding about the daily use of Punjabi vocabulary.	1,2,3	U,R,C
CO2	Develop linguistic knowledge by acquiring knowledge of Punjabi word structure.	1,2	R,U
CO3	Get information about Punjabi word creation.	1,2	R,U
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-I)</b>	<b>Course Code</b>	<b>BPBI-1102</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Gain knowledge of Punjabi language.	1,2,3	R,U
CO2	Develop their understanding through the functioning of vowels and consonants in Punjabi language.	1,2,3	R,U
CO3	Improve writing skills	2	R,U
CO4	Know about the grammatical system of Punjabi language.	1,2,3	R,U
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-II)</b>	<b>Course Code</b>	<b>BPBI-1202</b>



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SR. NO	On Completing the Course the Students will be able to	PSO's Addressed	Cognitive Levels.
CO1	Develop an understanding about the daily use of Punjabi vocabulary.	1,2,3	U,R,C
CO2	Develop linguistic knowledge by acquiring knowledge of Punjabi word structure.	1,2,3	R,U
CO3	Gain Knowledge of Punjabi word creation.	1,2,3	R,U
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-III)</b>	<b>Course Code</b>	<b>BPBI-2302</b>
SR. NO	On Completing the Course the Students will be able to	PSO's Addressed	Cognitive Levels.
CO1	Gain knowledge of Punjabi language.	1,2,3	R,U
CO2	Have linguistic Knowledge.	1,2,3	R,U
CO3	Write effectively.	1,2,3	U,C
CO4	Gain knowledge of idioms and proverbs.	4	R,U,C
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-IV)</b>	<b>Course Code</b>	<b>BPBI-2402</b>
SR. NO	On Completing the Course the Students will be able to	PSO's Addressed	Cognitive Levels.
CO1	Improve linguistic knowledge by the usage of grammatical units.	1,2,3	R,U
CO2	Gain knowledge about the nuances of para-rachna(Paragraph writing) and sankhep rachna.	4	R,U
CO3	Improve letter-writing skills.	2	R,U
CO4	Increase the knowledge and skills of Punjabi language.	1,2,3	U,C
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-I)</b>	<b>Course Code</b>	<b>BPB-1110</b>
SR. NO	On Completing the Course the Students will be able to	PSO's Addressed	Cognitive Levels.
CO1	Gain knowledge of Punjabi language.	1,2,3	R,U
CO2	Develop their understanding through the functioning of	1,2,3	R,U



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	vowels and consonants in Punjabi language.		
CO3	Enhance skills to read and write Punjabi.	1,2,3	R,U
CO4	Know about the grammatical system of Punjabi language.	1,2,3	R,U
<b>Course Title :</b>	<b>BASIC PUNJABI (Sem-II)</b>	<b>Course Code</b>	<b>BPB-1210</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Develop an understanding about the daily use of Punjabi vocabulary.	1,2,3	U,R,C
CO2	Develop linguistic knowledge by acquiring knowledge of Punjabi word-Structure.	1,2,3	R,U
CO3	Get Information about Punjabi word-creation.	1,2,3	R,U
<b>Course Title :</b>	<b>BASIC PUNJABI</b>	<b>Course Code</b>	<b>BPPB-1102</b>
<b>SR. NO</b>	<b>On Completing the Course the Students will be able to</b>	<b>PSO's Addressed</b>	<b>Cognitive Levels.</b>
CO1	Gain knowledge of Punjabi language.	1,2	R,U
CO2	Develop their understanding through the functioning of vowels and consonants in Punjabi language.	1,2,3	R,U
CO3	Read and write Punjabi.	3	R,U
CO4	Know about the grammatical system of Punjabi language.	1,3	R,U



### PUNJAB HISTORY AND CULTURE

**Programme Specific Outcomes (PSOs) of B. A.; B.A. (SS); B. A. (Hons. – English); B. Com. (Hons., R, Ac. & Finance); B. Sc. /Bio-Tech./Comp. Sc./Eco./FD/Food Sc./IT/Med./N.Med.; B.Sc. (Hons. –Botany, Chemistry, Mathematics, Physics, Zoology); B. of Mult.; B. in Int. & Mob. Tech.; BBA;BCA;BJMC; B. Voc. (Software Development, Theatre and Stage Craft, Food Processing, Textile Design & Apparel Technology), B.Sc. (H.) Agriculture, B.Sc. Physiotherapy**

<b>PSO-1</b>	After completion of this programme, the students who are not the domicile of Punjab will be able to learn about the rich heritage and culture of Punjab.
<b>PSO-2</b>	Know how historical and political changes in Punjab affected the history of India in ancient and medieval times.
<b>PSO-3</b>	Learn about the intermingling of the foreign and Punjabi culture and the development of composite culture in Punjab.
<b>PSO-4</b>	Get knowledge about the partition of the Punjab, consequent migration rehabilitation of the refugees , creation of the Punjabi Suba and reorganization of Punjab after independence.
<b>PSO-5</b>	Get familiar with the important contemporary issues such as drug abuse, female feticide, Punjabi Diaspora and their impact on Punjab.

### COURSE OUTCOMES

#### Semester I

**Course Title- PUNJAB HISTORY & CULTURE (From Earliest Times to C 320)**

**Course Code: BPHC-1104**

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
<b>CO-1</b>	Learn the history and culture of the Ancient Punjab.	1,2,3,4	R,U,AN
<b>CO-2</b>	Study the physical features of ancient Punjab.	1,2,3,4	U
<b>CO-3</b>	Understand about the sources of the history of the Punjab.	1,2,3,4	U,AN,E
<b>CO-4</b>	Analyze the social, economic, religious life of the Harrapan civilization and Vedic-Aryans.	1,2,3,4	U,AN,E
<b>CO-5</b>	Learn the teachings and impact of Jainism and Buddhism in the Punjab.	1,2,3,4	U

#### Semester II

**Course Title- PUNJAB HISTORY & CULTURE (C 321 TO 1000 A.D.)**





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<b>Course Code: BPHC-1204</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Understand the history and culture of Punjab in the Ancient Period	1,2,3,4	R,U,E
<b>CO-2</b>	Analyze social, economic, religious, cultural and political life of Ancient Indian dynasties.	1,2,3,4	R,U,AN,E
<b>CO-3</b>	Study about political developments from 7 <sup>th</sup> century to 1000 AD.	1,2,3,4	U,AN,E
<b>CO-4</b>	Understand socio-cultural history of the Punjab from 7 <sup>th</sup> century to 1000AD.	1,2,3,4	U,AN,E
<b>CO-5</b>	Analyze Language, literature, art and architecture of Ancient Punjab.	1,2,3,4	U,AN
<b>SEMESTER-III</b>			
<b>Course Title- PUNJAB HISTORY &amp; CULTURE (AD.1000-1606)</b>			
<b>Course Code- BPHC-2304</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Study about new changes brought by the Turks and the Mughals in the Punjabi society and culture.	1,2,3,4	R,U,AN,E
<b>CO-2</b>	Learn about the rise and impact of the Bhaki movement and the Sufism in the Punjab.	1,2,3,4	R,U,AN,E
<b>CO-3</b>	Study about the foundation of the Sikhism and its philosophy.	1,2,3,4	U
<b>CO-4</b>	Understand the expansion and consolidation of the Sikhism during the period of first five Gurus.	1,2,3,4	U,AN,E
<b>CO-5</b>	Study about the compilation of the Adi Granth and circumstances leading to the martyrdom of Guru Arjan Dev.	1,2,3,4	U
<b>Semester- IV</b>			
<b>Course Title- PUNJAB HISTORY &amp; CULTURE (AD.1606-1849)</b>			
<b>Course Code: BPHC-2404</b>			
<b>Sr. No</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
<b>CO-1</b>	Understand the major changes brought in the Sikhism after the adoption of new policy by Guru Hargobind Sahib.	1,2,3,4,5	R,U,E
<b>CO-2</b>	Study about the martyrdom of Guru Tegh Bahadur and its impact.	1,2,3,4,5	R,U,AN,E



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CO-3	Learn about the changes in the Sikhism after the creation of the Khalsa Panth	1,2,3,4,5	U
CO-4	Study about the legacy and impact of Banda Bahadur and Maharaja Ranjit Singh's rule in the Punjab.	1,2,3,4,5	U,AN,E
CO-5	Learn the cultural growth in the Punjab during the period under study.	1,2,3,4	U

### Semester- V

Course Title- PUNJAB HISTORY&CULTURE (AD.1849-1947)

Course Code: BPHC-3504

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Study about the history and culture of the Punjab under the British rule.	1,2,3,4,5	R,U
CO-2	Learn about British administrative structure in the Punjab.	1,2,3,4,5	R,U,E
CO-3	Study about British economic policies in the Punjab.	1,2,3,4,5	R,U
CO-4	Understand the spread of education and socio-religious consciousness in Punjab.	1,2,3,4,5	U,AN,E
CO-5	Learn about role of the Punjab in the national movement.	1,2,3,4,5	U

### Semester- VI

Course Title- PUNJAB HISTORY & CULTURE (AD. 1947-2000)

Course Code: BPHC-3604

Sr. No	On Completing the Course, the Students will be able to:	PSOs addressed	Cognitive Levels
CO-1	Learn about the history and culture of the Punjab during the period under study.	1,2,3,4	R,U,AN
CO-2	Study about the process of partition of the Punjab and problem of rehabilitation of the refugees after independence.	1,2,3,4	R,U,
CO-3	Understand about the creation of Punjabi Suba and reorganization of its territory.	1,2,3,4	U,E
CO-4	Analyze the Green revolution and its impact on the Punjab.	1,2,3,4	U,AN,E
CO-5	Study about contemporary issues of the Punjab such as drug addiction, female feticide and Punjabi Diaspora.	1,2,3,4	U



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<b>Semester- I</b>			
<b>Course Title- PUNJAB HISTORY &amp; CULTURE (From Earliest Times to 1000 A.D.)</b>			
<b>Course Code: BPHC-1124</b>			
<b>Sr. No:</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Study about the sources and physical features of ancient Punjab.	1,2,3,4	R,U
CO-2	Learn about the social, economic, religious life of the Harrapan civilization and Vedic-Aryans.	1,2,3,4	R,U,AN,E
CO-3	Understand the teachings and impact of Jainism and Buddhism in the Punjab.	1,2,3,4	R,U,AN,E
CO-4	Learn about Language, literature, art and architecture of Ancient Punjab.	1,2,3,4	U,E
CO-5	Study about Political, Social, Religious, Economic and Cultural life of the people of the Punjab under the Maurayan, Kushana, Gupta and Vardhana Emperors.	1,2,3,4	U
<b>Semester-II</b>			
<b>Course Title- PUNJAB HISTORY &amp; CULTURE (A.D. 1000 to 1799)</b>			
<b>Course Code: BPHC-1224</b>			
<b>Sr.No:</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>
CO-1	Study about changes brought by the Turks and the Mughals in Punjabi society and culture	1,2,3,4	R,U
CO-2	Learn about rise and impact of Bhaki movement and the Sufism in the Punjab.	1,2,3,4	R,U,AN,E
CO-3	Understand the foundation, consolidation and expansion of the Sikhism.	1,2,3,4	R,U
CO-4	Study about the political struggle of the Sikhs under Banda Bahadur and the Sikh Misl.	1,2,3,4,5	U
CO-5	Learn about the Art, Architecture and Culture in the Punjab during the medieval period.	1,2,3,4	U,AN,E
<b>Course Title- PUNJAB HISTORY &amp; CULTURE (From Earliest Times to 1000 A.D.)</b>			
<b>Course Code: BPHC-1125</b>			
<b>Sr. No:</b>	<b>On Completing the Course, the Students will be able to:</b>	<b>PSOs addressed</b>	<b>Cognitive Levels</b>



Estd. 1892

# ਖ਼ਾਲਸਾ ਕਾਲਜ ਅੰਮ੍ਰਿਤਸਰ

## Khalsa College Amritsar

An Autonomous College affiliated to G.N.D.U., Amritsar  
UGC Letter No. F.22-1/2013 (AC) Dt. 22-05-2013

☎ (O) : +91-183-2258097  
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Fax : +91-183-2255619  
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e-mail : khalsacollegeamritsar@yahoo.com

Web : www.khalsacollege.edu.in

◆ A HERITAGE INSTITUTION AND COLLEGE WITH POTENTIAL FOR EXCELLENCE - Status conferred by UGC ◆

◆ NAAC REACCREDITED "A" GRADE (CGPA) ◆ STAR STATUS CONFERRED BY DBT, NEW DELHI ◆ AN ISO CERTIFIED COLLEGE ◆

CO-1	Study about the sources and physical features of ancient Punjab.	1,2,4	R,U,E
CO-2	Understand the social, economic, religious life of the Harrapan civilization and Vedic-Aryans.	1,2,3,4	R,U
CO-3	Learn about teachings and impact of Jainism and Buddhism in Punjab.	1,2,3,4	R,U,AN,E
CO-4	Learn about Language, literature, art and architecture of Ancient Punjab.	1,2,3,4	R,U,AN,E
CO-5	Analyze the political, social, religious, economic and cultural life of the people of Punjab under the Mauryan, Kushana, Gupta and Vardhana Emperors.	1,2,3,4,5	R,U,AN,E





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## ABILITY ENHANCEMENT UG COURSES APPLICABLE FOR UG STUDENTS

### COURSE OUTCOMES (COs)

#### Drug Abuse

Name of Programme: All Undergraduate Programmes

#### COURSE OUTCOMES (COs)

##### Semester I

Course Title: Problem of Drug abuse

Course Code: ZDA111

Sr. No.	On completion of this course, the students will be able to:
CO-1.	Get information about a variety of models and theories of addiction and other problems related to substance abuse.
CO-2.	Learn about effects of the use of psychoactive substances on social, behavioural, psychological & physical health of a person
CO-3.	Have knowledge about risk for psychoactive substance use disorder.
CO-4.	Understand the factors that increase the likelihood for an individual, community or group to be at risk.
CO-5.	Understand principles and philosophy of prevention treatment and recovery

##### Semester II

Course Title-Drug abuse: Management & Prevention

Course Code: ZDA121

	On completion of this course, the students will be able to:
CO-1.	Understand the importance of family and its role in drug abuse prevention.
CO-2.	Understand the role of support system especially in Schools and inter-relationships between students, parents & teachers.
CO-3.	Understand the impact of Media on substance abuse prevention.
CO-4.	Understand the role of awareness drives, campaigns etc. in Drug abuse management.
CO-5.	Learn about the Legislations and Acts governing Drug trafficking & Abuse in India.



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### BPT Part-I

**Course Title: Problem of Drug abuse: Management & Prevention Course Code: ZDA-112**

S. No.	On completion of this course, the students will be able to:
CO-1.	Have information about variety of models and theories of addiction and other problems related to substance abuse.
CO-2.	Learn about the effects of the use of psychoactive substances on social, behavioural, psychological and physical health of a person
CO-3.	Have knowledge about risk for psychoactive substance use disorder.
CO-4.	Understand the factors that increase the likelihood for an individual, community or group to be at risk.
CO-5.	Understand principles and philosophy of prevention treatment and recovery
CO-6.	Understand the importance of family and its role in drug abuse prevention.
CO-7.	Understand the role of support system especially in schools and inter-relationships between students, parents and teachers.
CO-8.	Understand the impact of media on substance abuse prevention.
CO-9.	Understand the role of awareness drives, campaigns etc. in drug abuse management.
CO-10.	Learn about the legislations and acts governing drug trafficking and abuse in India.



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## Environmental Studies

Name of Programme: All Undergraduate Programmes

### COURSE OUTCOMES (COs)

#### Semester: III

Course Title: Environmental Studies-I (Compulsory)

Course Code: ESL-221

Sr. No.	On completing the course, the students will be able to:
CO1	Learn about the concept of sustainable environment.
CO2	Gain knowledge on the ecosystem and its functioning.
CO3	Become aware about the water conservation programs like rain water harvesting and water shedding.
CO4	Gain knowledge on environmental (Air, water and pollution) protections acts.
CO5	Know about the role and importance of NSS—a volunteer organization, in making up a better environment and to maintain better health and hygiene.

#### Semester: IV

Course Title: Environmental Studies-II (Compulsory)

Course Code: ESL-222

Sr. No.	On completing the course, the students will be able to:
CO1	Know about the meaning of Biodiversity and its role in environment.
CO2	Learn about the causes of different forms of pollution and their control measures.
CO3	Understand the causes and challenges of growing human population, women and child welfare programs.
CO4	Know the development of entrepreneurship and techniques of civil/self-defense.



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### Name of Programme: Bachelor of Physiotherapy (Part-II)

Course Title: Environmental Studies (Compulsory)

Course Code: ESL-225

Sr. No.	On completing the course, the students will be able to:
CO-1	Learn about the sustainable environment.
CO-2	Gain the knowledge about the judicious use of natural resources for a green environment.
CO-3	Understand the causes of different forms of pollution and their control measures.
CO-4	Learn the importance of green programs like vana mahotasava to promote afforestation.
CO-5	Know the meaning of Biodiversity and its role in environment.
CO-6	Understand the family (welfare) planning programs, role of NSS and road safety rules.





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### Ability Enhancement Paper: Computer Science

Name of Programme: B.Sc. (Non-Medical)

#### COURSE OUTCOMES (COs)

##### Semester-I

Course Code: NMC-111

Sr. No.	On completing the course, the students will be able to:
CO1	Understand the world of computer and information & technology.
CO2	Understand the importance of hardware and software of computers.
CO3	Understand the storage of data, memory devices.
CO4	Understand the applications of computer in our daily life and in science & technology.
CO5	Understand the basics, working and use of MS word.

##### Semester-II

Course Code: NMC-121

Sr. No.	On completing the course, the students will be able to:
CO1	Understand different Input/output devices of computer.
CO2	Understand the applications of Internet.
CO3	Understand the working and benefits of Search Engine.
CO4	Understand the use of electronic mail.
CO5	Work with excel and MS Power point.