



B. BOROOAH COLLEGE

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**PROGRAMME OUTCOMES PROGRAMME SPECIFIC OUTCOMES
& COURSE OUTCOMES**



B. BOROOAH COLLEGE, GUWAHATI, ASSAM

**PROGRAMME OUTCOMES, PROGRAMME SPECIFIC OUTCOMES
&
COURSE OUTCOMES**

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B. Borooah College is affiliated to Gauhati University, Guwahati and follows the curricula prescribed by the University. The college has, hereby, stated in details the Programme Outcomes, Programme Specific Outcomes and Course Outcomes of all its programmes and courses.

1. Programme Outcomes: BA

After completing the BA Programme, a student is expected to achieve the below-mentioned programme outcomes:

- A student should be able to think critically: A student should be able to take informed actions after identifying the assumptions that frame their thinking and deeds, checking the degree to which these assumptions are accurate and valid, and assessing their ideas and decisions (intellectual, organizational, and personal) from different perspectives.
- A student should learn effective communication: A student should acquire the ability to listen, speak, read, and write clearly in person and through electronic media in English and in at least one official language of Assam, and make meaning of the world by connecting people, ideas, books, media, and technology.
- A student should learn social interaction: A student should elicit views of others, mediate disagreements, and help reach conclusions in group settings.
- A student should acquire the knowledge of effective citizenship: A student should demonstrate empathetic social concern, knowledge of equity-centred national development, and the abilities to act with an informed awareness of issues and participate in civic life through volunteering.
- A student should learn ethics: A student should recognize different value systems including their own, understand the moral dimensions of their decisions, and accept responsibility for them.
- A student should acquire the knowledge of environment and sustainability: A student should understand the issues of environmentalism and sustainable development.
- A student should acquire the knowledge of self-directed and life-long learning: A student should acquire the ability to engage in independent and life-long learning in the broad contexts of socio-technological changes.
- A student should understand the basic concepts, fundamental principles, and theories in the taught subjects.
- A student should realize the importance of literature in terms of aesthetic, mental, moral, and intellectual development of an individual and accordingly of the society.
- A student should understand how issues in the social sciences get influenced by literature and how literature can provide solutions to social issues.

i. BA Assamese

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Acquire the basic knowledge of the Assamese language, literature, and culture.
2. Know about the development of the Assamese language and its relations with other Indian languages.
3. Understand the historical growth of Assamese literature.
4. Develop a refined taste for literature and art and build the capacity of making judgments on classic and popular literatures.
5. Become familiar with literary canons and critical methods.
6. Read and assess Assamese literature from comparative and pan-Indian perspectives.
7. Associate themselves with literary practice, both in the creative and critical genres.
8. Acquire grammatical knowledge.
9. Introduce themselves to basic linguistics.
10. Apply their competence in and systemic knowledge of linguistics in analyzing the Assamese language and its dialectical variations.
11. Become familiar with multi-lingual and multi-cultural realities of Assam through both theoretical and textual knowledge as well as through visiting certain places and gathering direct experience.
12. Know about and practice performing arts like theatre, film and dance.
13. Develop human values.
14. Cultivate the ideals of patriotism, pacifism, optimism, and humanitarianism.
15. Respect democratic and secular values.

16. Love nature, culture and heritage.

17. Work towards preserving the biodiversity of earth and building a sustainable future.

18. Become morally strong to face adverse realities of life.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	PSOs ADDRESSED	BLOOM'S TAXONOMY LEVEL
BA (Honours) Assamese					
1	I	ASM- HC-1016 History of Assamese Literature from (Charyapada to Sankara Era)	<ul style="list-style-type: none"> • Conceptual ideas on the development of Assamese literature. • Knowledge on the major writers of the concerned period. • Knowledge on the major literary works of the concerned period. 	PSO 1 and PSO 3	Knowledge, Understanding
2	I	ASM-HC-1026 History of Assamese Literature from Post-Sankari to Arunoday Era)	<ul style="list-style-type: none"> • Conceptual ideas on the development of Assamese literature. • Knowledge on the major writers of the concerned period. • Knowledge on the major literary works of the concerned period. 	PSO 3	Knowledge, Understanding
3	II	ASM-HC- 2016 Introduction to Linguistics	<ul style="list-style-type: none"> • Primary Knowledge on Phonetics, Morphology and Syntax. • Knowledge on Linguistic, Grammar and their various divisions and trends. 	PSO 9	Knowledge, Understanding
4	II	ASM- HC- 2026	<ul style="list-style-type: none"> • Introduction to Basic Concepts of 	PSO 4 and PSO 7	Knowledge, Understanding

		Literary Criticism	Literary Criticism, Genre, Western and Indian Criticism etc.		
5	III	ASM- HC- 3016 Entrance Course to Assamese Literature	<ul style="list-style-type: none"> • Development of literary taste through intense study of selected literary texts. 	PSO 4 and PSO 5	Analyse, Understanding
6	III	ASM- HC- 3026 Specimens of Assamese Poetry	<ul style="list-style-type: none"> • Introduction to history of Assamese Poetry. • Knowledge on methodology of critical analysis and evaluation of poetry. • Development of refined taste for poetry. 	PSO 4, PSO 5, PSO 13, PSO 14, PSP 16	Knowledge, Understanding, Analyse
7	III	ASM- HC- 3036 Culture of Assam	<ul style="list-style-type: none"> • Knowledge on multi-ethnic, composite culture of Assam, and its modernization. • Understanding on Assamese culture. 		Understanding
8	IV	ASM- HC- 4016 Comparative Indian Literature	<ul style="list-style-type: none"> • Comparative perspectives on Literature. • Conception of Indian and World Literature. • Study of selected texts of multilingual Indian literature. 	PSO 1, PSO 11 and PSO 15, PSO 16	Understanding, Analyse
9	IV	ASM- HC- 4026 Assimilation in Assamese: Aryan and Non-Aryan Languages	<ul style="list-style-type: none"> • Concept of Language Family- Indo-European, Sino-Tibetan and Austric. • Conceptualising Assamese as an Aryan Language with elements of Non-Aryan Languages. 	PSO 1 and PSO 2	Knowledge, Understanding
10	IV	ASM- HC- 4036	<ul style="list-style-type: none"> • Knowledge on lineage of Assamese 	PSO 1, PSO 4 and PSO	Understanding

		Assamese Prose Literature	<p>Prose.</p> <ul style="list-style-type: none"> • Knowledge on various Prose styles in Assamese. 	7	
11	V	ASM- HC- 5016 Assamese Drama and their Production	<ul style="list-style-type: none"> • Concept of drama- plot, character, dialogue, dramatic conflict etc. • Concepts on Ankiya, historical, realistic, absurd drama. • Stage art and craft. 	1, 3 and 12	Understanding
12	V	ASM- HC- 5026 Assamese Grammar	<ul style="list-style-type: none"> • Knowledge on Assamese Phonology, Morphology and Syntax. 	8 and 9	Understanding
13	V	ASM- HE- 5016 Study of Assamese Folk Literature	<ul style="list-style-type: none"> • Knowledge on Assamese folk literature- its varieties like lullaby, ballads, religious songs, folktales etc. 	1, 2 and 3	Knowledge, Understanding
14	V	ASM- HE- 5026 Assamese Romantic Poetry	<ul style="list-style-type: none"> • Conceptualising Romanticism, and its impact on Assamese poetry, major Romantic poets and poems in Assamese. 	3, 14, 15, 16	Understanding, Analyse
15	V	ASM- HE- 5036 Sankardeva	<ul style="list-style-type: none"> • Reading Sankardeva as an author, his merits and demerits, his contributions to Assamese literature. 	1, 3, 4	Understanding, Analyse
16	V	ASM- HE- 5046 Assamese Science Fiction	<ul style="list-style-type: none"> • Understanding the meaning of science fiction. • Study of exemplary texts of science fiction in Assamese. 	4	Understanding, Analyse
17	VI	ASM- HC- 6016 Assamese Short-story and Novel	<ul style="list-style-type: none"> • Introduction with Assamese Short-story and Novel-their Trends, Styles, importance etc. 	1, 4, 15 and 18	Understanding, Analyse

18	VI	ASM- HC- 6026 History of Assamese Script	<ul style="list-style-type: none"> • Knowledge on development of Assamese script through ages in Indian context. • Introduction with prescribed samples of Assamese script. 	1 and 2	Knowledge, Understanding
19	VI	ASM- HE- 6016 Lakshminath Bezbaroa	<ul style="list-style-type: none"> • Knowledge on Lakshminath Bezbaroa's contribution to Assamese literature. • Study of prescribed texts. 	3, 4 and 7	Knowledge, Understanding, Analyse
Generic and Skill Courses					
20	I	ASM-HG-1016 & ASM-RC-1016 History of Assamese Literature	<ul style="list-style-type: none"> • Introduction with the emergence of Assamese literature with special reference to certain texts. 	1, 3 and 4	Knowledge, Understanding
21	I	ASM-AE- 1014 Communicative Assamese	<ul style="list-style-type: none"> • Ability to write formal letters, quotation, social media posts in Assamese 	8, 11	Knowledge, Understanding
22	II	ASM-HG- 2016 & ASM-RC-2016 History of Assamese Literature	<ul style="list-style-type: none"> • Same as the ASM-HG- 1016 	1, 3, and 4	Knowledge, Understanding
23	III	ASM-HG- 3016 & ASM-RC- 3016 Assamese Plays and Stage Art	<ul style="list-style-type: none"> • Same as ASM- HC- 5016 • Assamese Drama and their Production 	3, 7 and 12	Knowledge, Understanding, Analyse
24	III	ASM-SE-3014 Functional Assamese	<ul style="list-style-type: none"> • Skill in application of Assamese in practical and professional lives- Use of Assamese in Advertising, 	8 and 10	Understanding, Apply, Cognitive

		Assamese	anchoring, public speech, debating, script writing etc.		
25	III	ASM-CC- 3016 Ancient Assamese Literature	<ul style="list-style-type: none"> Knowledge on prescribed Assamese texts in historical perspectives. 	1, 2, 3	Understanding, Analyse
26	IV	ASM-SE- 4014 Creative Literature	<ul style="list-style-type: none"> Story and Poetry writing in practice. 	5, 7, 12	Apply, Cognitive
27	IV	ASM-HG- 4016 & ASM-RC- 4016 Modern Assamese Lyrics	<ul style="list-style-type: none"> Acquaintance with Assamese music and its lyrical beauty. 	3, 7 and 12	Knowledge, Understanding, Analyse
28	IV	ASM- CC- 4016 Modern Assamese Literature	<ul style="list-style-type: none"> Conceptualization of Modernity, and Knowledge on prescribed Assamese texts in historical perspectives. 	1, 2,3	Understanding, Analyse, Cognitive
29	V	ASM-SE- 5014 Recitation	<ul style="list-style-type: none"> Skill on Recitation- theory and practice. 	8, 10, 11	Apply, Analyse
30	V	ASM-RE- 5016 Assamese Folk Literature	<ul style="list-style-type: none"> Knowledge on varieties of Assamese Folk Literature. 	1, 2	Knowledge, Understanding
31	V	ASM-RE- 5026 Sankardeva	<ul style="list-style-type: none"> Study of prescribed texts by Sankardeva in details, and knowledge on Sankardeva's contribution to Assamese. 	1, 2, 16	Knowledge, Understanding, Analyse
32	VI	ASM-SE-6014 Assamese Spelling	<ul style="list-style-type: none"> Knowledge and Skill on Assamese spelling. 	8, 10, 11	Knowledge, Apply
33	VI	ASM-RE- 6016 Meter and Prosody	Acquaintance with basic principles and divisions of Assamese meter and prosody.	1, 2, 7	Knowledge, Understanding, Analyse

34	VI	ASM-RE-6026 Adaptation	Adaptation of literary works within the same and different genre, e.g. from story to film, from poem to story.	6, 7, 12	Understanding, Analyse, Apply, Cognitive
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ii. BA/BSc Economics

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Acquire the ability to explain core economics terms, concepts, and theories.
2. Explain the functions of market and prices as allocative mechanisms.
3. Apply the concept of equilibrium to both microeconomics and macroeconomics.
4. Identify key macroeconomics indicators and measures of economic changes with respect to growth and development.
5. Acquire knowledge of economic systems.
6. Inculcate the ability to understand economic theories and the functioning of basic microeconomic and macroeconomic systems.
7. Acquaint themselves with statistical and mathematical skills like collection, organization, tabulation, and analysis of empirical data.
8. Assess sector-specific policies and their impact on trends in key economic indicators of India.
9. Learn about major policy debates and latest empirical data.
10. Acquire in-depth knowledge of regression analysis, its associated problems and other related issues which will help them understand and analyse causal relationships in an empirical context.
11. Develop the skill of estimation and testing of empirical data-based models with the help of the OLS method.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	ECO-HC-1016 Introductory Microeconomics	This course is designed to expose the students to the basic principles of microeconomic theory. The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyse real-life situations.	1. Exploring the subject matter of Economics	Knowledge, Understanding
				2. Supply and Demand: How Markets Work, Markets and Welfare	Knowledge, Understanding
				3. The Households	Knowledge, Understanding
				4. The Firm and Perfect Market Structure	Knowledge, Understanding
				5. Imperfect Market Structure	Knowledge, Understanding
				6. Input Markets	Knowledge, Understanding
2	I	ECO-HC-1026: Mathematical Methods In Economics-I	This is the first of a compulsory two-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook. This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights	1. Preliminaries	Knowledge, understanding, application
				2. Functions of one real variable	Knowledge, understanding, application
				3. Differential calculus	Knowledge, understanding, application
				4. Single variable optimization	Knowledge, understanding, application
				5. Integration of functions	Knowledge, understanding, application

			major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list will have to be updated annually.		
3	II	ECO-HC-2016: Introductory Macroeconomics	This course aims to introduce the students to the basic concepts of Macroeconomics. Macroeconomics deals with the aggregate economy. This course discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variables like savings, investment, GDP, money, inflation, and the balance of payments.	1. Introduction to Macroeconomics and National Income Accounting	Knowledge, Understanding
				2. Money	Knowledge, Understanding
				3. Inflation	Knowledge, Understanding
				4. The Closed Economy in the Short Run	Knowledge, Understanding
4	II	ECO-HC-2026: MATHEMATICAL METHODS IN ECONOMICS – II	This course is the second part of a compulsory two-course sequence. This part is to be taught in Semester II following the first part in Semester I. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this Syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of	1. Linear algebra	Knowledge, understanding, application
				2. Functions of several real variables	Knowledge, understanding, application
				3. Multi-variable optimization	Knowledge, understanding, application

			<p>the prescribed textbook. This is the first of compulsory two-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook. This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list will have to be updated annually.</p>		
5	III	ECO-HC-3016: INTERMEDIATE MICROECONOMICS-I	<p>The course is designed to provide a sound training in microeconomic theory to formally analyse the behaviour of individual agents. Since students are already familiar with the quantitative techniques in the previous semesters, mathematical tools are used to facilitate understanding of the basic concepts. This course looks at the</p>	1. Consumer Theory	Knowledge, understanding
				2. Production, Costs and Perfect Competition	Knowledge, understanding

			behaviour of the consumer and the producer and also covers the behaviour of a competitive firm.		
6	III	ECO-HC-3026 INTERMEDIATE MACROECONOMICS I	This course introduces the students to formal modelling of a macro-economy in terms of analytical tools. It discusses various alternative theories of output and employment determination in a closed economy in the short run as well as medium run, and the role of policy in this context. It also introduces the students to various theoretical issues related to an open economy.	1. Aggregate Demand and Aggregate Supply Curves	Knowledge, Understanding
				2. Inflation, Unemployment and Expectations	Knowledge, Understanding
				3. Open Economy Models	Knowledge, Understanding
7	III	ECO-HC-3036: STATISTICAL METHODS FOR ECONOMICS	This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It then develops the notion of probability, followed by probability distributions of discrete and continuous random variables and of joint distributions. This is followed by a discussion on sampling techniques used to collect survey data. The course introduces the notion of sampling distributions that act as a bridge between probability theory and statistical inference. The semester concludes with some topics in statistical inference that include point and interval estimation	1. Introduction and Overview	Knowledge, understanding.
				2. Elementary Probability Theory	Knowledge, understanding, application, analysis
				3. Random Variables and Probability Distributions	Knowledge, understanding, application, analysis
				4. Random Sampling and Jointly Distributed Random Variables	Knowledge, understanding, application, analysis
				5. Sampling	Knowledge , understanding , analysis
8	IV	ECO-HC-4016: INTERMEDIATE MICROECONOMICS -II	This course is a sequel to Intermediate Microeconomics I. The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools	1: General Equilibrium, Efficiency and Welfare	Knowledge, understanding
				2: Market Structure and Game Theory	Knowledge, understanding

			and reasoning. It covers general equilibrium and welfare, imperfect markets and topics under information economics.	3: Markets with Asymmetric Information	Knowledge, understanding
9	IV	ECO-HC-4026: INTERMEDIATE MACROECONOMICS-II	This course is a sequel to Intermediate Macroeconomics I. In this course, the students are introduced to the long run dynamic issues like growth and technical progress. It also provides the micro-foundations to the various aggregative concepts used in the previous course.	1. Economic Growth	Knowledge, understanding
				2. Microeconomic Foundations	Knowledge, understanding
				3. Fiscal and Monetary Policy	Knowledge, understanding
				4. Schools of Macroeconomic Thoughts	Knowledge, understanding
10	IV	ECO-HC-4036: INTRODUCTORY ECONOMETRICS	This course provides a comprehensive introduction to basic econometric concepts and techniques. It covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models. The course also covers the consequences of and tests for misspecification of regression models.	1. Statistical Background	Knowledge, understanding, application
11	V	ECO-HC-5016: INDIAN ECONOMY-I	Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in India, the reading list will have to be updated annually.	1. Economic Development since Independence	Knowledge, understanding
				2. Population and Human Development	Knowledge, understanding
				3. Growth and Distribution	Knowledge, understanding
				4. International Comparisons	Knowledge, understanding
12	V	ECO-HC-5026: DEVELOPMENT ECONOMICS-I	This is the first part of a two-part course on economic development. The course begins with a discussion of alternative	1. Conceptions of Development	Knowledge, understanding
				2. Growth Models and	Knowledge, understanding

			<p>conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.</p>	<p>Empirics</p>	
				<p>3. Poverty and Inequality: Definitions, Measures and Mechanisms</p>	<p>Knowledge, understanding</p>
				<p>4. Political Institutions and the Functioning of the State</p>	<p>Knowledge, understanding</p>
13	VI	ECO-HC-6016: INDIAN ECONOMY-II	<p>This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list will have to be updated annually</p>	<p>1. Macroeconomic Policies and Their Impact</p>	<p>Knowledge, understanding</p>
				<p>2. Policies and Performance in Agriculture</p>	<p>Knowledge, understanding</p>
				<p>3. Policies and Performance in Industry</p>	<p>Knowledge, understanding</p>
				<p>4. Trends and Performance in Services</p>	<p>Knowledge, understanding</p>
14	VI	ECO-HC-6026: DEVELOPMENT ECONOMICS-II	<p>This is the second module of the economic development sequence. It begins with basic demographic concepts and their evolution during the process of development. The structure of markets and contracts is linked to the particular problems of enforcement experienced in poor countries. The governance of communities and organizations is studied and this is then linked to questions</p>	<p>1. Demography and Development</p>	<p>Knowledge, understanding</p>
				<p>2. Land, Labour and Credit Markets</p>	<p>Knowledge, understanding</p>
				<p>3. Individuals, Communities and Collective Outcomes</p>	<p>Knowledge, understanding</p>
				<p>4. Environment and Sustainable Development</p>	<p>Knowledge, understanding</p>
				<p>5. Globalization</p>	<p>Knowledge, understanding</p>

			of sustainable growth. The course ends with reflections on the role of globalization and increased international dependence on the process of development		
16	V	ECO-HE-5026: MONEY AND FINANCIAL MARKETS	This course exposes students to the theory and functioning of the monetary and financial sectors of the economy. It highlights the organization, structure and role of financial markets and institutions. It also discusses interest rates, monetary management and instruments of monetary control. Financial and banking sector reforms and monetary policy with special reference to India are also covered.	1. Money	Knowledge, understanding
17	V	ECO-HE-5036: PUBLIC FINANCE	This course is a non-technical overview of government finances with special reference to India. The course does not require any prior knowledge of economics. It will look into the efficiency and equity aspects of taxation of the centre, states and the local governments and the issues of fiscal federalism and decentralisation in India. The course will be useful for students aiming towards careers in the government sector, policy analysis, business and journalism.	1.Theory	Knowledge, understanding
				2: Issues from Indian Public Finance	Knowledge, understanding
18	VI	ECO-HE-6016: ENVIRONMENTAL ECONOMICS	This course focuses on economic causes of environmental problems. In particular, economic principles are applied to environmental questions and their management through various	1. Introduction	Knowledge, understanding
				2. The Theory of Externalities	Knowledge, understanding
				3. The Design and Implementation of	Knowledge, understanding

			economic institutions, economic incentives and other instruments and policies. Economic implications of environmental policy are also addressed as well as valuation of environmental quality, quantification of environmental damages, tools for evaluation of environmental projects such as cost-benefit analysis and environmental impact assessments. Selected topics on international environmental problems are also discussed	Environmental Policy	
				4. International Environmental Problems	Knowledge, understanding
				5. Measuring the Benefits of Environmental Improvements	Knowledge, understanding
				6. Sustainable Development	Knowledge, understanding
19	VI	ECO-HE-6026: INTERNATIONAL ECONOMICS	This course develops a systematic exposition of models that try to explain the composition, direction and consequences of international trade, and the determinants and effects of trade policy. It then builds on the models of open economy macroeconomics developed in courses 08 and 12, focusing on national policies as well as international monetary systems. It concludes with an analytical account of the causes and consequences of the rapid expansion of international financial flows in recent years. Although the course is based on abstract theoretical models, students will also be exposed to real-world examples and case studies.	1. Introduction	Knowledge, understanding
				2. Theories of International Trade	Knowledge, understanding
				3. Trade Policy	Knowledge, understanding
				4. International Macroeconomic Policy	Knowledge, understanding
20	I	ECO-HG-1016: Principles of Microeconomics–I	This course intends to expose the student to the basic principles in Microeconomic Theory and illustrate with applications.	1. Introduction	Knowledge, understanding
				2. Consumer Theory	Knowledge, understanding
				3. Production and Costs	Knowledge, understanding
				4. Perfect Competition	Knowledge, understanding

21	II	ECO-HG-2016: Principles of Microeconomics–II	This is a sequel to Principles of Microeconomics covered in the first semester	1. Market Structures	Knowledge, understanding
				2. Factor pricing	Knowledge, understanding
22	III	ECO-HG-3016: Principles of Macroeconomics–I	This course introduces students to the basic concepts in Macroeconomics. Macroeconomics deals with the aggregate economy. In this course the students are introduced to the definition, measurement of the macroeconomic variables like GDP, consumption, savings, investment and balance of payments. The course also discusses various theories of determining GDP in the short run.	1. Introduction	Knowledge, understanding
				2. National Income Accounting	Knowledge, understanding
				3. Determination of GDP	Knowledge, understanding
				4. National Income Determination with Government Intervention and Foreign Trade	Knowledge, understanding
				5. Money in a Modern Economy	Knowledge, understanding
23	IV	ECO-HG-4016: Principles of Macroeconomics–II	This is a sequel to Principles of Macroeconomics–I. It analyses various theories of determination of National Income in greater detail. It also introduces students to concept of inflation, its relationship with unemployment and some basic concepts in an open economy.	1. IS-LM Analysis	Knowledge, understanding
				2. GDP and Price Level in Short Run and Long Run	Knowledge, understanding
				3. Inflation and Unemployment	Knowledge, understanding
				4. Balance of Payments and Exchange Rate	Knowledge, understanding
24	III	ECO-SE-3014: Data Collection and Presentation	This course helps students in understanding use of data, presentation of data using computer softwares like MS-Excel. Students will be involved practically to preparation of questionnaires /interview schedules, collection of both primary and secondary data and its presentation. Students will also be asked to prepare a report on collected data and will be evaluated accordingly.	1. Use of Data	Knowledge, understanding
				2. Questionnaires and Schedules	Knowledge, understanding, application, analysis
				3. Presentation of Data	Knowledge, understanding, application, analysis

25	IV	ECO-SE-4014: Data Analysis	This course discusses how data can be summarized and analysed for drawing statistical inferences. The students will be introduced to important data sources that are available and will also be trained in the use of statistical softwares like SPSS/PSPP to analyse data.	1. Data entry in softwares	Knowledge, understanding, application, analysis
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iii. BA Education

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Develop an understanding of the historical development of education in the contexts of pre-independence and post-independence India.
2. Acquire the ability to understand various eastern and western schools of philosophy.
3. Acquire knowledge about the philosophical foundations of various theories and principles of education.
4. Understand human psychology from infancy to adulthood.
5. Acquire knowledge of emerging issues and current trends in the education system of India.
6. Undertake research or project work in the future.
7. Acquaint themselves with concepts of statistics.
8. Become well-equipped with the concepts of “guidance” and “counselling service”.
9. Develop efficient communication and public speaking skills and become well-trained in writing CV, resume and bio-data.
10. Acquire the ability to create and develop curriculum according to the needs and requirements of society.
11. Acquire knowledge and practice of various techniques and methods used in the teaching-learning process.
12. Become excellent teachers who are well-versed in diverse areas like individual differences and developmental psychology of a child.
13. Explore the possibility and acquire the necessary skills of becoming a teacher-trainer.
14. Become familiar with clinical psychology as a career option.
15. Know about career options as a text-book content writer.
16. To enter the field of social science research.

Course Outcomes:

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT /CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	EDU-HC-1016 PRINCIPLES OF EDUCATION	1.Acquaint the sound principles of education. 2. Acquaint the important concepts of education, curriculum, democracy, discipline, and freedom. 3. Develop knowledge about different aims of education, various types of curriculums, correlation of studies, and forms of discipline. 4. Familiarize with democratic idea of modern education	Unit 1 Meaning and Concept of Education.	Remembering, Understanding
				Unit 2 Aims of Education.	Remembering, Understanding, Analysing
				Unit 3 Curriculum	Understanding, Analysing, Evaluating
				Unit 4 Discipline and Freedom.	Understanding, Analysing
				Unit 5 Democracy and Education	Understanding, Analysing
2	I	EDU-HC-1026 PSYCHOLOGICAL FOUNDATIONS OF EDUCATION	1.Explain the need of educational psychology in teaching learning process. 2. Describe the nature and theories of learning and role of motivation in learning. 3. Understand the concept of memory, forgetting, attention and interest, and understand the relationship between education and psychology. 4. Understand intelligence, its theories and measurement.	Unit 1 Psychology and Education	Remembering, Understanding
				Unit 2 Learning and Motivation	Understanding, Analysing, Application
				Unit 3 Memory, Attention, and Interest.	Understanding, Analysing, Application

3	II	EDU-HC-2016 PHILOSOPHICAL AND SOCIOLOGICAL FOUNDATION OF EDUCATION	<ol style="list-style-type: none"> 1. Know the concept of philosophy and its relationship with education. 2. Understand the educational implications of different Indian schools of philosophy. 3. Understand the educational implications of different Western schools of philosophy. 4. Know the concept of sociology and its relationship with education. 5. Develop understanding about the concept of educational sociology, social groups, and socialization. 	Unit 1 Philosophy and Education	Remembering, Understanding, Analysing, Evaluating
				Unit 2 Various Indian Schools of Philosophy and Education	Understanding, Evaluating, Analysing
				Unit 3 Various Western Schools of Philosophy and Education	Understanding, Evaluating
				Unit 4 Sociology and Education	Understanding, Analysing
				Unit 5 Socio-Cultural Context of Education.	Understanding, Evaluating, Analysing
4	II	EDU-HC-2026: DEVELOPMENT OF EDUCATION IN INDIA-I	<ol style="list-style-type: none"> 1. Recount the concept of Ancient Indian education system. 2. Describe the education system in Ancient India, particularly Vedic Education. 3. Examine the education system in Medieval India. 4. Analyse the education system during the British Period. 	Unit 1 Education in Ancient and Medieval India	Remembering, Understanding, Evaluating
				Unit 2 Education in British India: The Beginning	Understanding
				Unit 3 Education in British India: In 19th Century	Understanding, Analysing, Evaluating
				Unit 4 Rise of Nationalism and its Impact on Education	Understanding, Analysing
				Unit 5 Education in British India: A Period of Experiment	Understanding, Analysing, Evaluating
5	III	EDU-HC-3016: DEVELOPMENT OF EDUCATION IN INDIA-II	<ol style="list-style-type: none"> 1. Understand the educational situation during the time of Independence. 2. Explain the recommendations and educational importance of different 	Unit 1 Development of Indian Education in the Post Independence Period	Remembering, Understanding, Analysing Evaluating

			Education Commission and Committees in post Independent India. 3. Analyze the National Policy on Education in different tomes. 4. Accustom with the recent Educational Development in India.	Unit 2 Development of Secondary Education in the Post Independent Period	Understanding, Analysing, Evaluating
				Unit 3 Education Commission: 1964-66	Understanding, Evaluating
				Unit 4 National Policies on Education in Post Independent Period	Understanding
				Unit 5 Recent Developments and Programmes in Indian Education	Understanding, Analysing
6	III	EDU-HC-3026: EDUCATIONAL TECHNOLOGY AND TEACHING METHODS	1. Understand the objective of educational technology in teaching learning process. 2. Acquaint with innovations in the field of education through technology. 3. Understand about various methods and devices of teaching. 4. Acquaint with levels, effectiveness of teaching and classroom management. 5. Understand the strategies of effective teaching as a profession.	Unit 1 Educational Technology	Remembering, Understanding
				Unit 2 Information and Communication Technology in Teaching-Learning	Understanding, Analysing, Application
				Unit 3 Models of Teaching	Understanding
				Unit 4 Methods and Techniques of Teaching	Understanding, Analysing, Application.
				Unit 5 Lesson Planning and Micro Teaching	Understanding, Application.
7	III			Unit 1 Value	Understanding, Evaluation.

		EDU-HC-3036: VALUE AND PEACE EDUCATION	<ol style="list-style-type: none"> 1. Understand the concept and meaning of value. 2. Aware about the role of educational institutions in building a value-based society. 3. Understand the meaning and concept of peace and its importance in human life, the importance of peace education and its relevance at national and international level. 4. Identify the different issues/challenges in imparting peace education. 5. Identify the strategies and skills in promoting peace education at institutional level. 	<p>Unit 2 Types of Values, their characteristics, functions and educational significance</p> <p>Unit 3 Value Education</p> <p>Unit 4 Peace Education</p> <p>Unit 5 Challenges of Peace Education and Role of Different Organisations</p>	<p>Understanding, Analysing.</p> <p>Understanding, Analysing, Evaluation.</p> <p>Understanding, Analysing, Evaluation</p> <p>Understanding, Analysing.</p>
8	IV	EDU-HC-4016: GREAT EDUCATIONAL THINKERS	<ol style="list-style-type: none"> 1. Learn about the views of thinkers in an educational context. 2. Learn about the relevance of some of their thoughts in the present-day context. 3. Learn the Philosophy of life of different Educational Thinkers and their works. 	<p>Unit 1 Educational thoughts of Srimanta Sankardeva</p> <p>Unit 2 Educational thoughts of Mahatma Gandhi and Rabindranath Tagore</p> <p>Unit 3 Educational thoughts of A.P.J. Abdul Kalam.</p> <p>Unit 4 Educational thoughts of Rousseau and Froebel</p> <p>Unit 5 Educational thoughts of John Dewey and Madam Maria Montessori</p>	<p>Remembering, Understanding, Analysing</p> <p>Understanding, Analysing</p> <p>Understanding, Analysing</p> <p>Understanding, Analysing</p> <p>Understanding, Analysing</p>

9	IV	EDU-HC-4026: EDUCATIONAL STATISTICS AND PRACTICAL	<ol style="list-style-type: none"> 1. Develop the basic concept of Statistics. 2. Be acquainted with different statistical procedures used in Education. 3. Develop the ability to represent educational data through graphs. 4. Familiarize about the Normal Probability Curve and its applications in Education. 	Unit1 Basics of Educational Statistics	Understanding , Application
				Unit 2 Graphical presentations of data	Understanding , Application
				Unit 3 Co-efficient of correlation and percentiles	Understanding , Application
				Unit 4 Normal Probability Curve and its applications	Understanding , Application
				Unit 5 Statistical Practical	Understanding , Application
10	IV	EDU-HC-4036: EMERGING ISSUES IN EDUCATION	<ol style="list-style-type: none"> 1. Acquaint with major emerging issues national, state, and local. 2. Acquaint with the various issues in education that are emerging in the recent years in the higher education system. 3. Address the various problems and challenges of education in India at all levels. 	Unit 1 Social Inequality in Education and Constitutional Safeguards	Remembering, Understanding
				Unit 2 Liberalization, Privatization and Globalization of Education	Understanding , Analysing, Evaluating
				Unit 3 Issues related to students	Understanding , Analysing,
				Unit 4 Environmental Education and Population education	Understanding Analysing, Evaluating
				Unit 5 Multi-cultural education and Alternative Education	Understanding, Analysing
11	V	EDU-HC-5016: MEASUREMENT AND EVALUATION IN EDUCATION AND PRACTICAL	<ol style="list-style-type: none"> 1. Understand the concept of measurement and evaluation in education. 2. Acquaint with the general procedure of test construction and characteristics of a good test. 	Unit 1 Measurement and Evaluation in Education.	Understanding, Analysing.
				Unit 2 Test Construction	Understanding.
				Unit 3 Educational Achievement Test	Understanding, Analysing, Application.

			3. Develop an understanding of different types of educational tests and their uses. 4. Acquaint about personality test, and aptitude tests.	Unit 4 Personality Test	Understanding Analysing.
				Unit 5 Laboratory Practical	Understanding, Analysing, Creating.
12	V	EDU-HC-5026: GUIDANCE AND COUNSELLING	1. Understand the concept, need and importance of Guidance and Counselling. 2. Know the different types and approaches to Guidance and Counselling. 3. Acquaints with the organization of guidance service and school guidance clinic. 4. Understand the challenges faced by the teacher as guidance worker.	Unit 1 Introduction to Guidance	Remembering, Understanding.
				Unit 2 Introduction to Counselling	Understanding, Analysing.
				Unit 3 Organisation of Guidance Service	Understanding, Analysing.
				Unit 4 Guidance needs of Students	Understanding, Evaluation.
				Unit 5 School Guidance Programme	Understanding, Analysing, Evaluating.
13	V	EDU-HE-5016: CONTINUING EDUCATION	1. Know the concept, objectives, scope, and significance of continuing education in the context of present scenario. 2. Understand about different aspects and agencies of continuing education. 3. Realize different methods and techniques as well as issues of continuing education. 4. Know the meaning of open education and realize the importance of open school and open universities in continuing education. 5. Understand the development of adult education in India, kinds of adult education and different problems of adult education.	Unit 1 Continuing Education.	Remembering, Understanding, Analysing.
				Unit 2 Methodologies and Issues of Continuing Education	Understanding, Analysing.
				Unit 3 Open Education.	Understanding, Analysing.
				Unit 4 Adult Education	Understanding Analysing, Evaluating.
				Unit 5 Recent Literacy Programmes in India	Understanding

14	V	EDU-HE-5026: DEVELOPMENTAL PSYCHOLOGY	<ol style="list-style-type: none"> 1. Understand the basic concepts relating to development. 2. Acquaint about heredity and environmental factors affecting pre-natal development. 3. Understand the development aspects during infancy and childhood. 4. Understand the development aspects of adolescence, importance of adolescence period and problems associated with this stage. 	Unit 1 Introduction to Developmental Psychology	Remembering, Understanding, Evaluating.
				Unit 2 Infancy	Understanding, Evaluating.
				Unit 3 Childhood	Understanding, Evaluating.
				Unit 4 Adolescence	Understanding, Analysing.
				Unit 5 Social, Emotional and Personality Development of Adolescence	Understanding, Analysing.
15	V	EDU-HE-5036: HUMAN RIGHTS EDUCATION	<ol style="list-style-type: none"> 1. Explain the basic concept, nature, and scope of human rights. 2. Describe the meaning, nature, principles, curriculum, and teaching methods of human rights education at different levels of Education. 3. Know the role of United Nations on human rights. 4. Understand enforcement mechanism in India and know the role of advocacy groups. 	Unit 1 Basic Concept of Human Rights	Remembering, Understanding, Analysing.
				Unit 2 United Nations and Human Rights	Understanding.
				Unit 3 Human Rights-Enforcement Mechanism in India	Understanding , Analysing.
				Unit 4 Role of Advocacy Groups for Promotion of Human Rights	Analysing.
				Unit 5 Human Rights and Marginalised Sections	Analysing, Evaluating.
16	V	EDU-HE-5046: TEACHER EDUCATION IN INDIA	<ol style="list-style-type: none"> 1. Explain the concept, scope, aims and objectives and significance of teacher education. 2. Acquaint with the development of Teacher Education in India. 3. Acquaint with the different organizing bodies of teacher education in India and 	Unit 1 Conceptual Framework and Historical Perspectives of Teacher Education in India	Remembering, Understanding, Analysing.
				Unit 2 Teacher Education for Different Levels of Education	Understanding, Analysing.

			<p>their functions in preparation of teachers for different levels of education.</p> <p>4. Acquaint with the innovative trends and recent issues in teacher education, and be able to critically analyse the status of teacher education in India.</p> <p>5. Understand and conceive the qualities, responsibilities, and professional ethics of teachers</p>	<p>Unit 3 Structure and Organisations of Teacher Education in India</p>	Understanding.
				<p>Unit 4 Status of Teacher Education in India: Trends, Issues and Challenges</p>	Understanding, Evaluating.
				<p>Unit 5 Quality, Responsibility and Professional Ethics of Teachers</p>	Understanding, Analysing, Evaluating.
17	VI	EDU-HC-6016: EDUCATION AND DEVELOPMENT	<p>1. Relation between education and development.</p> <p>2. Educational development in the post globalization era.</p> <p>3. Role of education in community development.</p> <p>4. Education for human resource development.</p> <p>5. Economic and political awareness through education.</p>	<p>Unit 1 Basic Concepts of Education and Development</p>	Remembering, Understanding, Evaluating.
				<p>Unit 2 Education and Community Development</p>	Understanding, Analysing.
				<p>Unit 3 Education and Human Resource Development</p>	Understanding, Analysing.
				<p>Unit 4 Education and Economic Development</p>	Understanding, Analysing, Evaluating.
				<p>Unit 5 Education and Developing Political Awareness</p>	Understanding, Analysing.
18	VI	EDU-HC-6026: PROJECT	<p>1. Explain the process of conducting a Project.</p> <p>2. Prepare a project report.</p>		Understanding, Applying, Evaluating, Analysing, Creating.
19	VI	EDU-HE-6016: MENTAL HEALTH AND HYGIENE	<p>1. Acquaint with the fundamentals and development of mental health and the</p>	<p>Unit 1 Fundamentals of Mental Health</p>	Understanding.

			<p>characteristics of a mentally healthy person.</p> <p>2. Understand the concept and importance of mental hygiene and its relationship with mental health.</p> <p>3. Acquire knowledge about the principles, factors promoting mental health and the role of home, school, and society in maintaining proper mental health.</p> <p>4. Learn the meaning and problem of adjustment and the different adjustment mechanisms.</p> <p>5. Familiarize with the concept and issues of positive psychology, mental health of women, role of WHO and stress management.</p>	<p>Unit 2 Mental Hygiene- Meaning and Definitions</p>	<p>Understanding, Analysing.</p>
				<p>Unit 3 Education and Mental Health</p>	<p>Understanding, Analysing, Evaluating.</p>
				<p>Unit 4 Preservation of Mental Health and Hygiene</p>	<p>Understanding, Analysing</p>
				<p>Unit 5 Mental Health and Yoga</p>	<p>Understanding, Analysing</p>
20	VI	EDU-HE-6026: SPECIAL EDUCATION	<p>1. Understand the meaning and importance of special education.</p> <p>2. Acquaint with the different policies and legislations of special education.</p> <p>3. Familiarize with the different types of special children with their characteristics.</p> <p>4. Know about different issues, educational provisions, and support services of special education.</p>	<p>Unit 1 Special Education</p>	<p>Understanding, Analysing, Evaluating</p>
				<p>Unit 2 Physically Challenged Children</p>	<p>Understanding, Analysing, Evaluating</p>
				<p>Unit 3 Children with Intellectual Disability (Mental Retardation) and gifted</p>	<p>Understanding, Analysing</p>
				<p>Unit 4 Children with Learning Disability</p>	<p>Understanding, Analysing, Evaluating</p>
				<p>Unit 5 Policies, Legislation and Services</p>	<p>Understanding, Analysing, Application</p>
21	VI	EDU-HE-6036: EDUCATIONAL MANAGEMENT	<p>1. Develop an understanding of the basic concept of educational management.</p> <p>2. Know about the various resources in education.</p>	<p>Unit 1 Introduction to Educational Management</p>	<p>Understanding, Analysing</p>
				<p>Unit 2 Resources in Education</p>	<p>Understanding, Analysing</p>

			3. Understand the concept and importance of educational planning. 4. Know about the financial resources and financial management in education.	Unit 3 Educational Planning	Understanding
				Unit 4 Institutional Planning	Understanding, Analysing, Application
				Unit 5 Financing of Education and Recent Trends in Management	Understanding, Analysing
22	VI	EDU-HE-6046: WOMEN AND SOCIETY	1. Know the changing role of women in India. 2. Understand gender discrimination in Indian society. 3. Understand the constitutional provisions for women and their rights. 4. Understand women empowerment. 5. Develop an awareness and sensitivity towards women.	Unit 1 Status and Role of Women	Understanding, Analysing
				Unit 2 Constitutional Provisions and Rights of Women	Understanding
				Unit 3 Gender Inequalities in School and Society	Understanding, Evaluating
				Unit 4 Women Empowerment	Understanding, Analysing
				Unit 5 The Roles of Men and Women and its Implications	Understanding, Analysing

iv. BA English

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Understand various literatures and cultures by studying European, African, American, and other texts in the syllabus.
2. Obtain a broader view of the origin of literatures of the world and the possibility of cultural exchange by studying classical literatures.
3. Acquaint themselves with latest developments in the field of literature not only from Britain but also from other parts of the world by reading and analyzing modern English literature.
4. Acquire multidimensional knowledge of the subjects contained in texts that are contextualised in different socio-cultural and political events and movements.
5. Learn about the interrelation of life and literature via the wide variety of optional papers in the syllabus.
6. Explore new ideas and become motivated to undertake comparative studies by means of exposure to various texts from around the world in the curriculum.
7. Hone their moral and ethical values based on literary texts, characters and themes.
8. Access an appropriate platform to carry out extra-literary analyses, viz., discussion of socio-environmental issues, societal inequalities, and structural hierarchies.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	ENG-HC-1016 Indian Classical Literature	After completion of the course, learners will: <ul style="list-style-type: none"> acquire knowledge about the classical literature of India by reading and understanding texts in English translation. familiarise themselves with diverse classical genres like drama and epic. understand the diversity of the category "literature". 	Kalidasa: <i>Abhijnana Shakuntalam</i>	Remember, Understand, Analyse
				Vyasa: "The Dicing" "The Sequel to Dicing", "The Book of the Assembly Hall", "The Temptation of Karna", "The Book of Effort" in <i>The Mahabharata</i>	Remember, Understand, Analyse
				Sudraka: <i>Mrcchakatika</i>	Remember, Understand, Analyse
				Ilango Adigal: "The Book of Banci" in <i>Cilappatikaram</i>	Remember, Understand, Analyse
2	I	ENG-HC-1026 Western Classical Literature	After completion of the course, learners will: <ul style="list-style-type: none"> become familiar with classical European texts across genres like drama, epic and poetry. obtain an overview of the beginnings of European/English literature. acquire tools and methods to carry out literary analyses of texts. acquire knowledge of human character and develop moral values. form the foundation of studying literature as a mode 	Homer: <i>The Odyssey</i>	Remember, Understand, Analyse
				Sophocles: <i>Oedipus the King</i>	Remember, Understand, Analyse
				Plautus: <i>The Pot of Gold</i>	Remember, Understand, Analyse
				Ovid: Selections from <i>Metamorphoses</i> ; Horace: Satires I:4 in <i>Horace: Satires and Epistles and Persius: Satires</i>	Remember, Understand, Analyse

			of cultural exchange.		
3	II	ENG-HC-2016 Indian Writing in English	After completion of the course, learners will: <ul style="list-style-type: none"> ● become acquainted with the category of Indian Writing in English and its place vis-à-vis British/English as well as global literatures. ● read and understand a variety of Indian texts in English across genres and from different time periods. ● be able to analyse issues of language, gender, nationalism and modernity in the Indian colonial and postcolonial contexts. 	H.L.V. Derozio: “Freedom to the Slave”, “The Orphan Girl”	Remember, Understand, Analyse
				Kamala Das: “Introduction”, “My Grandmother’s House”	Remember, Understand, Analyse
				Nissim Ezekiel: “Enterprise”, “Night of the Scorpion”, “Very Indian Poem in English”	Remember, Understand, Apply, Analyse
				Robin S. Ngangom: “The Strange Affair of Robin S. Ngangom”; “A Poem for Mother”	Remember, Understand, Apply, Analyse,
				Mulk Raj Anand: “The Two Lady Rams”	Remember, Understand, Analyse
				R.K. Narayan: <i>Swami and Friends</i> ; Salman Rushdie: “The Free Radio”	Remember, Understand, Analyse
				Anita Desai: <i>In Custody</i>	Remember, Understand, Analyse
				Shashi Deshpandee: “The Intrusion”	Remember, Understand, Analyse
				Manjula Padmanabhan: <i>Lights Out</i>	Remember, Understand, Analyse
				Mahesh Dattani: <i>Tara</i>	Remember, Understand, Analyse, Evaluate
4	II	ENG-HC-2026	After completion of the course, learners will:	Geoffrey Chaucer: <i>The Wife of Bath’s Prologue</i>	Remember, Understand, Analyse

		British Poetry and Drama: 14 th to 17 th Centuries	<ul style="list-style-type: none"> • understand the beginnings of modern British literature. • develop an awareness of the interconnections between the medieval and the modern. • become acquainted with two major genres of English literature, poetry and drama. • be able to evaluate the socio-historical-cultural aspects of the Renaissance and the Elizabethan period. 	Edmund Spenser: Selections from <i>Amoretti</i>	Remember, Understand, Analyse
				John Donne: “The Sunne Rising”, “Batter My Heart”, “Valediction: Forbidding Mourning”	Remember, Understand, Analyse
				Christopher Marlowe: <i>Doctor Faustus</i>	Remember, Understand, Analyse, Evaluate
				William Shakespeare: <i>Macbeth</i>	Remember, Understand, Analyse, Create
				William Shakespeare: <i>Twelfth Night</i>	Remember, Understand, Analyse, Evaluate, Create
5	III	ENG-HC-3016 History of English Literature and Forms	After completion of the course, learners will: <ul style="list-style-type: none"> • become familiar with the broad and specific periods of British English literature. • acquire a sense of the historical development of literary forms and genres. • gain an understanding of the contexts in which literary forms and individual texts emerge. • learn to analyse texts by applying interpretive methods as representative of broad generic explorations. 	Poetry from Chaucer to the Present	Remember, Understand, Apply, Analyse, Evaluate
				Drama from Everyman to the Present	Remember, Understand, Apply, Analyse, Evaluate
				Fiction	Remember, Understand, Apply, Analyse, Evaluate
				Non-Fictional Prose	Remember, Understand, Apply, Analyse, Evaluate
6	III	ENG-HC-3026	After completion of the course, learners will:	Tennessee Williams: <i>The Glass Menagerie</i>	Remember, Understand, Analyse

		American Literature	<ul style="list-style-type: none"> ● become familiar with the main trends of American literature in its social, cultural and historical contexts. ● get an overview of American society and its evolutionary stages. ● gain knowledge about the various generic innovations and developments in American literature. ● be able to attempt a comparative analysis of American and British literatures. ● be able to expand their cultural understanding of the world. 	<p>Mark Twain: <i>The Adventures of Huckleberry Finn</i></p> <p>Edgar Allan Poe: "The Purloined Letter"</p> <p>F. Scott Fitzgerald: "The Crack-up"</p> <p>Anne Bradstreet: "The Prologue"</p> <p>Emily Dickinson: "A Bird Came Down the Walk", "Because I Could not Stop for Death"</p> <p>Walt Whitman: Selections from <i>Leaves of Grass</i>: "O Captain, My Captain", "Passage to India" (Lines: 1-68)</p> <p>Langston Hughes: "I too"</p> <p>Robert Frost: "Mending Wall"</p> <p>Sherman Alexie: "Crow Testament", "Evolution"</p>	<p>Remember, Understand, Analyse, Evaluate</p> <p>Remember, Understand, Analyse</p> <p>Remember, Understand, Analyse</p> <p>Remember, Understand, Analyse</p> <p>Remember, Understand, Analyse, Evaluate</p> <p>Remember, Understand, Apply, Analyse</p> <p>Remember, Understand, Analyse</p> <p>Remember, Understand, Analyse</p> <p>Remember, Understand, Analyse</p>
7	III	ENG-HC-3036 British Poetry and Drama: 17 th and 18 th Centuries	<p>After completion of the course, learners will:</p> <ul style="list-style-type: none"> ● become familiar with British poetry and drama in the 17th and 18th centuries. ● feel encouraged to look at the economic, political and social changes in Britain during the 	<p>John Milton: <i>Paradise Lost: Book I</i></p> <p>John Webster: <i>The Duchess</i></p>	<p>Remember, Understand, Apply, Analyse</p> <p>Remember, Understand, Analyse</p>

			<p>period, viz., the shifts from the Puritan Age to the Restoration and Neoclassical Periods.</p> <ul style="list-style-type: none"> ● acquire the ability to analyse larger contexts that generated the literature of the period and the effects of such literature on society. ● gain knowledge about significant phenomenon of the period like the scientific revolution in relation to literary production. 	<p><i>of Malfi</i></p>	
				Aphra Behn: <i>The Rover</i>	Remember, Understand, Analyse, Evaluate, Create
				John Dryden: <i>Mac Flecknoe</i>	Remember, Understand, Apply, Analyse
				Alexander Pope: <i>The Rape of the Lock</i>	Remember, Understand, Apply, Analyse
8	IV	ENG-HC-4016 British Literature: The 18 th Century	<p>After completion of the course, learners will:</p> <ul style="list-style-type: none"> ● acquire knowledge about British literature in the 18th century. ● learn about the reasons the period is known as the age of reason and rationality. ● gain insight into the rise of the novel and the development of satire. ● become acquainted with a particular kind of drama, namely, sentimental comedy. 	Jonathan Swift: <i>Gulliver's Travels</i> (Books III and IV)	Remember, Understand, Analyse
				Samuel Johnson: "London"	Remember, Understand, Analyse
				Thomas Gray: "Elegy Written in a Country Churchyard"	Remember, Understand, Analyse
				Daniel Defoe: <i>Moll Flanders</i>	Remember, Understand, Analyse
				Joseph Addison: "Pleasures of the Imagination", <i>The Spectator</i> , 411	Remember, Understand, Analyse, Evaluate
				Oliver Goldsmith: <i>She Stoops to Conquer</i>	Remember, Understand, Analyse
9	IV	ENG-HC-4026	<p>After completion of the course, learners will:</p>	William Blake: "The Lamb", "The Chimney Sweeper", "The Tyger", "Introduction"	Remember, Understand, Analyse

		British Romantic Literature	<ul style="list-style-type: none"> ● become familiar with the Romantic Movement in British literature. ● be able to comprehend Romanticism's relation with socio-historical developments like industrialism. ● understand some key notions of Romanticism, viz., the role of imagination in literature, the poet as an individual, critique of neoclassical ideals, etc. ● be able to apply the above-mentioned insights in understanding the prescribed texts. ● be able to evaluate the interrelations between human beings and nature. 	<i>to The Songs of Innocence</i> Robert Burns: "A Bard's Epitaph", "Scots WhaHae" William Wordsworth: "Tintern Abbey", "Upon Westminster Bridge" Samuel Taylor Coleridge: "Kubla Khan", "Dejection: An Ode" Percy Bysshe Shelley: "Ode to the West Wind", "Hymn to Intellectual Beauty", <i>The Cenci</i> John Keats: "Ode to a Nightingale", "To Autumn", "On First Looking into Chapman's Homer" Mary Shelley: <i>Frankenstein</i>	Remember, Understand, Analyse Remember, Understand, Apply, Analyse Remember, Understand, Apply, Analyse Remember, Understand, Analyse Remember, Understand, Analyse, Evaluate Remember, Understand, Analyse, Evaluate
10	IV	ENG-HC-4036 British Literature: The 19 th Century	After completion of the course, learners will: <ul style="list-style-type: none"> ● become acquainted with British literature of the middle and later parts of the 19th century. ● learn about the novel's coming into its own by reading and analysing pathbreaking novels of the time. ● become familiar with the 	Jane Austen: <i>Pride and Prejudice</i> Charlotte Bronte: <i>Jane Eyre</i> Charles Dickens: <i>The Pickwick Papers</i> (Chapters: 1, 2, 23, 56, 57) Thomas Hardy: "The Three Strangers" Alfred Tennyson: "The Defence of Lucknow" Robert Browning: "Love	Remember, Understand, Analyse, Evaluate Remember, Understand, Analyse Remember, Understand, Analyse, Evaluate Remember, Understand, Analyse Remember, Understand, Analyse Remember, Understand, Analyse

			<p>significant poetic efforts and achievements of the period.</p> <ul style="list-style-type: none"> develop human values. 	among the Ruins”	
				Christina Rossetti: “Goblin Market”	Remember, Understand, Analyse
11	V	ENG-HC-5016 British Literature: The 20 th Century	<p>After completion of the course, learners will:</p> <ul style="list-style-type: none"> acquire knowledge about socio-politico-economic as well as aesthetic shifts in the world with the breaking of the world wars, through an understanding of 20th century British texts. become familiar with the voice of modernism in arts and literature. get an opportunity to evaluate the chief tenets of modernism, viz., desire to break with the codes and conventions of the past, experiment with new forms and idioms, etc. get acquainted with the ethos of postmodernism through a reading of recent poetic and fictional works. 	Joseph Conrad: <i>Heart of Darkness</i>	Remember, Understand, Analyse
				Virginia Woolf: <i>Mrs Dalloway</i>	Remember, Understand, Apply, Analyse
				W.B. Yeats: “The Second Coming”, “Sailing to Byzantium”	Remember, Understand, Analyse
				T.S. Eliot: “The Love Song of J. Alfred Prufrock”; “Journey of the Magi”	Remember, Understand, Apply, Analyse, Evaluate
				W.H. Auden: “In Memory of W.B. Yeats”	Remember, Understand, Analyse
				Hanif Kureshi: <i>My Beautiful Launderette</i>	Remember, Understand, Analyse, Evaluate
				Phillip Larkin: “Church Going”	Remember, Understand, Analyse
				Ted Hughes: “Hawk Roosting”	Remember, Understand, Analyse
				Seamus Heaney: “Casualty”	Remember, Understand, Analyse
				Carol Ann Duffy: “Standing Female Nude”	Remember, Understand, Analyse, Evaluate
12	V	ENG-HC-5026 Women’s Writing	<p>After completion of the course, learners will:</p> <ul style="list-style-type: none"> become familiar with 19th and 20th century writings by 	Mary Wollstonecraft: <i>A Vindication of the Rights of Woman</i> (Chapters 1 and 2)	Remember, Understand, Apply, Analyse

			<p>women from different geographical and socio-cultural settings.</p> <ul style="list-style-type: none"> ● get acquainted with the distinct experiences of women articulated in a variety of genres, namely, poetry, novel, short story, and autobiography. ● gain an understanding of the earliest feminist treatises of the western world. ● get an opportunity of reading and analysing texts as a mode of cultural exchange. 	<p>Rassundari Debi: Excerpts from <i>Amar Jiban</i></p>	Remember, Understand, Analyse
				<p>Katherine Mansfield: "Bliss"</p>	Remember, Understand, Analyse
				<p>Sylvia Plath: "Daddy"; "Lady Lazarus"</p>	Remember, Understand, Analyse, Evaluate
				<p>Alice Walker: <i>The Color Purple</i></p>	Remember, Understand, Analyse, Evaluate
				<p>Mahashweta Devi: "Draupadi"</p>	Remember, Understand, Analyse, Evaluate
				<p>Nirupama Bargohain: "Celebration"</p>	Remember, Understand, Apply, Analyse
				<p>Adrienne Rich: "Orion"</p>	Remember, Understand, Analyse
				<p>Eunice De Souza: "Advice to Women", "Bequest"</p>	Remember, Understand, Analyse
13	V	ENG-HE-5016 Popular Literature	<p>After completion of the course, learners will:</p> <ul style="list-style-type: none"> ● be able to understand the nature of popular literature as a genre. ● become equipped to engage with the critical ideas underlying the theorization of popular literature. ● gain insight into the high/low culture debate. ● be able to investigate the move of popular literature from the margins to an 	<p>Lewis Carroll: <i>Alice in Wonderland</i></p>	Remember, Understand, Analyse
				<p>Agatha Christie: <i>The Murder of Roger Ackroyd</i></p>	Remember, Understand, Apply, Analyse, Evaluate, Create
				<p>J. K. Rowling: <i>Harry Potter and the Philosopher's Stone</i></p>	Remember, Understand, Analyse, Evaluate
				<p>DurgabaiVyam and Subhash Vyam: <i>Bhimayana: Experiences of Untouchability/</i> Autobiographical Notes on Ambedkar (for visually challenged students)</p>	Remember, Understand, Analyse

			important place in the literary and critical consciousness.		
14	V	ENG-HE-5026 Modern Indian Writing in English Translation	<p>After completion of the course, learners will:</p> <ul style="list-style-type: none"> ● become familiar with Indian literature written in the regional languages. ● be able to explore the diverse cultural and regional contexts of the prescribed texts. ● gather insight into socio-political issues of the present times. ● be able to carry out comparative studies of texts from different regions and in multiple languages. ● delve into the debates surrounding Indian writings in English vis-à-vis Indian writings in the regional languages. 	Premchand: "The Shroud"	Remember, Understand, Apply, Analyse
				IsmatChughtai: "The Quilt"	Remember, Understand, Apply, Analyse
				BhabendranathSaikia: "Celebration"	Remember, Understand, Apply, Analyse, Evaluate
				Fakir Mohan Senapati: "Rebati"	Remember, Understand, Apply, Analyse
				Rabindra Nath Tagore: "Light, Oh Where is the Light?", "When My Play was with thee"	Remember, Understand, Apply, Analyse, Create
				G.M. Muktibodh: "The Void", "So Very Far"	Remember, Understand, Apply, Analyse
				Amrita Pritam: "I Say Unto Waris Shah"	Remember, Understand, Apply, Analyse
				ThangjamIbopishak Singh: "Dali, Hussain, or Odour of Dream, Colour of Wind", "The Land of the Half-Humans"	Remember, Understand, Apply, Analyse
				Dharamveer Bharati: <i>AndhaYug</i>	Remember, Understand, Apply, Analyse
Hiren Bhattacharyya: "What Is It That Burns in Me?"	Remember, Understand, Apply, Analyse, Evaluate, Create				
15	V	ENG-HE-5056	After completion of the course,	William Wordsworth:	Remember, Understand, Apply,

		Literary Criticism and Literary Theory	learners will: <ul style="list-style-type: none"> ● become familiar with important texts on literary criticism and literary theory. ● grasp the differences between literary theory and literary criticism. ● understand the shifts in literary interpretations and critical approaches. ● become equipped with analytical and interpretive tools to read texts across genres. ● apply the above-mentioned tools in the theoretical and practical criticism of texts. 	Preface to the <i>Lyrical Ballads</i>	Analyse
				S.T. Coleridge: <i>Biographia Literaria</i> (Chapters: IV, XIII and XIV)	Remember, Understand, Apply, Analyse, Evaluate
				Virginia Woolf: “Modern Fiction”	Remember, Understand, Analyse
				T.S. Eliot: “Tradition and the Individual Talent”	Remember, Understand, Analyse
				I.A. Richards: <i>Principles of Literary Criticism</i> (Chapters: 1, 2 and 34)	Remember, Understand, Apply, Analyse
				Cleanth Brooks: “The Language of Paradox”	Remember, Understand, Apply, Analyse
				Terry Eagleton: “Introduction” to <i>Marxism and Literary Criticism</i>	Remember, Understand, Apply, Analyse, Evaluate
				Elaine Showalter: “Twenty Years on: <i>A Literature of Their Own</i> Revisited”	Remember, Understand, Analyse, Evaluate
				Toril Moi: “Introduction” to <i>Sexual/Textual Politics</i>	Remember, Understand, Analyse
				Jacques Derrida: “Structure, Sign and Play in the Discourse of the Human Science”	Remember, Understand, Apply, Analyse
				Michel Foucault: “Truth	Remember, Understand,

				and Power”	Analyse, Evaluate
				Mahatma Gandhi: “Passive Resistance”, “Education”	Remember, Understand, Analyse, Evaluate
				Edward Said: “The Scope of Orientalism”	Remember, Understand, Apply, Analyse
				Frantz Fanon: <i>Black Skin, White Masks</i> (Chapter 4)	Remember, Understand, Analyse
16	VI	ENG-HC-6016 Modern European Drama	After completion of the course, learners will: <ul style="list-style-type: none"> ● get acquainted with innovative dramatic works of playwrights from different parts of Europe. ● develop an understanding of the emergence of avant-garde movements and trends in reference to drama. ● learn about dramatic devices and techniques used during the period of modernism in Europe which influenced theatrical practices in other parts of the world. ● be able to analyse literary-social-intellectual movements like existentialism, absurdism, nihilism, etc. 	Henrik Ibsen: <i>Ghosts</i>	Remember, Understand, Analyse
				Anton Chekhov: <i>The Cherry Orchard</i>	Remember, Understand, Analyse
				Bertolt Brecht: <i>The CaucasianChalk Circle</i>	Remember, Understand, Analyse
				Samuel Beckett: <i>Waiting for Godot</i>	Remember, Understand, Analyse, Evaluate
17	VI	ENG-HC-6026	After completion of the course, learners will:	Chinua Achebe: <i>Things Fall Apart</i>	Remember, Understand, Analyse

		Postcolonial Literatures	<ul style="list-style-type: none"> familiarize themselves with European colonialism since the 15th century. learn about the effects of the experience of colonialism around the world. get acquainted with texts from postcolonial literatures across the world. delve into the conditions of postcolonial peoples and societies. acquire an introduction to regional/cultural peculiarities as well as shared experiences of the postcolonial condition. 	Gabriel Garcia Marquez: <i>Chronicle of a Death Foretold</i> Bessie Head: "The Collector of Treasures"; Ama Ata Aidoo: "The Girl who Can"	Remember, Understand, Analyse Remember, Understand, Analyse
				Grace Ogot: "The Green Leaves"	Remember, Understand, Analyse
				Shyam Selvadurai: <i>Funny Boy</i>	Remember, Understand, Analyse, Evaluate
				Pablo Neruda: "Tonight I can Write"; "The Way Spain Was"	Remember, Understand, Analyse
				Derek Walcott: "A Far Cry from Africa"; "Names"	Remember, Understand, Analyse
				David Malouf: "Revolving Days"; "Wild Lemons"	Remember, Understand, Analyse
				Easterine Kire: <i>When the River Sleeps</i>	Remember, Understand, Analyse, Evaluate
18	VI	ENG-HE-6036 Partition Literature	After completion of the course, learners will: <ul style="list-style-type: none"> learn about the far-reaching impact of partition on people. view partition as leading not only to momentary but also continual changes in human 	Intizar Husain: <i>Basti</i> Amitav Ghosh: <i>The Shadow Lines</i> Dibyendu Palit: "Allam's Own House"	Remember, Understand, Analyse Remember, Understand, Analyse, Evaluate Remember, Understand, Analyse

			<p>lives, emotions and values.</p> <ul style="list-style-type: none"> comprehend the trauma and sufferings of people as a result of partitions in the Indian subcontinent. analyse and evaluate how writers across regions deal with partition and its aftermath. develop human values like empathy and sensitivity. 	<p>Manik Bandhopadhyaya: "The Final Solution"</p>	Remember, Understand, Analyse
				<p>Sa'adat Hasan Manto: "Toba Tek Singh"</p>	Remember, Understand, Analyse, Evaluate
				<p>LalithambikaAntharajanam: "A Leaf in the Storm"</p>	Remember, Understand, Analyse
				<p>Faiz Ahmad Faiz: "For Your Lanes, My Country"</p>	Remember, Understand, Analyse
				<p>Jibananda Das: "I Shall Return to This Bengal"</p>	Remember, Understand, Analyse
				<p>Gulzar: "Toba Tek Singh"</p>	Remember, Understand, Analyse, Evaluate
19	VI	ENG-HE-6066 Writings from North East India	<p>After completion of the course, learners will:</p> <ul style="list-style-type: none"> understand the latest trends in writings from Northeast India. learn about the ways in which writers from the northeast represent the region in the national/global scenario. be able to analyse region-specific features and concerns of Northeast India. evaluate the similarities and differences between the various cultures of the northeast. 	<p>Mamang Dai: "On Creation Myths and Oral Narratives"</p>	Remember, Understand, Analyse
				<p>Tachyscope: "The Story of Creation"</p>	Remember, Understand, Analyse, Evaluate
				<p>Kynpham Sing Nongkynrih: "U Thlen: The Man-Eating Serpent"</p>	Remember, Understand, Analyse
				<p>Deva Kanta Barua: "And we open the Gates"</p>	Remember, Understand, Analyse, Evaluate
				<p>Ajit Barua: "Lovely is Our Village", Parts I & II</p>	Remember, Understand, Analyse, Evaluate
				<p>Rajendra Bhandari: "Time Does Not Pass"</p>	Remember, Understand, Analyse
				<p>HomenBorgohain: "Spring in Hell"</p>	Remember, Understand,

					Analyse, Evaluate
				TemsulaAo: "An Old Man Remembers"	Remember, Understand, Analyse
				Mahim Bora: "Audition"	Remember, Understand, Analyse, Evaluate
				Gopinath Bardoloi: "Reminiscences of Gandhiji"	Remember, Understand, Analyse, Evaluate
				Moji Riba: "Rites, In Passing"	Remember, Understand, Analyse, Evaluate
				Arun Sarma: <i>Aahar</i>	Remember, Understand, Analyse

v. BA/BSc Geography

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Understand the basic principles of physical geography, human geography, economic geography, population and settlement geography, environmental geography, geography of resources and development, and geography of tourism.
2. Learn the basic principles of geomorphology, climatology, biogeography, environmental and disaster management, cartographic and quantitative methods, surveying techniques, remote sensing, GIS, and GPS.
3. Practice the application of theoretical principles through laboratory experiments and field studies.
4. Acquire in-depth knowledge of the geography of India with reference to Northeast India.
5. Gain theoretical and practical knowledge of regional development and planning as well as resource and development.
6. Develop the critical thinking ability in order to design, analyse, record, and map the various results that acquired through laboratory experiments and field studies.
7. Acquire knowledge about the safe handling of surveying instruments, computers, and GPS gadgets during laboratory experiments and field work.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
BA/BSc (Honours) Geography					
1	I	GGY-HG-1016 Physical Geography	The students will learn that the earth is unstable and it is undergoing constant changes due to dynamic earth's processes. The students will come to know about the meaning and scope of geomorphology, which a major branch of Physical Geography. After gaining knowledge based on the contents embodied in this paper, the students will be able to realize the importance of geomorphological knowledge as applied in various developmental activities executed on the land and over the earth's surface.	Physical Geography – Definition and Scope, Components of Earth System	Understand, Remember
				Atmosphere – Composition and the vertical structure, Heat Balance	Understand, Remember
				Lithosphere– InternalStructureofEarthbasedonSeismicEvidence	Understand, Remember
				Endogenetic and Exogenetic processes, Works of River, Fluvial Cycle of Erosion – Davis	Understand, Remember
				Hydrosphere: hydrological cycle	Understand, Remember
		Relief representation from the topographical sheet		Apply, Analyse and Evaluate	
		Profile Drawing			
		Practical		Rainfall-Temperature Graph, Climograph and Hythergraph	
2	II	GGY-HG-2016 Human Geography	The paper will be useful for students in developing ideas on human-environment issues that geographers usually address in the Anthropocene. The paper will be useful for students preparing for various	Field of human geography	Understand, Remember
				Concepts of man-environment relationship	Understand, Remember
				Impact of environment on man	Understand, Remember
				Global patterns of racial, religious and linguistic composition of population	Understand, Remember

			competitive examinations including the civil services.	Origin, growth and characteristics of rural and urban settlements	Understand, Remember
		Practical		Traditional house types of selected ethnic groups of North-East India, Trend of population growth in the world in relation to five most populous countries of the world using line graph, Religious composition of population in the world and three most populous countries of the world using pie-graph, Spatial patterns of urban population in Assam and N.E. India at state level through choropleth map, Drawing of major rural settlement types/patterns; Morphological diagram of a village and a town	Apply, Analyse and Evaluate
3	III	GGY-HG-3016 Economic Geography	This paper will be useful for the students in developing understanding on how geographical factors organize economic space, and to acquire knowledge about spatial patterns of various economic activities on the earth.	Meaning and scope of Economic Geography	Understand, Remember
				Economic activity	Understand, Remember
				Agriculture	Understand, Remember
				Manufacturing	Understand, Remember
				Transport system	Understand, Remember
				Trade	Understand, Remember
		Practical		Trend of rice, wheat and iron & steel production in the world/India since 1960 using moving average method, Trend of production of wheat, rice, maize and barley in the world/India since 1960 using Band-graph, Trend of balance of trade relations (export and import value) of India with Bangladesh, Nepal and Bhutan in respect of major commodities since 1990 using Bar-graph, Regional variation in fertilizer consumption and agricultural productivity in rice, wheat and barley in selected countries of the world using Bar-graph, . Inter-state and Inter-nation volume of movement of selected commodities through flow	Apply, Analyse and Evaluate

				cartogram	
4	III	GGY-HG-3026 Cartographic Methods	Understanding the importance of various cartographic techniques in geographical study General understanding of map type, map scale and map content. An acquaintance of different cartographic techniques for representation of various facets of physical and human geographic data of any area.	Meaning of cartography and its need in geography	Understand, Remember
				Shape and size of the earth	Understand, Remember
				Map	Understand, Remember
				Map Projection	Understand, Remember
				Thematic map	Understand, Remember
		Practical		Construction of graphical scale; Computation work for conversion of map scale, Construction of graticule of map projection along with properties and uses: Zenithal polar gnomonic, Simple conical with one standard parallel, simple cylindrical and Gall's stereographic cylindrical, Representation of physical and human geographic data through Choropleth and Isopleth mapping and Pie cartogram	Apply, Analyse and Evaluate
5	IV	GGY-HG-4016 Geography of India with Reference N.E. India	The paper will be useful for students in developing understanding on Indian geography and its various dimensions. It will also be useful for students preparing for various competitive examinations including civil services.	India's location and its significance; administrative divisions	Understand, Remember
				Physical setting	Understand, Remember
				Climate	Understand, Remember
				Population Growth and distribution	Understand, Remember
				Agriculture	Understand Remember
				Distribution and characteristics/potential of Natural Resources	Understand, Remember
				Factors influencing Industrial development in the country	Understand, Remember
				North-East India	Understand Remember

		Practical		Trend of population growth and growth rates in India and N.E. India, spatial variation in decennial population growth rate in India, Spatial variation in the patterns of religious composition of population in India, Trend of food grains production in India since 1950-51 using band-graph, Map showing distribution of major tribal groups in North-East India	Apply, Analyse and Evaluate
6	IV	GGY-HG-4026 Population and Settlement Geography	The paper will be useful for students in developing ideas about spatio-temporal changes in the characteristics of population and settlement and the factors associated with them. The paper will be useful for students preparing for various competitive exams including the civil services.	Defining the field of population geography	Understand, Remember
				Sources of population data	Understand, Remember
				Distribution and density of population	Understand, Remember,
				Population Growth	Understand, Remember
				Theories of population growth	Understand, Remember
				Population composition and associated characteristic patterns in global contexts	Understand, Remember
				Defining the field of settlement of geography	Understand, Remember
				Rural and urban settlements	Understand, Remember
		Practical		Population growth of Assam by line graph, choropleth map to show decadal variation in population growth, choropleth map to show density map, pie graph, Choropleth map showing spatial pattern of level of urbanization in Assam, Flow cartogram showing direction and volume of migration into Assam, Map showing distribution of towns and their varied population size with spheres in Assam	Apply, Analyse and Evaluate
7	V	GGY-RE-5016 Environmental geography and	This paper will be useful for students in developing ideas on environmental issues	Environmental Geography	Understand, Remember
				Human – environmental relationships	Understand, Remember
				Major global environmental problems	Understand, Remember

		disaster management	including disasters that geographers usually address. This paper will also be useful for students preparing for different competitive exams including the civil services.	Meaning of hazard, disaster, risk and vulnerability	Understand, Remember
				Disaster management cycle and phases	Understand, Remember
				Major hazard and disaster and their management	Understand, Remember
				National Environmental Policy and National Disaster Management Plan	Understand, Remember
		Practical	Exploring satellite imageries and toposheets to observe bank line change of the Brahmaputra river, Mapping of major wetlands in a district and computation of shape and size, Preparation of a map of a nearby wetland and to identify the changes in dimension, water level and encroachment it faced during the last one decade, Preparation of a long-term precipitation time series curve for any selected station of N.E. India using moving average method, Drawing of a diagram of disaster management cycle with reference to some disasters in North-East India, Drawing of a map of Assam showing the major fault lines thereon, Preparation of a disaster vulnerability map of Assam	Apply, Analyse and Evaluate	
8	VI	GGY-RE-6026 Geography of Resources and Development	This paper will be useful to students in developing ideas on different aspects of resources, and the linkages with development issues that geographers usually address. This paper will also be useful for students preparing for different competitive	Geography of Resources and Development	Understand, Remember
		Natural Resources for Development		Understand, Remember	
		Development and Environment		Understand, Remember	
		Global issues of Natural Resources and Development		Understand, Remember	
		Pattern of Economic Development and Resource use		Understand, Remember	

		Practicals	examinations including the civil services.	Determination of levels of development in India using simple composite index and ranking method, Mapping of physiological density of population in Assam, Mapping of spatial variation of category-wise forest cover, Identification of important natural resources/ resource sites, Preparation of resource potential map of North-East India at state level showing spatial variation in production of selected commodities, Correlation analysis of irrigation and intensity of cropping in Assam, Time series analysis of the trend of Coal production in India using moving average method	Apply, Analyse and Evaluate
BA/BSc (Regular) Geography					
9	I	GGY - HC – 1016 Geomorphology	The students will learn that the earth is unstable and it is undergoing constant changes due to dynamic earth's processes. The students will come to know about the meaning and scope of geomorphology as a major branch of Physical Geography. After gaining knowledge based on the contents embodied in this paper, the students will be able to realize the importance of geomorphological knowledge as applied in various developmental activities executed in different areas.	Physical Geography, components of Earth System	Understand, Remember, Analyze
				Atmosphere	Understand, Remember, Analyze
				Lithosphere	Understand, Remember
				Endogenetic and exogenetic processes, Works of River	Understand, Remember
				Hydrosphere, Hydrological cycle	Understand, Remember
		Study of Topographical Maps: Topographical map content and numbering system, Profile drawing, Preparation of Slope Map / Relative Relief Map: Wentworth's method and Smith's method, Delineation of drainage basin and drainage network, construction of cross and long profiles, stream		Understand, Analyze, Apply	
Practical					

				ordering by Horton and Strahler's method, Interpretation of Geological map and Construction of cross-section	
10	I	GGY-HC-1026 Cartographic Techniques Practical	Understanding the importance of various cartographic techniques in geographical study General understanding of map type, map scale and map content. An acquaintance of different cartographic techniques for representation of various facets of physical and human geographic data of any area.	Cartography	Understand, Remember, Analyze
				Coordinate system	Understand, Remember, Analyze
				Maps type	Understand, Remember, Analyze
				Map projection	Understand, Remember, Analyze
				Thematic mapping	Understand, Remember, Analyze
11		Practical		Construction of graphical scale, conversion of map scale, Construction of graticules of Zenithal Polar Gnomonic and Stereographic, Simple Conical with one standard parallel, Bonne's conical, Gall's Stereographic Cylindrical along with their properties, uses and limitations, Preparation of thematic maps	Understand, Analyze, Apply
12	II	GGY-HC-2016 Human Geography	The paper will be useful for students in developing ideas on human-environment issues that geographers usually address in the anthropocene. The paper will be useful for students preparing for	Defining the field of human geography	Understand, Remember
				Schools of human geography	Understand, Remember
				Paradigms of man-environment	Understand, Remember

			UGC NET/SLET exams and other competitive exams including the civil services.	relationship study	
				Man and environment relationship	Understand, Remember
				Man and culture	Understand, Remember
				Human Settlements	Understand, Remember
		Practical	Traditional house types of selected ethnic groups of N.E. India and India, Trend of population growth in the world in relation to five most populous countries of the world using line graph, . Religious and Linguistic composition of population in the world and five most populous countries of the world using pie-graph, Spatial patterns of scheduled tribes population and urban population in India at state level through choropleth map, Drawing of major rural settlement types/patterns; Morphological diagram of a village and a town, Drawing of internal model structure of towns according to Burgess and Hoyt, Mapping of distribution of major racial and linguistic groups of population in the world	Understand, Evaluate Analyze,	
12	II	GGY-HC-2026 Climatology and Biogeography	The paper will be useful for students in developing ideas on climate related aspects of geographical analyses. The paper will help provide theoretical insights and perspectives to students if they wish to pursue a research programme in future. Students will develop a basic understanding of the introductory concepts in biogeography. The paper	Meaning of climatology	Understand, Remember
				Atmospheric Composition and Structure	Understand, Remember
				Insolation and Temperature	Understand, Remember
				Atmospheric Pressure and Wind system	Understand, Remember

			be very useful for students preparing for UGC NET-JRF / SLET exam and other competitive exams including civil services.	Atmospheric Moisture	Understand, Remember
				Climatic classification of Koppen and Trewartha	Understand, Remember
				Cyclones and anticyclones	Understand, Remember
				Meaning, Scope and Significance of biogeography	Understand, Remember
				Ecology and Ecosystem	Understand, Remember
				Global distribution of major plants and animals	Understand, Remember
				Biomes and Biodiversity hotspots of the world	Understand, Remember
				Soil as a component of environment	Understand, Remember
		Practical	Interpretation of Indian Weather map, Preparation of weather reports of Indian subcontinent, Preparation of rainfall-temperature graphs; hythergraph, climograph and ergograph taking data from India/N.E. India/Assam, Calculation of average annual rainfall and variability of annual rainfall	Understand, Evaluate, Analyze,	
13	III	GGY-HC-3016 Economic Geography	The paper will be useful for students in developing ideas on how geographical aspects organize economic space and will offer perspectives to students if they wish to pursue a research programme. The paper will be useful for students preparing for UGC NET/SLET exams and other competitive exams including the civil services.	Meaning, scope and approaches of Economic Geography	Understand, Remember
				Economic activity	Understand, Remember
				Agriculture	Understand, Remember
				Manufacturing	Understand, Remember
				Transport system	Understand, Remember
				Trade	Understand, Remember

		Practical		Trend of rice, wheat and iron & steel production in the world/USA/India since 1960 using moving average and least squares methods, Trend of production of wheat, rice, maize and barley in the world/USA since 1960 using Band-graph, Trend of balance of trade relations of India with USA, China and Japan in respect of major commodities since 1990 using Bar-graph, Regional variation in fertilizer consumption and agricultural productivity in rice, wheat and barley in selected countries of the world using Bar-graph, Inter-state/Inter-nation volume of movement of selected commodities and Inter-city movement of traffic/bus in N.E. India through flow cartogram	Understand, Analyze
14	III	GGY-HC-3026 Geography of India with Special Reference to N.E. India	The paper will be useful for students in developing understanding on Indian geography and its various dimensions. It will also be useful for students preparing for various competitive examinations including civil services.	India's location and its significance; administrative divisions	Understand, Remember
				Physical setting of India	Understand, Remember
				Population of India	Understand, Remember
				Agriculture of India	Understand, Remember
				Industry of India	Understand, Remember
				North-East India	Understand, Remember
		Practical		Trend of population growth and growth rates in India and N.E. India since 1901 using Census data, Choropleth mapping to show spatial variation in decennial population growth rate in India, Spatial variation	Understand, Analyze

				in the patterns of religious composition of population in India and Social composition of population, Trend of food grains production, Map showing distribution of major tribal groups in North-East India	
15	III	GGY-HC-3036 Quantitative Methods in Geography	Thorough understanding of the statistical methods and techniques used in geographical studies. Understanding of tabulation, analysis and interpretation of geographical data.	Quantification and its significance in geographical study	Understand, Remember, Analyze
				Geographical Data	Understand, Remember, Analyze
				Measures of central tendency	Understand, Remember, Analyze
				Sampling techniques	Understand, Remember, Analyze
				Time series analysis and its applications in geographical studies	Understand, Remember, Analyze
				Correlation and Regression Analysis	Understand, Remember, Analyze
		Practical		Trend of population growth and growth rates in India and N.E. India since 1901 using Census data, Choropleth mapping to show spatial variation in decennial population growth rate in India, Spatial variation in the patterns of religious composition of population in India and Social composition of population)in N.E. India using pie-graph, Trend of food grains production using band-graph, Map showing distribution of major tribal groups in	Understand, Analyze

				North-East India	
16	III	GGY-SE-3024 Thematic Cartography	Understanding the importance of various techniques of preparation of maps in geographical study. General understanding of preparation of different types of plan and maps. An acquaintance of different cartographic techniques for representation of various facets of earth's surface.	Thematic cartography	Understand, Remember, Analyze
				Thematic Mapping	Understand, Remember, Analyze
				Concepts and principles of cartographic overlay and mapping	Understand, Remember, Analyze
				Concept of base map	Understand, Remember, Analyze
				Techniques of interpretation of Topographical maps	Understand, Remember, Analyze
		Practical		Preparation of an administrative/physical map of India containing necessary map elements using appropriate typography, Preparation of thematic maps for representing human geographic data using choropleth, isopleth, dot, sphere and proportionate circle techniques, Interpretation of topographical maps for preparation of thematic maps through overlay method to show relationship between relief and agriculture; and relief, drainage and settlements, Locational accessibility mapping based on travel time through isochoric cartogram, Preparation of landuse/landcover map through visual interpretation of satellite imagery using appropriate classification scheme	Understand, Apply, Analyze

17	IV	GGY-HC-4016 Environmental Geography and Disaster Management	This paper will be useful for students in developing ideas on environmental issues including disasters that geographers usually address. This paper will be useful for students preparing for different competitive exams including the civil services.	Environmental Geography	Understand, Analyze	Remember,
				Human-Environment Relationships	Understand, Analyze	Remember,
				Major Global Environmental Problems	Understand, Analyze	Remember,
				Meaning of Hazard, Disaster, Risk and Vulnerability; Types of hazard/disaster	Understand, Analyze	Remember,
				Disaster Management Cycle and Phases	Understand, Analyze	Remember,
				Major Hazards and Disasters, and their Management	Understand, Analyze	Remember,
				National Environmental Policy and National Disaster Management Plan	Understand, Analyze	Remember,
	Practical	Exploring satellite imageries and toposheets to observe bank line change of Brahmaputra river from any selected stretch in three different time periods and preparation of map the reform, Mapping of major wetlands in a district of assam, Preparation of a map of a nearby wetland and identify the changes in dimension, water level and encroachment it faced during the last one decade. Present your data in tabular form along with the map, Precipitation time series curve, drawing of disaster management cycle, fault line map of Assam, Disaster vulnerability map	Understand, Apply, Analyze			

18	IV	GGY-HC-4026 Population and Settlement Geography	The paper will be useful for students in developing ideas about spatio-temporal changes in the characteristics of population and settlement and the factors associated with them. The paper will be useful for students preparing for various competitive exams including the civil services.	Defining the field of population geography	Understand, Remember
				Sources, characteristics and problems of population data	Understand, Remember
				Distribution and density of population	Understand, Remember
				Population Growth	Understand, Remember
				Theories of population growth	Understand, Remember
				Population composition and associated characteristic patterns in global contexts	Understand, Remember
				Defining the field of settlement of geography	Understand, Remember
				Rural and urban settlements Morphology of rural and urban settlements Concept of settlement hierarchy, primate city and urban fringe; Christelle's Central Place Theory	Understand, Remember Understand, Remember

		Practical		Trend of population growth in Assam/N.E. India/India through line graph, Calculation and graphical representation of trend of decadal and annual growth rates of population in Assam/N.E. India/India, decadal variation in population growth in Assam, population density in Assam, Nearest Neighbour Analysis, pie-graph, Map showing distribution of towns, Flow cartogram	Understand, Apply, Analyze
19	IV	GGY-HC-4036 Remote Sensing, GIS and GPS	The paper remains useful for students in developing skills in spatial data analysis if they wish to pursue a research programme. The paper will be useful for students preparing for different competitive exams including the civil services.	Remote Sensing: Definition and History of Development	Understand, Remember
				Principles of Remote Sensing System	Understand, Remember
				Remote Sensing data products, sources and characteristics	Understand, Remember
				Application of Remote Sensing	Understand, Remember
				Geographical Information System	Understand, Remember
				GIS Data Types & Structures	Understand, Remember
				Data Layer Extraction and Spatial Analysis	Understand, Remember
				Application of GIS in geographical studies	Understand, Remember
				Global Positioning System	Understand, Remember
		Application of GPS in surveying and mapping		Understand, Remember	
		Practical		Visual Interpretation of Aerial photograph and Satellite Imagery, Analysis of aerial photographs and	Create, Understand, Analyze, Apply

				satellite image, Geo-referencing and Data layer creation, GPS data collection, plotting and mapping of various features within college campus	
20	IV	GGY-SE-4014 Advanced Statistical Techniques for Spatial Analysis	It provides general understanding of geographical data and application of various statistical measures for their meaningful analysis. Acquiring basic knowledge about probability and normal distributions and their applications for sample data collection and analysis. Understanding the patterns and processes associated with various geographical phenomena through application of different statistical techniques.	Statistics and Geography	Understand, Remember
				Application of the measures of central tendency and dispersion	Understand, Remember
				Application of probability distributions	Understand, Remember
				Meaning and importance of sampling in geographical studies	Understand, Remember
				Correlation and regression analysis in geography	Understand, Remember
				Introduction to the concept and application of Location quotient;	Understand, Remember
		Practical		Setting of hypothetical data of a geographical phenomenon for normal, positively skewed and negatively skewed distributions, calculation of mean, median, mode and coefficient of skewness, and representation of the positions of mean, median and mode in the respective frequency distribution curves, Graphical representation of median and mode for a given set of grouped data of a geographical attribute, Graphical representation of median and mode for a given set of grouped data of a geographical attribute, Computation of correlation	Understand, Analyze, Apply

				coefficient, Analysis of appropriate geographical data for computation/representation of LQ, gender disparity in literacy or work participation, and composite scores of socio-economic development	
21	IV	GGY-SE-4024 Surveying Techniques	Understanding the importance of various surveying techniques in geographical study. General understanding of preparation procedures of different types of plan and map. An acquaintance of different surveying techniques for representation of various spatial objects/ Phenomena.	Surveying	Understand, Remember
				Principles of surveying	Understand, Remember
				Techniques of surveying by Plane Table, Prismatic Compass, Theodolite and Dumpy Level	Understand, Remember, Apply
				Methods of radiation, intersection, traversing, contouring and levelling in surveying	Understand, Remember, Apply
				GPS	Understand, Remember, Apply
		Practical		Preparation of a plan or a map of an area within the college campus or any suitable area using Plane Table, Open and Closed Traverse Surveying with Prismatic Compass, Closed Traverse Surveying with Theodolite, Profile levelling and contouring in a selected area by Dumpy Level, . Preparing a map of a short trail along with prominent features by using hand-held GPS and associated software/freeware	Understand, Analyze, Apply
22	V	GGY-HC-5016 Social and Political Geography	This course will help equip the students to comprehend various social and political aspects of phenomena and their interface within the realm of geography. The paper will be very useful for	Social Geography	Understand, Remember
				Concept and types of social space and social groups	Understand, Remember
				Social Well-being	Understand, Remember

			students preparing for various competitive examinations including civil services.	Contribution of race, religion, language and ethnicity in promoting diversity in India	Understand, Remember
				Social Geographies of inclusion and exclusion	Understand, Remember
				Political Geography	Understand, Remember
				Concept of state, nation, and nation-state	Understand, Remember
				Concept of frontiers and boundaries	Understand, Remember
				Concept of Geopolitics, Heartland and Rimland; Mackinder's Heartland Theory	Understand, Remember
				Concept of colonialism, neo colonialism and lebensraum	Understand, Remember
		Practical		Mapping the spatial patterns of human development in India and Assam using HDI, Construction of Ternary Diagram, Level of Social well-being with the help of composite Z-score, Sex disparity in literacy in India/North-East India using Sopher's Disparity Index, Computation of Shape Index, Construction of a map of India, . Reorganization of the states of North-East	Understand, Analyze, Apply

23	V	GGY-HC-5026 Field Techniques in Geography	This course will help students to proceed with a research problem and the steps she/he should adopt and the tools and craft to be employed for doing quality research. Students perceive fieldwork to be beneficial to their learning, because through it they experience 'geographical reality', and have deeper understanding of the subject. The students will have a chance to interact with respondents and collect data through questionnaire directly from the field. This course will develop understanding about designing and writing a field report.	Geography and Field Studies	Understand, Analyze, Apply
				Concept of Case Study and Its identification in the varying geographical contexts	Understand, Remember, Analyze
				Tools and Techniques in Field Studies	Understand, Analyze, Apply
				Surveying	Understand, Analyze, Apply
				Preparation of Field Study Report and its broad design	Apply, Create, Analyze

		Practical		Field observations of a near-by area and preparation of a brief report (within 4-5 pages) about the prevailing physical and human landscape of the area along with its spot photograph, Longitudinal profile levelling and contouring in College campus and any nearby area with Dumpy Level, and plotting of collected data in the forms of longitudinal profile and contour map. Collection of point data from an area with handheld GPS and preparation of a GPS data table and distribution map with down-loaded data.	Understand, create, Analyze, Apply
24	V	GGY-HE-5046 Regional Development and Planning	The paper will be useful for students in developing ideas on disparities within and between countries and their fallout. The paper will help provide theoretical insights and perspectives to students, if they wish to pursue a higher studies or research in future. The paper will be very useful for students preparing for various competitive examinations including civil services.	Region	Understand, Remember
				Regional planning	Understand, Remember
				Regional Planning in India	Understand, Remember
				Planning regions of India with special reference to North-East India	Understand, Remember
				Concept of Development	Understand, Remember
				Regional Development theories and models	Understand, Remember
				Human development	Understand, Remember
				Disparity of Regional Development in India: Development indicators	Understand, Remember
		Practical		Delineation of agricultural productivity regions in Assam, Delineation of influence zones of selected urban centres of Assam/ NE India by using Reilly's Breaking Point formula, Preparation of land use	

				maps of any suitable area for two different points of time for identifying the changes in settlement, agriculture land, forest cover, water bodies, etc. during the period, Preparation of a choropleth map to show regional disparity in development in India and N. E. India based on selected indicators using Ranking Method and Composite Z-Score method, Preparation of flow cartogram to show volume of inter-state movement of different commodities in India/NE India	Understand, Analyze, Apply
25	V	GGY-HE-5056 Urban Geography	It seeks to develop new insights among students on the relevance of an urban geography and associated problems in a rapidly urbanizing world. It will help build skills among students seeking advanced studies on urban development and planning. The paper will be very useful for students preparing for various competitive examinations including civil services.	Urban Geography	Understand, Remember
				Origin and growth of towns in global and national contexts	Understand, Remember
				Patterns of Urbanisation in developed and developing countries	Understand, Remember
				Organization of urban space	Understand, Remember
				Concept of city-region, urban agglomeration, urban sprawl, umland and periphery, rural-urban dichotomy and continuum, urban fringe, satellite town, new town, smart city	Understand, Remember
				Urban Systems	Understand, Remember
				Urban issues and problems	Understand, Remember
Urbanization and urban development planning in India	Understand, Remember				

		Practical		Plotting of million cities of India by using proportionate sphere method, sphere method, Determination of spatial mean centres of urban settlements using weighted Centographic measure in Assam and NE India, Nearest Neighbour Analysis, Choropleth map showing spatial pattern of level of urbanization in Assam, Determination of rank-size relationship of urban centres in Assam, Urban population potential mapping based on selected urban centres of Assam, Delineation of urban influence zones of selected urban centres of Assam	Understand, Analyze, Apply
26	VI	GGY-HC-6016 Geographical Thought	This course develops a comprehensive understanding of the discipline. This course helps the students to apply the historic and contemporary perspective to explain and approach the real world geographic problems.	Early development of Geography	Understand, Remember
				Foundation of modern geography	Understand, Remember
				Evolution of geographical thought	Understand, Remember
				Recent trends in geography	Understand, Remember
				Geographical debates	Understand, Remember
				Models in geography	Understand, Remember
		Practical		Mapping of routes of exploration and discoveries, intensity of spatial interaction of Guwahati city with neighbouring urban centres, Mapping of population potential surfaces in Assam using the gravity model, Demarcation of urban influence zone by using Reilly's breaking point formula, Trend of development of paradigms in	Understand, Analyze, Apply

				geography, Preparation of a world map highlighting the major developments of geography, Greek and Arabian contributions to the development of Geography in different ages	
27	VI	GGY-HC-6026 Research Methods in Geography and Project Work	This course will help the students to proceed with a research problem and the steps she/he should adopt and the tools and craft to be employed while doing quality research.	Meaning and significance of research	Understand, Remember, Apply
				Geographic Research	Understand, Remember, Apply
				Research Design	Understand, Remember, Apply
				Data Collection	Understand, Remember, Apply
				Statistical Analysis of Data	Understand, Remember, Apply
				Structure of a Research Report	Understand, Apply
		Practical		Each student will have to prepare a Project Report on a suitable geographical problem under the guidance of respective teacher following appropriate methodology, data base and literature review	Understand, Analyze, Apply
28	VI	GGY-HE-6026 Hydrology	After completion of this course the students will be able to speak on the basic concepts of hydrology and its application in river basin studies. Students will also have a practical orientation of the concepts both in laboratory and in the field.	Meaning and Scope of hydrology	Understand, Remember, Analyze
				Hydrological cycle	Understand, Remember, Analyze
				Runoff characteristics	Understand, Remember, Analyze
				Ground water hydrology	Understand, Remember, Analyze

				Basin or catchment hydrology	Understand, Analyze	Remember,
				River Hydrology	Understand, Analyze	Remember,
				Flood hydrology	Understand, Analyze	Remember,
				Anthropogenic activities and river basin hydrology	Understand, Analyze	Remember,
		Practical		To estimate runoff from daily water discharge data, discharge hydrographs of Brahmaputra, stage-discharge hydrograph of Brahmaputra, stage-discharge rating curves, rainfall variability map of Assam, Collection and mapping of monthly /seasonal fluctuation data of ground water level of selected wells in a locality	Understand, Analyze, Apply	
29	VI	GGY–HE-6036 Geography of Tourism	The paper will be useful for students in developing ideas on how geographical factors tangent on tourism activities and how geographers seek to address issues of development and carrying capacities of varied environments. It will also build skills for students seeking to enroll in a research programme and/or provide openings for them to	Geography of Tourism	Understand, Remember	
				Factors and types of tourism	Understand, Remember	
				Recent trends in tourism	Understand, Remember	
				Impact of tourism on economy, environment and society	Understand, Remember	
				Tourism development in India	Understand, Remember	

		Practical	work with tourism/eco-tourism planning agencies.	<p>Trend of growth of tourist arrivals in the World/India/Assam since 1960 using Movingaverage method and least squares method, Trend of tourist arrivals in the north-eastern states of India and a few top-ranking tourist arriving states of India since 1980 using Band-graph, Line Graph showing pattern of tourist arrival in relation to rainfall and temperature in a year for selected tourist spots of North-East India, Spatial Patterns of Seasonal variation (Spring, Summer, Autumn and Winter) in tourist arrival in capital cities of North-East Indian states using Pie diagram and Bar Diagram, Preparation of a transport connectivity (road, railway and air) map of Assam, Preparation of a tourist map of North-East India, Preparation of a tourist guide map of North-East, Mapping of trekking route in a hilly area suitable for adventure tourism using GPS</p>	Understand, Analyze, Apply
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vi. BA History

Programme Specific Outcomes

After completion of the programme, a student will be able to:

1. Critically approach the study of history as a discipline by acquiring the ability to distinguish between fact and fiction.
2. Learn about the correlation of history with other disciplines which will enable them to adopt a multi-disciplinary approach in their work.
3. Expand their knowledge base of the history of Assam, India, and the contemporary world.
4. Develop perspectives on historical inquiry to understand different values systems like Buddhism, Jainism, Sufism, Islam, and Christianity that affected and shaped the lives of multiple cultures of the past.
5. Recognize continuity and change and sequences of historical events across civilizations in relation to any given period, viz., the Harappan, Greek, Roman, Anatolia, and Minoan.
6. Understand the concept of cause-and-effect relationship and to identify chains of events and developments, both short-term and long-term, which will enable them to identify, examine, and analyse reasons why events like important revolutions, world wars, and India's independence occurred and the resulting consequences.
7. Understand and acquire a historical perspective on important national and regional concerns such as identity, economy, polity, and culture.
8. Become sensitive to gender and social inequities.
9. Develop a range of historical skills, essential for historical inquiry and research.
10. Understand the origin, usefulness, and application of primary and secondary sources to prepare well-researched projects.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	HIS-HC-1016 History of India I	After the completion of this paper, the students will be able to explore and effectively use historical tools in reconstructing the remote past of ancient Indian pre and proto history. The course will also train the students to analyse the various stages of evolution of human cultures and the belief systems in the proto- history period.	Unit I. Reconstructing Ancient Indian History	Remember, understand, Analyze
				Unit II. Pre-historic hunter- gatherers	Remember, understand, Analyze
				Unit III. The advent of food production	Remember, understand, Analyze
				Unit IV. The Harappan civilization	Remember, understand, Analyze, Evaluate
				Unit V. Cultures in transition	Remember, understand, Analyze
2	I	HIS-HC-1026 Social Formations and Cultural Patterns of the Ancient World	After the completion of this paper, the students will be able to explain the processes and stages of the evolution of the variety of cultural pattern throughout antiquarian periods in History. They will be able to relate the connections between the various Bronze Age civilizations in the ancient world as well as development of slave and polis societies in ancient Greece.	Unit I. Evolution of Humankind:	Remember, understand, Analyze
				Unit II. Bronze Age Civilizations: economy, social stratification, state structure, Religion	Remember, understand, Analyze
				Unit III. Nomadic groups in Central and West Asia	Remember, understand, Analyze
				Unit IV. Slave society in Ancient Greece:	Remember, understand, Analyze, Evaluate
				Unit V. Polis in ancient Greece	Remember, understand, Analyze
3	II	HIS-HC-2016	On successful completion of this course the students will be able to	Unit I. Economy and Society	Remember, understand, Analyze

		History of India-II	explain the economic and socio-cultural connections, transitions and stratifications during the ruling houses, empires and the politico- administrative nuances of early Indian History from 300 BCE to 300 CE.	Unit II. Changing political Formations	Remember, understand, Analyze
				Unit III. Towards early medieval India	Remember, understand, Analyze
				Unit IV. Religion, philosophy and society	Remember, understand, Analyze, Evaluate
				Unit V. Cultural developments	Remember, understand, Analyze
4	II	HIS-HC-2026 Social Formations and Cultural Patterns of The Medieval World Paper	After the completion of this course, the students will be able to analyse and explain the historical socio-political, administrative and economic patterns of the medieval world. They will be able to describe the emergence, growth and decline of various politico-administrative and economic patterns and the resultant changes therein	Unit I. Roman Republic: I	Remember, understand, Analyze
				Unit II. Roman Republic: II	Remember, understand, Analyze
				Unit III. Economic developments in Europe from the 7th to the 14th centuries:	Remember, understand, Analyze
				Unit IV. Religion and culture in medieval Europe:	Remember, understand, Analyze, Evaluate
				Unit V. Societies in Central Islamic Lands:	Remember, understand, Analyze
5	III	HIS-HC-3016 History of India III (c. 750 -1206)	The completion of this paper will enable the students to relate and explain the developments in India in its political and economic fields and its relation to the social and cultural patterns therein in the historical time period between c.700 to 1206. They will also be able to analyse India's interaction with another wave of	Unit I. Studying Early Medieval India:	Remember, understand, Analyze
				Unit II. Political Structures:	Remember, understand, Analyze
				Unit III. Agrarian Structure and Social Change:	Remember, understand, Analyze
				Unit IV. Trade and Commerce	Remember, understand, Analyze, Evaluate

			foreign influence and the changes brought in its wake in the period.	Unit V. Religious and Cultural Developments:	Remember, understand, Analyze, Evaluate
6	III	HIS-HC-3026 Rise of the Modern West I	On completion of this course, the students will be able to explain the major trends and developments in the Western world between the 14 th to the 16 th century CE. They will be able to explore and analyse the significant historical shifts and events and the resultant effects on the civilizations of Europe in the period.	Unit I. Transition from feudalism (to capitalism):	Remember, understand, Analyze
				Unit II. Geographical explorations and early colonial expansion:	Remember, understand, Analyze
				Unit III. Renaissance:	Remember, understand, Analyze
				Unit IV. Reformation in the 16th century: Origin and impact	Remember, understand, Analyze, Evaluate
				Unit V. Economic developments of the sixteenth century:	Remember, understand, Analyze, Evaluate
7	III	HIS-HC-3036 History of India (c.1206-1550)	After completion of this course students will be able to explain the political and administrative history of medieval period of India from 1206 to 1550 AD. They will also be able to analyse the sources of history, regional variations, social, cultural and economic set up of the period.	Unit I. Sources	Remember, understand, Analyze
				Unit II. Polity:	Remember, understand, Analyze
				Unit III. Society and Economy:	Remember, understand, Analyze
				Unit IV. Regional Polities:	Remember, understand, Analyze Evaluate
				Unit V. Religion and Culture:	Remember, understand, Analyze
8	IV	HIS - HC- 4016 Rise of the Modern West II	After the completion of this course, the student will be able to explain the political and intellectual currents in Europe in the Modern Age. They will also be able to relate the circumstances and casual factors of the intellectual and	Unit I. Europe in the 17th Century.	Remember, understand, Analyze
				Unit II. The English Revolution:	Remember, understand, Analyze
				Unit III. European Economy	Remember, understand, Analyze

			revolutionary currents of both Europe and America at the beginning of the Modern Age.	Unit IV. Politics in the 18th century:	Remember, understand, Analyze Evaluate
				Unit V. Prelude to the Industrial Revolution	Remember, understand, Analyze
9	IV	HIS - HC- 4026 History of India V (c.1550-1605)	At the completion of this course, the students will be able to analyse the circumstances and historical shifts and foundations of a variety of administrative and political setup in India between c.1550-1605. They will also be able to describe the inter relationships between the economy, culture and religious practices of the period.	Unit I. Sources and Historiography	Unit I. Sources and Historiography
				Unit II. Establishment of Mughal rule	Unit II. Establishment of Mughal rule
				Unit III. Consolidation of Mughal rule under Akbar:	Unit III. Consolidation of Mughal rule under Akbar:
				Unit IV. Expansion and Integration:	Unit IV. Expansion and Integration:
				Unit V. Rural Society and Economy:	Unit V. Rural Society and Economy:
10	IV	HIS-HC-4036 History of India VI (c. 1605-1750)	After the completion of this course, the students will be able to explain and reconstruct the linkages of the history of India under the Mughal Rule. As a whole, this course will enable them to relate to the socio-economic and religious orientation of the people of Medieval period in India.	Unit I. Political Culture under Jahangir and Shah Jahan:	Remember, understand, Analyze,
				Unit II. Mughal Empire under Aurangzeb:	Remember, understand, Analyze,
				Unit III. Patterns of Regional Politics:	Remember, understand, Analyze,
				Unit IV. Trade and Commerce:	Remember, understand, Analyze, Evaluate
				Unit V: 18th century India	Remember, understand, Analyze
11	V	HIS-HC-5016 History of Modern Europe- I (c. 1780-	After the completion of this course the students will be able to evaluate the historical evolution and political developments that	Unit I. The French Revolution and its European repercussions	Remember, understand, Analyze,
				Unit II. Restoration and Revolution: c. 1815 - 1848:	Remember, understand, Analyze, evaluate

		1939)	occurred in Europe in the period between 1780 to 1939. They will also be able to critically analyse the evolution of social classes, nation states, evolution of capitalism and nationalist sentiment in Europe. They will also be able to relate to the variety of causes that dragged the world into devastating wars in the intervening period.	Unit III. Capitalist Industrialization	Remember, understand, Analyze,
				Unit IV. Social and Economic Transformation (Late 18th century to c. 1914)	Remember, understand, Analyze, Evaluate
				Unit V. Varieties of Nationalism and the Remaking of States in the 19th and 20th Centuries.	Remember, understand, Analyze
12	V	HIS-HC-5026 History of India VII (c. 1780 - 1857)	After the completion of this course, the students will be able to relate the circumstances leading to the consolidation of colonial rule over India and their consequences. They will also be able to explain the orientation of the indigenous population and the masses towards resistance to the colonial exploitation. The course will also enable the students to analyse popular uprisings among the tribal, peasant and common people against the British policies.	Unit I. Expansion and Consolidation of colonial Power:	Remember, understand, Analyze
				Unit II. Colonial State and Ideology:	Remember, understand, Analyze
				Unit III. Rural Economy and Society:	Remember, understand, Analyze
				Unit IV. Trade and Industry	Remember, understand, Analyze, Evaluate
				Unit V. Popular Resistance:	Remember, understand, Analyze
13	V	HIS-HE-5016 History of Assam Up to c. 1228	This paper will give a general outline of the history of Assam from the earliest times to the advent of the Ahoms in the 13 th century. Upon completion, students will be acquainted with major stages of developments in the political, social and cultural history of Assam during the early times.	Unit-I: a) A brief survey of the sources: Literary, Archaeological b) Land and people: Migration routes c) Cultural linkages with South East Asia : the Stone Jars of Dima Hasao	Remember, understand, Analyze
				Unit-II: a) Origin and antiquity of	Remember, understand, Analyze

				Pragjyotisha or Kamrupa Society b) Traditional rulers and early History c) Religion and belief systems	
				Unit-III: Political dynasties: a) Varmana b) Salastambha c) Pala	Remember, understand, Analyze
				Unit-IV: a) Political condition of Assam in the Post-Pala period. b) Turko-Afghan invasions c) Disintegration of the Kingdom of Kamarupa	Remember, understand, Analyze, Evaluate
				Unit-V: a) Central and Provincial administration b) Judicial administration c) Revenue administration d) Cultural Life : Literature, Art and architecture	Remember, understand, Analyze
14	V	HIS-HE-5026 History of Assam (c. 1228-1826)	On completion of this paper, students will be able to identify major stages of developments in the political, social and cultural history of Assam during the medieval times. This paper will	Unit-1 <i>[a]</i> Sources- archaeological, epigraphic, literary, numismatic and accounts of the foreign travelers; <i>Buranjis</i>	Remember, understand, Analyze.

			enable the student to explain the history of Assam from the 13 th century to the occupation of Assam by the English East India Company in the first quarter of the 19 th century	<p>[b] Political conditions of the Brahmaputra valley at the time of foundation of the Ahom kingdom.</p> <p>[c] Siu-ka-pha - An assessment</p> <p>[d] State information in the Brahmaputra valley-the Chutiya, Kachari and the Koch</p> <p>d) state</p>	
				<p>Unit-II</p> <p>[a] Expansion of the Ahom Kingdom in the 16th century: Suhungmung (Dihingiya Raja)</p> <p>[b] Political Developments in the 17th century: rule of Pratap Singha)</p> <p>d) Ahom-Mughal wars- the treaty of 1639</p>	Remember, understand, Analyze.
				<p>Unit –III</p> <p>[a] Assam in the second half of the 17th Century- the Ahom- Mughal Wars – Mir Jumla’s Assam Invasion- causes and consequences,</p> <p>[b] Invasion of Ram Singha - the Battle of Saraighat (1671) and its results</p> <p>d) Post-Saraighat Assam: Ascendancy of the Tungkhungia dynasty – the reign of Gadadhar Singha</p>	Remember, understand, Analyze.

				<p>Unit: IV</p> <p>[a] Ahom Rule at its zenith of RudraSingha (1696-1714) to Rajeswar Singha (1751-1769)</p> <p>[b] Decline and fall of the Ahom Kingdom the Moamariya Rebellion and the</p> <p>[c] Burmese Invasions- The English East India Company in Assam Politics</p> <p>d) Treaty of Yandaboo and Assam</p>	Remember, understand, Analyze, Evaluate.
				<p>Unit :V</p> <p>[a] Ahom system of administration: the Paik system [b]Ahom Policy towards the neighbouring hill tribes</p> <p>[b] Religious life —Sankaradeva and the Neo Vaishnavite Movement- background and implications</p> <p>e) Cultural developments : Art, Architecture and literature.</p>	Remember, understand, Analyze.
15	VI	HIS-HC-6016	At the completion of this course, the learners will be able to analyse the course of British colonial exploitation, the social	Unit I. Cultural changes and Socio- Religious Reform Movements:	Remember, understand, Analyze
		History of India VIII (c.		Unit II. Nationalism: Trends up to 1919	Remember, understand, Analyze,

		1857 - 1950)	mobilizations during the period between c.1857 to 1950 and also the techniques of Indian resistance to British policies. It will also enable the students to explain the circumstances leading to de-colonization and also the initial period of nation building in India.	Unit III. Gandhian nationalism after 1919: Ideas and Movements: Unit IV. Nationalism and Social Groups Unit V. Communalism and Partition:	Remember, understand, Analyze, Remember, understand, Analyze, Evaluate Remember, understand, Analyze
16	VI	HIS-HC-6026 History of Modern Europe II (c. 1780 - 1939)	After the completion of this course, the students will be able to analyse the historical developments in Europe between c.1780 to 1939. As the course structure of this paper focuses on the democratic and socialist foundations modern Europe, the students will be able to situate the historical development of workingclass movements,	Unit I. Liberal Democracy, Working Class Movements and Socialism in the 19th and 20th Centuries Unit II. The Crisis of Feudalism in Russia and Experiments in Socialism: Unit III. Imperialism, War, and Crisis: c. 1880 -1919 Unit IV. The post 1919 World Order Unit V. Cultural and Intellectual Developmentssincecirca1850	Remember, understand, Analyze Remember, understand, Analyze Remember, understand, Analyze Remember, understand, Analyze, Evaluate Remember, understand, Analyze, Evaluate
17	VI	HIS-HE-5026 History of Assam (c. 1228-1826)	Upon completion of this course, students will be able to describe the period of British rule in Assam after its annexation by the imperialist forces. They will also be able to situate the development of nationalism in Assam and its role in India's freedom struggle. The course would enable the students to analyse the main currents of the political and socio- economic developments in Assam during the	Unit I: [a] Political condition in Assam on the eve of the British rule. [b] Establishment and Consolidation of the British rule: Reforms and Reorganizations- David Scott – Annexation of Lower Assam, Administrative [c] Reorganisation and Revenue Measures of Scott; Robertson – Administrative and Revenue Measures; Jenkin Administrative	Remember, understand, Analyze,

			colonial period.	Measures e)	
				Unit II: [a] Ahom Monarchy in Upper Assam (1833-38) [b] Annexation of Cachar [c] Early phase of Revolts and Resistance to British rule- GomdharKonwar, Piyali Phukan, U.Tirut Singh, [d] The Khamti and the Singpho rebellion e) The 1857 Revolt in Assam and its aftermath	Remember, understand, Analyze
				Unit III: [a] Establishment of Chief Commissionership in Assam. [b] Land Revenue Measures and Peasant Uprisings in 19th century Assam [c] Growth of national consciousness – Assam Association, SarbajanikSabhas, RaiyatSabhas. e) Government of India Act, 1919– Dyarchy on Trial in Assam.	Remember, understand, Analyze
				Unit IV : [a] Non Co-operation Movement and SwarajistPolitics in Assam [b] The Civil Disobedience Movement [c] Trade Union and Allied Movements	Remember, understand, Analyze, Evaluate

				e) Tribal League and Politics in Assam	
				Unit V: [a] Quit India Movement in Assam. [b] Cabinet Mission Plan and the Grouping Controversy [c] The Sylhet Referendum f) Migration, Line System and its Impact on Politics in Assam	Remember, understand, Analyze
18	VI	HIS-HE-6026 Assam Since Independence	Students will be able to assess the aftermath of Partition and other socio- economic developments in post-independence Assam upon completion of this course. They will also be able to identify the main currents of political and socio-economic development in Assam after India's independence and the causes and impact of various struggles and movements in contemporary Assam.	Unit I- Political developments	Remember, understand, Analyze
				Unit II- Economic developments	Remember, understand, Analyze
				Unit III : Movements and Ethnic Ressurgence	Remember, understand, Analyze
				Unit IV: Environmental issues	Remember, understand, Analyze, Evaluate
				Unit V- Cultural development	Remember, understand, Analyze

vii. हिंदीविभाग

विशिष्ट पाठ्यक्रम परिणाम

गौहाटी विश्वविद्यालय द्वारा निर्धारित चयन आधारित क्रेडिट-व्यवस्था की पाठ्यचर्चा के अंतर्गत हिंदी स्नातक (ऑनर्स) पाठ्यक्रम के विशिष्ट परिणाम नीचे उद्धृत किया गया है :

1. शिक्षार्थी हिंदी साहित्य के विभिन्न कालखंडों की सूचनाओं से परिचित होते हैं, जैसे भक्तिकाल, रीतिकाल और आधुनिक काल।
2. सिद्ध व नाथ साहित्य से लेकर कबीरदास, सूरदास, तुलसीदास, बिहारी, घनानंद, भूषण और अन्य आदिकालीन तथा रीतिकालीन कवियों के परिचय प्राप्त करने के पश्चात भारतेन्दु हरिश्चंद्र, महावीरप्रसाद द्विवेदी, प्रेमचंद, महादेवी वर्मा, अज्ञेय, सुमित्रानंदन पंत, मन्नू भण्डारी, जैनेन्द्र कुमार आदि आधुनिक कवि तथा लेखकों के साहित्यकर्म और व्यक्तित्व का परिचय प्राप्त करेंगे।
3. आदिकालीन और आधुनिक कवियों तथा लेखकों की रचनाओं जैसे- कहानी, उपन्यास, निबंध और हिंदी कविताएँ आदि को पढ़कर और उनके विश्लेषण के द्वारा शिक्षार्थियों को जीवन की वास्तविकताओं को समझने की प्रेरणा मिलती है। कबीर की साखी पारिवारिक जीवन के दैनिक मामलों को समझने की सीख देती है तो तुलसी का वर्णन आध्यात्मिकता से जोड़ती है। प्रेमचंद की कहानियाँ जीवन संघर्ष करने की सीख देती है तो मन्नू भण्डारी, जैनेन्द्र का साहित्य आधुनिक मानवजीवन की चुनौतियों को उजागर करते हुए अच्छे-बुड़े का फर्क सीखाते हैं।
3. हजारी प्रसाद द्विवेदी, विद्यानिवास मिश्र, जयशंकर प्रसाद आदि लेखकों के निबंधों में छिपा दर्शन शिक्षार्थियों को शुद्ध-साहित्यिक भाषाई ज्ञान पाने का अवसर देता है और साथ ही देश के विभिन्न हिस्सों के सामाजिक-सांस्कृतिक ढांचों से परिचय करवाता है।
4. पाठ्यक्रम में अंतर्निहित 'भाषाविज्ञान' का अध्ययन करते हुए विद्यार्थी भाषा के उद्भव विकास से लेकर ध्वनि संदर्भ, रूप संदर्भ, अर्थ विस्तार, अर्थ संकोचन, भाषाविज्ञान और मानविकी का संबंध आदि का ज्ञान प्राप्त करेंगे।

5. भारतेन्दु हरिश्चंद्र, मोहन राकेश आदि नाटककारों के नाटकों से जीवन की वास्तविक शिक्षा प्राप्त करने में विद्यार्थी सक्षम होंगे।
6. हिन्दी साहित्य अध्ययन को सुदृढ़ आधार प्रदान करने के लिए भारतीय और पाश्चात्य काव्यशास्त्र का अध्ययन पाठ्यक्रम में शामिल किया गया है। इसके अंतर्गत छंद, अलंकार, रस आदि को पाठ्यक्रम में सम्मिलित किया गया है। तकनीकी रूप में इनका अध्यापन करते हुए इनकी प्रायोगिकता पर भी विचार किया जाता है। विशिष्ट भारतीय और पाश्चात्य काव्यशास्त्रियों के विचारों से विद्यार्थी अवगत होते हैं।
7. प्रयोजनमूलक हिन्दी का अध्ययन करते हुए सभी विद्यार्थी सरकारी कार्यालयों में हिन्दी का प्रयोग सीखते हैं तथा सरकारी कामकाजों में हिन्दी प्रयोग से संबंधित तकनीकी शब्दावलियों का भी ज्ञान प्राप्त कर सकते हैं।
8. हिन्दी की साहित्यिक पत्रकारिता अपने आप में विशिष्ट है जहां पत्रकारिता के गुण-अवगुण तथा आदिकाल से लेकर आधुनिक काल तक समाज और साहित्य में पत्रकारिता के प्रभाव और समाज निर्माण में इसके योगदान से सभी विद्यार्थी परिचित होते हैं।
9. अनुवाद विज्ञान का अध्ययन विद्यार्थियों को अनुवाद संबंधी आवश्यकता, महत्व, गुण-अवगुण से परिचित करवाते हैं।
10. इन सबके अलावा हिन्दी का वैश्विक परिदृश्य एवं प्रवासी साहित्य, हिन्दी व्याकरण एवं सम्प्रेषण, लोक साहित्य चिंतन आदि का अध्ययन कर विद्यार्थी हिन्दी साहित्य से जुड़ी अनेक तथ्यों और उनकी प्रगति से परिचित हो सकते हैं।

प्रश्न-पत्र परिणाम

क्रमिक संख्या	सेमेस्टर	प्रश्न-पत्रों के कोड एवं प्रश्न-पत्रों के नाम	प्रश्न-पत्र का परिणाम	इकाई/पाठ	ब्लूम्स टैक्सोनोमिक लेवल लागू
1.	I	HIN-HC-1016 हिन्दी साहित्य का इतिहास (रीतिकाल तक)	<p>1. इस पत्र के जरिए विद्यार्थी आदिकालीन, भक्तिकालीन, रीतिकालीन हिन्दी साहित्य के इतिहास की सम्यक जानकारी प्राप्त करेंगे।</p> <p>2. इसके द्वारा विद्यार्थी तीनों कालों के कवि और उनकी रचनाओं का सम्यक ज्ञान प्राप्त करते हुए उसके महत्व से परिचित होंगे।</p> <p>3. प्रत्येक काल में साहित्य चेतना में हो रहे निरंतर परिवर्तन के बारे में विद्यार्थी विशेष रूप से अवगत होंगे।</p>	<p>इकाई 1: आदिकाल: सीमांकन, नामकरण, परिस्थितियाँ: सिद्धसाहित्य, नाथसाहित्य, जैन साहित्य आदि।</p> <p>इकाई 2: भक्तिकाल सीमांकन, नामकरण, परिस्थितियाँ: संतकाव्य, सूफीकाव्य, रामकाव्य, कृष्णकाव्य आदि।</p> <p>इकाई 3: रीतिकाल : सीमांकन, नामकरण, परिस्थितियाँ: रीतिबद्ध, रीतिसिद्ध, रीतिमुक्त काव्यधारा</p>	याद रखना, समझना और विश्लेषण करना

2.		<p>HIN-HC-1026 हिन्दी साहित्य का इतिहास (आधुनिक काल)</p>	<p>1. इस पत्र के माध्यम से विद्यार्थी आधुनिक हिन्दी साहित्य के इतिहास की सम्यक जानकारी प्राप्त करेंगे।</p> <p>2. विद्यार्थी खड़ीबोली हिन्दी गद्य के उद्भव विकास के साथ परिचित होंगे।</p> <p>3. आधुनिक कवियों की रचनाओं और उनमें निहित संवेदनाओं को यथार्थ के धरातल पर विश्लेषण करते हुए आधुनिक साहित्य की धारा से अवगत होंगे।</p>	<p>इकाई 1: आधुनिक काल: सीमांकण, नामकरण, परिस्थितियाँ, आधुनिक और आधुनिकता के तात्पर्य, भारतेन्दुयुगीन काव्य प्रवृत्तियाँ एवं प्रमुख कवि।</p> <p>इकाई 2: द्विवेदी-युग, छायावाद, प्रगतिवाद - काव्य प्रवृत्तियाँ और प्रमुख कवि</p> <p>इकाई 3: प्रयोगवाद, नई कविता, समकालीन कविता- काव्य प्रवृत्तियाँ और प्रमुख कवि</p> <p>यूनिट 4 : हिन्दी गद्य (खड़ीबोली) का विकास</p>	<p>याद रखना, समझना, विश्लेषण करना और लागू करना</p>
3.		<p>HIN-AE-1014 हिन्दी व्याकरण और सम्प्रेषण</p>	<p>1. इस पत्र के माध्यम से विद्यार्थी हिन्दी व्याकरण और हिन्दी के माध्यम से सम्प्रेषण की जानकारी प्राप्त करेंगे।</p> <p>2. हिन्दी भाषा के उपयोग के संदर्भ में उनकी योग्यता में वृद्धि होगी।</p> <p>3. उपसर्ग, प्रत्यय, समास, शब्द शुद्धि तथा वाक्य शुद्धि जैसे व्याकरणिक प्रसंगों के ज्ञान प्राप्त कर लाभान्वित होंगे।</p>	<p>इकाई 1 : हिन्दी की वर्ण व्यवस्था, हिन्दी व्याकरण एवं रचना</p> <p>इकाई 2 : उपसर्ग, प्रत्यय, समास, विलोम शब्द। अनेक शब्दों के लिए एक शब्द आदि।</p> <p>इकाई 3: सम्प्रेषण की अवधारण, महत्व, प्रकार, मुहावरा, लोकोक्ति आदि।</p>	<p>याद रखना, समझना, विश्लेषण करना और लागू करना</p>

4.	II	HIN-HC-2016 आदिकालीन एवं मध्यकालीन हिन्दी कविता	<p>1. विद्यार्थी विद्यापति, कबीर, जायसी, सूरदास, तुलसीदास, बिहारी, घनानन्द जैसी अमर विभूतियों का काव्य रस प्राप्त कर सकेंगे।</p> <p>2. इन प्रमुख कवियों के जीवन परिचय प्राप्त करेंगे।</p> <p>3. इसके माध्यम से कृष्णभक्ति, रामभक्ति, वीरकाव्य, चरितकाव्य, नीतिकाव्य, रीतिकाव्य आदि की जानकारी प्राप्त करते हुए विद्यार्थी जीवन की वास्तविकता से परिचित होंगे।</p>	<p>इकाई 1: विद्यापति, कबीर, जायसी द्वारा रचित काव्य</p> <p>इकाई 2: सूरदास, तुलसीदास के काव्य</p> <p>यूनिट 3: बिहारी, घनानंद के काव्य</p>	याद रखना और समझना
5.		HIN-HC-2026 आधुनिक हिंदी कविता (छायावाद तक)	<p>1. इस पत्र का अध्ययन कर विद्यार्थी खड़ीबोली हिन्दी में रचित भारतेन्दुयुगीन, द्विवेदीयुगीन और छायावादयुगीन काव्यसाहित्य का ज्ञान प्राप्त कर सकेंगे।</p> <p>2. आधुनिक काल के कुछ प्रमुख कवियों के जीवन के बारे में जानकारी हासिल कर सकेंगे।</p>	<p>इकाई 1: भारतेन्दु हरिश्चंद्र और मैथिलीशरण गुप्त की कविताएँ</p> <p>इकाई 2: मैथिलीशरण गुप्त, निराला और सुमित्रानंदन पंत की कविताएँ</p> <p>इकाई 3: महादेवी वर्मा और जयशंकर प्रसाद की कविताएँ</p>	याद रखना, समझना और विश्लेषण करना

			3. आधुनिक हिन्दी काव्यधारा से संबंधित विशेषताओं, वर्तमान धारा और संवेदनाओं से परिचित होंगे।		
6.	III	HIN-HC-3016 छायावादोत्तर हिन्दी कविता	<p>1. इस पत्र के माध्यम से विद्यार्थी हिन्दी की प्रगतिवादी, राष्ट्रीय-सांस्कृतिक, प्रयोगवादी और नयी कविता से परिचित होंगे।</p> <p>2. छायावादोत्तर हिन्दी काव्यधारा की संवेदना और शिल्पगत विशेषताओं का ज्ञान प्राप्त करेंगे।</p> <p>3. छायावादोत्तर कवियों के जीवन-दर्शन से विद्यार्थी अवगत होंगे और प्रेरणा ग्रहण कर सकेंगे।</p>	<p>इकाई 1: केदारनाथ अग्रवाल और नागार्जुन की कविताएँ</p> <p>इकाई 2 : दिनकर, माखनलाल चतुर्वेदी, भवानीप्रसाद मिश्र और अज्ञेय की कविताएँ</p> <p>इकाई 3: रघुवीर सहाय, सर्वेश्वर दयाल सक्सेना और गिरिजाकुमार माथुर की कविताएँ</p>	याद रखना और समझना और विश्लेषण करना
7.		HIN-HC-3026 भारतीय काव्यशास्त्र	<p>1. विद्यार्थियों को काव्य-साहित्य की शास्त्रीय समीक्षा हेतु भारतीय काव्यशास्त्र के मुख्य सिद्धांतों की जानकारी प्राप्त होगी।</p> <p>2. भारतीय काव्यशास्त्र के विभिन्न संप्रदायों जैसे अलंकार, रीति, ध्वनि, वक्रोक्ति, औचित्य और रस की जानकारी मिलेगी।</p>	<p>इकाई 1 : काव्यलक्षण, काव्याहेतु एवं काव्यप्रयोजन, रस सिद्धांत</p> <p>यूनिट 2: ध्वनि सिद्धांत और अलंकार सिद्धांत</p> <p>यूनिट 3: रीति सिद्धांत, वक्रोक्ति सिद्धांत और औचित्य सिद्धांत</p>	याद रखना, समझना, विश्लेषण करना और लागू करना

			3. काव्य का मर्म व संवेदना समझने के लिए विद्यार्थियों को काव्य शास्त्र का व्यावहारिक ज्ञान लाभ होगा ।		
8.	HIN-HC-3036 पाश्चात्य काव्यशास्त्र		<p>1. विद्यार्थियों को काव्य-साहित्य की शास्त्रीय समीक्षा हेतु पाश्चात्य समीक्षकों के सिद्धांतों की सम्यक जानकारी मिलेगी।</p> <p>2. छात्रों को काव्य संबंधी मान्यताएँ तथा काव्यभाषा संबंधी सिद्धांतों की जानकारी हासिल होगी।</p> <p>3. शैलीविज्ञान की उपयोगिता सीखकर लाभान्वित होंगे।</p>	<p>इकाई 1: प्लेटो, अरस्तू और लॉगिनुस</p> <p>इकाई 2: वर्ड्सवर्थ, कॉलरिज और क्रोचे</p> <p>यूनिट 3: टी.एस. इलियट, आई.ए. रिचर्ड्स, स्वच्छंदतावाद, यथार्थवाद और शैलीविज्ञान</p>	याद रखना, समझना, विश्लेषण करना और लागू करना
9.	HIN-SE-3014 कार्यालयीन अनुवाद		<p>1. विद्यार्थी हिन्दी भाषा के विविध रूपों, हिन्दी संबंधी संवैधानिक प्रावधानों का ज्ञान प्राप्त करेंगे।</p> <p>2. कार्यालयीन हिंदी पत्राचार से संबंधित पारिभाषिक शब्दावलियों को सीखेंगे।</p> <p>3. कार्यालयीन प्रयोजनों में विभिन्न यांत्रिक उपकरणों जैसे टेलीप्रिंटर, वीडियो कॉन्फ्रेंसिंग आदि पर ज्ञान प्राप्त करेंगे।</p>	<p>इकाई 1: हिन्दी भाषा के विविध रूप : राष्ट्रभाषा, राजभाषा, जनभाषा आदि</p> <p>इकाई 2: टिप्पन, प्रारूप/लेखन, पल्लवन, संक्षेपन, विविध प्रकार के पत्राचार आदि।</p> <p>इकाई 3: पारिभाषिक शब्दावली, कार्यालयीन प्रयोजनों के लिए कंप्यूटर, टेलीप्रिन्टर, टेलेक्स, वीडियो कॉन्फ्रेंसिंग आदि का प्रयोग।</p>	याद रखना, समझना, विश्लेषण करना, लागू करना और सृजन करना

10.	IV	HIN-HC-4016 भाषा विज्ञान, हिंदी भाषा एवं देवनागरी लिपि	<p>1. इस पत्र का उद्देश्य भाषाविज्ञान के आधारभूत सिद्धांतों को विद्यार्थियों के सामने बोधगम्य रूप में उपस्थित करना है।</p> <p>2. विद्यार्थी भाषा विज्ञान, हिन्दी भाषा के उद्भव-विकास तथा देवनागरी लिपि के बारे में सम्यक जानकारी प्राप्त कर सकेंगे।</p> <p>3. भाषाविज्ञान से संबन्धित ध्वनि, पद, वाक्य तथा अर्थविज्ञान के अलावा विभिन्न बोलियों से परिचित होंगे।</p>	<p>इकाई 1: भाषा: परिभाषा, विशेषताएँ, भाषा परिवर्तन के कारण आदि भाषाविज्ञान: परिभाषा, अंग आदि।</p> <p>इकाई 2 : ध्वनि विज्ञान: परिभाषा, स्वरों का वर्गीकरण आदि। रूपविज्ञान: शब्द और रूप, पद विभाग, अक्षर आदि। वाक्य विज्ञान: परिभाषा, तत्व, प्रकार आदि।</p> <p>इकाई 3: अर्थविज्ञान: शब्द और अर्थ का संबंध, अर्थ परिवर्तन के कारण और दिशाएँ, हिंदी भाषा का उद्भव विकास और देवनागरी लिपि आदि।</p>	याद रखना, समझना, विश्लेषण करना और लागू करना
11.		HIN-HC-4026 हिंदी कथा साहित्य	<p>1. गौरवशाली हिन्दी उपन्यास के उद्भव और विकास की जानकारी प्राप्त करेंगे। उपन्यास के अंग और स्वरूप को भी जान पाएंगे।</p> <p>2. हिन्दी कहानी के उद्भव और विकास यात्रा से विद्यार्थी परिचित होंगे तथा कहानी के कला और तत्वों की विशेष जानकारी प्राप्त करेंगे।</p> <p>3. कहानी और उपन्यासों का अध्ययन करते हुए पात्रों तथा चरित्रों के माध्यम से आधुनिक जीवन यात्रा</p>	<p>काई 1: उपन्यास एवं कहानी: परिभाषा, तत्व एवं प्रकार उपन्यास और कहानी में अंतर, उद्भव-विकास आदि।</p> <p>इकाई 2: त्यागपत्र और आपका बंटी उपन्यास</p> <p>यूनिट 3: उसने कहा था, पुस की रात, आकाशदीप, हार की जीत, पाजेब, मिस पाल, सिक्का बादल गया और पिता।</p>	याद रखना, समझना, लागू करना और सृजन करना

			संबंधी व्यावहारिक ज्ञान प्राप्त कर सकेंगे।		
12.	HIN-HC-4036 हिंदी नाटक एवं एकांकी	1. हिंदी नाटक एवं एकांकी के स्वरूप और उसके इतिहास को जानेंगे। 2. इन दोनों विधाओं के हिंदी साहित्य में महत्व के बारे में जानेंगे। 3. विद्यार्थी अभिनय कला की जानकारी प्राप्त कर सकेंगे।	इकाई 1 : नाटक एवं एकांकी : परिभाषा तत्व एवं प्रकार, उद्भव विकास आदि। इकाई 2 : नाटक : अंधेर नगरी, आषाढ़ का एक दिन यूनिट 3: एकांकी: विषकन्या, भोर का तारा, ये स्वतंत्रता का युग।	याद रखना, समझना, विश्लेषण करना, लागू करना और सृजन करना।	
13.	HIN-SE-4014 अनुवाद विज्ञान	1. विद्यार्थियों को अनुवाद संबंधी सैद्धांतिक और व्यावहारिक ज्ञान प्राप्त होगी। 2. कार्यालयीन अनुवाद के संदर्भ में राजभाषा नीति के अनुपालन में धारा 3(3) के अंतर्गत निर्धारित दस्तावेजों की सटीक अनुवाद की जानकारी प्राप्त होगी। 3. तकनीकी और सर्जनात्मक साहित्य के विविध क्षेत्रों में हिंदी अनुवाद संबंधी कौशल की जानकारी मिलेगी।	इकाई 1: अनुवाद का अर्थ, परिभाषा, स्वरूप एवं प्रकृति, अनुवाद की आवश्यकता एवं महत्व आदि। इकाई 2: अनुवाद प्रक्रिया के तीन चरण: विशेषण, अंतरण एवं पुनर्गठन अनुवाद की भूमिका : पाठक की भूमिका, द्विभाषी की भूमिका आदि। इकाई 3: कार्यालयीन अनुवाद: शासकीय पत्र, परिपत्र, ज्ञापन, विज्ञापन आदि। व्यवहारिक अनुवाद: हिंदी से अंग्रेजी, अंग्रेजी से हिंदी।	याद रखना, समझना, विश्लेषण करना, लागू करना और सृजन करना।	

14.	V	HIN-HC-5016 हिंदी निबंध एवं अन्य गद्य विधाएं	<p>1. यह पत्र छात्रों को निबन्ध, संस्मरण, रेखाचित्र की परिभाषा, स्वरूप और तत्व को जानने में मदद करता है।</p> <p>2. यह पत्र निबंधकारों के चिंतन और दर्शन से परिचित कर विद्यार्थियों को व्यावहारिक जीवन की परिस्थितियों, द्वंद, संघर्ष की वास्तविकता का परिचय प्रदान करता है।</p> <p>3. निबंध, संस्मरणों के माध्यम से सर्वभारतीय धरातल पर सामाजिक-सांस्कृतिक पटभूमि से परिचय करवाता है।</p>	<p>इकाई 1: निबन्ध, संस्मरण, रेखाचित्र: परिभाषा, स्वरूप एवं तत्व आदि।</p> <p>इकाई 2: मजदुरी और प्रेम, करुणा, देवदारू, मेरे राम का मुकुट भी रहा है और महाकवि जयशंकर प्रसाद।</p> <p>इकाई 3: तुम्हारी स्मृति, भक्तिन, सुभान खां और पीपल</p>	याद रखना, समझना और विश्लेषण करना और सृजन करना
15.		HIN-HC-5026 प्रयोजनमूलक हिन्दी	<p>1. इस पत्र से विद्यार्थियों को हिन्दी भाषा के विविध रूपों और हिन्दी संबंधी विविध संवैधानिक प्रावधानों की जानकारी प्राप्त होगी।</p> <p>2. विद्यार्थी कार्यालय, विज्ञान, व्यवसाय, संचार-माध्यम, अनुवाद आदि के संदर्भों में प्रयुक्त होनेवाली हिन्दी के प्रयोजनमूलक स्वरूपों का परिचय प्राप्त करते हैं।</p> <p>3. यह पत्र विद्यार्थियों को सरकारी पत्राचार, टिप्पणी तथा मसौदा</p>	<p>इकाई 1: राष्ट्रभाषा, संपर्क भाषा, राजभाषा, अंतरराष्ट्रीय भाषा के रूप में हिंदी और संविधान में हिंदी।</p> <p>इकाई 2 : प्रयोजनमूलक हिन्दी के प्रमुख प्रकार</p> <p>इकाई 3: भाषा व्यवहार: सरकारी पत्राचार, टिप्पणी तथा मसौदा लेखन, आलेखन, व्यावसायिक पत्र लेखन, पारिभाषिक शब्दावली आदि।</p>	याद रखना, समझना, विश्लेषण करना, लागू करना और सृजन करना

			लेखन, आलेखन, व्यावसायिक पत्र लेखन, पारिभाषिक शब्दावलियों का ज्ञान प्राप्त करने में लाभदायक है।		
16.	HIN-HE-5016 लोक-साहित्य-चिंतन	<p>1. इस पत्र के द्वारा विद्यार्थियों को लोक, लोक-वार्ता, लोक-संस्कृति और लोक साहित्य (लोक-गीत, लोक-नाट्य, लोक-कथा) की सम्यक जानकारी मिलती है।</p> <p>2. लोक जीवन में समाविष्ट सम्पूर्ण भावात्मक एवं सृजनात्मक सामग्री जैसे विश्वासों, मान्यताओं, परम्पराओं, प्रथाओं तथा रीतियों के बारे में ज्ञान प्राप्त होगा।</p> <p>3. जीवन में बिखड़े अनंत लोकाचारों, संस्कारों एवं परंपरागत मूल्यों से भी परिचित हो सकेंगे।</p>	<p>इकाई 1: लोक और लोक- वार्ता, लोक-संस्कृति की अवधारणा, लोक-वार्ता और लोक-संस्कृति, लोक-संस्कृति और साहित्य आदि।</p> <p>इकाई 2: भारत में लोक- साहित्य के अध्ययन का इतिहास। लोकगीत: संस्कार गीत, व्रतगीत, श्रमगीत आदि।</p> <p>इकाई 3: लोक नाट्य: रामलीला, रासलीला कीर्तनिया, यक्षगान, नौटंकी, ब्रतकथा आदि।</p>	याद रखना, समझना, विश्लेषण करना	
17.	HIN-HE-5026 हिन्दी की राष्ट्रीय-सांस्कृतिक काव्यधारा	<p>1. इस पत्र में विद्यार्थियों को हिन्दी की समृद्ध राष्ट्रीय- सांस्कृतिक काव्यधारा के इतिहास के बारे में जानकारी मिलेगी।</p> <p>2. राष्ट्रीय-सांस्कृतिक काव्यधारा के चुनिन्दा कवियों के जीवन और कर्म संबंधी ज्ञान प्राप्त होगा।</p>	<p>इकाई 1: हिंदी की राष्ट्रीय सांस्कृतिक काव्यधारा का उद्भव एवं विकास, मैथिलीशरण गुप्त की कविताएं</p> <p>इकाई 2 : माखनलाल चतुर्वेदी की कविताएँ</p> <p>इकाई 3: रामधारी सिंह 'दिनकर' की कविताएँ</p>	याद रखना, समझना, विश्लेषण करना, सृजन करना	

			3. राष्ट्र के प्रति आत्मभाव और सांस्कृतिक चेतना जागृत होगी।	इकाई 4: सुभद्रा कुमारी चौहान की कविताएँ	
18.	VI	HIN-HC-6016 हिन्दी की साहित्यिक पत्रकारिता	<p>1. इस पत्र द्वारा साहित्यिक पत्रकारिता के स्वरूप तथा भारतेन्दु युग से अब तक अनवरत रूप से प्रवाहित साहित्यिक पत्रकारिता की जानकारी मिलेगी।</p> <p>2. समाज पर पत्रकारिता का प्रभाव और इसके महत्व से परिचित हो सकेंगे।</p> <p>3. विद्यार्थी पत्रकारिता और पत्रकार के उद्देश्य तथा गुण-अवगुणों की जानकारी हासिल कर पाएंगे।</p>	<p>इकाई 1: साहित्यिक पत्रकारिता: अर्थ, अवधारण और महत्व भारतेन्दुयुगीन साहित्यिक पत्रकारिता: परिचय और प्रवृत्तियाँ</p> <p>इकाई 2: द्विवेदीयुगीन साहित्यिक पत्रकारिता: परिचय और प्रवृत्तियाँ प्रेमचंद और छायावादयुगीन साहित्यिक पत्रकारिता: परिचय और प्रवृत्तियाँ</p> <p>इकाई 3: स्वातंत्र्योत्तर साहित्यिक पत्रकारिता: परिचय और प्रवृत्तियाँ, समकालीन साहित्यिक पत्रकारिता: परिचय और प्रवृत्तियाँ, महत्वपूर्ण पत्र-पत्रिकाएँ: सरस्वती, भारत मित्र आदि।</p>	याद रखना, समझना, विश्लेषण करना, लागू करना और बनाना
19.		HIN-HC-6026 हिंदी परियोजना कार्य	<p>1. इस पत्र के अंतर्गत विद्यार्थियों में शोध-प्रवृत्ति जागृत होगी।</p> <p>2. आलोचनात्मक समीक्षा की योग्यता में अभिवृद्धि होगी।</p>	विद्यार्थी कबीरदास, बिहारीलाल, जयशंकर प्रसाद, निराला, महादेवी वर्मा, दिनकर, उषा प्रियंवदा, नागार्जुन, मोहन राकेश आदि हिंदी के प्रमुख साहित्यकारों की साहित्यिक कृतियों पर एक परियोजना प्रस्तुत करेंगे।	याद रखना, समझना, विश्लेषण करना, लागू करना और लिखना

			3. नए तकनीकों (कम्प्यूटर, इन्टरनेट आदि) के प्रयोग संबंधी ज्ञान प्राप्त कर सकेंगे।		
20.	HIN-HE-6016 छायावादी काव्यधारा	1. विद्यार्थी हिन्दी की छायावादी काव्यधारा के इतिहास और चुनी हुई छायावादी कविताओं से परिचित होंगे। 2. अनोखी छायावादी काव्यधारा की संवेदना एवं शिल्पगत विशेषताओं का ज्ञान प्राप्त कर सकेंगे। 3. छायावादी कवियों के व्यक्तित्व व लेखन कौशल के बारे में जानकर प्रेरित हो सकेंगे।	इकाई 1: छायावादी काव्यधारा का उद्भव और विकास, जयशंकर प्रसाद की कविताएँ इकाई 2 : सूर्यकान्त त्रिपाठी निराला की कविताएँ इकाई 3: सुमित्रानंदन पंत की कविताएँ इकाई 4: महादेवी वर्मा की कविताएँ	याद रखना, समझना और विश्लेषण करना	
21.	HIN-HE-6026 प्रेमचंद का साहित्य	1. विद्यार्थियों को हिन्दी के महान कथाकार मुंशी प्रेमचंद द्वारा विरचित साहित्य की जानकारी मिलेगी। 2. प्रेमचंद की लेखन कला और विचारों तथा समाज पर पड़नेवाले प्रभावों से अवगत होंगे। 3. समाज में व्याप्त विभिन्न कुरीतियों के समाधान के साथ-साथ समाज सुधार संबंधी प्रेमचंद के प्रयासों से परिचित होंगे।	इकाई 1: प्रेमचंद के साहित्य का सामान्य परिचय उपन्यास : सेवासदन इकाई 2: नाटक - कर्बला इकाई 3: निबन्ध- साहित्य का उद्देश्य इकाई 4: कहनियां- पुस की रात, शतरंज के खिलाड़ी आदि।	याद रखना और समझना और विश्लेषण करना	

**BA
Hindi**

Programme Specific Outcomes

After completion of the programme, a student will be able to:

1. Become acquainted with information regarding the origin and development of Hindi Literature and know about the importance of various periods of Hindi literature like *Adikaal*, *Bhaktikal* and *Ritikal* as well as the modern period.
2. Introduced to the personalities and literary works of different poets of *Adikaal*, *Bhaktikaal*, *Ritikaal* and *Adhunik Kaal* like Kabirdas, Bihari, Bharatendu, Mahadevi, and Agyey.
3. Read and analyse the creations of ancient and modern poets and writers, viz., stories, novels and poems etc. and become inspired to understand the realities of life. For instance, Kabir's Sakhī teaches us to understand the daily affairs of family life while the descriptions of Tulsi and Surdas connects us with spirituality. Premchand's stories teaches us about life struggles while Mannu Bhandari and Jainendra's literature highlights the challenges of modern life.
4. Become familiar with different languages and their characteristics through the compositions of various poets and writers. The spiritual essence of the writings imparts lessons on traditional value systems of our country and familiarises us with life realities.
5. Gain knowledge about the origin and development of language and the *devnagri* script by studying Bhashavigyan.
6. Get an opportunity to understand linguistic patterns as well as socio-cultural affairs of various peoples of the country by means of the philosophy hidden in the essays of authors such as Hazari Prasad Dwivedi and Vidyanivas Mishra.
7. Obtain a solid foundation of Hindi technical literature through *Kavyashastra*, under which verses, *rasa*, etc. appear in the syllabus and get exposed to the thoughts and philosophy of eminent Indian and western writers.
8. Learn about the need and importance of translation and acquire translation skills.
9. Thoroughly acquaint themselves with the concept and importance of literary journalism and different forms of Hindi literary journalism and know about the influence of journalism on literature and society.

10. Awaken their research instinct and critical review ability.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1.	I	HIN-HC-1016 Hindi Sahitya Ka Itihas (Ritikaltak)	<ul style="list-style-type: none"> This paper aims to get students acquainted with history of Hindi literature i.e from Adikal to Ritikal. This paper will provides the students about the information of Adikal, Bhaktikal, Ritikal and its historical importance. By this paper the students will get acquainted with the personality and literary works of the poets. 	Unit 1: Adikal : seemankan , naamkaran,paristhitiyan: siddh, nath, jein Sahitya Unit 2: Bhaktikalseemankan , naamkaran,paristhitiyan: santkavya, sufikavya, ramkavya, krishnakavya Unit 3: Ritikal : seemankan , naamkaran,paristhitiyan: ritbaddh, ritisiddh, ritimuktakavyadhara	Remembering, Understanding &Analyzing

2.		<p>HIN-HC-1026</p> <p>Hindi Sahitya Ka Itihas (Adhunik Kal)</p>	<ul style="list-style-type: none"> • This paper helps the students to get the knowledge of different ages of Adhunik Kal & its importance. • Students will be familiar with the origin and development of the Khadiboli Hindi prose. • Analyzing the writings of modern poets and the sensibilities contained in them on the ground of reality, students will be aware of the stream of modern literature. 	<p>Unit 1: Adhunik kal : seemankan , naamkaran, paristhitiyan, adhunik aur adhuniktakeatparya, bharatendyugin kavya pravrittiyanevampramukhkavi</p> <p>Unit 2: Dwivedi yug, Chayavad, pragativad – kavya pravritiyan aur pramukhkavi</p> <p>Unit 3: Prayogvad, Nayi Kavita, Samkalin Kavita- kavya pravritiyan aur pramukhkavi</p> <p>Unit 4 : Hindi gadya (khadiboli) ka vikas</p>	<p>Remembering, Understanding, Analyzing& Applying</p>
3.		<p>HIN-AE-1014</p> <p>Hindi vyakaran aur sampreshan</p>	<ul style="list-style-type: none"> • Through this paper students will learn about Hindi Grammar and 	<p>Unit 1 : Hindi ki VarnVyavastha, Hindi vyakaranevam Rachna</p>	<p>Remembering, Understanding, Analyzing& Applying</p>

			<p>composition.</p> <ul style="list-style-type: none"> • This paper enables the students to use Hindi language correctly. • They will also know about concept and importance of communication. 	<p>Unit 2 : Upsarg, Pratyay, Samas, vilomshabd etc.</p> <p>Unit 3: Smpreshan ki avdharna, Mahatva, prakar, muhavra, lokokti etc.</p>	
4.	II	<p>HIN-HC-2016</p> <p>AdikalinevamMadhyaKalin Hindi Kavita</p>	<ul style="list-style-type: none"> • Through this paper students can learn about the old poetries of Hindi Literature. • They can also learn about the life & literary works of Vidyapati, Kabir, Surdas, Tulsidas, Bihari &Ghananda. • Through this paper students will get 	<p>Unit 1: Vidyapati, Kabir, Jaysilikhitkaavya</p> <p>Unit 2: Surdas, Tulsidas ke kavya sahitya</p> <p>Unit 3: Bihari, Ghananand ki kavitayen</p>	Remembering & Understanding

			<p>information about Krsihna Bhakti kavyadhara, Ram bhakti kavyadhara, Veerkavya, Nitikavya, Ritikavya etc.</p>		
5.		<p>HIN-HC-2026</p> <p>Adhunik Hindi Kavita (Chayavad Tak)</p>	<ul style="list-style-type: none"> The objective of the paper is to learn about modern period of Hindi literature & about the Poets of modern periods like Bhartendu, Maithelisharan Gupta & Mahadevi Verma etc. Student will be motivated by knowing about the life history 	<p>Unit 1: Poems of BharatenduHarichandra & Maithelisharan Gupta</p> <p>Unit 2 : Poems of Maithelisharan Gupta, Nirala& Sumitranandan Pant</p> <p>Unit 3: Poems of Mahadevi Verma & Jayshankar Prasad</p>	<p>Remembering, Understanding & Analyzing</p>

			<p>and writing skills of poets of modern period.</p> <ul style="list-style-type: none">• Learners will be familiar with the characteristics of Hindi Modern era.		
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6.	III	<p>HIN-HC-3016</p> <p>Chayavadottar Hindi Kavita</p>	<p>Through this paper, students will get acquainted with the progressive poetry, national-cultural poetry, experimental and new poetry of modern Hindi literature.</p> <p>Students will know about the poets & their writing skills.</p> <p>Learners will be familiar with the characteristics of post romantic period of Hindi literature.</p>	<p>Unit 1: Poems of KedarnathAgrwal&Nagarjun</p> <p>Unit 2 : Poems of Dinkar, MakhanlalChturvedi, Bhavaniprasad Mishra & Ajyey</p> <p>Unit 3: Poems of Raghuveer Sahay, Srveshvar Dayal Saksena & Girijakumar Mathur</p>	<p>Remembering, Understanding & Analyzing</p>
7.		<p>HIN-HC-3026</p> <p>Bharatiya Kavya Shastra</p>	<p>The paper will familiarize the students with the principles of Indian poetry.</p> <p>The students will also learn about the views given by Indian critics regarding poetry.</p>	<p>Unit 1 : Kavyalakshan, KavyahetuevamKavyaprayojan& Rasa Siddhant</p> <p>Unit 2 : Dhvani Siddhant &Alankar Siddhant</p> <p>Unit 3 : Riti Siddhant, Vakrokti Siddhant &Auchitya Siddhant</p>	<p>Remembering, Understanding, Analyzing& Applying</p>

			The learner will know about the features, purpose of writing poetry and also about various theories of poetry.		
8.		HIN-HC-3036 Pashchatya Kavya Shastra	<ul style="list-style-type: none"> • Students will learn about the views of Western critics like Plato, Aristotle, Wordsworth, T.S Eliot etc. regarding poetry. • Students will get knowledge of poetic beliefs and principles related to poetic language. • They will know about utility and forms of stylistics. 	Unit 1 : Plato, Aristotle & Longinus Unit 2: Wordsworth, Coleridge & Croce Unit 3: T. S. Elliot, I. A. Richards, Swchandatavad, Ytharthvaad&Sheilivigyan	Remembering, Understanding, Analyzing& Applying

9.		<p>HIN-SE-3014</p> <p>KaryalayinAnuvad</p>	<ul style="list-style-type: none"> • Through this paper students will know about various forms of Hindi language and constitutional provision related to Hindi. • It will help to increase terminology of administrative correspondence . • To give knowledge about application of various mechanical devices for office purpose. 	<p>Unit 1: Hindi Bhasha kevidhroop</p> <p>Unit 2: Tippan, prarup/ alekhan. Pallavan, Sankshepan, vividhprakarkepatrachar etc.</p> <p>Unit 3: ParibhashikShbdavali, karyalayinprayojanon men computer, teleprompter, telex, video conferencing aadi ka prayog.</p>	<p>Remembering, Understanding, Analyzing, Applying & creating</p>
10.	IV	<p>HIN-HC-4016</p> <p>Bhasha Vigyan, Hindi Bhasha evamDevnagriLipi</p>	<ul style="list-style-type: none"> • Through this paper students will learn about the origin and development of 	<p>Unit 1: Bhasha : Paribhasha, vishestayen, parivartankekaranaadi</p> <p>Bhashavigyan: Paribhasha, ang etc.</p>	<p>Remembering, Understanding, Analyzing& Applying</p>

			<p>Hindi language.</p> <ul style="list-style-type: none"> Students will be able to get proper information about linguistics, origin and development of different Hindi dialects and Devanagari script. This paper will also help the students to get the basic knowledge of phonology, morphology, letters, syntax etc. 	<p>Unit 2 : Dhvani Vigyan: Paribhasha, swaron ka vargikaran etc.</p> <p>Roopvigyan: shabd aur roop, pad vibhag, akshar etc.</p> <p>Vakya-vigyan: paribhasha, tatva, prakaar etc.</p> <p>Unit 3: Arthvigyan : shabd aur arth ka sambandh, arthparivartankekaran aur dishayen, Hindi bhasha ka udbhavvikas&devnagarilipi etc.</p>	
11.		<p>HIN-HC-4026</p> <p>Hindi Katha Sahitya</p>	<ul style="list-style-type: none"> Through this paper students will learn about the definition of novel. They will get information about the origin and development of 	<p>Unit 1: Upanyasevamkahani: paribhasha, tatvaevamprakarUpnyaas aur kahani men antar, udbhavvikas etc.</p> <p>Unit 2: Tyagpatra&Apka Banti Upnyaas</p>	<p>Remembering, Understanding , Applying & creating</p>

			<p>the glorious Hindi novel. Will also get to know the parts and form of the novels.</p> <ul style="list-style-type: none"> • Students will be familiar with the journey of origin and development of Hindi story and will get special information about the art and elements of the story. • By reading the stories and novel learner will be able to get practical knowledge about life. 	Unit 3: Usnekahtha, pus ki rat, akashdeep, Har Ki Jeet, Pajeb. Miss Pal, Sikka Badal Gaya & Pita	
12.		HIN-HC-4036 Hindi Natak evamekanki	<ul style="list-style-type: none"> • Through this paper students will learn about the concept and history of drama and one act 	Unit 1 : Natak Evam Ekanki : ParibhashaTatvaevamPrakar, udbhavvikas etc.	Remembering, Understandin, analyzing, Applying & creating

			<p>play.</p> <ul style="list-style-type: none"> • They will also know about importance of drama and one act play in the field of hindi literature. • Through this paper they will learn the art of acting, writing drama etc 	<p>Unit 2 : Natak : andhernagri, Aashadh Ka Ek Din</p> <p>Unit 3: Ekanki: Vishkanya, Bhor ka tara, Ye swatantrata Ka Yug.</p>	
13.		<p>HIN-SE-4014</p> <p>Anuvad Vigyan</p>	<ul style="list-style-type: none"> • Through this paper students will know about the concept and importance of translation. • They will know about the different types of translation and will get practical knowledge. 	<p>Unit 1: Anuvad Ka Arth, Pribhasha, Swarup evam Prakriti, Anuvad ki avashyaktaevammahtva etc.</p> <p>Unit 2: AnuvadPrakriyaKe teen Charan: Vishleshan, antaranevampunargathan Anuvad ki Bhumika : Pathak ki Bhumika, dwibhashi ki bhumika etc.</p> <p>Unit 3: KaryalayinAnuvad: Shasakiyapatra, paripatra, gyapan, vigyapan etc.</p>	<p>Remembering, Understanding, Analyzing, Applying & creating</p>

			<ul style="list-style-type: none"> In the context of official translation, the students will get information about the accurate translation of the documents prescribed under section 3(3) in compliance with the official language policy. This paper will help the students to develop Hindi translation skills in various fields of technical and creative literature. 	Vyavharikanuvad: Hindi to English, English to Hindi.	
14.	V	HIN-HC-5016 Hindi Nibandhevamanyagadyavidha yen	<ul style="list-style-type: none"> This paper also helps the student to know about the concept of essay, sketch, memory writing 	Unit 1: Nibandh, Sansmaran, Rekhachitra: pribhasha, shabdroopevamatatva etc. Unit 2: Majduri aur prem, Karuna, Devdaru, Mere Ram Ka Mukutbhig	Remembering, Understanding, Analyzing and creating

			<p>etc.</p> <ul style="list-style-type: none"> • Students will get knowledge about practical life situation, real life conflict and struggle by reading different essays. • By this paper, students will get introduce to the socio-cultural background of India 	<p>Raha hai & Mahakavi Jayshankar Prasad</p> <p>Unit 3: Tumhari Smriti, Bhaktin, Subhan khan & peepal</p>	
15.		<p>HIN-HC-5026</p> <p>Prayojanmulak Hindi</p>	<ul style="list-style-type: none"> • Through this paper students will get the knowledge about the National language, Official language, international language etc. • Students will 	<p>Unit 1: Rashtrabhasha, Sampark Bhasha, Rajbhasha, Antarrashtriya Bhasha keroop men Hindi & sanvidhan men Hindi.</p> <p>Unit 2 : Prayojanmulak Hindi kepramukhPrakar</p> <p>Unit 3: Bhasha vyavahar: Sarkari patrchar, Tippanitathamasaudalekhan,</p>	<p>Remembering, Understanding, Analyzing, Applying & Creating</p>

			<p>also know about the functional language and also about language practice in various field.</p> <ul style="list-style-type: none"> Students will also know about the various constitutional provisions related to hindi. 	<p>alekhan, vyavsayikptralekhan, paribhashikshabdavali etc.</p>	
16.		<p>HIN-HE-5016</p> <p>Lok-Sahitya-Chintan</p>	<ul style="list-style-type: none"> Through this paper Students will know about the concept of folklore and history of the study of folklore in India. They will also know about the major forms of folklore such as folk songs, folk dances etc. of India. 	<p>Unit 1: Lok aur lok-Varta, Lok-Sanskriti Ki Avdharana. Lok-Varta aur lok-sanskriti, lok-sanskriti aur sahitya etc.</p> <p>Unit 2: Bharat men lok-sahitya keadhyayan ka itihās. Lok geet: Sanskar geet, vratgeet, shramgeet etc.</p> <p>Unit 3: Lok-Natya: Ramleela, Raasleelakeertaniya, yakshagan, nautanki, vratkatha etc.</p>	<p>Remembering, Understanding, Analyzing</p>

			<ul style="list-style-type: none"> They will know about the different rituals, traditional values, beliefs practices in different parts of India. 		
17.		<p>HIN-HE-5026</p> <p>Hindi ki Rashtriya-sanskritikkavyadhara</p>	<ul style="list-style-type: none"> Through this paper Students will know about the origin and development of National-cultural poetry. They will also know about the life and writing skill of various poets of National-cultural poetry. Patriotism, cultural consciousness to the nation will be awaken amongst the students. 	<p>UNIT 1: Hindi ki RashtriyasanskritikKavyadhara ka Udbhavevamvikas, Poems of Meithisharan Gupta</p> <p>Unit 2 : Poems of Makhanlal Chaturvedi</p> <p>Unit 3: Poems of Ramdhari Singh 'Dinkar'</p> <p>Unit 4: Poems of Subhadra Kumari Chauhan</p>	Remembering, Understanding, Analyzing& creating

18.	VI	HIN-HC-6016 Hindi Ki sahityikpatrakarita	<ul style="list-style-type: none"> • Through this paper students will know about concept and importance of Journalism in society. • Through this paper, students will get information about the form of literary journalism and the continuous flow of literary journalism from Bharatendu era till now. • This paper also describes the trends of different era of Journalism. • Students will be able to get information about the 	Unit 1: SahityikPtrakarita : arth, avdharana & mahatva BharatenduyuginSahityikpatrakarita : parichay aur pravrittiyan Unit 2: DwivediyuginsahityikPtrakarita: parichay aur pravrittiyan Premchand aur chayavyuginSahityikpatrakarita: parichay aur pravrittiyan Unit 3: swatantryottarsahityikPtrakarita : parichay aur pravrittiyan, samakalinsahityikPtrakarita: parichay aur pravrittiyan, mahtvapurnpatra-patrikayen: Saraswati, Bharat mitra etc.	Remembering, Understanding, Analyzing, Applying & creating
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			purpose and merits and demerits of journalism and journalists.		
19.		HIN-HC-6026 Hindi PariyojanaKarya (Hindi Project Work)	<ul style="list-style-type: none"> • The objectives of this paper are to arouse the research instinct of the students. • It will also encourage their ability of critical review and analysis. • Students will be able to acquire knowledge to use new technologies such as computer, internet etc. 	Students will Submit a Project on the literary work of prominent Hindi writers such as Kabirdas, Biharilal, Jyasankar Prasad, Nirala, mahadevi Verma, Dinkar, Usha priyamvada, Nagarjun, Mohan Rakesh etc.	Remembering, Understanding, Analyzing, Applying & creating
20.		HIN-HE-6016 ChayavadiKavyadhara	<ul style="list-style-type: none"> • This paper will help the students to know the origin and 	Unit 1: ChayavadiKavyadhara Ka Udbhav aur Vikas , Poems of Jayshankar Prasad	Remembering, Understanding &analyzing

			<p>development of chayavadi poetry.</p> <ul style="list-style-type: none"> This will help to know about the prominent Poets of Chhyavadi age like Jayashankar Prasad, Suryakant Tripathi Nirala, Sumitranandan pant and Mahadevi Verma. Student will know about the writing skills of poets of Chhyavadi age. 	<p>Unit 2 : Poems of Suryakant Tripathi Nirala</p> <p>Unit 3: Poems of Sumitranandan Pant</p> <p>Unit 4: Poems of Mahadevi Verma</p>	
21.		<p>HIN-HE-6026</p> <p>Premachand ka Sahitya</p>	<ul style="list-style-type: none"> Through this paper students will know about the Premchand Literature. Know about the writing skill of 	<p>Unit 1: Premchandke Sahitya ka Samanya Parichay</p> <p>Upnyas : Sevasadan</p> <p>Unit 2 : Natak – Karbala</p>	<p>Remembering, Understanding &Analyzing</p>

			<p>Premchand.</p> <ul style="list-style-type: none"> Students will also know about the importance and impact of Premchand literature in society. 	<p>Unit 3: Nibandh- Sahitya ka uddeshya</p> <p>Unit 4: Kahniyan- Pus ki Rat, Satranjkekhiladi etc.</p>	
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viii. BA Philosophy

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Analyse the ways in which human beings experience the world and develop a sense of value.
2. Develop the critical thinking ability.
3. Understand the concepts of right and wrong as well as moral principles and their application in everyday life.
4. Develop the ability to summarize and explain difficult ideas and concepts on their own.
5. Acquire the ability to understand reality from different perspectives and examine different sides of an issue.
6. Develop the analytical writing skill.
7. Develop creative and independent thinking.
8. Acquire knowledge of research methodology and learn how to specifically state and defend a clear and substantive thesis.
9. Carefully and insightfully analyse argument and rhetoric expressed in various media like print, television, radio, and social media.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	PHI-HC-1016(Indian Philosophy- I)	Indian philosophy has been concerned with various philosophical problems such as nature of the world, nature of reality, nature of knowledge, logic, ethics and the philosophy of religion. Indian philosophy creates awareness about the spiritual aspects of individual as well as ancient philosophical traditions of India.	Unit I Development of Indian Philosophy: the Vedas, the Upaniṣads, Bhagavadgītā Meaning and scope of Indian Philosophy Schools of Indian Philosophy; the Common Characteristics of Indian Systems	R and U
				Unit II Carvaka Materialism: Epistemology (Denial of Inference and Testimony); Metaphysics Four elements; denial of soul; denial of God; Ethics Jainism: Anekāntavāda; Syadvada; Saptabhaṅgi Naya Jainism: Navatattva	R and U
				Unit III Buddhism: Four Noble Truths; Suffering; Cause of Suffering and Chain of Twelve Links; Cessation of Suffering and <i>Nirvana</i> ; Way of Cessation of Suffering and <i>Astangika Marga</i>	R and U

				<p>Buddhism: Theory of Dependent Origination Buddhism: Theory of Impermanence; Theory of No-soul</p>	
				<p>Unit IV Abhidharma Schools: Vaibhasika (bahya-pratyakṣa-vāda); Sautrānika (bahyānumeya-vāda) Madhyamaka: Sunyavāda Yogacāra: Vijñānavāda</p>	R, U and E
2	I	PHI--HC-1026(Logic-I)	<p>Logic helps students to clarify thought process and make correct reasoning. Also Modern or Symbolic Logic gives us the knowledge of the formal techniques of evaluating arguments and deductive systems.</p>	<p>Unit I: Argument and Argument Form Truth and Validity Deduction and Induction</p>	R,UAp, An
				<p>Unit II: Categorical Propositions; Translating Ordinary Proposition into Standard Form; Square of Opposition. Categorical Syllogism; Figures and Moods Immediate Inference</p>	R,U, Ap and An

				Unit III: Venn Diagrammatic Representation of Propositions and Arguments Idea of Existential Import Testing Validity by Venn Diagram	R, U, Ap and An
				Unit IV: Concept of Set Operations of Set- Union, Intersection and Difference Symbolization of Sentences by Set Notations	R, U, Ap and An
3	II	PHI-HC-2016(Greek Philosophy)	Greek Philosophy As Greek philosophy deals with wide variety of subjects like political philosophy, ontology, aesthetic etc, it helps a student to know about the origin of philosophy and cultural.	Unit I: Thales, Anaximander, Anaximenes Pythagoras Heraclitus, Democritus and Parmenides	R, U and E
				Unit II: Protagoras Socrates' method Socrates' virtue	R, U and E
				Unit III: Plato Knowledge and Opinion Theory of Forms Justice	R, U and E
				Unit IV: Aristotle Form and Matter Causation Actuality and Potentiality	R, U and E

4	II	PHI-HC-2026 (Logic-II)	Logic helps students to clarify thought process and make correct reasoning. Also Modern or Symbolic Logic gives us the knowledge of the formal techniques of evaluating arguments and deductive system	Unit I: Symbolic Logic and its Characteristics, Uses of Symbols Relation between Traditional Logic and Symbolic Logic Modern Classification of Propositions	R, U, Ap and An
				Unit II: Logical Connectives and Variables Symbolization of Sentences Symbolization of Arguments	R, U, Ap and An
				Unit III: Truth Tables for Logical Connectives Direct Truth-Table for testing validity of arguments Indirect Truth-Table for testing validity of arguments	R, U, Ap and An
				Unit IV: Formal Proof of Validity Rules of Inference Rules of Replacement	R, U, Ap and An

5	III	PHI-HC-3026 (Western Philosophy (Descartes to Hegel))	Through the study of Western Philosophy (Descartes to Hegel) students are acquainted with the modern approach and systematic development of Western Philosophy which is primarily based on rational, critical and analytic thinking. The study of Western Philosophy helps the students to grow an understanding to analyse the philosophy by comparing it with Indian Philosophy.	Unit I: Rationalism Descartes: Cartesian Method, mind-body dualism Spinoza: God and Substance Leibnitz: Theory of monads, pre-established harmony	R, U, An and E
				Unit II: Empiricism Locke: critique of innate ideas, substance and qualities Berkeley: <i>esse est percipi</i> Hume: Impression and ideas, concept of self	R, U, An and E
				Unit III: Kant Possibility of synthetic a priori judgement Space and time Categories	R, U, An and E
				Unit IV: Hegel Dialectic Method Absolute Idealisms Master-slaves dialectic	R, U, An and E
6	III	PHI-HC-3026 (Indian Philosophy-II)	Indian philosophy has been concerned with various philosophical problems such as nature of the world, nature of reality, nature of knowledge, logic, ethics and	Unit I Sāṃkhya: Puruṣa; Prakṛti; Causation Yoga: Citta-vṛtti and its Nirodha; Aṣṭāṅgika Mārga	R, U and An

			the philosophy of religion. Indian philosophy creates awareness about the spiritual aspects of individual as well as ancient philosophical traditions of India.		
	III			Unit II Nyāya: Pramānas Vaiśeṣika: Padārthas; Atomistic theory of Creation	R,U and E
				Unit III Mimāṃsa: Pramānas Mimām sa: Pramānyavāda; Khyātivāda	R,U and E
				Unit IV Śāṅkara: Brahman; Atman; Adhyāsa and Avidyā Rāmanuja; Brahman; Jiva and Jagat; Aprthaksiddhi Sankardeva's concept of God and Bhakti	R,U and E
7		PHI-HC-3036(Ethics)	Through the study of ethics an individual can look upon his life critically evaluate his actions and make decisions freely. It gives us the knowledge of ethical theory with the help of which we can apply it to specific discipline or issues including business, science, medicine and technology etc.	Unit I Nature, Scope and Utility of study of ethics Object of Moral Judgement, Moral Obligation Postulates of Morality	R, U, Ap and E

				Unit II Virtue Ethics: Aristotle Deontological Ethics: Kant Utilitarianism: Bentham, Mill	R, U, Ap and E
				Unit III Theories of Punishment Professional Ethics Environmental Ethics	R, U, Ap and E
				Unit IV Law of Karma, Varṇa and Aśrama Dharma, Puruṣārtha Buddhist Pañcaśīla; Brahmavihāra Jaina Triratna, Aṇuvrata and Mahāvratā	R, U, Ap and E
8	IV	PHI-HC-4016 (Contemporary Indian Philosophy)	Through the study of Contemporary Indian Philosophy students are acquainted with the humanistic approach of life and philosophy. With the help of which they become aware about the reconciliation between the forces of tradition with the concept of modernity. ²¹	Unit I: Aurobindo Evolution Super mind Synthesis of yoga Unit II: Radhakrishnan	R,U and E

				Religious experience Intellect and intuition Man and his destiny	R,U and E
				Unit III: Gandhi Religion, Truth, Non- violence Satyagraha, Sarvodaya, Swadeshi Critique of industrialization, trusteeship Unit IV: Vivekananda	R,U and E
				Universal religion Practical Vedanta Philosophy of education	R,U and E
	IV				

9		PHI-HC-4026 (Philosophy of Religion)	Philosophy of Religion help students to analyze philosophically various religious points of view and at the same time the study of comparative religion brings tolerant attitude in ones' life.	Unit I Nature of Philosophy of religion and its distinction from theology Religious experience Religion and Science	R, U and An
				Unit II: Ontological argument Cosmological argument; Teleological argument Moral argument	R, U and An
				Unit III Reason, Faith and Revelation Freedom of Will Immortality of the soul	R, U and An

	IV			Unit IV Religious language and symbolism Anti religious theories- Materialism and logical positivism Religious Philosophy of Sankaradeva	R, U and An
10		PHI-HC-4036 (Political and Social Philosophy)	The study of Social Philosophy makes a student aware about their social behaviors, duties and responsibilities etc as well as the study of political philosophy allows student to examine the complex nature of political power. By studying Political Philosophy student can know what makes a government legitimate, what rights and freedoms it should protect, what form it should take etc.	Unit I Rights and Duties Justice Equality & Liberty	R and U
				Unit II Anarchism Socialism Marxism	R and U
				Unit III Monarchy Theocracy Democracy	R and U

	V			Unit IV Humanism Secularism Multiculturalism	R and U
11		PHI-HC-5016(Analytic Philosophy)	Analytic philosophy which is also called as a Linguistic Philosophy is based on the idea that the philosophical problems can be solved through the analysis of their terms in a pure and systematic logic.	Unit I: Moore: The Analytic Turn of Philosophy Moore: Refutation of Idealism Moore: Defence of Common Sense	R, U and An
				Unit II: Russell: Logical Atomism Russell: General Propositions and Existence Russell: Theory of Description Unit III:	R, U and An

				<p>Wittgenstein: The World as a Totality of Facts Wittgenstein: Picture Theory of Meaning Vienna Circle: Verification Theory and Rejection of Metaphysics Unit IV:</p>	R, U and An
				<p>Wittgenstein: Meaning and Use Wittgenstein: Language Game Wittgenstein: Critique of Private Language</p>	R, U and An
	V				

12		PHI-HC-5026(Phenomenology and Existentialism)	<p>Phenomenology is the study of structures of consciousness as experiences from the first person point of view as well as it is related to under key discipline in philosophy, such as ontology, epistemology, logic and ethics.</p> <p>The study of Existentialism helps student to know about the man_s existence, freedom, emotion, action etc. It helps student to develop a consistent scale of values, authenticate their existence by being committed these values. As a philosophical</p>	<p>Unit I: Kierkegaard The three stages of human existence Subjectivity and Truth</p>	R, U and E
			<p>trend it also helps students to construct a systematic thought.</p>	<p>Unit II: Sartre Existence and Essence Freedom and Choice</p>	R, U and E
				<p>Unit III: Heidegger Authentic existence Being-in-the-world and Temporality</p>	R, U and E
				<p>Unit IV: Husserl Theory of essence Intentionality and Bracketing</p>	R, U and E

	V				
13		PHI-HE-5016(Philosophy of Upanisads)	Philosophy of Upanisad is a philosophical study of various upanisads . Through such study student can gain a clear understanding of the philosophical perspective of Upanisads.	Unit I Relation to Vedas General Social Conditions Outlines of Upanisadic Philosophy.	R and U
				Unit II Diversity of Theories in Creation Acosmic Theory of Creation Cosmic Theory of Creation	R and U

	V			Unit III Brahman, the Absolute Brahman, the World- Ground Brahman as Cosmic and Acosmic Ideal	R and U
				Unit IV Individual Destiny: Individual Soul Karma and Saṃsāra Liberation	R and U
14		PHI-HE-5026 (Philosophy of Gita)	The study of the Philosophy of Gita makes a student aware about the rights, duties , responsibilities and ethical values of man. The study of Karmayoga explained in Gita is very much practical not only	Unit I: Law of Karma Concept of Karma, Akarma, Vikarma Freedom and Choice	R, U and Ap

			for students but for whole		
			human being.	Unit II: Kṣetra-Kṣetrajña, puruṣa- prakṛti Uttama Puruṣa and Ultimate Reality Relation of individual self and Ultimate Reality	R, U and Ap
				Unit III: Conception of Yoga Karma Yoga, Jñāna Yoga, Bhakti Yoga Reconciliation of the Yogas	R, U and Ap

	V			Unit Iv: Svabhāva, Svakarma, Svadharmā Niṣkamakarmayoga; Lokasam graha Liberation	R, U and Ap
15		PHI-HE-5036 (Isa Upanisad with Sankara Bhasya (Textual Study))	The textual study of the Isa Upanisha with Sankara Bhasya makes students aware to acquire the skills to lead a virtuous and successful life . The	Unit I: Mantras 1-4 Unit II: Man	R and U

			prescribed ways in this regard are significant and important for all human beings.	tras 5-9	
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				Unit III: Mantras 10-14 Unit IV:	R and U
				Mantras 15-18	R and U
16	VI	PHI-HC-6016 (Philosophy of Mind)	From the study of Philosophy of Mind students can know the philosophical study of the nature of mind, mental events, mental functions, mental properties and consciousness and of the nature of their relationship with the physical body.	Unit I Psychology and Philosophy of mind Cartesian dualism Problems of Cartesian dualism	R and U
				Unit II	

				Parallelism Occasionalism Epiphenomenalism Unit III Behaviourism Identity theory Functionalism	R and U
				Unit IV Problem of Personal identity Physical Criterion Memory Criterion	R and U

17	VI	PHI-HC-6026 (Meta Ethics)	Through the study of Meta Ethics student can know the connection between values, reason for actions, human motivation, etc. which address many of the issues commonly bound up with the nature of freedom and its significant.	Unit I: Normative Ethics Ethical Concepts and Evaluation- Good and Right Meta Ethics	R and U
				Unit II: G. E. Moore: Indefinability of 'Good' G. E. Moore: Naturalistic Fallacy G. E. Moore: Autonomy of Morals	R, U and An
				Unit III: A. J. Ayer: Ethical Terms as Pseudo Concepts C.L. Stevenson: Characteristics of Moral Discourse C.L. Stevenson: Persuasive Definition	R, U and An

	VI			Unit IV: R. M. Hare: Universal Prescriptivism R. M. Hare: Nature of Moral Arguments R. M. Hare: Weakness of the Will	R, U and An
18		PHI-HE-6016 (Western Philosophy (Textual Study))	The textual study of Plato's Republic , Hegel's Phenomenology of Spirit, Wittgenstein's Philosophical Investigation and Sartre's Existentialism and Humanism helps a student to acquaint with their philosophy thoroughly and it helps them to know about the development of western Philosophy since Greek period to contemporary period.	Unit I: Plato: <i>Republic</i> (books 2 and 4)	R and U
				Unit II: Hegel: The Preface to the <i>Phenomenology of Spirit</i> Unit III: Wittgenstein: <i>Philosophical Investigation</i> (part 1, section 65-91)	R and U
				Unit IV: Sartre: <i>Existentialism and Humanism</i>	R and U
19	PHI-HE-6026 (Philosophy of Language)	Philosophy of Language is an analytic Western Philosophy developed in contemporary . It helps a student to develop language analysis in regard of expression of philosophical concepts.	Unit I Language and World Frege's Sense and Reference Russell's Definite Description	R, U and E	

				Unit II Ideational Theory of Meaning Referential Theory of Meaning Use Theory of Meaning	
				Unit III Correspondence Theory of Truth Coherence Theory of Truth Pragmatic Theory of Truth	R, U and E
				Unit IV Performative and Constative Utterances Locutionary, Illocutionary and Perlocutionary Acts Theory of Illocutionary Forces	R, U and E

ix. BA Political Science

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Become familiar with the basic concepts of political theory, global politics, public administration, and comparative politics.
2. Understand the basis of key public institutions and their functioning.
3. Become aware about human rights, gender studies, global peace, and conflict.
4. Develop critical thinking about various political and administrative institutions and their functioning.
5. Carry out critical and reflective analysis and interpretation of social practices through relevant political ideologies.
6. Develop logical thinking about socio-political and economic issues on the basis of contemporary political discourses.
7. Understand the trajectory of development of political thoughts and their implications on the formation of social ideas.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	POL HC 1016 Understanding Political Theory	The course syllabus is divided into two sections. Section A deals with the idea of political theory, its history and approaches, and an assessment of its Critical and contemporary trends. On the other hand, Section B is designed to reconcile political theory and Practice through reflections on the ideas and practices related to democracy	I.Introducing Political Theory II. Political Theory and Practice, The Grammar of Democracy	Remember, Understanding Apply
2	I	POL HC 1026 Constitutional Government and	This course acquaints students with the constitutional design of state structures and institutions, and their actual working overtime. The Indian Constitution	I. The Constituent Assembly and the Constitution II Organs of Government	Remember, Understanding Analyze

		Democracy In India	accommodates conflicting impulses (of liberty and justice, territorial decentralization and a strong union, for instance) within itself. The course traces the embodiment of some of the conflicts in constitutional provisions, and shows how these have played out in political practice. It further encourages a study of state institutions in their mutual interaction, and in interaction with the larger extra-constitutional environment.	III Federalism and Decentralisation	Evaluate
3	II	POL HC 2016 Political Theory Concepts and Debates	This course is divided into two sections. Section A helps the student familiarize with the basic normative concepts of political theory. Each concept is related to a crucial political issue that requires analysis with the aid of our conceptual understanding. This exercise is designed to encourage critical and reflective analysis and interpretation of social practices through the relevant conceptual toolkit. Section B introduces the students to the important debates in the subject. These debates prompt us to consider that there is no settled way of understanding concepts and that in the light of new insights and challenges, besides newer ways of perceiving and interpreting the world around us, we inaugurate new modes of political debates.	I Importance of Freedom II significance of Equality III. Indispensability of Justice IV The Universality of Rights V. Major Debates.	Remember, Understanding Apply Analyze
4	II	POL HC 2026 Political Process in India	Actual politics in India diverges quite significantly from constitutional Legal rules. An understanding of the political process thus calls for a different mode of	I Political Parties and the Party system II Determinants of Voting	Remember, Understanding Analyze

			analysis - that offered by political sociology. This course maps the working of _modern_ institutions, premised on the existence of an individuated society, in a context marked by communitarian solidarities, and their mutual transformation thereby. It also familiarizes students with the working of the Indian state, paying attention to the contradictory dynamics of modern state power.	Behaviour III Regional Aspirations IV Religion and Politics V. Caste and Politics VI Affirmative Action Policies VII The Changing nature of the Indian States	Evaluate
5	III	POL HC 3016 Introduction to Comparative Government and Politics	This is a foundational course in comparative politics. The purpose is to familiarize students with the basic concepts and approaches to the study of comparative politics. More specifically the course will focus on examining politics in a historical framework while engaging with various themes of comparative analysis in developed and developing countries.	I Understanding Comparative Politics II Historical Context Of Modern Government III Themes for Comparative Analysis	Remember, Understanding Apply Analyze
6	III	POL HC 3026 Perspectives on Public Administration	The course provides an introduction to the discipline of public administration. This paper encompasses public administration in its historical context with an emphasis on the various classical and contemporary administrative theories. The course also explores some of the recent trends, including feminism and ecological conservation and how the call for greater democratization is restructuring public administration. The course will also attempt to provide the students a comprehensive understanding on contemporary administrative	I Public Administration as a Discipline II Theoretical Perspectives Classical Theories III Public Policy IV Major Approaches in Public Administration	Remember, Understanding analyze

			developments		
7	III	POL HC 3036 Perspectives on International Relations and World History	This paper seeks to equip students with the basic intellectual tools for understanding International Relations. It introduces students to some of the most important theoretical approaches for studying international relations. The course begins by historically contextualizing the evolution of the international state system before discussing the agency structure problem through the levels-of-analysis approach. After having set the parameters of the debate, students are introduced to different theories in International Relations. It provides a fairly comprehensive overview of the major political developments and events starting from the twentieth century. Students are expected to learn about the key milestones in world history and equip them with the tools to understand and analyze the same from different perspectives.	I Studying International Relations II Theoretical Perspectives III An Overview of 20 th century IR History, World War II onwards	Remember, Understanding Analyze
8	IV	POL HC 4016 Political Processes and Institutions in Comparative Perspective	In this course students will be trained in the application of comparative methods to the study of politics. The course is comparative in both what we study and how we study. In the process the course aims to introduce undergraduate students to some of the range of issues, literature, and methods that cover comparative politics.	I Approaches to Studying Comparative Politics II Electoral System III Party system IV Nation- State V Democratization VI Federalism.	Remember, Understanding Apply Evaluate

9	IV	POL HC 4026 Public Policy and Administration in India	The paper seeks to provide an introduction to the interface between public policy and administration in India. The essence of public policy lies in its effectiveness in translating the governing philosophy into programs and policies and making it a part of the community living. It deals with issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.	I Public Policy II Decentralization III Budget	Remember, Understanding Apply Analyze Evaluate
10	IV	POL HC 4036 Global Politics	This course introduces students to the key debates on the meaning and nature of globalization by addressing its political, economic, social, cultural and technological dimensions. In keeping with the most important debates within the globalization discourse, it imparts an understanding of the working of the world economy, its anchors and resistances offered by global social movements while analyzing the changing nature of relationship between the state and transnational actors and networks. The course also offers insights into key contemporary global issues such as the proliferation of nuclear weapons, ecological issues, international terrorism, and human security before concluding with a debate on the phenomenon of global governance	I Globalization II Comparative Global Issues III Global Shifts	Remember, Understanding Analyze Evaluate
11	V	POL HC 5016 Classical Political Philosophy	This course goes back to Greek antiquity and familiarizes students with the manner in which the political questions were first posed. Machiavelli comes as an interlude	I Text and Interpretation II Antiquity II Interlude	Remember, Understanding Analyze

			inaugurating modern politics followed by Hobbes and Locke. This is a basic foundation course for students.	IV Possessive Individualism	Evaluate
12	V	POL HC 5026 Indian Political Thought-I	This course introduces the specific elements of Indian Political Thought spanning over two millennia. The basic focus of study is on individual thinkers whose ideas are however framed by specific themes. The course as a whole is meant to provide a sense of the broad streams of Indian thought while encouraging a specific knowledge of individual thinkers and texts. Selected extracts from some original texts are also given to discuss in class. The list of additional readings is meant for teachers as well as the more interested students.	I Traditions of Pre Colonial Indian Political Thought II Ved Vyas III Manu IV Kautilya V Aggannasutta VI Barani VII Abul Fazal VIII Kabir	Remember, Understanding Analyze Evaluate
13	V	POL HE 5016 Human Rights	: This course provides a theoretical and practical understanding of the concepts and methods that can be employed in the analysis of public policy. It uses the methods of political economy to understand policy as well as understand politics as it is shaped by economic changes. The course will be useful for students who seek an integrative link to their understanding of political science, economic theory and the practical world of development and social change.	I Introduction to Human Rights II Approaches and Perspectives III Human Rights and UNO IV Human Rights and the Role of NGOs	Remember, Understanding Analyze Evaluate
14	V	POL HE 5046 Select Constitution I	The course introduces the constitutional and political systems of two (2) countries. Students will have a stronger and more informed perspective on approaches to studying the constitutional and political	I Constitution and Constitutionalism II United Kingdom III United States of America	Remember, Understanding Analyze Evaluate

			systems of these countries in a comparative manner.	IV Comparative Study of UK and USA	
15	VI	POL HC 6016 Modern Political Philosophy	Philosophy and politics are closely intertwined. We explore this convergence by identifying four main tendencies here. Students will be exposed to the manner in which the questions of politics have been posed in terms that have implications for larger questions of thought and existence	I Modernity and Its Discourses II Romantics III Liberal Socialist IV Radicals	Remember, Understanding Analyze Evaluate
16	VI	POL HC 6026 Indian Political Thought-II	Based on the study of individual thinkers, the course introduces a wide span of thinkers and themes that defines the modernity of Indian political thought. The objective is to study general themes that have been produced by thinkers from varied social and temporal contexts. Selected extracts from original texts are also given to discuss in the class. The list of additional readings is meant for teachers as well as the more interested students.	I Introduction to Modern Indian Political Thought II Rammohan Roy III Pandita Ramabai IV Vivekananda V Gandhi VI Ambedkar VII Tagore VIII Iqbal IX Savarkar X Nehru XI Lohia	Remember, Understanding Analyze Evaluate
17	VI	POL HE 6016 Human Rights in India	The course introduces the historical legacies and geopolitics of South Asia as a region. It imparts an understanding of political regime types as well as the socioeconomic issues of the region in a comparative framework. The course also apprises students of the common challenges and the strategies deployed to deal with them by countries in South Asia.	I Origin and Development of HR in India II Institutional Mechanism for Protection of HR III Emerging Issues of HR IV HR of Vulnerable Groups	Remember, Understanding Apply Analyze Evaluate

18	VI	POL HE 6046 Select Constitutions II	The course introduces the constitutional and political systems of two (2) countries. Students will have a stronger and more informed perspective on approaches to studying the constitutional and political systems of these countries in a comparative manner.	I Peoples Republic of China- I II Peoples Republic of China- II III Switzerland- I IV Switzerland- II	Remember, Understanding Analyze
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x. BA Sanskrit

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Acquire a concrete perception of ancient Indian history, philosophy, and literature.
2. Enhance the communication skills of listening, speaking, reading, and writing.
3. Get in-depth knowledge of the core areas of the subject.
4. Achieve reasonable understanding of the multi-disciplinary relevance of Sanskrit literature such as *veda*, philosophy, grammar, *kavya*, *dharmasastras*, etc.
5. Compete in competitive exams like civil services and apply for jobs in different service sectors.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	Semester I	PAPER: SKT- HC-1016 CLASSICAL SANSKRIT LITERATURE (POETRY)	This course aims to get students acquainted with Classical Sanskrit Poetry. It intends to give an understanding of literature, through which students will be able to appreciate the development of Sanskrit Literature. The course also seeks to help students to negotiate texts independently.	UNIT :I --- RAGHUVAMSAM: CANTO I(Verses 1-25) Introduction(Author and Text), Appropriateness of title, Verses 1-10 = Grammatical Analysis, Meaning/Translation, Explanation, Content Analysis, Characteristics of Raghu clan. Verses 11-25: Grammatical analysis, Meaning/ Translation, Explanation, Role of Dilipa, Welfare of Subjects. UNIT :II ---KUMARASAMBHAVAM, CANTO-V (Verses; 1-30)	U, R and An.

				<p>Introduction (Author and Text), Appropriateness of title, Background of given contents.</p> <p>Text reading.</p> <p>Verses 1-15---Grammatical Analysis, Translation and Explanation, Poetic excellence and plot.</p> <p>Verses 16-30---- Grammatical Analysis, Translation and Explanation, Penance of Parvati, Poetic excellence and plot.</p> <p>UNIT –III--- KIRATARJUNIYAM, CANTO I (Verses 1-25)</p> <p>KIRATARJUNIYAM : Introduction(Author and Text,Appropriateness of title, Background of given contents.</p> <p>Verses 1-25...Grammatical Analysis, Translation and Explanation, Poetic excellence, Thematic analysis.</p> <p>UNIT – IV---NITISATAKAM(Verses 1-20)</p> <p>Verses 1-10 ---Grammatical Analysis, Translation and Explanation,</p> <p>Verses 11-20---Grammatical Analysis, Translation and Explanation, Thematic analysis, Bhartihari’s comments on society.</p> <p>UNIT –V—ORIGIN AND DEVELOPMENT OF MAHAKAVYA AND GITIKAVYA</p> <p>Origin and development of different types of Mahakavya with special</p>	
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				reference to Asvaghosa, Kalidasa, Bharavi, Magha ,bhatti, Sriharsa.	
2	Semester I	PAPER: SKT-HC-1026 CRITICAL SURVEY OF SANSKRIT LITERATURE	This course aims to get students acquainted with the journey of Sanskrit Literature from Vedic literature to Purāṇa. It also intends to give an outline of different shastric traditions, through which students will be able to know the different genres of Sanskrit Literature and Śāstras.	<p>UNIT- I :VEDIC LITERATURE : <i>SAMHITA (Rik, Yajuh, Sama, Atharva) : Time, Subject matter, religion & philosophy, social life.</i> <i>Brahmana, Aranyaka, Upanisad, Vedanga – Brief Introduction.</i></p> <p>UNIT- II:RAMAYANA: Subject-matter, Ramayana as an Adikavya, Ramayana as a source text and its cultural importance.</p> <p>UNIT- III :MAHABHARATA : Mahabharata and its time, Development, Encyclopedic nature, as a Source, Text, Cultural importance.</p> <p>UNIT-IV: PURANAS : Subject – matter, characteristics, Purana’s social, cultural and historical importance with special reference to the Kalikapurana.</p> <p>UNIT-V: GENERAL INTRODUCTION TO VYAKARANA, DARSANA AND SAHITYASASTRA General introduction to Vyakarana, Brief history of</p>	U , R & An.

				<p>Vyakaranasastra. General introduction to Darsana : Major schools of Indian Philosophy- Carvaka, Buddha, Jaina, Sankhya-yoga, Nyaya-vaiesika, Purvamimansa and Uttaramimansa. General introduction to Poetics : Six major schools of Indian Poetics – Rasa, Alamkara, Riti, Dhvani, Vakrokti and Aucitya.</p>	
3	Semester II	SKT-HC-2016 CLASSICAL SANSKRIT LITERATURE (PROSE)	This course aims to acquaint students with Classical Sanskrit Prose literature. Origin and development of prose, important prose romances and fables Sanskrit are also included here for students to get acquainted with the beginnings of Sanskrit Prose literature. The course also seeks to help students negotiate texts independently.	<p>Unit I Sukanasopadesa (Ed. Prahlad Kumar): Introduction – Author/Text, Text up to page 116 of Prahlad Kumar up to the end of the Text. Society, Ayurveda and Political thoughts depicted in Sukanasopadesa, logical meaning and application of sayings: Banocchistam, Pancananbanah</p> <p>Unit II VisrutacaritamUpto 15th Para: Para 1 to 10 - Introduction – Author/Text, Text reading (Grammar, Translation and Explanation), Poetic excellence, plot, Timing of Action, Society, language and style of Dandin.</p>	U , R & An.

				<p>Exposition of Sayings “Dandinahpadalalityam”, “KavirdandiKavirdandinaSamsayah”.</p> <p>Unit III</p> <p>Origin and Development of Prose, Important Prose Romances and Fables:</p> <p>Origin and development of prose, important prose romances and fables</p> <p>Subandhu, Dandin, Bana, AmbikadattaVyasa.</p> <p>Pancatantra, Hitopadesa, Vetalapancavimsatika, Simhasanadvatrimika, Purusapariksa, Sukasaptati.</p>	
4	Semester II	SKT-HC-2026 SELF MANAGEMENT IN THE GITA	The objective of this course is to study the philosophy of self-management in the Gītā. The course seeks to help students negotiate the text independently without referring to the traditional commentaries so as to enable them to experience the richness of the text.	<p>Unit I</p> <p>Gita: Cognitive and emotive apparatus:</p> <p>Hierarchy of <i>indriya</i>, <i>manas</i>, <i>buddhi</i>, and <i>atman</i> III.42; XV.7</p> <p>Role of atman – XV.7; XV.9</p> <p>Mind as a product of prakriti VII.4</p> <p>Properties of three gunas and their impact on the mind- XIII.5-6; XIV.5-8, 11-13; XIV.17</p> <p>Unit II</p> <p>Gita: Controlling the Mind:</p> <p>Confusion and Conflict</p> <p>Nature of conflict I.1; IV.16; I.45; II.6</p>	U, R, An. & Ap.

				<p>Causal factors- Ignorance- II.41; <i>Indriya</i>-II.60, Mind- II.67; <i>Rajoguna</i> – III.36-39; XVI.21; Weakness of mind- II.3; IV.5 Means of controlling mind Meditation- difficulties-VI.34-35; procedure VI.11-14 Balanced life- III.8; VI.16-17 Diet control- XVII.8-10 Physical and mental discipline – XVII.14-19, VI.36. Means of conflict resolution Importance of knowledge –II.52; IV.38-39; IV.42 Clarity of <i>buddhi</i>- XVIII.30-32 Process of decision making – XVIII.63 Control over senses – II.59, 64 Surrender of <i>kartribhava</i> – XVIII. 13-16 Desirelessness– II.48; II.55 Unit III Gita: Self- management through devotion: Surrender of ego Abandoning frivolous debates Acquisition of moral qualities</p>	
5	Semester III	PAPER- SKT-HC-3016 CLASSICAL SANSKRIT LITERATURE (DRAMA)	This course aims to acquaint students with three most famous dramas of Sanskrit literature	UNIT-I: SVAPNABASAVADATTAM of Bhasa, Act I & Act VI	U, R & An.

			which represent three stages in the growth of Sanskrit drama.	<p>UNIT _II :ABHIJNANASAKUNTALAM of Kalidasa, Act I & Act IV.</p> <p>UNIT-III: MUDRARAKSASAM of Visakhadatta : Act I,II & III</p> <p>UNIT-IV : CRITICAL SURVEY OF SANSKRIT DRAMA</p> <p>Sanskrit Drama : Origin and Development, Nature of Nataka, Some important Dramatists and Dramas :- Bhasa, Kalidasa, Sudraka, Visakhadatta, Sriharsa, Bhavabhuti , Bhattanarayana and their works.</p>	
6	Semester III	PAPER- SKT-HC-3026 POETICS AND LITERARY CRITICISM	The study of <i>Sāhityasāstra</i> (Sanskrit Poetics) embraces all poetic arts and includes concepts like <i>alamkāra</i> , <i>rasa</i> , <i>rīti</i> , <i>vakrokti</i> , <i>dhvani</i> , <i>aucitya</i> etc. The entire domain of Sanskrit poetics has flourished with the topics such as definition of poetry and divisions, functions of word and meaning, theory of <i>rasa</i> and <i>alamkāra</i> (figures of speech) and <i>chandas</i> (metre), etc. This develops capacity for creative writing and literary appreciation.	<p>UNIT- I: Intoduction to Sanskrit Poetics</p> <p>UNIT- II: Forms of Kavya Literature,</p> <p>UNIT- III: Sabda-Sakti and Rasa-sutra & Kavyadosa</p> <p>UNIT_ IV : Figures of Speech and Metre</p>	U, R & An.
7	Semester III	PAPER- SKT-HC-3036 INDIAN SOCIAL	Social institutions and Indian Polity have been highlighted in the	<p>UNIT –I: Indian Social Institutions : Nature and</p>	U, R & An.

		<p>INSTITUTIONS AND POLITY</p>	<p><i>Dharmaśāstra</i> literature. The aim of this course is to make the students acquainted with various aspects of social institutions and Indian polity as propounded in the ancient Sanskrit texts such as <i>Samhitās</i>, <i>Mahābhārata</i>, <i>Purāṇa</i>, <i>Kautilya's Arthaśāstra</i> and other works known as <i>Nītiśāstra</i>.</p>	<p>Concepts Indian Social Institutions : Definition and Scope: Sociological definition of Social Institutions. Trends of Social Changes, Sources of Indian Social Institutions. Social Institutions and Dharmasastra Literature Dharmasastra as a special branch of studies of social institutions, sources of Dharma, Different kinds of Dharma in the sense of Social Ethics, Six kinds of Dharma in the sense of Duties.</p> <p>UNIT II : Structure of Society and Values of Life Varna system and Caste System Origin of Caste-system from Inter Caste Marriages Position of Women in the Society. Social Values of Life.</p> <p>UNIT- III: INDIAN POLITY: ORIGIN AND DEVELOPMENT Initial stage of Indian Polity from Vedic period to Buddhist period. Relevance of Gandhian Thought in Modern period</p>	
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				<p>with special reference to Satyagraha philosophy.</p> <p>UNIT-IV: CARDINAL THEORIES AND THINKERS OF INDIAN POLITY <i>Saptanga Theory, Mandala Theory, Saragunya Policy of War and Peace, CaturvidhaUpaya</i> for balancing the power of State, Three types of State Power, Important Thinkers on Indian Polity.</p>	
8	Semester III	PAPER: SKT-SE-3014 ACTING AND SCRIPT WRITING	<p>The acting is connected with the practical aspect of the play and depends on actor while script writing is closely related with society and this paper aims at the teaching the theoretical aspect of this art. The training of composition and presentation of drama can further enhance one's natural talent. This paper deals with the rules of presentation of play (acting) and dramatic composition</p> <p>(script writing) and aims at sharpening the dramatic talent of the students.</p>	<p>UNIT-I :Abhinaya (Acting)- Persons competent for presentation, Assignment of Role, Kinds of Roles.</p> <p>UNIT-II: Script Writing – Types of dramatic production, Dialogue Writing: Kinds of Dialogue.</p>	U, R & Ap.
9	Semester	SKT-HC-4016	This course aims to acquaint the	Unit I	U, R & An.

	IV	INDIAN EPIGRAPHY, PALEOGRAPHY AND CHRONOLOGY	students with the epigraphical journey in Sanskrit, the only source which directly reflects the society, politics, geography and economy of the time. The course also seeks to help students to know the different styles of Sanskrit writings.	<p>Epigraphy: Introduction to Epigraphy and Types of Inscriptions Importance of Indian Inscriptions in the reconstruction of Ancient History and Culture History of Epigraphical Studies in India History of Decipherment of Ancient Indian Scripts (Contribution of Scholars in the field of epigraphy) : Fleet, Cunningham, Prinsep, Bulher, Ojha, D. C. Sircar.</p> <p>Unit II Paleography: Antiquity of the Art of Writing Writing Materials, Inscribers and Library Introduction to Ancient Indian Scripts.</p> <p>Unit III Study of selected inscriptions: Asoka's Girnara Rock Edict- 1 Asoka's Sarnatha Pillar Edict Girnara Inscription of Rudradaman Dubi Copper Plates of Bhaskaravarman Parbatiya Copper Plates of Vanamalavarmadeva</p> <p>Unit IV Chronology:</p>	
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				<p>General Introduction to Ancient Indian Chronology</p> <p>System of Dating the Inscriptions(Chronograms)</p> <p>Main Eras used in Inscriptions – Vikrama Era, Saka Era and Gupta Era</p>	
10	Semester IV	SKT-HC-4026 MODERN SANSKRIT LITERATURE	The purpose of this course is to expose students to the rich & profound tradition of modern creative writing in Sanskrit, enriched by new genres of writing.	<p>Unit I</p> <p>Mahakavya and Charitakavya: Svatantryasambhavam, Canto 2, verses 1-45 Sankaradevacarita of (MaheswarHazarika) Chapter- 5, Manikancanamilanam</p> <p>Unit II</p> <p>Gadya and Rupaka: Satapavika (AbhirajaRajendra Mishra) Sardulasakatam (Virendra Kumar Bhattacharya)</p> <p>Unit III</p> <p>Gitikavya and Other genres: Ketakikavya Taranga, I Srutipasastimanjari by MukundaMadhavaSarma: AnundoramBarooah, KrisnakantaHandique, Sankaradev Harshdev Madhava Haiku</p> <p>Unit IV</p> <p>General Survey:</p>	U, R & An.

				<p>PanditaKshamaRao, P.K. NarayanaPillai, S.B. Varnekar, ParmanandShastri, Reva Prasad Dwivedi</p> <p>Bhavadeva Bhagavati, MonoranjanShastri, BiswanarayanShastri, M. M. Sharma HaridasSiddhantavagish, Mula Shankar M. Yajnika, MahalingaShastri, LeelaRaoDayal, YatindraVimalChowdhury, Virendra Kumar Bhattacharya</p>	
11	Semester IV	SKT-HC-4036 SANSKRIT AND WORLD LITERATURE	This course is aimed to provide information to students about the spread & influence of Sanskrit literature and culture through the ages in various parts of the world in medieval & modern times.	<p>Unit I: Survey of Sanskrit Literature in the World</p> <p>Unit II : Upanisads and Gita in the World Literature</p> <p>Unit III: Sanskrit Fables in the World Literature</p> <p>Unit IV :Ramayana and Mahabharata in South East Asian Countries</p> <p>Unit V :Kalidasa's Literature in World Literature</p> <p>Unit VI :Sanskrit Studies across the World</p>	U, R & An.
12	Semester IV	SKT-SE-4014, SANSKRIT METRE AND MUSIC	The objective of this course to learn Sanskrit metre for analysis and lyrical techniques. Students will get the complete information regarding selected Vedic and Classical metres with lyrical	<p>Unit I :Brief Introduction to Chandasastra</p> <p>Unit II : Classification and Elements of Sanskrit Metre :Syllabic verse, Syllabo-quantitative verse, Quantitative verse,</p>	U, R & Ap.

			techniques.	Syllables (laghu, guru,), Guna, Feet Unit III : Analysis of Selected Vedic Metre as per Chandamanjari and their Lyrical Methods: Definition, Example, Analysis and Lyrical Methods of selected Metres Unit IV :Analysis of Selected Classical Metreas per Chandamanjari and their Lyrical Methods:Definition, Example, Analysis and Lyrical Methods of selected Metres	
13	Semester V	SKT-HC-5016 VEDIC LITERATURE	This course on Vedic Literature aims to introduce various types of vedictexts . Students will also be able to read one <i>Upanisad</i> namely <i>Mundaka</i> where primary Vedanta-view is propounded.	UNIT-I SAMHITA AND BRAHMANA : Rigveda, Yajurveda, Atharvaveda , Satapathabrahmana UNIT –II VEDIC GRAMMAR : Declensions, Subjunctive Mood, Gerunds, Vedic Accent and Padapatha UNIT-III MUNDAKOPANISAD : 1.1 -3.2	U & R
14	Semester V	PAPER: SKT-HC-5026 SANSKRIT GRAMMAR	To acquaint the students with general Sanskrit Grammar.	UNIT-I: General Introduction to Vyakarana, Sivasutra, Paribhasa, Sandhi UNIT –II: Natvavidhi & Satvavidhi UNIT-III : Declention , Conjugation and Roots UNIT- IV : Karaka Prakaranam,	U, R & Ap.

				SamasaPrakaranam	
15	Semester V	PAPER -SKT-HE-5016 ART OF BALANCED LIVING	This course aims to get the students with theories of art of living inherent in Sanskrit literature and apply them to live a better life.It also intends to make students work on human resource management for giving better results.	UNIT –I : Self Presentation , Method of Self Presentation-Hearing, Reflection and Meditation.(Brihadaranyakaopanisad with Sankarabhasya) UNIT- II : Concentration – concept of yoga, Restrictions of Fluctuations by practice, Eight aids to Yoga, Yoga and Action, Four distinct means of mental purity. UNIT-III : Refinement of Behaviour.	U, R & Ap.
16	Semester V	PAPER-SKT-HE-5026 THEARE AND DRAMATURGY	Being audio-visual drama is considered to be the best amongst all forms of arts. The history of theatre in India is very old, the glimpses of which can be traced in the hymns of the Rigveda. The dramaturgy was later developed by the Bharatamuni. The objectives of this curriculum are to identify the beauty of drama and to introduce classical aspects of development of Indian theatre among the students.	UNIT –I :Theatre : Types and Construction. UNIT-II : Drama : Vastu, Neta and Rasa UNIT-III : Tradition and History of Indian Theatre .	U , R & Ap.
17	Semester V	PAPER- SKT-HE-5036	This course aims to get the	UNIT-I :Bhasasastra – Its	U, R & An.

		SANSKRIT LINGUISTIC	students acquainted with comparative philology and its relation with Sanskrit language. It will also make the students acquire knowledge about the historical development of Sanskrit from Indo-European family of language.	Nature, Importance, Origin and Development, Nature and Scope of Comparative Philology, Aim and Objective of Comparative Philology, Branches of Comparative Philology. UNIT- II: Indo- European Language Family, UNIT-III: History and Pre-history of Sanskrit UNIT-IV: Phonetic Changes.	
18	Semester V	PAPER- SKT-HE-5046 PROJECT DISSERTATION	This course aims to understand the students acquainted with the Research Methodology.	WORD LIMIT: 8000 – 10000 WORDS LANGUAGE : SANSKRIT OR ENGLISH	Ap.

2. Programme Outcomes: BSc

After completing the BSc Program, a student is expected to achieve the below-mentioned programme outcomes:

- A student should be able to think critically: A student should be able to take informed actions after identifying the assumptions that frame their thinking and deeds, checking the degree to which these assumptions are accurate and valid, and assessing their ideas and decisions (intellectual, organizational, and personal) from different perspectives.
- A student should learn effective communication: A student should acquire the ability to listen, speak, read, and write clearly in person and through electronic media in English and in at least one official language of Assam, and make meaning of the world by connecting people, ideas, books, media, and technology.
- A student should learn social interaction: A student should elicit views of others, mediate disagreements, and help reach conclusions in group settings.
- A student should acquire the knowledge of effective citizenship: A student should demonstrate empathetic social concern, knowledge of equity-centred national development, and the abilities to act with an informed awareness of issues and participate in civic life through volunteering.
- A student should learn ethics: A student should recognize different value systems including their own, understand the moral dimensions of their decisions, and accept responsibility for them.
- A student should acquire the knowledge of environment and sustainability: A student should understand the issues of environmentalism and sustainable development.
- A student should acquire the knowledge of self-directed and life-long learning: A student should acquire the ability to engage in independent and life-long learning in the broad contexts of socio-technological changes.
- A student should understand the basic concepts, fundamental principles, and theories in the taught subjects.
- A student should acquire skills required for handling scientific instruments as well as for planning and performing laboratory experiments.
- A student should acquire the skills of observation and drawing logical inferences from scientific experiments.
- A student should be able to analyse scientific data critically and systematically, trace objectives and draw conclusions.

- A student should be able to think creatively to propose novel ideas.
- A student should realize how an interdisciplinary approach provides better solutions and new ideas for sustainable development.
- A student should be able to develop a scientific outlook not only with respect to science subjects but also all aspects of life.
- A student should be imbued with ethical, moral, and social values in personal and social lives leading to a highly cultured and civilized personality.

i. BSc Botany

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Critically evaluate ideas and arguments by collecting relevant information about plants to recognize the position of the plants in the broad classification and the phylogenetic levels.
2. Acquire in-depth knowledge/expertise in the field of plant identification.
3. Interpret collected information and use taxonomical information to evaluate and formulate the position of plants in taxonomy.
4. Collect data and formulate and analyse the collected data by applying scientific methods.
5. Present scientific hypotheses and data both in oral and written formats.
6. Access primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.
7. Use physical principles (physics, chemistry) for bio-chemical analysis and analyse data by using statistical and mathematical formulas.
8. Identify the major groups of plants and classify them within a phylogenetic framework.
9. Compare and contrast the characteristics of plants, algae, and fungi that differentiate them from each other and from other forms of life.
10. Use the evidence of comparative biology to explain the theory of evolution in relation to the unity and diversity of life on earth.
11. Give specific examples to explain how modification has shaped plant morphology, physiology, and life history.
12. Explain functions at the levels of gene, genome, cell, tissue, and flower development of plants.
13. Give specific examples of physiological adaptations, reproductions, development, and modes of life cycle of different forms of plants.
14. Explain the ecological interconnections among different life forms on earth by tracing nutrient and energy flow through the environment and structures of populations, communities and ecosystems.

15. Explain the experimental techniques and methods of analysis for their areas of specializations within biology.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	BOT-HC-1016 Phycology and Microbiology	<ul style="list-style-type: none"> Understand the diversity among Algae. Know the systematic, morphology and structure, of Algae. Understand the life cycle pattern of Algae. Understand the useful and harmful activities of Algae. Understand the Microbial world and their diversity Know the Economic Importance of Microbes Know the harmful effects of microbes Know the role of microbes in Research activities 	<ul style="list-style-type: none"> Introduction to microbial world 	Knowledge, understanding, application
				<ul style="list-style-type: none"> Viruses 	Knowledge, Understanding
				<ul style="list-style-type: none"> Bacteria 	Knowledge, understanding, apply, create
				<ul style="list-style-type: none"> Algae 	Knowledge, understanding, apply, create
				<ul style="list-style-type: none"> Cyanophyta and Xanthophyta 	Knowledge, understanding, apply, analyze, create
				<ul style="list-style-type: none"> Chlorophyta, Charophyta and Bacillariophyta 	Knowledge, understanding, apply, create
				<ul style="list-style-type: none"> Pheophyta and Rhodophyta 	Knowledge, understanding, apply, create
2	I	BOT-HC-1026 Biomolecules and Cell biology	<ul style="list-style-type: none"> Know the chemical nature of biomolecules. Understand the different types of interaction in Biomolecules. Structure and general features of enzymes. Concept of enzyme activity and enzyme inhibition. 	<ul style="list-style-type: none"> Biomolecules 	Knowledge, understanding, application
				<ul style="list-style-type: none"> Bioenergetics 	Knowledge, understanding
				<ul style="list-style-type: none"> Enzymes 	Knowledge, understanding, application
				<ul style="list-style-type: none"> The cell 	Knowledge, understanding, application, creation
				<ul style="list-style-type: none"> Cell wall and plasmamembrane 	Knowledge, understanding, application.

			<ul style="list-style-type: none"> Understand the Biochemical nature of cell and cell organallies Know about the cell divisions: mitosis & meiosis know the endomembrane system and protein transport 	<ul style="list-style-type: none"> Cell organelles 	Knowledge, understanding, application, creation
				<ul style="list-style-type: none"> Cell division 	Knowledge, understanding
3	II	BOT-HC-2016 Mycology and Phytopathology	<ul style="list-style-type: none"> Understand the Biodiversity of Fungi and understand the life cycle pattern of Fungi Know the Economic Importance of Fungi Know the terminologies in plant pathology. Understand the scope and importance of Plant Pathology. Know the prevention and control measures of plant diseases and its effect on economy of crops. 	<ul style="list-style-type: none"> Introduction to Fungi 	Knowledge, understanding, application, analysis, creation
				<ul style="list-style-type: none"> Mastigomycotina (Chytridiomycetes to Oomycetes) 	knowledge, understanding
				<ul style="list-style-type: none"> Zygomycotina 	knowledge, understanding
				<ul style="list-style-type: none"> Ascomycotina 	knowledge, understanding
				<ul style="list-style-type: none"> Basidiomycotina 	knowledge, understanding
				<ul style="list-style-type: none"> Deuteromycotina (Fungi imperfecti) 	knowledge, understanding
				<ul style="list-style-type: none"> Allied fungi- Myxomycota 	knowledge, understanding
				<ul style="list-style-type: none"> Symbiotic association 	knowledge, understanding, application, creation
				<ul style="list-style-type: none"> Applied Mycology 	Knowledge, understanding, application, creation
				<ul style="list-style-type: none"> Phytopathology 	Knowledge, understanding, application, analysis
4	II	BOT-HC-2026 Archegoniate	<ul style="list-style-type: none"> Understand the morphological diversity of Bryophytes. Understand the economical and ecological importance of the Bryophytes. Know the taxonomic position, occurrence, thallus structure, 	<ul style="list-style-type: none"> Introduction 	Knowledge, understanding, application, analysis
				<ul style="list-style-type: none"> Bryophytes 	Knowledge, understanding, application, analysis
				<ul style="list-style-type: none"> Type studies- Bryophytes 	Knowledge, understanding, application, analysis, creation
				<ul style="list-style-type: none"> Pteridophytes 	Knowledge, understanding,

			<ul style="list-style-type: none"> reproduction of Bryophytes. Understand the morphological diversity of Pteridophytes. Understand the economic and ecological importance of the Pteridophytes Know the taxonomic position, occurrence, thallus structure, reproduction of Pteridophytes. Know the evolution of Bryophytes and Pteridophytes. 		<ul style="list-style-type: none"> application, analysis, creation
				<ul style="list-style-type: none"> Type studies- Pteridophytes 	<ul style="list-style-type: none"> Knowledge, understanding, application, analysis, creation
				<ul style="list-style-type: none"> Gymnosperms 	<ul style="list-style-type: none"> Knowledge, understanding, application, analysis, creation
5	III	BOT-HC-3016 Morphology and Anatomy of Angiosperms	<ul style="list-style-type: none"> Understand plant communities and ecological adaptations in plants. Understand the tissues and tissue systems of Plants Know the wood anatomy Know the anatomical difference of dicot and monocot Know the origin, development, arrangement and diversity in size and shape of leaves. 	<ul style="list-style-type: none"> Morphology 	<ul style="list-style-type: none"> Knowledge, understanding, application
				<ul style="list-style-type: none"> Introduction and scope of plant anatomy 	<ul style="list-style-type: none"> Knowledge, understanding
				<ul style="list-style-type: none"> Structure and development of plant body 	<ul style="list-style-type: none"> Knowledge, understanding
				<ul style="list-style-type: none"> Tissues 	<ul style="list-style-type: none"> Knowledge, understanding, application, analysis
				<ul style="list-style-type: none"> Apical meristems 	<ul style="list-style-type: none"> Knowledge, application
				<ul style="list-style-type: none"> Vascular cambium and wood 	<ul style="list-style-type: none"> Knowledge, application
				<ul style="list-style-type: none"> Adaptive and protective systems 	<ul style="list-style-type: none"> Knowledge, application
6	III	BOT-HC-3026 Economic Botany	<ul style="list-style-type: none"> Know the major introduced plant species, concept of centre of origin and their importance Know about crop 	<ul style="list-style-type: none"> Origin of cultivated plants 	<ul style="list-style-type: none"> Knowledge, application
				<ul style="list-style-type: none"> Cereals 	<ul style="list-style-type: none"> Knowledge, application
				<ul style="list-style-type: none"> Legumes 	<ul style="list-style-type: none"> Knowledge, application
				<ul style="list-style-type: none"> 4. Sources of sugars and 	<ul style="list-style-type: none"> Knowledge, application

			<p>domestication and loss of genetic diversity</p> <ul style="list-style-type: none"> • Understand the evolution of new crops /varieties • Know about the germplasm diversity • Understand the economic importance of various plant species. 	<p>starches</p>	
				<ul style="list-style-type: none"> • 5.Spices 	Knowledge, application
				<ul style="list-style-type: none"> • Beverages 	Knowledge, application
				<ul style="list-style-type: none"> • Sources of oils and fats 	Knowledge, application
				<p>Natural rubber</p>	Knowledge, application
				<ul style="list-style-type: none"> • Drug-yielding plants 	Knowledge, application
				<ul style="list-style-type: none"> • Timber plants 	Knowledge, understanding, application, creation
				<ul style="list-style-type: none"> • Fibres 	Knowledge, understanding, application
7	III	BOT-HC-3036 Genetics	<ul style="list-style-type: none"> • Know about the genomic organization or living organisms, study of genes genome, chromosome etc. • Gain knowledge on Mendels genetics and its extensions • Know about variation in chromosome number and structure • 4 understand about population and evolutionary genetics 	<ul style="list-style-type: none"> • Mendelian genetics and its extension 	Knowledge, understanding, application
				<ul style="list-style-type: none"> • Extrachromosomal Inheritance 	Knowledge, understanding, application
				<ul style="list-style-type: none"> • Linkage, Crossing over & chromosome mapping 	Knowledge, understanding, application
				<ul style="list-style-type: none"> • Variation in chromosome number and structure 	Knowledge, understanding, application
				<ul style="list-style-type: none"> • Gene Mutations 	Knowledge, understanding, application
				<ul style="list-style-type: none"> • Fine structure of gene 	Knowledge, understanding, application
				<ul style="list-style-type: none"> • Population and evolutionary genetics 	Knowledge, understanding, application
8	III	BOT-SE-3014 Biofertilizers (Sec I)	<ul style="list-style-type: none"> • To know about the microbes used as biofertilizers. • Know the method of isolation and multiplication of different 	<ul style="list-style-type: none"> • General account about microbes used as biofertilizers 	Knowledge, understanding, application
				<ul style="list-style-type: none"> • Azospirillum and 	Knowledge, understanding,

			<p>microorganisms.</p> <ul style="list-style-type: none"> To gain knowledge on Cyanobacteria, Azolla etc. and their use in rice cultivation. Knowledge about mycorrhizal associatin, their taxonomy, their influence on growth and yield of crop plants. Knowledge about green manuring and organic fertilizer; recycling of bio-degradable and other wastes; vermicomposting. 	<p>Azotobacter</p>	<p>application</p>
				<ul style="list-style-type: none"> Cyanobacteria, Azolla and Anabaena 	<p>Knowledge, understanding, application</p>
				<ul style="list-style-type: none"> Mycorrhizal association 	<p>Knowledge, understanding, application</p>
				<ul style="list-style-type: none"> Organic farming 	<p>Knowledge, understanding, application</p>
9	IV	BOT-HC-4016 Molecular Biology	<ul style="list-style-type: none"> Gain knowledge about the mechanism of DNA replication. Gain knowledge of transcription in prokaryotes and eukaryotes. Gain knowledge of Processing and modification of RNA. Gain knowledge of protein synthesis, its modification and its involvement in formation of polypeptides. 	<ul style="list-style-type: none"> Nucleic Acids: Carriers of genetic information 	<p>Knowledge, understanding, application</p>
				<ul style="list-style-type: none"> The structure of DNA and RNA/ Genetic Material 	<p>Knowledge, understanding, application</p>
				<ul style="list-style-type: none"> The replication of DNA 	<p>Knowledge, understanding, application</p>
				<ul style="list-style-type: none"> Central Dogma and Genetic Code 	<p>Knowledge, understanding, application</p>
				<ul style="list-style-type: none"> Transcription 	<p>Knowledge, understanding, application</p>
				<ul style="list-style-type: none"> Processing and modification of RNA 	<p>Knowledge, understanding, application</p>
				<ul style="list-style-type: none"> Translation 	<p>Knowledge, understanding, application</p>
10	IV	BOT-HC-4026 Plant Ecology and Phytogeography	<ul style="list-style-type: none"> Understands the inter-relationship between the living world and environment Know the soil profile and role of climate in soil development 	<ul style="list-style-type: none"> Introduction 	<p>Knowledge, understanding, application</p>
				<ul style="list-style-type: none"> Soil 	<p>Knowledge, understanding, application</p>
				<ul style="list-style-type: none"> Water 	<p>Knowledge, understanding, application</p>

			<ul style="list-style-type: none"> Understand the concept of ecology and its specification Understands Ecosystem and its components Understands the principles, endemism, biomes and phytogeographical divisions of India 	<ul style="list-style-type: none"> Adaptation of plants to various env. factors 	Knowledge, understanding, application
				<ul style="list-style-type: none"> Biotic interactions 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 6. Population Ecology 	Knowledge, understanding
				<ul style="list-style-type: none"> 7. Plant communities 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 8. Ecosystems 	Knowledge, understanding
				<ul style="list-style-type: none"> 9. Functional aspects of ecosystem 	Knowledge, understanding
				<ul style="list-style-type: none"> 10. Phytogeography 	Knowledge, understanding
11	IV	BOT-HC-4036 Plant Systematics	<ul style="list-style-type: none"> Gain knowledge of plant identification, concept of classification, principle and rules of nomenclature Gain knowledge of origin and evolution of angiosperm and their evolutionary relationship Know biometrics, numerical taxonomy and cladistics Know the history of plant classification. 	<ul style="list-style-type: none"> 1. Significance of plant systematics 	Knowledge, understanding
				<ul style="list-style-type: none"> 2. Botanical nomenclature 	Knowledge, understanding
				<ul style="list-style-type: none"> 3. Systems of classification 	Knowledge, understanding
				<ul style="list-style-type: none"> 4. Numerical taxonomy and cladistics 	Knowledge, understanding
				<ul style="list-style-type: none"> 5. Phylogeny of Angiosperms 	Knowledge, understanding
				<ul style="list-style-type: none"> 6. Angiospermic Families 	Knowledge, understanding
12	IV	BOT-SE-4024 Floriculture (Sec-I)	<ul style="list-style-type: none"> To know the history of gardening, its importance and scope. All about nursery practices., ornamental plants, pot cultivation, indoor gardening, Bonsai. Various garden designs, water garden. Knowledge of landscaping; 	<ul style="list-style-type: none"> 1. Introduction 	Knowledge, understanding
				<ul style="list-style-type: none"> 2. Nursery Management and Routine Garden Operations 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 3. Ornamental Plants 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 4. Principles of garden design 	Knowledge, understanding

			<ul style="list-style-type: none"> commercial floriculture. Disease and pest control of ornamental plants. 	<ul style="list-style-type: none"> 5. Landscaping places of public interest 	Knowledge, understanding
				<ul style="list-style-type: none"> 6. Commercial floriculture 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 7. Diseases and pests of ornamental plants 	Knowledge, understanding, application
13	V	BOT-HC-5016 Reproductive Biology of Angiosperms	<ul style="list-style-type: none"> Gain knowledge of reproductive development of Angiospermic plant Understand the pollination and fertilization mechanism Gain knowledge embryo, endosperm, seed, structure and their development Know about apomixes and polyembryony 	<ul style="list-style-type: none"> 1. Introduction 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 2. Reproductive development 	Knowledge, understanding,
				<ul style="list-style-type: none"> 3. Anther and pollen biology 	Knowledge, understanding
				<ul style="list-style-type: none"> 4. Ovule 	Knowledge, understanding
				<ul style="list-style-type: none"> 5. Pollination and fertilization 	Knowledge, understanding
				<ul style="list-style-type: none"> 6. Self incompatibility 	Knowledge, understanding
				<ul style="list-style-type: none"> 7. Embryo, endosperm and seed 	Knowledge, understanding
				<ul style="list-style-type: none"> 8. Polyembryony and apomixis 	Knowledge, understanding
12	V	BOT-HC-5026 Plant Physiology	<ul style="list-style-type: none"> Gain knowledge of Plant water relationship Gain knowledge of mineral nutrition, nutrient uptake and translocation Gain knowledge of plant growth regulators, Physiology of flowerings Gain knowledge of cryptochromes and phototropins 	<ul style="list-style-type: none"> 1. Plant water relations 	Knowledge, understanding
				<ul style="list-style-type: none"> 2. Mineral Nutrition 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 3. Nutrient uptake 	Knowledge, understanding
				<ul style="list-style-type: none"> 4. Translocation in the phloem 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 5. Plant growth regulators 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 6. Physiology of flowering 	Knowledge, understanding
				<ul style="list-style-type: none"> 7. Phytochrome, 	Knowledge, understanding

				cryptochromes and phototropins	
13	V	BOT-HE-5016 Natural Management Resource	<ul style="list-style-type: none"> 1. Know the natural resources and their sustainable utilization. 2. Use of land, water, biological resources. 3. Significance of forest cover, forest product management. Renewable and non-renewable sources of energy. 5. Knowledge of EIA, GIS, Waste management. 	<ul style="list-style-type: none"> 1. Natural resources 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 2. Sustainable Utilisation 	Knowledge, understanding
				<ul style="list-style-type: none"> 3. Land 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 4. Water 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 5. Biological Resources 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 6. Forests 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 7. Energy 	Knowledge, understanding
				<ul style="list-style-type: none"> 8. Contemporary Practices 	Knowledge, understanding
				<ul style="list-style-type: none"> 9. National and international efforts in resource management and conservation 	Knowledge, understanding, application
14	V	BOT-HE-5026 Horticultural practices and Post-Harvest Technology	<ul style="list-style-type: none"> 1. Know about ornamental plants, fruit and vegetable crops. 2. To know horticultural techniques. 3. Knowledge of landscaping and garden design, floriculture. Importance of post-harvest technology in horticultural crops, preservation and processing. Knowledge of field and post 	<ul style="list-style-type: none"> 1. Introduction 	Knowledge, understanding
				<ul style="list-style-type: none"> 2. Ornamental plants 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 3. Fruit and Vegetable crops 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 4. Horticultural techniques 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 5. Landscaping and garden design 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 6. Floriculture 	Knowledge, understanding,

			<ul style="list-style-type: none"> harvest diseases, crop sanitation, IPM strategies, quarantine practices. Conservation of germplasm, role of micropropagation, tissue culture, IPR issues. 7. Field trip for practical knowledge. 		<ul style="list-style-type: none"> application
				<ul style="list-style-type: none"> 7. Post-harvest technology 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 8. Disease control and management 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 9. Horticultural crops – conservation and management 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 10. Field Trip 	Knowledge, understanding, application, creation
15	VI	BOT-HC-6016 Plant Metabolism	<ul style="list-style-type: none"> Understand the concept of Metabolism Gain knowledge of mechanism of photosynthesis, respiration, ATP synthesis. Gain knowledge of Metabolisms of Carbohydrate, Lipid 	<ul style="list-style-type: none"> 1. Concept of metabolism 	Knowledge, understanding
				<ul style="list-style-type: none"> 2. Carbon assimilation 	Knowledge, understanding
				<ul style="list-style-type: none"> 3. Carbohydrate metabolism 	Knowledge, understanding
				<ul style="list-style-type: none"> 4. Carbon oxidation 	Knowledge, understanding
				<ul style="list-style-type: none"> 5. ATP-Synthesis 	Knowledge, understanding
				<ul style="list-style-type: none"> 6. Lipid Metabolism 	Knowledge, understanding
				<ul style="list-style-type: none"> 7. Nitrogen Metabolism 	Knowledge, understanding
				<ul style="list-style-type: none"> 8. Mechanism of signal transduction 	Knowledge, understanding
16	VI	BOT-HC-6026 Plant Biotechnology	<ul style="list-style-type: none"> Understand the method, utilization and importance of Plant Tissue culture. Gain knowledge of DNA technology Gene cloning and method of gene transfer. Gain knowledge on application of Biotechnology 	<ul style="list-style-type: none"> 1. Plant Tissue Culture 	Knowledge, understanding, application
				<ul style="list-style-type: none"> 2. Recombinant DNA technology 	Knowledge, understanding
				<ul style="list-style-type: none"> 3. Gene cloning 	Knowledge, understanding
				<ul style="list-style-type: none"> 4. Methods of gene transfer 	Knowledge, understanding
				<ul style="list-style-type: none"> 5. Applications of biotechnology 	Knowledge, understanding, application
			<ul style="list-style-type: none"> 1. Knowledge of different types 	<ul style="list-style-type: none"> 1. Scope of microbes in 	Knowledge, understanding,

ii. BSc Chemistry

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Understand the basic principles of organic, inorganic, physical, analytical, pharmaceutical, polymer, pesticide, and green chemistry in the molecular level and their applications through various laboratory experiments.
2. Achieve the critical thinking ability in order to design, carry out, record, and analyse the results of chemical reactions performed in the laboratory.
3. Understand the concepts of practical techniques and different analytical procedures so that they can easily involve themselves in laboratory-based research activities.
4. Gain knowledge required for the safe handling of chemicals and apparatus in the laboratory.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
BSc (HONOURS) Chemistry					
1	I	CHE-HC-1016: INORGANIC CHEMISTRY-I	On successful completion, students would have clear understanding of the concepts related to atomic and molecular structure, chemical bonding, periodic properties and redox behavior of chemical species. Students will also have hands on experience of standard solution preparation in different concentration units and learn volumetric estimation through acid-base and redox reactions.	Atomic Structure	Understand and Remember
				Periodicity of Elements	Understand and Remember
				Chemical Bonding	Understand and Remember
				Oxidation-Reduction	Understand and Remember
		LAB	Titrimetric Analysis, Acid-Base Titrations and Oxidation-Reduction Titrimetry	Apply, Analyse and Evaluate	

2	I	CHE-HC-1026: PHYSICAL CHEMISTRY I	In gaseous state unit the students will learn the kinetic theory of gases, ideal gas and real gases. In liquid state unit, the students are expected to learn the qualitative treatment of the structure of liquid along with the physical properties of liquid, viz, vapour pressure, surface tension and viscosity. In the molecular and crystal symmetry unit they will be introduced to the elementary idea of symmetry which will be useful to understand solid state chemistry and group theory in some higher courses. In solid state unit the students will learn the basic solid state chemistry application of x-ray crystallography for the determination of some very simple crystal structures. The students will also learn another important topic "ionic equilibria" in this course.	Gaseous State	Understand and Remember
		Liquid State		Understand and Remember	
		Molecular and Crystal Symmetry		Understand and Remember	
		Solid State		Understand and Remember	
		Ionic Equilibria		Understand and Remember	
		Surface tension measurements, Viscosity measurement using Ostwald's viscometer, Indexing of a given powder diffraction pattern of a cubic crystalline system and pH metry		Apply, Analyse and Evaluate	
3	II	CHE-HC-2016: ORGANIC CHEMISTRY I	Students will be able to identify different classes of organic compounds, describe their reactivity and explain/analyse their chemical and stereo chemical aspects.	Basics of Organic Chemistry	Understand and Remember
				Stereo chemistry	Understand, Remember and Apply
				Chemistry of Aliphatic Hydrocarbons a) Carbon-Carbon sigma bonds b) Carbon-Carbon Pi bonds c) Cycloalkanes and Conformational Analysis	Understand and Remember
				Aromatic Hydrocarbons	Understand and Remember
		LAB		Checking the calibration of the thermometer,	Apply, Analyse and Evaluate

				Purification of organic compounds by crystallization, Determination of melting points and boiling points of unknown organic compounds, Effect of impurities on the melting point – mixed melting point of two unknown organic Compounds and chromatography	
4	II	CHE-HC-2026: PHYSICAL CHEMISTRY II	In this course the students are expected to learn laws of thermodynamics, thermochemistry, thermodynamic functions, relations between thermodynamic properties, Gibbs Helmholtz equation, Maxwell relations etc. Moreover, the students are expected to learn partial molar quantities, chemical equilibrium, solutions and colligative properties. After completion of this course, the students will be able to understand the chemical systems from thermodynamic point of view.	Chemical Thermodynamics	Understand and Remember
				System of variable compositions	Understand and Remember
				Chemical Equilibrium	Understand and Remember
				Solutions and Colligative properties	Understand and Remember
		Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system, Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide, Calculation of the enthalpy of ionization of ethanoic acid, Determination of heat capacity of the calorimeter		Apply, Analyse and Evaluate	
LAB					

				and integral enthalpy (endothermic and exothermic) solution of salts, Determination of basicity/proticity of a polyprotic acid by the thermochemical method, Determination of enthalpy of hydration of copper sulphate and Study of the solubility of benzoic acid in water and determination of ΔH .	
5	III	CHE-HC-3016: INORGANIC CHEMISTRY-II	On successful completion of this course students would be able to apply theoretical principles of redox chemistry in the understanding of metallurgical processes. Students will be able to identify the variety of s and p block compounds and comprehend their preparation, structure, bonding, properties and uses. Experiments in this course will boost their quantitative estimation skills and introduce the students to preparative methods in inorganic chemistry.	General Principles of Metallurgy	Understand and Remember
				Acids and Bases	Understand, Remember and Apply
				Chemistry of s and p Block Elements	Understand and Remember
				Noble Gases	Understand and Remember
				Inorganic polymers	Understand and Remember
		LAB		Iodo/Iodimetric Titrations and Inorganic preparations	Apply, Analyse and Evaluate
6	III	CHE-HC-3026: ORGANIC CHEMISTRY-II	Students will be able to describe and classify organic compounds in terms of their functional groups and reactivity.	Chemistry of Halogenated Hydrocarbons	Understand and Remember
				Alcohols, Phenols, Ethers and Epoxides	Understand and Remember
				Carbonyl compounds	Understand and Remember
				Carboxylic Acids and their Derivatives	Understand and Remember

				Sulphur containing compounds	Understand and Remember
		LAB		Test of functional groups like alcohols, phenols, carbonyl and carboxylic acid group and organic preparations	Apply, Analyse and Evaluate
7	III	CHE-HC-3036: PHYSICAL CHEMISTRY- III	The students are expected to learn phase rule and its application in some specific systems. They will also learn rate laws of chemical transformation, experimental methods of rate law determination, steady state approximation etc. in chemical kinetics unit. After attending this course the students will be able to understand different types of surface adsorption processes and basics of catalysis including enzyme catalysis, acid base catalysis and particle size effect on catalysis.	Phase Equilibria	Understand and Remember
				Chemical Kinetics	Understand and Remember
				Catalysis	Understand and Remember
				Surface Chemistry	Understand and Remember
				Determination of critical solution temperature and composition of the phenol-water system, Construction of the phase diagram using cooling curves or ignition tube method, Distribution of acetic/ benzoic acid between water and cyclohexane, Equilibrium and Kinetics study of different reactions	Apply, Analyse and Evaluate
8	III	CHE-SE-3034: BASIC ANALYTICAL CHEMISTRY	Upon completion of this course, students shall be able to explain the basic principles of chemical analysis, design/implement microscale and semimicro experiments, record, interpret and analyze data following scientific	Introduction	Understand and Remember
				Analysis of soil	Understand and Remember
				Analysis of water	Understand and Remember
				Analysis of food products	Understand and Remember

			methodology.	Chromatography	Understand and Remember
				Ion-exchange	Understand and Remember
				Analysis of cosmetics	Understand and Remember
		LAB		To study the use of phenolphthalein in trap cases, To analyze arson accelerants, To carry out analysis of gasoline, Estimation of macro nutrients, Spectrophotometric determination of Iron in Vitamin /Dietary Tablets and Spectrophotometric Identification and Determination of Caffeine and Benzoic Acid in Soft Drink	Apply, Analyse and Evaluate
9	IV	CHE-HC-4016: INORGANIC CHEMISTRY-III	<p>On successful completion, students will be able name coordination compounds according to IUPAC, explain bonding in this class of compounds, understand their various properties in terms of CFSE and predict reactivity. Students will be able to appreciate the general trends in the properties of transition elements in the periodic table and identify differences among the rows.</p> <p>Through the experiments students not only will be able to prepare, estimate or separate metal complexes/compounds but also will be able to design experiments independently which they</p>	Coordination Chemistry	Understand and Remember
				Transition Elements	Understand and Remember
				Lanthanoids and Actinoids	Understand and Remember
				Bioinorganic Chemistry	Understand and Remember
		LAB		Gravimetric Analysis, Inorganic Preparations and Chromatography of metal ions	Apply, Analyse and Evaluate

			should be able to apply if and when required.		
10	IV	CHE-HC-4026: ORGANIC CHEMISTRY- III	Students shall demonstrate the ability to identify and classify different types of N-based derivatives, alkaloids and hetrocyclic compounds/explain their structure mechanism and reactivity/critically examine their synthesis and reactions mechanism.	Nitrogen Containing Functional Groups	Understand and Remember
				Polynuclear Hydrocarbons	Understand and Remember
				Heterocyclic compounds	Understand and Remember
				Alkaloids	Understand and Remember
				Terpenes	Understand and Remember
		LAB		Detection N, S, halogens in organic compounds, Functional group test for nitro, amine and amide groups and Qualitative analysis of unknown organic compounds containing simple functional groups	Apply, Analyse and Evaluate
11	IV	CHE-HC-4036: PHYSICAL CHEMISTRY- IV	In this course the students will learn theories of conductance and electrochemistry. Students will also understand some very important topics such as solubility and solubility products, ionic products of water, conductometric titrations etc. The students are also expected to understand the various parts of electrochemical cells along with Faraday's Laws of electrolysis. The students will also gain basic theoretical	Conductance	Understand and Remember
				Electrochemistry	Understand and Remember
				Electrical & Magnetic Properties of Atoms and Molecules	Understand and Remember
		LAB		Determination of cell constant, equivalent conductance, degree of dissociation and	Apply, Analyse and Evaluate

			idea of electrical & magnetic properties of atoms and molecules.	dissociation constant of a weak acid and conductometric and potentiometric titrations	
12	IV	CHE-SE-4034: PHARMACEUTICAL CHEMISTRY	Students will be able to appreciate the drug development process, identify various small molecules used for treatments different ailments and other physiological processes.	Drugs & Pharmaceuticals	Understand and Remember
		LAB		Fermentation	Understand and Remember
				Preparation of Aspirin and its analysis, Preparation of magnesium bisilicate	Apply, Analyse and Evaluate
13	V	CHE-HC-5016: ORGANIC CHEMISTRY- IV	Students will be able to explain/describe the important features of nucleic acids, amino acids and enzymes and develop their ability to examine their properties and applications.	Nucleic Acids	Understand and Remember
				Amino Acids, Peptides and Proteins	Understand and Remember
				Enzyme	Understand and Remember
				Lipids	Understand and Remember
				Concept of Energy in Biosystems	Understand and Remember
				Pharmaceutical Compounds: Structure and Importance	Understand and Remember
		LAB		Estimation of glycine by Sorenson's formalin method, Study of the titration curve of glycine, Estimation of proteins by Lowry's method, Study of the action of salivary amylase on starch at optimum conditions, Effect of temperature on the action of salivary amylase,	Apply, Analyse and Evaluate

				Saponification value of an oil or a fat, Determination of Iodine number of an oil/ fat and Isolation and characterization of DNA from onion/ cauliflower/peas.	
14	V	CHE-HC-5026: PHYSICAL CHEMISTRY V	After completion of this course the students are expected to understand the application of quantum mechanics in some simple chemical systems such as hydrogen atom or hydrogen like ions. The students will also learn chemical bonding in some simple molecular systems. They will be able to understand the basics of various kinds of spectroscopic techniques and photochemistry.	Quantum Chemistry	Understand and Remember
				Molecular Spectroscopy	Understand and Remember
				Photochemistry	Understand and Remember
		LAB		UV/Visible spectroscopy and Colourimetry	Apply, Analyse and Evaluate
15	V	CHE-HE-5026: ANALYTICAL METHODS IN CHEMISTRY	On successful completion students will have theoretical understanding about choice of various analytical techniques used for qualitative and quantitative characterization of samples. At the same time through the experiments students will gain hands on experience of the discussed techniques. This will enable students to take judicious decisions while analyzing different samples.	Qualitative and quantitative aspects of analysis	Understand and Remember
				Optical methods of analysis	Understand and Remember
				Thermal methods of analysis	Understand and Remember
				Electroanalytical methods	Understand and Remember
				Separation techniques	Understand and Remember
		LAB		Chromatographic separations, solvent extractions, Determine the pH of the given aerated drinks fruit juices, shampoos and soaps, Determination of Na, Ca, Li in cola drinks and fruit juices using flame	Apply, Analyse and Evaluate

				photometric techniques, Analysis of soil, ion-exchange and spectrophotometry experiments	
16	V	CHE-HE-5056: POLYMER CHEMISTRY	After completion of this course the students will learn the definition and classifications of polymers, kinetics of polymerization, molecular weight of polymers, glass transition temperature, and polymer solutions etc. They also learn the brief introduction of preparation, structure and properties of some industrially important and technologically promising polymers.	Introduction and history of polymeric materials	Understand and Remember
				Functionality and its importance	Understand and Remember
				Kinetics of Polymerization	Understand and Remember
				Crystallization and crystallinity	Understand and Remember
				Nature and structure of polymers	Understand and Remember
				Determination of molecular weight of polymers	Understand and Remember
				Glass transition temperature (T _g) and determination of T _g	Understand and Remember
				Polymer Solution	Understand and Remember
				Properties of Polymers	Understand and Remember
		LAB	Polymer synthesis, Polymer characterization and Polymer analysis	Apply, Analyse and Evaluate	
17	VI	CHE-HC-6016: INORGANIC CHEMISTRY-IV	By studying this course the students will be expected to learn about how ligand substitution and redox reactions take place in coordination complexes. Students will also learn about	Mechanism of Inorganic Reactions	Understand and Remember
				Organometallic Compounds	Understand and Remember
				Transition Metals in Catalysis	Understand and Remember

			organometallic compounds, comprehend their bonding, stability, reactivity and uses. They will be familiar with the variety of catalysts based on transition metals and their application in industry.	Theoretical Principles in Qualitative Inorganic Analysis (H ₂ S Scheme)	Understand and Remember
		LAB	On successful completion, students in general will be able to appreciate the use of concepts like solubility product, common ion effect, pH etc. in analysis of ions and how a clever design of reactions, it is possible to identify the components in a mixture. With the experiments related to coordination compound synthesis, calculation of 10Dq, controlling factors etc. will make the students appreciate the concepts of theory in experiments.	Qualitative semimicro analysis of mixtures containing 3 anions and 3 cations, Synthesis of ammine complexes of Ni(II) and their ligand exchange reactions involving bidentate ligands like acetylacetonate, dimethylglyoxime, glycine, Preparation of acetylacetonate complexes of Cu ²⁺ /Fe ³⁺ , Controlled synthesis of two copper oxalate hydrate complexes, Determination of ϵ_{max} value from UV-visible spectra of complexes and Measurement of 10 Dq by spectrophotometric method	Apply, Analyse and Evaluate
18	VI	CHE-HC-6026: ORGANIC CHEMISTRY-V	Students will be able to explain/describe basic principles of different spectroscopic techniques and their importance in chemical/organic analysis. Students shall be able to classify/identify/critically examine carbohydrates, polymers and dye materials.	Spectroscopy	Understand and Remember
				Carbohydrates	Understand and Remember
				Dyes	Understand and Remember
				Polymers	Understand and Remember
		LAB		Extraction of caffeine from tea leaves, Preparation of sodium polyacrylate and urea formaldehyde,	Apply, Analyse and Evaluate

				Analysis of Carbohydrate, Qualitative analysis of unknown organic compounds containing monofunctional groups, Identification of simple organic compounds by IR spectroscopy and NMR spectroscopy and preparation of methyl orange	
19	VI	CHE-HE-6016 : GREEN CHEMISTRY	Apart from introducing learners to the principles of green chemistry, this course will make them conversant with applications of green chemistry to organic synthesis. Students will be prepared for taking up entry level jobs in the chemical industry. They also will have the option of studying further in the area.	Introduction to Green Chemistry	Understand and Remember
				Principles of Green Chemistry and Designing a Chemical synthesis	Understand and Remember
				Examples of Green Synthesis/ Reactions	Understand and Remember
				Future Trends in Green Chemistry	Understand and Remember
		Safer starting materials, Preparation of biodiesel from vegetable oil, Principle of atom economy, Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide, Reaction between furan and maleic acid in water and at room temperature rather than in benzene and reflux, Extraction of D-limonene from orange peel using liquid CO ₂ prepared form		Apply, Analyse and Evaluate	
LAB					

				<p>dry ice, Mechanochemical solvent free synthesis of azomethines, Co-crystal controlled solid state synthesis (C_2S_3) of N-organophthalimide using phthalic anhydride and 3-aminobenzoic acid, Solvent free, microwave assisted one pot synthesis of phthalocyanine complex of copper (II) and Photoreduction of benzophenone to benzopinacol in the presence of sunlight</p>	
20	VI	CHE-HE-6056 : DISSERTATION	Student will complete a project work and then prepare a report on that		Analyse, Evaluate and Create

BSc (Regular) Chemistry

SL NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOME	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	CHE-RC/HG-1016: CHEMISTRY-1	After completion of this course the students will learn the atomic structure through the basic concepts of quantum mechanics. They will understand the chemical bonding through VB and MO approaches. In organic part, the students are expected to learn basic ideas used in organic chemistry, stereochemistry, functional groups, alkanes, alkenes, alkynes etc.	Atomic Structure	Understand and Remember
				Chemical Bonding and Molecular Structure	Understand and Remember
				Fundamentals of Organic Chemistry	Understand and Remember
				Stereochemistry	Understand and Remember
				Aliphatic Hydrocarbons Alkanes, Alkenes and Alkynes	Understand and Remember
		Estimation of Na ₂ CO ₃ , NaHCO ₃ , oxalic acid, water of crystallization, Fe(II) and Cu(II) ions by volumetric analysis Detection of extra elements in organic compounds and Separation of mixtures by chromatography		Apply, Analyse and Evaluate	
LAB					
2	II	CHE-RC/HG-2016: CHEMISTRY-2	After completion of this course the students will learn periodic properties in main group elements, transition metals (3d series). They will also learn the crystal field theory in coordination chemistry unit. In physical chemistry part, the students are expected to learn kinetic theory of gases, ideal gas and real gases, surface tension, viscosity, basic solid state chemistry and chemical kinetics.	s- and p-Block Elements	Understand and Remember
				Transition Elements (3d series)	Understand and Remember
				Coordination Chemistry	Understand and Remember
				Kinetic Theory of Gases	Understand and Remember
				Liquids	Understand and Remember
				Solids	Understand and Remember
				Chemical Kinetics	Understand and Remember
		Semi-micro inorganic qualitative analysis, Estimation		Apply, Analyse and Evaluate	
LAB					

				of Ni and Al gravimetrically, Determination of composition of Fe ³⁺ -salicylic acid complex solution by Job's method, Estimation of Mg ²⁺ , Zn ²⁺ and total hardness by complexometric titration, Determination of N ⁺ and K ⁺ using Flame Photometry, Surface tension measurement, Viscosity measurement and Chemical Kinetics	
3	III	CHE-RC/HG-3016: CHEMISTRY-3	After completion of this course the students will able to understand the chemical system from thermodynamic points of view. They will also learn two very important topics in chemistry- chemical equilibrium and ionic equilibrium. In organic chemistry part, the students are expected to learn various classes of organic molecules-alkyl halides, aryl halides, alcohols, phenols, ethers, aldehydes and ketones.	Chemical Energetics	Understand and Remember
				Chemical Equilibrium	Understand and Remember
				Ionic Equilibria	Understand and Remember
				Aromatic hydrocarbons	Understand and Remember
				Alkyl and Aryl Halides	Understand and Remember
				Alcohols, Phenols and Ethers	Understand and Remember
				Aldehydes and ketones (aliphatic and aromatic)	Understand and Remember
		LAB		Determination of heat capacity of calorimeter for different volumes,enthalpy of neutralization of hydrochloric acid with sodium hydroxide, enthalpy of ionization of acetic acid, integral enthalpy of solution of salts and enthalpy of hydration of copper sulphate, Study of the solubility of benzoic acid in water and determination of ΔH , Measurements of pH of	Apply, Analyse and Evaluate

				different solutions and preparation of buffer solutions. Purification of organic compounds by crystallization, Determination of melting and boiling points and preparation of various organic compounds.	
4	III	CHE-SE-3034: BASIC ANALYTICAL CHEMISTRY	Upon completion of this course, students shall be able to explain the basic principles of chemical analysis, design/implement microscale and semimicro experiments, record, interpret and analyze data following scientific methodology.	Introduction	Understand and Remember
				Analysis of soil	Understand and Remember
				Analysis of water	Understand and Remember
				Analysis of food products	Understand and Remember
				Chromatography	Understand and Remember
				Ion-exchange	Understand and Remember
				Analysis of cosmetics	Understand and Remember
		LAB		To study the use of phenolphthalein in trap cases, To analyze arson accelerants, To carry out analysis of gasoline, Estimation of macro nutrients, Spectrophotometric determination of Iron in Vitamin /Dietary Tablets and Spectrophotometric Identification and Determination of Caffeine and Benzoic Acid in Soft Drink	Apply, Analyse and Evaluate
5	IV	CHE- RC/HG-4016: CHEMISTRY-4	After completion of this course the students learn solutions, phase rule and its application in specific cases, basics of conductance and	Solutions	Understand and Remember
				Phase Equilibrium	Understand and Remember

			electrochemistry. Students will also learn some important topics of organic and biochemistry- carboxylic acids, amines, amino acids, peptides, proteins and carbohydrates.	Conductance	Understand and Remember
				Electrochemistry	Understand and Remember
				Carboxylic acids and their derivatives	Understand and Remember
				Amines and Diazonium Salts	Understand and Remember
				Amino Acids, Peptides and Proteins	Understand and Remember
				Carbohydrates	Understand and Remember
		LAB		Study of equilibrium by distribution method, Construction of the phase diagram of a binary system, Determination of the critical solution temperature and composition of the phenol water system, Study of the variation of mutual solubility temperature with concentration for the phenol water system and determination of the critical solubility temperature, Determination of cell constant, equivalent conductance, degree of dissociation and dissociation constant of a weak acid and conductometric and potentiometric titrations of strong acid vs. strong base and weak acid vs. strong base Qualitative Organic Analysis of Organic Compounds, Separation of amino acids by	Apply, Analyse and Evaluate

				paper chromatography, Determination of the concentration of glycine solution by formylation method, Titration curve of glycine, Action of salivary amylase on starch, Effect of temperature on the action of salivary amylase on starch, Determination of the saponification value of an oil/fat, Determination of the iodine value of an oil/fat, Differentiation between a reducing/nonreducing sugar, Extraction of DNA from onion/ cauliflower	
6	IV	CHE-SE-4034: PHARMACEUTICAL CHEMISTRY	Students will be able to appreciate the drug development process, identify various small molecules used for treatments different ailments and other physiological processes.	Drugs & Pharmaceuticals	Understand and Remember
		Fermentation		Understand and Remember	
		LAB		Preparation of Aspirin and its analysis, Preparation of magnesium bisilicate	Apply, Analyse and Evaluate
7	V	CHE-RE-5026: ANALYTICAL METHODS IN CHEMISTRY	On successful completion students will be have theoretical understanding about choice of various analytical techniques used for qualitative and quantitative characterization of samples. At the same time through the experiments students will gain hands on experience of the discussed techniques. This will enable students to take judicious decisions while analyzing different samples.	Qualitative and quantitative aspects of analysis	Understand, Remember and Apply
				Optical methods of analysis	Understand and Remember
				Thermal methods of analysis	Understand and Remember
				Electroanalytical methods	Understand and Remember
				Separation techniques	Understand, Remember and Apply
		LAB		Chromatographic separations, solvent extractions, Determine	Apply, Analyse and Evaluate

				the pH of the given aerated drinks fruit juices, shampoos and soaps, Determination of Na, Ca, Li in cola drinks and fruit juices using fame photometric techniques, Analysis of soil, ion-exchange and spectrophotometry experiments	
8	V	CHE-SE-5044: INTELLECTUAL PROPERTY RIGHTS	After completing this course, students will have in-depth understanding about the importance and types of IPR. This course will also provide the clarity on the legal and economic aspects of the IP system.	Introduction to Intellectual Property	Understand and Remember
				Copyrights	Understand and Remember
				Trademarks	Understand and Remember
				Patents	Understand and Remember
				Geographical Indications	Understand and Remember
				Industrial Designs	Understand and Remember
				Layout design of integrated circuits	Understand and Remember
				Trade Secrets	Understand and Remember
Different International agreements a) Word Trade Organization (WTO) b)Paris Convention	Understand and Remember				
9	VI	CHE-RE-6016: GREEN CHEMISTRY	Apart from introducing learners to the principles of green chemistry, this course will make them conversant with applications of green chemistry to organic synthesis. Students will be prepared for taking up entry level jobs in the chemical industry. They also will have the option of studying further in the	Introduction to Green Chemistry	Understand and Remember
				Principles of Green Chemistry and Designing a Chemical synthesis	Understand and Remember
				Examples of Green Synthesis/ Reactions	Understand and Remember

			area.	Future Trends in Green Chemistry	Understand and Remember
		LAB		<p>Safer starting materials, Preparation of biodiesel from vegetable oil, Principle of atom economy, Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide, Reaction between furan and maleic acid in water and at room temperature rather than in benzene and reflux, Extraction of D-limonene from orange peel using liquid CO₂ prepared from dry ice, Mechanochemical solvent free synthesis of azomethines, Co-crystal controlled solid state synthesis (C₂S₃) of N-organophthalimide using phthalic anhydride and 3-aminobenzoic acid, Solvent free, microwave assisted one pot synthesis of phthalocyanine complex of copper (II) and Photoreduction of benzophenone to benzopinacol in the presence of sunlight</p>	Apply, Analyse and Evaluate
10	VI	CHE-SE-6024: PESTICIDE CHEMISTRY	Students will be able to explain or describe and critically examine different types of pesticides, their activity/toxicity and their applications and the need for the	Definition of pesticides, general introduction to pesticides, benefits and adverse effects of pesticides.	Understand and Remember

			search of an alternative based on natural products.	Classification, mode of action, toxicity and methods of pesticides residue analysis.	Understand and Remember
				Synthesis and technical manufacture and uses of representative pesticides	Understand and Remember
		LAB		To calculate acidity/alkalinity in given sample of pesticides formulations as per BIS specifications	Apply, Analyse and Evaluate
		Preparation of simple organophosphates, phosphonates and thiophosphates		Apply, Analyse and Evaluate	

iii. BSc Mathematics

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Communicate mathematics effectively by oral, written, computational and graphic means.
2. Create mathematical ideas from basic axioms.
3. Gauge hypotheses, theories, techniques, and proofs provisionally.
4. Utilize mathematics to solve theoretical and applied problems through critical understanding, analysis, and synthesis.
5. Identify the applications of mathematics in other disciplines and in the real world, leading to the enhancement of career prospects in a plethora of fields.
6. Appreciate the requirement of lifelong learning through continued education and research.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1.	I	MAT-HC-1016 Calculus (Including Practical)	This course will enable the students to: i) Learn first and second derivative tests for relative extremum and apply the knowledge in problems in business, economics and life sciences. ii) Sketch curves in a plane using its mathematical properties in different coordinate systems. iii) Compute area of surfaces of	Unit 1 : Higher order derivatives, it's application, geometrical interpretation.	Remember, understand, apply, evaluate.
				Unit 2 : Reduction formula for integration and application of integration in geometry.	Remember, understand, apply, evaluate.
				Unit 3 : Vector functions and it's	Remember, understand, apply,

			<p>revolution and the volume of solids by integrating over cross-sectional areas.</p> <p>iv) Understand the calculus of vector functions and its use to develop the basic principles of planetary motion.</p>	applications.	evaluate.
2.	I	MAT-HC-1026 Algebra	<p>This course will enable the students to:</p> <p>i) Employ De Moivre's theorem in a number of applications to solve numerical problems.</p> <p>ii) Learn about equivalent classes and cardinality of a set.</p> <p>iii) Use modular arithmetic and basic properties of congruences.</p> <p>iv) Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix.</p> <p>v) Learn about the solution sets of linear systems using matrix method and Cramer's rule</p>	Unit 1 : Polar representation of complex numbers, De Moivre's theorem and applications.	Remember, understand, apply, evaluate
				Unit 2 : Mathematical logic, sets, functions	Remember, understand, apply, evaluate
				Unit 3 : Relations, Induction principles, GCD of integers	Remember, understand, apply, evaluate
				Unit 4 : Linear equations, matrix and it's applications	Remember, understand, apply, evaluate
3.	II	MAT-HC-2016 Real analysis	<p>This course will enable the students to:</p> <p>i) Understand many properties of</p>	Unit 1 : Algebraic and order properties of R.	Remember, understand, apply, evaluate

			<p>the real line \mathbb{R}, including completeness and Archimedean properties.</p> <p>ii) Learn to define sequences in terms of functions from \mathbb{N} to a subset of \mathbb{R}.</p> <p>iii) Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.</p>	<p>Unit 2 : Real sequences and it's convergence</p>	Remember, understand, apply
				<p>Unit 3 : Infinite series and it's convergence</p>	Remember, understand, apply
4.	II	MAT-HC-2026 Differential Equations	<p>The course will enable the students to:</p> <p>i) Learn basics of differential equations and mathematical modeling.</p> <p>ii) Formulate differential equations for various mathematical models.</p> <p>iii) Solve first order non-linear differential equations and linear differential equations of higher order using various techniques.</p> <p>iv) Apply these techniques to solve and analyze various mathematical models.</p>	<p>Unit 1 : Basics of Mathematical Model, solution of 1st order differential equations.</p>	Remember, understand, apply, analyse.
				<p>Unit 2: Introduction and analysis of different models.</p>	Understand, apply, evaluate, create
				<p>Unit 3 : Solutions of 2nd order differential equations.</p>	Remember, understand, apply, analyse.

5.	III	MAT-HC-3016 Theory of Real functions	<p>This course will enable the students to:</p> <p>i) Have a rigorous understanding of the concept of limit of a function.</p> <p>ii) Learn about continuity and uniform continuity of functions defined on intervals.</p> <p>iii) Understand geometrical properties of continuous functions on closed and bounded intervals.</p> <p>iv) Learn extensively about the concept of differentiability using limits, leading to a better understanding for applications.</p>	Unit 1 : Limit point of sets, limits of functions.	Remember, understand
				Unit 2 : Continuous functions and related theorems	Understand, Remember
				Unit 3 : Differentiability of a function and related theorems	Remember, understand analysis
6.	III	MAT-HC-3026 Group Theory-1	<p>The course will enable the students to:</p> <p>i) Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc.</p> <p>ii) Link the fundamental concepts of groups and symmetrical figures.</p> <p>iii) Analyze the subgroups of cyclic groups and classify subgroups of</p>	Unit 1 : Definition and examples of group, subgroups, cyclic groups.	Remember, understand, analyse.
				Unit 2 : Permutations, Lagrange's theorem, normal subgroups and factor groups.	Understand, Remember

			<p>cyclic groups.</p> <p>iv) Explain the significance of the notion of cosets, normal subgroups and factor groups.</p> <p>v) Learn about Lagrange's theorem and Fermat's Little theorem.</p> <p>vi) Know about group homomorphisms and group isomorphisms.</p>	Unit 3 : Group homomorphism and related theorems	Remember, understand, analyse.
7.	III	MAT-HC-3036 Analytical Geometry	<p>This course will enable the students to:</p> <p>i) Learn conic sections and transform co-ordinate systems</p> <p>ii) Learn polar equation of a conic, tangent, normal and properties</p> <p>iii) Have a rigorous understanding of the concept of three dimensional coordinates system.</p>	Unit 1 : Transformation of co-ordinates, pair of straight lines, different types of conics with general form.	Remember, understand, analyse, apply.
				Unit 2 : Plane, sphere, cone, cylinder, central conicoid	Remember, understand, apply.
8.	IV	MAT-HC-4016 Multivariate Calculus	<p>This course will enable the students to:</p> <p>i) Learn the conceptual variations when advancing in calculus from one variable to multivariable discussion.</p> <p>ii) Understand the maximization and minimization of multivariable</p>	Unit 1 : Functions of several variables, limit, continuity, partial derivatives, chain rule, level curves, tangent, gradient, directional derivative, total differential.	Remember, understand, apply, analyse, create.
				Unit 2 : Extrema of functions of several variables	Understand, Remember, apply, evaluate.

			<p>functions subject to the given constraints</p> <p>iii) Learn about inter-relationship amongst the line integral, double and triple integral formulations.</p> <p>iv) Familiarize with Green's, Stokes' and Gauss divergence theorems.</p>		
				Unit 3 : Double and triple integration, volume, area, surface area by it.	Remember, understand analyse, apply, create
				Unit 4 : Line , surface integral. Green, Stokes, Divergence theorem and applications.	Apply, analyse, evaluate.
9.	IV	MAT-HC-4026 Numerical Methods (Including Practical)	<p>The course will enable the students to:</p> <p>i) Learn some numerical methods to find the zeroes of nonlinear functions of a single variable and solution of a system of linear equations, up to a certain given level of precision.</p> <p>ii) Know about methods to solve system of linear equations, such as False position method, Fixed point iteration method, Newton's method, Secant method and LU decomposition.</p> <p>iii) Interpolation techniques to compute the values for a tabulated function at points not in the table.</p> <p>iv) Applications of numerical differentiation and integration to convert differential equations into difference equations for numerical</p>	<p>Unit 1 : Algorithms, convergence, Solution of system of equations by different methods, LU decomposition</p> <p>Unit 2 : Lagrange and Newton interpolation, finite difference operators.</p> <p>Unit 3 : Numerical differentiation and integration. Trapezoidal, Simpson's and Euler's rule.</p>	<p>Remember, understand, apply, evaluate.</p> <p>Remember, understand, apply, evaluate.</p> <p>Understand, apply, analyse, evaluate.</p>

			solutions.		
10.	IV	MAT-HC-4036 Ring Theory	<p>This course will enable the students to:</p> <p>i) appreciate the significance of unique factorization in rings and integral domains</p> <p>ii) learn about fundamental concepts of ring, integral domains and fields.</p> <p>iii) know about ring homomorphism and isomorphisms theorems of rings.</p> <p>iv) learn about polynomial rings over commutative rings and about UFD.</p>	Unit 1 : Definition, examples and properties of rings, sub ring, ideal, integral domains, fields. Isomorphisms and homomorphisms of rings and related theorems.	Remember, understand, analyse.
				Unit 2 : Polynomial rings over commutative rings, division algorithm, principal and prime ideals, UFD and Euclidean domains, divisibility in integral domains.	Remember, understand, analyse.
1.	V	MAT-HC-5016 Complex Analysis (Including Practical)	<p>The course will enable the students to:</p> <p>i) Learn the significance of differentiability of complex functions leading to the understanding of Cauchy–Riemann</p>	Unit 1 : Function of a complex variable. Limit, continuity, differentiability of complex numbers. Cauchy Riemann equations.	Remember, understand, apply, analyse.

			<p>equations.</p> <p>ii) Learn some elementary functions and can evaluate the contour integrals.</p> <p>iii) Understand the role of Cauchy–Goursat theorem and the Cauchy integral formula and their applications in evaluating complex integrals.</p>	<p>Unit 2 : Analytic functions, harmonic functions, exponential, logarithmic and trigonometric functions, derivative and definite integral of functions.</p>	Remember, apply, evaluate.
				Unit 3 : Contours, contour integrals and examples	Remember, analyse, apply, evaluate.
				Unit 4 : Antiderivative, Cauchy-Goursat theorem, Cauchy integral formula, Liouville’s theorem and fundamental theorem of algebra.	Apply, analyse, evaluate, create.
12.	V	MAT-HC-5026 Linear Algebra	<p>The course will enable the students to:</p> <p>i) Learn about the concept of linear independence of vectors over a field, dimension of a vector space.</p> <p>ii) Basic concepts of linear transformations, dimension theorem, matrix representation of LT and change of co-ordinate matrix.</p> <p>iii) Compute characteristic polynomial, eigen values, eigen vectors, eigen space. Apply basic diagonalization results.</p> <p>iv) Compute inner products and determine orthogonality on vector spaces.</p>	<p>Unit 1 : Vector spaces, subspaces, null and column space, linear transformations, kernel, range, base, dimension, rank of vector space, change of basis.</p>	Remember, understand, analyse, apply.
				Unit 2 : Eigen vectors and eigen values of a matrix, the characteristics equation, diagonalization, eigen vectors of a LT, complex eigen values. Invariant subspaces and Caley Hamilton theorem.	Remember, apply, evaluate.
				Unit 3 : Inner product, length, orthogonality, orthogonal sets and projections. Gram Schmidt process, inner product space. Diagonalization of symmetric matrices and spectral theorem.	Remember, understand, analyse, evaluate.

13.	V	MAT-HE-5016 Number Theory	<p>This course will enable the students to:</p> <p>i) Learn about some fascinating discoveries related to the properties of prime numbers, and some of the open problems in number theory, viz., Goldbach conjecture etc.</p> <p>ii) Know about number theoretic functions and modular arithmetic.</p> <p>iii) Solve linear, quadratic and system of linear congruence equations.</p>	<p>Unit 1 : Linear Diophantine equation, prime counting function, Goldbach conjecture, linear congruence, residue, Chinese remainder theorem, Fermat's Little theorem, Wilson's theorem.</p> <p>Unit 2 : Number theoretic functions, sum and number of divisors, totally multiplicative functions, definition and properties of Dirichlet product, Mobius inversion formula, the greatest integer function, Euler's phi function, Euler's theorem, residue.</p>	<p>Remember, understand, analyse.</p> <p>Remember, understand, analyse.</p>
14.	V	MAT-HE-5066 Programming in C (Including Practical)	<p>The course will enable the students to:</p> <p>i) Understand and apply the programming concepts of C which is important to mathematical investigation and problem solving.</p> <p>ii) Learn about structured data types in C and learn about different applications</p> <p>iii) Represent the outputs of</p>	<p>Unit 1 : Variables, constants, different terms related to C and its library functions, structure of a C program, input/output functions and statements.</p> <p>Unit 2 : Control statements, if-else statements, switch statement-</p>	<p>Understand, apply, create.</p> <p>Understand, apply, create.</p>

			<p>programs visually in terms of well formatted text and plots.</p> <p>iv) Practical will enable the students to create and evaluate different problems using C</p>	<p>Unit 3 : Arrays and subscripted variables, function, function declaration, actual and formal arguments, function prototype, recursive function.</p>	<p>Understand, apply, analyse, create.</p>
15.	VI	MAT-HC-6016 Riemann Integration and Metric spaces	<p>The course will enable the students to:</p> <p>i) Learn about some of the classes and properties of Riemann integrable functions, and the applications of the Fundamental theorems of integration.</p> <p>ii) Know about improper integrals including, beta and gamma functions.</p> <p>iii) Learn various natural and abstract formulations of distance on the sets of usual or unusual entities. Become aware one such formulations leading to metric spaces.</p> <p>iv) Analyse how a theory advances from a particular frame to a general frame.</p> <p>v) Appreciate the mathematical understanding of various geometrical concepts, viz. Balls or connected sets etc. in an abstract setting.</p>	<p>Unit 1 : Riemann integration concepts and some related theorems. Concepts of improper integrals, Gamma functions.</p>	<p>Remember, understand, apply, analyse, evaluate.</p>
				<p>Unit 2 : Metric spaces, definition, examples sequence and Cauchy sequence, open and closed ball, complete metric space, subspace, dense and separable space.</p>	<p>Remember, Understand, analyse.</p>
				<p>Unit3. Continuous mappings, sequential criterion , uniform continuity, homeomorphism, contraction mapping, connectedness.</p>	<p>Remember, understand analyse.</p>

16.	VI	MAT-HC-6026 Partial Differential Equations (Including practical)	<p>The course will enable the students to:</p> <p>i) Formulate, classify and transform first order PDEs into canonical form.</p> <p>ii) Learn about method of characteristics and separation of variables to solve first order PDE's.</p> <p>iii) Classify and solve second order linear PDEs.</p> <p>iv) Learn about Cauchy problem for second order PDE and homogeneous as well as nonhomogeneous wave equations.</p>	Unit 1 : Introduction, classification, construction of first order PDE, Cauchy problem, Integral surface, Cauchy, Charpit and Jacobi's method of solution.	Remember, understand, analyse, evaluate.
				Unit 2 : Canonical form of 1 st order PDE, Method of separation of variables	Understand, analyse, apply.
				Unit 3 : Reduction to canonical forms, equations with constant co-efficients, general solution.	Understand, apply, evaluate.
17.	VI	MAT-HE-6046 Hydromechanics	<p>The course will enable the students to:</p> <p>i) Know about Pressure equation, rotating fluids.</p> <p>ii) Learn about Fluid pressure on plane surfaces, resultant pressure</p>	Unit 1 : Pressure equation, equilibrium conditions, homogeneous and heterogeneous fluids, rotating fluid, pressure on curved and plane surfaces, centre of pressure, gas, mixture of gases, adiabatic expansion.	Remember, understand, analyse. Apply.

			<p>on curved surfaces, Gas law, mixture of gases</p> <p>iii) Learn about the Eulerian and Lagrangian method.</p> <p>iv) Learn about equation of continuity, examples, acceleration of a fluid at a point.</p>	<p>Unit 2 : Velocity , acceleration of fluid at a point, Lagrangean and Eulerian methods of study of fluid motion, equation of continuity and equation of motion of fluid.</p>	<p>Remember, understand, analyse, apply.</p>
Generic and Regular Course					
18.	I	MAT-HG-1016/ MAT-RC-1016 Calculus	<p>Completion of the course will enable the students to:</p> <p>i) Understand continuity and differentiability in terms of limit.</p> <p>ii) Describe asymptotic behavior in terms of limit involving infinity.</p> <p>iii) Understand importance of Mean value theorems.</p> <p>iv) Use derivative to explore behavior of a function and graphing it.</p>	<p>Unit 1 : Graph of different functions</p>	<p>Understand, apply, analyse, create.</p>
				<p>Unit 2 : Limits and continuity of functions, properties of continuous functions, intermediate value theorem.</p>	<p>Remember, apply, evaluate.</p>
				<p>Unit 3 : Differentiability, successive differentiation, Leibnitz theorem, higher order derivatives.</p>	<p>Understand, apply, evaluate.</p>
				<p>Unit 4 : Rolle's Theorem, Lagrange's mean value theorem, geometrical interpretation and application, Taylor's theorem, Maclaurin's theorem,</p>	<p>Remember, apply, analyse, evaluate.</p>
				<p>Unit 5 : Functions of two and more variables, level curves, partial differentiation.</p>	<p>Understand, apply, create.</p>

19.	II	MAT-HG-2016/ MAT-RC-2016 Algebra	<p>The course will enable the students to:</p> <p>i) Learn to solve cubic and biquadratic equations. Also learn relation between the roots and coefficients and it's uses.</p> <p>ii) Employ De Moivre's theorem in a number of applications.</p> <p>iii) Recognize consistent and inconsistent system of equations by row echelon form of matrix. Learn to find rank and inverse.</p> <p>iv) Learn basic ideas of group, subgroup, permutation group, cyclic group and preliminary knowledge of rings.</p>	Unit 1 : Theory of equations, De Moivre's Theorem, roots of complex numbers.	Remember, understand, apply, evaluate.
				Unit 2 : Matrices, algebra, row echelon and reduced row echelon form, inverse, rank , solution of system of equations.	Understand, apply, evaluate.
				Unit 3 : Groups and rings. Permutation and cyclic groups.	Remember, understand, analyse.
20.	III	MAT-HG-3016/ MAT-RC-3016 Differential Equations	<p>This course will enable the students to:</p> <p>i) Learn basics of differential equations and it's applications</p> <p>ii) learn to classify 1st order linear differential equations and different methods of solutions.</p> <p>iii) learn to solve 2nd order linear homogeneous as well as nonhomogeneous differential equations by different methods.</p>	Unit 1 : First order equations and methods of solutions, orthogonal and oblique trajectories, Wronskian and it's properties.	Remember, understand, analyse, apply.
				Unit 2 : Solutions of 2 nd order linear homogeneous and nonhomogeneous equations, Cauchy-Euler equations, simultaneous equations.	Remember, understand, analyse, apply.

21.	IV	MAT-HG-4016/ MAT-RC-4016 Real Analysis	<p>This course will enable the students to:</p> <p>i) understand many properties of real line \mathbb{R}, including Archimedean and completeness properties.</p> <p>ii) learn to define sequences in terms of functions from \mathbb{R} to a subset of \mathbb{R}.</p> <p>iii) Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior and limits of bounded sequences.</p> <p>iv) learn to apply different tests to test convergence of infinite series.</p>	Unit 1 : Algebraic and order properties of real numbers, open and closed sets. Limits and continuity of a function and their properties, uniform continuity.	Remember, understand, analyse, apply.
				Unit 2 : Sequences, convergent and Cauchy sequences, sub sequences , limits of sequence. Infinite series and convergence.	Remember, understand, apply, evaluate.

iv. BSc Physics

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Gain knowledge and understanding of various mathematical techniques used in physics such as the Frobenius method, Fourier series, solutions of different types of differential equations, the use of complex functions, integral transforms, curve fitting, and least square fit as well as C/C++ computational techniques and Python programming for solving various theoretical problems.
2. Acquire the ability to understand the properties of matter, viz., elasticity, surface tension and viscosity as well as the theory of relativity.
3. Understand waves and oscillation and gain knowledge of various wave phenomena related to optics like interference, diffraction, and holography and use them to determine wavelengths of light from multiple sources.
4. Understand electricity and magnetism, electromagnetic theory starting with Maxwell's equations, propagation of EM waves, polarization, wave guides, and network theorems and analyse the results experimentally.
5. Gain knowledge of thermal physics covering the basic laws of thermodynamics, entropy, kinetic theory of gases, and real gases and evaluate experimental outcomes to measure thermal conductivity of good and bad conductors.
6. Understand various digital circuits starting with CRO, integrated circuits, Boolean algebra and their applications in timers, flip-flops, counters, shift registers, and microprocessors.
7. Gain familiarity with concepts of modern physics, viz., Planck's quantum theory, Heisenberg uncertainty principle, and Eigen value problems in confined particles; then move forward to Schrodinger equations, bound states and ideas of atomic physics.
8. Understand analog systems with diodes, transistors, amplifiers, and OPAMP and their various day-to-day applications.
9. Acquire knowledge and understanding of crystal structures, magnetic properties, dielectric properties, superconductivity, and hysteresis loop of ferro-magnets and experimentally find dielectric constants and magnetic susceptibility.

10. Understand the concepts of both classical and quantum statistical physics and analyse large samples of data both theoretically and using computational techniques.
11. Gain knowledge of classical dynamics, fluid dynamics, nuclear physics, radioactive decay, particle physics, and astrophysics along with detailed information regarding our universe and planetary systems as well as numerous experimental techniques.
12. Understand the basic instrumental skills and their usages through practice.
13. Build a strong basis for pursuing various career options.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT /CHAPTER	BLOOM'S TAXONOMIC LEVELS
1.	I	PHY-HC-1016 Mathematical Physics I	Students should be able to understand the different types of mathematical tools: Vector calculus, Differential equations, orthogonal curvilinear coordinate, Dirac Delta function, Probability Theory of errors and their use in solving problems in various physical fields.	UnitI: Vector Calculus	Remember, Understand, Apply, Analyse , Evaluate
				Unit II: First and Second order Differential Equations	Remember, Understand, Apply, Analyse, Evaluate
				Unit III: Orthogonal Curvilinear Coordinates	Remember, Understand, Apply, Analyse, Evaluate, Create
				Unit IV: Dirac Delta function and its Properties	Remember, Understand, Apply, Analyse, Evaluate
				Unit V: Introduction to Probability	Remember, Understand, Apply, Analyse, Evaluate
				UnitVI:Theory of Errors	Remember, Understand, Apply, Analyse, Evaluate
2	I	PHY-HC-1026 Mechanics	Students completing the course will gain knowledge on Fundamentals of Dynamics,	UnitI: Fundamentals of Dynamics	Remember, Understand, Apply, Evaluate

			principles of work and energy, collisions, rotational dynamics, elasticity, fluid motion, gravitational and central force motion, oscillations as well as understand Non Inertial Systems and Special theory of relativity.	UnitII: WorkandEnergy	Remember, Understand, Apply, Analyse, Evaluate
				UnitIII:Collisions	Remember,Understand,Apply, Evaluate
				UnitIV:RotationalDynamics	Remember, Understand, Apply, Analyse, Evaluate
				UnitV:Elasticity	Remember, Understand, Apply
				UnitVI:FluidMotion	Remember , Understand,Apply
				UnitVII:Gravitationand CentralForceMotion	Remember, Understand, apply, Analyse, evaluate
				UnitVIII:Oscillations	Remember, understand, apply
				UnitIX:Non-InertialSystems	Remember, Understand, Apply, Analyse
				UnitX:Special TheoryofRelativity	Remember, Understand, Apply
3	II	PHY-HC-2016 Electricity & Magnetism	Oncompletionofthiscourse,studentswillbeabletounderstandelectricandmagneticfields in matter, Dielectric propertiesofmatter,magneticpropertiesofmatter,electromagneticinduction, applicationsofKirchhoff'slawindifferentcircuits,applicationsofnetworktheoremincircuits	UnitI:ElectricFieldand ElectricPotential	Remember, Understand, Apply, Analyse, Evaluate
				UnitII:DielectricPropertiesof Matter	Remember, Understand, Apply, Analyse, Evaluate, Create
				UnitIII:MagneticField	Remember, Understand, Apply, Analyse, Evaluate
				Unit IV: Magnetic PropertiesofMatter	Remember, Understand, Apply, Analyse, Evaluate
				Unit V: ElectromagneticInduction	Remember, Understand, Apply, Analyse, Evaluate

				UnitVI:ElectricalCircuits	Remember,Understand, Apply, Analyse,Evaluate, Create
				UnitVII:NetworkTheorems	Remember,Understand, Apply, Analyse,Evaluate, Create
				UnitVIII:BallisticGalvanometer	Remember,Understand, Apply, Evaluate
4	II	PHY-HC-2026 Waves and Optics	Thecourse will enablestudentstounderstandsuperpositionof harmonicoscillations,differenttypesofwave motions,superpositionofharmonicwaves,int erferenceandinterferometer,diffraction,holo-graphy	Unit I:SuperpositionofCollinear HarmonicOscillations	Remember,Understand, Apply,Analyse
				UnitII:SuperpositionofTwo Perpendicular HarmonicOscillations	Remember,Understand, Apply,Analyse,Evaluate
				UnitIII:WaveMotion	Remember,Understand, Apply,Analyse,Evaluate
				UnitIV: VelocityofWaves	Remember,Understand, Apply, Analyse
				Unit V: Superposition of TwoHarmonicWaves	Remember,Understand, Apply,Analyse,Evaluate
				UnitVI:WaveOptics	Understand, Apply, Analyse,Evaluate
				UnitVII:Interference	Understand, Apply,Analyse,Evaluate
				UnitVIII:Interferometer	Remember,Understand, Apply,Analyse,Evaluate
				Unit IX: Diffraction	Understand, Apply,Analyse,Evaluate
5	III	PHY-HC-3016	Aftersuccessfulcompletionofthecourse,studentswillbeabletosolve differential equation	UnitI:FrobeniusMetho dandSpecial	Remember,Understand, Apply,Analyse,Evaluate

		Mathematical Physics II	using powerseries solution method. The course will also enable students to understand different properties of matrix. Also students will be motivated to apply Fourier series for analysis of different types of periodic functions.	Functions	
				Unit II: Partial Differential Equations	Remember, Understand, Apply, Analyse, Evaluate
				Unit III: Some Special Integrals	Remember, Understand, Apply, Analyse, Evaluate
				Unit IV: Matrix	Remember, Understand, Apply, Analyse, Evaluate, Create
				Unit V: Fourier Series	Remember, Understand, Apply, Analyse, Evaluate
6	III	PHY-HC-3026 Thermal Physics	Students will have the knowledge and skills to identify and describe the statistical nature of concepts and laws in thermodynamics, in particular: entropy, temperature, thermodynamic potentials, Free energies, Maxwell's relations in thermo-dynamics, behaviour of real gases.	Unit I: Zeroth and First Law of Thermodynamics	Remember, Understand, Apply
				Unit II: Second Law of Thermodynamics	Remember, Understand, Apply, Evaluate
				Unit III: Entropy	Remember, Understand, Apply, Analyse, Evaluate
				Unit IV: Thermodynamic Potentials	Remember, understand, apply, evaluate
				Unit V: Maxwell's Thermodynamic relations	Remember, Understand, Apply, Evaluate
				Unit VI: Distribution of Velocities	Understand, Apply, Evaluate
				Unit VII: Molecular Collisions	Remember, Understand, Apply, Evaluate
				Unit VIII: Real Gases	Remember, Understand, Apply, Evaluate
7	III	PHY-HC-3036	After successful completion of the	Unit I: Introduction to CR	Remember, Understand, Apply,

		Digital Systems & Applications	course student will be able to understand the working principle and application of CRO, Integrated circuits, develop a digital logic and apply it to solve real life problems, Analyse, Design and implement combinational Logic circuits, Classify different semiconductor memories, Analyse, design and implement sequential logic circuits. Also students will be able to analyze digital system design using PLD, Simulate and implement combinational and sequential circuits.	O	Analyse..
				Unit II: Integrated Circuits	Remember & Understand.
				Unit III: Digital Circuits	Understand, Apply, Analyse.
				Unit IV: Boolean Algebra	Remember, Understand, Apply, Analyse, Evaluate.
				Unit V: Data Processing Circuits	Understand & Apply.
				Unit VI: Arithmetic Circuits	Understand, Apply, Analyse.
				Unit VII: Sequential Circuits	Understand, Apply, Analyse.
				Unit VIII: Timers-IC555	Understand & Apply.
				Unit IX: Shift Registers	Understand, Apply, Analyse.
				Unit X: Counters (4 bits)	Understand & Apply.
				Unit XI: Computer Organization	Remember, Apply, Analyse.
				Unit XII: Intel 8085 Microprocessor Architecture	Understand, Apply, Analyse.
				Unit XIII: Introduction to Assembly Language	Remember, Understand, Apply.
8	III	PHY-SE-3014 Physics Workshop Skills	The aim of this course is to enable the students to familiarize and experiment with various mechanical and electrical tools through hands-on mode.	Unit I: Introduction	Remember, Understand
				Unit II: Mechanical Skill	Remember, Understand, Apply & Analyse.
				Unit III: Electrical and Electronic Skill	Remember, Understand, Apply & Analyse.

				Unit IV: Introduction to prime movers	Remember, Understand, Apply, Analyse
9	IV	PHY-HC-4016 Mathematical Physics III	On successful completion of the course students will understand and gain knowledge on complex analysis and integration using residue theorem, applications of Fourier and Laplace transforms in solving differential equations, various properties of Tensor	Unit I: Complex Analysis	Remember, Understand, Analyse, Evaluate
				Unit II: Complex Integration	Remember, Understand, Analyse, Evaluate
				Unit III: Fourier Transforms	Remember, Understand, Apply, Analyse, Evaluate
				Unit IV: Laplace Transforms	Remember, Understand, Apply, Analyse, Evaluate
				Unit V: Tensor Algebra	Remember, Understand, Apply, Analyse, Evaluate
10	IV	PHY-HC-4026 Elements of Modern Physics	After completion of the course students will be able to learn modern development in Physics, starting from Planck's law, its development of the idea of probability interpretation and the Schrodinger equation. Students will also get idea of Structure of nucleus, Radioactivity, Fission and Fusion, Gas filled Detectors and Laser.	Unit I: Quantum Theory and Blackbody Radiation	Remember, Understand, Apply, Analyse, Evaluate
				Unit II: Uncertainty and Wave-Particle Duality	Remember, Understand, Apply, Evaluate
				Unit III: Schrödinger Equation	Remember, Understand, Apply, Evaluate
				Unit IV: One-dimensional Box and Step Barrier	Remember, Understand, Apply, Evaluate
				Unit V: Structure of the Atomic Nucleus	Remember, Understand, Apply, Evaluate
				Unit VI: Radioactivity	Remember, Understand, Apply, Evaluate
				Unit VII: Detection of nuclear radiation	Remember, Understand, Apply, Evaluate.

				UnitVIII:Fissionand Fusion	Remember, Understand, Apply,Evaluate
				UnitIX:Lasers	Remember, Understand, Apply,Evaluate
11	IV	PHY-HC-4036 Analog Systems & Applications	On completion of thecourse,studentswillbeabletounderstand about the physics ofsemiconductor: p-njunctionanddevices such as rectifier diodes,Zener diode, photodiode etc. andbipolarjunctiontransistors.Students will also learn transistorbiasing and stabilization circuits,theconceptoffeedbackinamplifiers andtheoscillatorcircuits and alsounderstandoperational amplifiersandtheirapplications.	UnitI:SemiconductorDiodes	Remember, Understand, Apply,Analyse.
				UnitII:Two-terminalDevicesandtheirApplications	Remember,Understand,Analyse, Evaluate.
				Unit III: Bipolar JunctionTransistors	Understand,Apply,Analyse.
				UnitIV:Amplifiers	Remember,Understand,Apply, Analyse,Evaluate.
				UnitV:CoupledAmplifier	Understand,Apply,Analyse.
				UnitVI:FeedbackinAmplifiers	Remember,Apply,Analyse.
				UnitVII:SinusoidalOscillators	Understand,Apply,Analyse.
				UnitVIII:OperationalAmplifiers	Understand&Apply.
				Unit IX: Applications of Op-Amps	Understand,Apply,Analyze, Create
				Unit X:Conversion	Remember,understand,Apply.
12	IV	PHY-SE-4014 Basic Instrumentation Skills	The aim of the course is to get exposure with various aspects of instruments and their usage	UnitI: Basic of Measurement	Remember, Understand, Apply,Analyse.
				UnitII: Electronic Voltmeter	Remember,Understand,Analyse,

			through hands-on mode.		Evaluate.
				Unit III: Cathode Ray oscilloscope	Understand,Apply,Analyse.
				UnitIV:Use of CRO for the measurement of voltage	Remember,Understand,Apply,Analyse,Evaluate.
				UnitV: Signal Generators and Analysis Instruments	Understand,Apply,Analyse.
				UnitVI:Impedance Bridges & Q-Meters	Remember,Apply,Analyse.
				UnitVII: Digital Instruments	Understand,Apply,Analyse.
				UnitVIII: Digital Multimeter	Understand&Apply.
13	V	PHY-HC-5016 Quantum Mechanics and Applications	After completion of the course students will be able to understand the principles in quantum mechanics, such as the Schrödinger equation, the wave function, the uncertainty principle, as well as the relation between quantum mechanics and linear algebra. Students will be able to solve the Schrödinger equation for hydrogen atom. Students will understand the concepts of angular momentum and spin, as well as the rules for quantization and addition of these, spin-orbit coupling and Zeeman Effect.	Unit I: Time Dependent Schrödinger Equation	Remember, Understand,Apply,Analyse,Evaluate
				Unit II: Time Independent Schrödinger Equation	Remember, Understand,Apply,Analyse,Evaluate
				UnitIII: Bound States	Remember, Understand,Apply,Analyse,Evaluate
				UnitIV:Hydrogen-like Atoms	Remember, Understand,Apply,Analyse,Evaluate
				UnitV:Atoms in Electric & Magnetic Fields	Remember, Understand,Apply,Analyse,Evaluate

				UnitVI:ManyElectronAtoms	Remember, Understand,Apply,Analyse,Evaluate
14	V	PHY-HC-5026 Solid State Physics	On successful completion of the course students should be able to explain the main features of crystal lattices and phonons, understand the elementary lattice dynamics and its influence on the properties of materials, describe the main features of the physics of electrons in solids; explain the dielectric, ferroelectric and magnetic properties of solids and understand the basic concepts in superconductivity.	UnitI:CrystalStructure	Remember, Understand,Apply,Analyse,Evaluate
				Unit II: Elementary Lattice Dynamics	Remember, Understand,Apply,Analyse,Evaluate
				Unit III: Magnetic Properties of Matter	Remember, Understand,Apply,Analyse,Evaluate
				Unit IV : Dielectric Properties of Materials	Remember, Understand,Apply,Analyse,Evaluate
				Unit V : Ferroelectric Properties of Materials	Remember, Understand,Apply,Analyse,Evaluate
				Unit VI : Free Electron Theory of Metals	Remember, Understand,Apply,Analyse,Evaluate
				UnitVII:Superconductivity	Remember, Understand,Apply,Analyse,Evaluate
15	V	PHY-HE-5046 Physics of Devices and Instruments	Upon completion of this course, students will be able to gain knowledge on advanced electronics devices such as UJT, JFET, MOSFET, CMOS etc., detailed process of IC fabrication, Digital Data serial and parallel Communication Standards along with the understanding of communication systems.	Unit I: Devices	Remember, understand, apply
				Unit II: Power supply and Filters	Remember, understand, apply,
				Unit III: Active and Passive Filters	Remember, understand, apply, analyse, evaluate, Create
				Unit IV: Multivibrators	Remember, understand, apply, analyse, evaluate
				Unit V: Phase Locked Loop(PLL)	Remember, understand, apply, analyse

				Unit VI: Processing of Devices	Remember, understand, apply, analyse
				Unit VII: Digital Data Communication Standards	Remember, understand, apply, analyse
				Unit VIII: Introduction to communication systems	Remember, understand, apply
16	V	PHY-HE-5056 Nuclear and Particle Physics	On completion of this course, students will have the understanding of the subatomic particles and their properties. They will gain knowledge about the different nuclear techniques and their applications in different branches of Physics and societal application. The course will develop problem based skills and acquired knowledge can be applied in the areas of nuclear, medical, and other interdisciplinary fields of Physics and Chemistry.	Unit I: General Properties of Nuclei	Remember, understand, apply
				Unit II: Nuclear Models	Remember, understand
				Unit III: Radioactivity decay	Remember, understand, apply, analyse, evaluate
				Unit IV: Nuclear Reactions	Remember, understand, apply, analyse, evaluate
				Unit V: Interaction of Nuclear Radiation with matter	Remember, understand, apply, analyse
				Unit VI: Detector for Nuclear Radiations	Remember, understand, apply, analyse
				Unit VII: Particle Accelerators	Remember, understand, apply, analyse
				Unit VIII: Particle physics	Remember, understand
17	VI	PHY-HC-6016 Electromagnetic Theory	On successful completion of the course students will understand the concepts of Maxwell's equations, propagation of electromagnetic (EM) waves in different media production and detection of different types of polarized EM	Unit I: Maxwell Equations	Remember, understand, Evaluate, apply
				Unit II: EM Wave Propagation in Unbounded Media	Remember, understand, Evaluate, apply

			waves,general informationas waveguidesandfibreopectics	Unit III: EM Wave in BoundedMedia	Remember, understand, Evaluate,apply
				Unit IV: Polarization ofElectromagn eticWaves	Remember, understand, Evaluate,apply
				Unit V: Rotatory Polarization	Remember, understand, Evaluate, apply
				Unit VI: Optical Fibres	Remember, understand, apply, Create
18	VI	PHY-HC-6026 Statistical Mechanics	Onsuccessfulcompletionofthecoursestuden tswilllearnthetechniques of Statistical Mechanicsto apply in various fields includingAstrophysics,Semi- conductors,Physics,Bio- Physics,Chemistryetc..	UnitI:ClassicalStatistics	Remember,understand,apply
				Unit II: Classical Theory ofRadiation	Remember,understand,apply
				UnitIII:Quantum Theoryof Radiation	Remember,understand,apply
				Unit IV: Bose- EinsteinStatist ics	Remember,understand,apply
19	VI	PHY-HE-6046 Astronomy and Astrophysics	Upon completion of this course, students will be able to understand the origin and evolution of the Universe. The course will give a comprehensive introduction on the measurement of basic astronomical parameters such as astronomical scales, luminosity and astronomical quantities as well as an overview on key developments in observational astrophysics. Students will have the idea of the instruments implemented for astronomical observation, the formation of planetary system and its	Unit I: Stellar properties	Remember, understand, apply,analyse,evaluate
				Unit II: The Sun and the solar system	Remember,understand,apply
				Unit III: Positional Astronomy	Remember,understand,apply, analyse
				Unit IV: Astronomical Techniques	Remember,understand,apply, analyse

			evolution with time, the physical properties of Sun and the components of the solar system; and stellar and interstellar components of our Milky Way galaxy. Students will also have the understanding of the origin and evolution of galaxies, presence of dark matter and large scale structures of the Universe.	Unit V: Galaxies	Remember, understand, apply
				Unit VI: Large Scale Structure and cosmology	Remember, understand, analyse
20	VI	PHY-HE-6056 Classical Dynamics	Upon completion of this course, students will understand and gain knowledge on Newton's Laws of Motion, Special Theory of Relativity by 4-vector approach and fluids. Students will also have the understanding of Lagrangian and Hamiltonian mechanics.	Unit I: Classical Mechanics of Point Particles	Remember, understand, apply, analyse, evaluate
				Unit II: Small Amplitude Oscillations	Remember, understand, apply
				Unit III: Special Theory of relativity	Remember, understand, apply, analyse
				Unit IV: Fluid Dynamics	Remember, understand, apply, analyse, evaluate

v. BSc Statistics

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Build the basis for pursuing higher studies leading to post graduate or doctorate degrees.
2. Become equipped with skill enhancement courses with statistical packages such as M.S Excel, SPSS, R-language, and C/C++.
3. Become acquainted with a range of career paths in fields/organisations like academics, research, Indian Administrative Services, Indian Statistical/Economic Services, Banks and Insurance Sectors, Central Statistical Office, National Sample Survey Office, investigative work in government organisations such as NCAER, ICMR, IAMR, Statistical and Economic Bureau and various PSUs, market research, actuarial sciences, bio statistics, and demography.
4. Explore career options like stock broker analyst, sports analyst, poll analyst, business analyst and financial analyst.

Course Outcomes

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT /CHAPTER	BLOOM'S TAXONOMIC LEVELS
1	I	STA-HC-1016 Descriptive Statistics	<p>Students will acquire knowledge on:-</p> <ol style="list-style-type: none"> 1. Statistics and its scope and importance in various areas such as Medical, Engineering, Agriculture and Social Science etc. 2. Various types of data, organization of data, tabular and graphical representation of data, evaluation of summary measures such as measures of central tendency and dispersion etc. 3. Concept of correlation, various correlation coefficients- Pearson's correlation coefficient, Spearman's rank correlation coefficient, partial correlation coefficient and Multiple correlation coefficient. 4. Concept of Principle of least squares for curve fitting and regression lines. 5. The idea and Construction of different types of Index numbers 	1	Remembering & Understanding
				1 and 2	Understanding, Applying & Analyzing
				3	Understanding, Applying & Analyzing
				4	Understanding & Applying
2	I	STA-HC-1026 Calculus	<p>Students will acquire knowledge on:-</p> <ol style="list-style-type: none"> 1. Limits on function, continuous function, Partial and total differentiation, L Hospital's rule. 	1	Remembering, Understanding & Applying
				2	Understanding & Applying
				3	Understanding & Applying

			<p>2. Leibnitz's rule for successive differentiation, Euler's theorem, maxima and minima of functions of one and two variables.</p> <p>3. Integral Calculus, Definite Integral, Double Integral, Beta and Gamma functions.</p>	4	Understanding & Applying
			<p>4. Differential equation of first order and higher order.</p> <p>5. Partial differential equations, their formation and solution</p>		
3	II	STA-HC-2016 Probability and Probability Distribution	<p>Students will acquire knowledge :-</p> <p>1. To distinguish between random and non random experiments.</p> <p>2. on probabilities of events, calculation of probability of event by mathematical approach, calculation of inverse probability by Bayes theorem.</p> <p>3. On discrete and continuous random variable and their probability distribution including expectation and moments.</p> <p>4. On discrete distribution such as Binomial, Poisson, Geometric, Negative Binomial, Hyper geometric, and on continuous distribution such as normal, exponential, uniform, etc.</p>	1	Remembering, Understanding, Applying & Analyzing
				2 & 3	Understanding, & Applying
				4	Remembering, Understanding & Applying

4	II	STA-HC-2026 Matrices	<p>Students will acquire knowledge :-</p> <ol style="list-style-type: none"> 1. On relation between roots and coefficients of any polynomial equation, to solve bi-quadratic and cubic equations when some conditions on roots of equations are given, knowledge on vector space and linear dependence and independence of vectors, spanning vector space. 2. On fundamental concepts of matrices and determinants, ranks of matrix, characteristics root and characteristics vectors, quadratic form etc. 	1	Remembering & Applying
				2,3 & 4	Understanding & Applying
5	III	STA-HC-3016 Sampling Distribution	<p>Students will acquire knowledge on :-</p> <ol style="list-style-type: none"> 1. Order statistic and related sampling distributions. 2. Parameter statistic, statistical hypothesis, basic principles underlying test of significance (large and small sample test) with applications. 3. Derivation of exact sampling distribution of statistics like “t”, Chi-square and “F”. 	1	Remembering & Understanding
				2	Understanding & Applying
				3 & 4	Remembering, Understanding & Applying
6	III	STA-HC-3026	Students will acquire knowledge on:-	1	Remembering & Understanding

		Survey Sampling & Indian Official Statistics	<ol style="list-style-type: none"> 1. Population, sample, difference between census and sample survey. 2. Sampling error and non sampling error. 3. The principles of sample survey and different techniques of drawing random sample such as simple random sampling, stratified random sampling, systematic sampling, cluster sampling, double sampling etc and situations where these are applicable. 	1 & 2	Understanding & Applying
				2	Understanding & Applying
				3	Understanding & Applying
			<ol style="list-style-type: none"> 4. Probability proportional to size sampling 5. Auxiliary variable and the use of it in ratio and regression method of estimation for estimating population parameters. 6. Sources of Official statistics, methods of collection of Official Statistics in India under MoSPI. 	4	Understanding
7	III	STA-HC-3036 Mathematical Analysis	<p>Students will acquire knowledge on:-</p> <ol style="list-style-type: none"> 1. Representation of real numbers, identifying sequences of real numbers and their properties. 2. Sequences and different test to study their convergence and divergence, Limits of sequence 3. Infinite series and their convergence. 4. Limits, continuity and differentiability 	1	Remembering, Understanding & Applying
				2	Understanding & Applying
				3	Understanding & Applying
				4	Understanding & Applying

			<p>5. Finite difference, divided difference, interpolation, extrapolation and different methods of interpolation</p> <p>6. Difference equation and their solutions.</p>		
8	III	STA-SE-3014 Statistical Data analysis using software packages	<p>Students will acquire knowledge on:-</p> <ol style="list-style-type: none"> 1. How to handle data and its analysis using software packages such as ms excel, spss, mini tab, mat lab 2. Loading data, plotting a graph, viz. histogram, box plot, stem leaf, frequency polygon, pie chart and ogive. 3. Generating automated reports:- Descriptive Statistics, correlation and line of regression 4. Random number generation and sampling procedures, curves. Application problems based on fitting of suitable distribution, normal probability plot. 5. Creating and managing statistical analysis projects, imports data, code, editing, basics of statistical inferences, p-values and confidence intervals. 	1	Remembering, Understanding & Applying
				2	Remembering, Understanding & Applying
				3	Remembering, Understanding & Applying
				4	Remembering, Understanding & Applying
9	IV	STA-HC-4016 Statistical Inference	<p>Students will acquire knowledge on:-</p> <ol style="list-style-type: none"> 1. Idea of point estimation and criteria for a good estimator. 	1	Remembering, Understanding & Applying
				2	Remembering, Understanding & Applying

			<ol style="list-style-type: none"> 2. Cramer Rao inequality, Rao Blackwell and Lehman Scheff theorems and their application in minimum variance bound estimator. 3. Different methods of estimation 4. Statistical hypothesis, type I and type II errors. 5. The concept of optimum tests under different situations. 6. The concept of likelihood ratio test and its important properties. 7. Sequential Probability Ratio Test (SPRT). 	3	Remembering, Understanding & Applying
				4	Remembering & Understanding
10	IV	STA-HC-4026 Linear Models	<p>Students will acquire knowledge on:-</p> <ol style="list-style-type: none"> 1. Linear Estimation, use of Gauss Markov set up in estimation of parameters, Gauss Markov theorem. 2. Regression and simple linear regression model, testing of hypothesis in case of simple regression model. 3. Analysis of variance(ANOVA), Different type of models in ANOVA. 4. How to carry out ANOVA and Analysis of Covariance for one way and two classified data. 5. How to predict from a fitted model. 	1	Understanding & Applying
				2	Understanding & Applying
				3	Understanding & Applying
				4	Understanding & Analyzing
11	IV	STA-HC-4036 Statistical Quality Control	<p>Students will be able to understand :-</p>	1	Understanding
				2	Understanding & Applying

			<ol style="list-style-type: none"> 1. The meaning of quality and its dimension 2. How the concept of quality arises since World War II. 3. How to construct control charts for variables and attributes to determine whether the given quality of the product is under control or not. 4. Sampling inspection plan in product control. 5. The concept of six sigma. 	3	Understanding & Applying
				4	Understanding
12	IV	STA-SE-4014 Statistical Data Analysis using R	<p>Students will be able to learn :-</p> <ol style="list-style-type: none"> 1. How to load data and do analysis through graphical representation. 2. To generate automated reports with detailed descriptive statistics, correlation and lines of regression. 3. Random number generation, sampling procedures viz. SRSWR and SRSWOR and fitting of suitable distributions and their applications. 4. Basics of statistical inference viz. testing of hypothesis and confidence intervals. 	1	Understanding & Applying
				2	Understanding & Applying
				3	Understanding & Applying
				4	Understanding & Applying
13	V	STA-HC-5016 Stochastic Processes and Queuing Theory	<p>Students will acquire knowledge on:-</p> <ol style="list-style-type: none"> 1. Generating functions, bivariate probability generating functions, and Stationary Processes 	1	Remembering, Understanding & Applying
				2	Remembering, Understanding & Applying
				3	Understanding & Applying

			<ol style="list-style-type: none"> 2. Markov chains including the notion of transition probability matrix, classification of States and chains. 3. Poisson process, its properties and application in real life problem. 4. Different types of queuing models and waiting time distribution. 	4	Understanding & Applying
14	V	STA-HC-5026 Statistical Computing using C/C++ Programming	<p>Students will acquire knowledge on:-</p> <ol style="list-style-type: none"> 1. Basic structure of C programming language with different data types 2. Different types of operators(viz. arithmetic, relational, logical etc) and their expressions. 3. Loops and arrays used in C programming. 	1	Remembering, Understanding & Applying
				2	Remembering, Understanding & Applying
15	V	STA-HE-5016 Operations Research	<p>Students will acquire knowledge on :-</p> <ol style="list-style-type: none"> 1. Operation research (O.R), its history, various types of O.R problems. 2. Mathematical formulation of LPP, solution of LPP by graphical and simplex method. 3. Transportation problem and its initial and optimal solution using different methods. 4. Game theory including rectangular game and its solution by different method. 5. Inventory, their types, characteristics and inventory control system. 	1	Remembering & Applying
				2	Understanding & Applying
				3	Understanding & Applying
				4	Understanding & Applying

15	V	STA-HE-5026 Time Series Analysis	<p>Students will acquire knowledge on :-</p> <ol style="list-style-type: none"> 1. Time series data, its application to various fields and components of time series. 2. Estimation of trend, seasonal variation, cyclical variation and irregular variations using different methods. 3. Forecasting by exponential smoothing. 	1	Understanding
				1, 2, 3 & 4	Understanding & Applying
				4	Understanding & Analyzing
16	VI	STA-HC-6016 Design of Experiments	<p>Students will acquire knowledge on :</p> <ol style="list-style-type: none"> 1. Design of experiments, its terminology and basic principles. 2. Construction of standard designs such as Completely Randomized design, Randomized Block Design and Latin Square Design and their application to analyze experimental data using ANOVA technique. 3. Relative efficiency of CRD, RBD and LSD and analysis of RBD and LSD with one missing observation. 4. Strip Plot Design, Split Plot Design and Incomplete Block Design. 5. Construction and analysis of 2^n ($n \leq 5$) factorial design, 3^2 design. 6. Confounding, construction of total and partially confounded design for 2^n ($n \leq 5$). 	1	Understanding, Applying & Analyzing
				2	Understanding, Applying & Analyzing
				3	Understanding, Applying & Analyzing

17	VI	STA-HC-6026 Multivariate Analysis and Non- Parametric Methods	Students will acquire knowledge on :- 1. Bivariate normal distribution along with their properties. 2. Multivariate normal distribution and their properties. 3. Partial and multiple correlation and their properties. 4. Nonparametric method of testing of hypothesis.	1	Remembering, Understanding & Applying
				2	Understanding & Applying
				3	Understanding & Applying
18	VI	STA-HE-6026 Demography and Vital Statistics	Students will be able to know: 1. The different sources for collection demographic data and its errors. 2. The use of balancing equation for population change. 3. Population composition and dependency ratio. 4. The basic measures of mortality, fertility and population growth. 5. The concept of stable and Stationary population. 6. The concept of life table and their construction.	1	Understanding & Applying
				2 & 4	Understanding & Applying
				3	Understanding & Applying

vii. BSc Zoology

Programme Specific Outcomes

After the completion of the programme, a student will be able to:

1. Attain a broad understanding of animal diversity, including scientific classification, evolutionary relationships among animals, and the adaptations they show.
2. Learn about ecology, the relationship between biological, chemical, and physical factors of the environment, and the need for wildlife conservation and management.
3. Understand how organisms function at the levels of gene, genome, cell, tissue, organ, and organ-system, drawing upon the knowledge of which they will be able to comprehend histology and the comparative anatomy of the organisms.
4. Understand the development, growth, reproduction, structural and physiological adaptations, and behavior of different forms of animal life.
5. Comprehend the relationships between structure and function at different levels of biological organization (e.g., molecules, cells, organs, organisms, populations, and species) in animals and their coordinated functions (physiological, biochemical, endocrine, and immune system).
6. Understand biological techniques, bioinformatics, and the application of statistics in biological science.
7. Acquire knowledge and understanding of applied biological sciences and economic zoology, viz., sericulture, apiculture, aquaculture, lac culture, and pest management for expanding career options.
8. Think logically based on the knowledge gathered, undertake research projects, assimilate and analyze data and ideas, and draw conclusions, steps necessary for preparing project reports.

Course Outcomes:

SL. NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOMES	UNIT /CHAPTER	BLOOM'S TAXONOMIC LEVELS
1	I	ZOO-HC-1016 NonCordates-1	Students are able to understand about the characters and classification and life cycle of various Protista, Porifera, Cnidaria, Ctenophora, Platyhelminthes and Nematohelminthes	1, 2, 3, 4, 5, 6	Remembering, Understanding
2		ZOO-HC-1016 NonCordates-1(Practical)	Students are able to understand and learn how to prepare whole mount, life cycle of various organisms included under above mentioned kingdoms and phyla.	1,2,3,4,5,6,7,8	Understanding, Analyzing, Applying
3		ZOO-HC-1026 Principle of Ecology	Students are able to understand about the basic principle with special reference to population community and ecosystem. At the same time in applied ecological part student will be aware with the process of wildlife conservation and management.	1,2,3,4 5	Remembering, Understanding Remembering, Understanding, Analyzing
4		ZOO-HC-1026 Principle of Ecology (Practical)	Through the practical study students will come to know about the practical use of various population characteristics, community and ecosystem services. Visits to National park/Biodiversity Park/wildlife sanctuaries will give them live study of ecology.	1,2,3 4	Understanding, Analyzing, Applying Understanding, Analyzing
5	II	ZOO-HC-2016 Non-Chordates II:Coelomates	Students are able to understand about the characters and classification, social life and evolutionary significance of Coelomates.	1,2,3,4,5,6	Remembering and Understanding
6		ZOO-HC-2016	Students are able to understand about the museum specimen, anatomical and	1,2,3,4, 5	Understanding, Analyzing, Applying

		Non-Chordates li:Coelomates (Practical)	morphological structure andpreparationofslide.		Understanding, Analyzing, Evaluating, Applying
7		ZOO-HC-2026 CellBiology	Students are able to understand about the structure andfunction of cell and cellular organelles, process of celldivision andcell communication.	1,2,3,4,5,6 7,8	Understanding, Remembering Understanding, Analyzing
8		ZOO-HC-2026 CellBiology (Practical)	Studentsareabletounderstandaboutthepre parationofvariousstainsandfixatives,deter minationofprotein,mucopolysaccharidesan dchromosome	1,2,3,4	Understanding, Analyzing, Applying
9	III	ZOO-HC-3016 Diversity of Chordata	Studentsareabletounderstandaboutthegen eralcharacteristics,classification,metamor phosisandanimal distribution.	1,2,3,4,5,6,7,8,9,10	Understanding, Remembering
		ZOO-HC-3016 Diversity of Chordata (Practical)	Studentsareabletounderstandaboutthegen eralcharacteristics,classification,metamor phosisandanimal distribution.	1,2,3,4,5,6,7	Understanding, Analyzing, Applying
		ZOO-HC-3026 Animal Physiology:Controlling andCoordinatingSystems	Studentsareabletounderstandtheentireani malfunctionsofthebodywhichincludesnutri tion.Respiration, heart, excretion, nerve physiology etc inwhichallstructure,function,processandco ntrol.	1,2,3,4,5,6	Understanding, Analyzing
10		ZOO-HC-3026 Animal Physiology:Controlling andCoordinatingSystems (Practical)	Students are able to understand and learned about thevarious microscopic procedures including microtomy,permanentslidesstudy.	1,2,3,4	Analyzing, Applying
11		ZOO-HC-3036 Fundamentals ofBiochemistry	Studentsareabletounderstandallthebioche micalcomponents of the body system are studied. It helps thestudent to get a view about the chemical	1,2,3,4,5	Understanding, Analyzing, Applying

			compositionsofdifferentchemicalcompoun dssuchasenzymes,hormonesandothersecre tions.Italsoincludesthepathway and chemical which are responsible for theenergyproductioninour body		
12		ZOO-HC-3036 Fundamentals ofBiochemistry (Practical)	Studentsareableto understand andlearned varioustechnique of separation and determination of protein,lipid,carbohydratesetc.	1,2,3,4,5	Analyzing, Applying
13	IV	ZOO-HC-4016 Comparative Anatomy ofVertebrates	Students are able to understand about the comparativestructuresofheart,aoticarches, kidney,balancingorgan, hearing organ, thyroid, respiratory organs, brainofdifferentanimalswhich givethem adefiniteideanotonlythestructurebutalsoh estructuraldevelopmentofthatorganandho wtheybecomemodifiedaccordingtotheirne edandenvironment.	1,2,3,4,5,6,7,8	Remembering, Understanding, Analyzing
14		ZOO-HC-4016 ComparativeAnatomy ofVertebrates (Practical)	Studentsareableto understandand learnedvariousskeletal parts of different organisms and their structuralcomponent.	1,2,3,4,5, 6	Understanding, analyzing, Applying, Analyzing, Applying
15		ZOO-HC-4026 Animal Physiology:Life SustainingSystems	Theentireanimalsfunctionsofthebodyarest udiedinthispart.Itincludesnutrition,Respira tion,heart,excretion, nerve physiology etc in which all structure,function,processandcontrol.	1,2,3,4,5	Understanding, Analyzing, Applying
16		ZOO-HC-4026 Animal Physiology:Life SustainingSystems (Practicals)	Students will be able to learn to determine the blood group, haemoglobin content, enumerate the RBC and WBC count and able to measure the blood pressure. Moreover, they will e able to examine the	1,2,3,4,5,6	Analyzing, Applying

			histological slides of different organ of mammalian tissues.		
17		ZOO-HC-4036 Animal Physiology:Biochemistry ofMetabolicProcesses	Studentsareabletounderstandmetabolicpr ocessincludingcarbohydrates,lipidandprote inandalsoATPproduction.	1,2,3,4,5	Analyzing, Understanding
18		ZOO-HC-4036 Animal Physiology:Biochemistry ofMetabolicProcesses (Practical)	Studentsareabletolearnvariousessaysfroms erumandtissues.	1,2,3,4,5	Analyzing, Applying
19	V	ZOO-HC-5016 MolecularBiology	Studentsare able to understand indetailsaboutthenucleic acid, DNA replication, Protein synthesis and itsmodificationandgeneregulation.	1,2,3,4,5,6,7,8	Understanding, Analyzing
20		ZOO-HC-5016 MolecularBiology (Practical)	Studentsareableto understandabout the estimationofDNA,RNAandproteinsynthesis .	1,2,3,4,5,6	Analyzing, Applying
21		ZOO-HC-5026 Principles ofGenetics	Students are able to understand about the Mandelianinheritance,interactionofgenes, mutationanditseffects.	1,2,3,4,5,6,7,8	Understanding, Analyzing
22		ZOO-HC-5026 Principles ofGenetics(Practical)	Studentsareabletolearnaboutthepedigreea nalysis,geneinteractionstudy.	1,2,3,4,5,6	Analyzing, Applying

23		ZOO-HE-5016 Computational Biology and Biostatistics	Students are able to learn different tools used in bioinformatics and their practical usage	1,2,3,4,5,6	Understanding, Analyzing
24		ZOO-HE-5016 Computational Biology and Biostatistics (Practical)	Students will have a practical hand on experience on retrieval of sequences from the databases, construction of phylogenetic tree, prediction of protein structure, performing statistical test.	1,2,3,4,5,6	Analyzing, Applying
25		ZOO-HE-5036 Endocrinology	Students are able to learn different endocrine glands, their function and secretion, diseases related to endocrine gland, hormonal regulation etc.	1,2,3,4	Understanding, Analyzing
26		ZOO-HE-5036 Endocrinology (Practical)	Students are able to identify different endocrine gland through permanent slide study.	1,2,3,4	Analyzing, Applying
27	VI	ZOO-HC-6016 Developmental Biology	Students are able to acquire a thorough knowledge of embryonic development along with the factors affecting it.	1,2,3,4,5	Understanding, Analyzing
28		ZOO-HC-6016 Developmental Biology (Practical)	Students will be able to learn different developmental stages through microscopic study of permanent slides and also from culture based study of certain animals.	1,2,3,4,5	Analyzing, Applying
29		ZOO-HC-6026 Evolutionary Biology	Students are able to learn different concept of evolution, fossils, process of speciation and population genetics	1,2,3,4,5,6,7,8,9	Understanding, Remembering, Analyzing
29		ZOO-HC-6026 Evolutionary Biology (Practical)	Students are able to learn different types of fossils, application of Hardy-Weinberg principle and construction of phylogenetic tree.	1,2,3,4,5	Analyzing, Applying

30		ZOO-HE-6016 Biology of Insecta	Students are able to learn general features of insects their classification, physiology, insect society their importance, insect plant interaction etc.	1,2,3,4,5,6	Understanding, Remembering
31		ZOO-HE-6016 Biology of Insecta (Practical)	Students are able to identify different kinds antennae, legs, mouthparts, wings and their preservation, collection etc.	1,2,3,4,5,6,7,8,9	Understanding, Analyzing
32		ZOO-HE-6056 Dissertation	Acquire practical knowledge and get the hands on practice in the various Biological science. This will help the students to persue research further in their desired field.		Applying, Analyzing

3. Programme Outcome: BBA Outcomes

- BBA is a three year degree course, which can be pursued by students, after passing higher secondary examination from any stream (science, arts or commerce).
- The programme is designed to cultivate entrepreneurial skills, understand corporate work culture as well as to prepare one for various challenges related to career and life at large.
- After completion of the course, students can opt for various higher studies such as MBA, LAW, Civil services etc.

Course Outcome

SL NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOME	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	ENG-AE-1014 Business communication	To enhance communication skills among students and develop speaking as well as writing ability.	Business Letters, Different types of communication	Understanding Applying Creating
2		BBA-HC-1026 Principles of management	To make students aware of the basics of management studies.	Management Concept Management principles	Remembering Understanding
3		BBA-HC-1036 Managerial economics	To introduce students to various concepts of micro and macro economics.	Demand, supply, market, firm.	Remembering Understanding
4		BBA-HG-1046 Mathematical techniques in business	To make students aware of the various mathematical tools used in modern business.	Arithmetic progression, determinants, matrices, calculus.	Remembering Understanding Evaluating Applying

					Analyzing
5	II	ENV-AE-2014 Environmental Science	To make students aware of sustainable development and conservation of our environment at large.	Ecosystem, Sustainable management	Remembering Understanding Applying
6		BBA-HC-2026 Financial accounting	Introducing students to the basics of accounting procedures	Double entry system, Final accounts	Remembering Understanding Evaluating Applying Analyzing
7		BBA-HC-2036 Statistics for business decisions	Introducing students to various statistical methods used in business	Probability, Correlation, Regression, time series, measures of central tendency	Remembering Understanding Evaluating Applying Analyzing
8		BBA-HC-2046 Indian economic scenario	Making students aware of the various economic plans undertaken at various govt and private levels	Business environment, GATT, WTO, Govt. Budget, Planning in India	Remembering Understanding
9		BBA-HG-2056 Computer fundamentals	Introducing the basics of computers among students	Operating system, Basic commands, Information Technology	Remembering Understanding Applying
10	III	BBA-HC-3016 Cost & management accounting	Introducing various costing techniques used in management and manufacturing process	Cost elements, Budgets and Budgetary control , standard costing	Remembering Understanding Evaluating Applying Analyzing

11		BBA-HC-3026 Human resource management	Introducing the basics of HRM to students	Human resource management, Training, industrial relations	Remembering Understanding
12		BBA-HC-3036 Personality & Personal skill development	Helps in developing the personality of students	Personality, Career development, business etiquettes	Remembering Understanding Applying
13		BBA-HG-3046 Operations management & control	Introducing the various plant layout and machine related activities	Production management, material management, Facility location	Remembering Understanding Evaluating Applying Analyzing
14		BBA-SE-3054 Computer applications	Introducing students to computerised accounting such as Tally	Word processing, Database management system, Tally	Remembering Understanding Applying
15	IV	BBA-HC-4016 Organisational behaviour & industrial psychology	To make students aware of the various ethics prevalent in an industry	Individual behaviour, Learning, Interpersonal behaviour, Organizational issues, Industrial Psychology	Remembering Understanding
16		BBA-HC-4026 Financial management	Introducing students to various finance related activities and its applications	Capital structures, working capital management, long term investment decisions	Remembering Understanding Evaluating Applying Analyzing

4. Programme Outcomes: BSc (Information Technology)

Students who choose BSc(IT) programme develop the ability to think critically, logically ,analytically and to use and apply current technical concepts and practices in the core development of solutions in the form of Information technology.The knowledge and skills gained with a degree in Computer Science prepare graduates for a broad range of jobs in education, research, government sector, business sector and industry.

Programme Specific Outcomes

After completion of the Programme, the student will be able to:

1. To communicate technical information both orally and in writing.
2. Apply the knowledge gained in core courses to a broad range of advanced topics in computer science, to learn and develop sophisticated technical products independently.
3. To design, implement and evaluate computer-based system process, component, or program to meet desired needs by critical understanding analysis and synthesis.
4. Identify applications of Computer Science in other fields in the real world to enhance the career prospects.
5. Realize the requirement of lifelong learning through continued education and research.
6. Use the concepts of best practices and standards to develop user interactive and abstract application.
7. Understand the professional, ethical, legal, security, social issues and responsibilities.

Course Outcomes

SL NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOME	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	Computer Fundamental and Programming (ITB- HC-1016)	<p>Upon completion of this course the student will be able to :</p> <p>a. Converse in basic computer terminology.</p> <p>b. Formulate opinions about the impact of computers on society.</p> <p>c. Possess the knowledge of basic hardware peripherals.</p> <p>d. Know and use different number system and the basics of programming. Able to perform the conversion among different number systems Binary, Hexadecimal, Octal, BCD, and conversions of number systems. 1's complement and 2's complement representation</p> <p>e. Understood what ASCII is. EDCDIC and Gray codes</p> <p>e. Discover their interests in C programming and solve basic computational problems with C language.</p>	1.Fundamentals of computer system	Remembering, Understanding
				2.Introduction to C	Remembering, Understanding,Applying, Analyzing, Evaluating, Creating
				3.Arrays and pointers	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				4.Searching and Sorting	Remembering, Understanding, Applying, analyzing, Evaluating, Creating

				5.Structures and Files	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
2	I	ICT Hardware (ITB-HG-1016)	<p>Upon completion of this course the student will be able to :</p> <p>a. Indicate the names and functions of hardware ports and the parts of the motherboard.</p> <p>b. Identify the names and distinguishing features of different kinds of input and output devices.</p> <p>c. Describe how the CPU processes data and instructions and controls the operation of all other devices.</p> <p>d. Identify the names, distinguishing features, and units for measuring different kinds of memory and storage devices.</p> <p>e. Search your personal computer for the various hardware components it contains.</p>	1.Evolution of Computer System	Remembering, Understanding
				2.Hard Disk Drive	Remembering, Understanding
				3.Theory of operation	Remembering, Understanding
				4.Processor	Remembering, Understanding
				5.SMPS,BIOS,Networking	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
3	I	ENG-AE-1014	<p>Upon completion of this course the student will be able to :</p>	1.Communication:Theory and Types	Remembering, Understanding, Applying

			<p>a. Introduce the theory, fundamentals and tools of communication.</p> <p>b. To help to become an independent users of English language.</p> <p>c. Develop in them vital communication skills which are integral to their personal, social and professional interactions</p> <p>d. Become a proficient in professional communication such as interviews, group discussions, office environments, important reading skills as well as writing skills such as report writing, note taking etc.</p>	2.Speaking skills	Remembering, Understanding, Applying
				3.Reading and Understanding	Remembering, Understanding, Applying
				4.Writing skills	Remembering, Understanding, Applying
4	I	Mathematics-I (ITB-HC-1026)	<p>Upon completion of this course the student will be able to:</p> <p>a) Perform operations on various discrete structures such as sets, functions, relations, and sequences.</p> <p>b) Ability to solve problems using Counting techniques, Permutation and Combination, Recursion and generating functions.</p> <p>c) Apply algorithms and use of graphs and trees as tools to visualize and simplify Problems.</p> <p>d) Use of K-Maps and Truth Tables to construct and verify correctness of a Boolean expression.</p>	1.Sets, Relations and Functions	Remembering, Understanding, Applying
				2.Graph Theory	Remembering, Understanding, Applying
				3.Combinatorics	Remembering, Understanding, Applying
				4. Matrices	Remembering, Understanding, Applying
				5. Logic	Remembering, Understanding, Applying

			e) Understand the various properties of algebraic systems like Rings, Groups		
				6. Vector Space	Remembering, Understanding, Applying
5	II	DIGITALLOGIC (ITB-HC-2026)	<p>Upon completion of the course the student will be able to :</p> <p>a. Perform the conversion among different number systems</p> <p>b. Familiar with basic logic gates -- AND, OR & NOT, XOR, XNOR; Independently or work in team to build simple logic circuits</p> <p>c. Understand Boolean algebra and basic properties of Boolean algebra.</p> <p>c. Able to simplify simple Boolean functions by using the basic Boolean properties.</p> <p>a. Able to design simple combinational logics using basic gates. Able to optimize simple logic using Karnaugh maps, understand "don't care".</p> <p>b. Familiar with basic sequential logic components: SR Latch, D Flip- Flop and their usage</p>	1.Boolean algebra and Logic gates	Remembering, Understanding, Applying
				2.Combinational circuit	Remembering, Understanding, Applying
				3.Sequential Circuit	Remembering, Understanding, Applying
				4.Counters	Remembering, Understanding, Applying

			<p>and able to analyze sequential logic circuits.</p> <p>c. Understand finite state machines (FSM) concept and work in team to do sequence circuit design based FSM and state table using D-FFs.</p> <p>d. Familiar with basic combinational and sequential components used in the typical data path designs: Register, Adders, Shifters</p> <p>e. Comparators; Counters, Multiplier, Arithmetic-Logic Units (ALUs), RAM.</p>	5. Registers and the Memory Unit	Remembering, Understanding, Applying
6	II	Data Structure and algorithm (ITB-HC-2016)	<p>Upon completion of this course the student will be able to:</p> <p>a) Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.</p> <p>b) Understand basic data structures such as arrays, linked lists, stacks and queues.</p> <p>c) Describe the hash function and concepts of collision and its resolution methods</p> <p>d) Solve problem involving graphs, trees and heaps</p> <p>e) Apply Algorithm for solving problems like sorting,</p>	1. Fundamentals of data structures	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2. Arrays Linked Structure	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				3. Stacks and Queues	Remembering, Understanding, Applying, analyzing, Evaluating, Creating

			searching, insertion and deletion of data	4.Binary Trees	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				5.Sorting and Searching	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				6.Analysis of Algorithm	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
7	II	GE-2B: Programming in C++ (ITB-HG-2026)	Upon completion of this course the student will be able to: describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects. Understand dynamic memory management techniques using pointers, constructors, destructors, etc. describe the concept of function overloading, operator overloading, virtual functions and polymorphism.	1: Introduction to C++	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2: Data Types, Variables, Constants, Operators and Basic I/O	Remembering, Understanding, Applying, analyzing, Evaluating, Creating

			<p>Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.</p> <p>Demonstrate the use of various OOPs concepts with the help of programs.</p>	3: Expressions, Conditional Statements and Iterative Statements	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				4: Functions and Arrays	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				5: Derived Data Types (Structures and Unions)	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				6: Pointers and References in C++	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				7: Memory Allocation in C++	Remembering, Understanding, Applying, analyzing, Evaluating, Creating

				8:File I/O, Preprocessor Directives	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
8	III	ENV-AE-2014	<p>Upon completion of this course the student will be able to:</p> <p>a) Conceptualize the processes and various factors involved in the formation of environment.</p> <p>b) Recognize the importance of environment and the sustainable of natural resources.</p> <p>c) Analyze interaction between social and environmental processes.</p> <p>d) Use scientific reasoning to identify and understand environment problems and evaluate potential solutions.</p> <p>e) Visualize the impacts of human activities on environment and role of society in these impacts.</p> <p>f) Recall critically about their role as citizens, consumers and environmental actors and inter connected world.</p>	1.Introduction to environmental studies	Remembering, Understanding, Applying
				2.Ecosystem	Remembering, Understanding, Applying
				3.Natural resources	Remembering, Understanding, Applying
				4.Biodiversity and conservation	Remembering, Understanding, Applying
				5.Environmental Pollution	Remembering, Understanding, Applying
				6.Social Issues and the Environment	Remembering, Understanding, Applying
				7.Environmental Policies AND PRACTICES	Remembering, Understanding, Applying
				8.Human Communities and the Environment	Remembering, Understanding, Applying

				9.Field work	Remembering, Understanding, Applying
9	III	Computer Oriented Numerical Methods (ITB-HG-3026)	<p>Upon completion of this course the student will be able to:</p> <p>a. Obtain an intuitive and working understanding of numerical methods for the basic problems of numerical analysis.</p> <p>b. Gain experience in the implementation of numerical methods using a computer.</p> <p>c. Trace error in these methods and need to analyze and predict it.</p> <p>d. Provide knowledge of various significant and fundamental concepts to inculcate in the students an adequate understanding of the application of Statistical Methods.</p> <p>e. Demonstrate the concepts of numerical methods used for different applications</p>	1. Floating point representation and computer arithmetic	Remembering, Understanding, Applying
				2. Bisection method	Remembering, Understanding, Applying
				3.Iterative methods	Remembering, Understanding, Applying
				4. Finite difference operators	Remembering, Understanding, Applying
				5. Numerical integration:	Remembering, Understanding, Applying
				6.Modified Euler's methods	Remembering, Understanding, Applying
10	III	SEC-1C HTML Programming (ITB-SE-3034)	<p>Upon completion of this course the student will be able to :</p> <p>a. Define HTML and common terminology related to HTML.</p> <p>b. Recognize correct HTML syntax.</p> <p>c. Be able to write a brief, error-free HTML code.</p>	1. The Basics	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2.HTML Formatting	Remembering, Understanding, Applying, analyzing,

					Evaluating, Creating
				3. Links	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				4. Images	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				5.Tables	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				6.Forms	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
11	III	OPERATINGSYSTEM (ITB-HC-3026)	Upon completion of this course the student will be able to:	1. Introduction	Remembering, Understanding, Applying,

			<p>a. Identify the role of Operating System.</p> <p>b. To understand the design of control unit.</p> <p>c. Understanding CPU Scheduling, Synchronization, Deadlock Handling and Comparing CPU Scheduling Algorithms.</p> <p>d. Solve Deadlock Detection Problems.</p> <p>e. Describe the role of paging, segmentation and virtual memory in operating systems. Description of protection and security and also the Comparison of UNIX and Windows based OS.</p> <p>f. Defining I/O systems, Device Management Policies and Secondary Storage Structure and Evaluation of various Disk Scheduling Algorithms</p>	<p>2.Memory Management</p>	<p>Remembering, Understanding, Applying,</p>
				<p>3.Processes and Threads</p>	<p>Remembering, Understanding, Applying,</p>
				<p>4.Deadlocks</p>	<p>Remembering, Understanding, Applying,</p>
				<p>5.File System</p>	<p>Remembering, Understanding, Applying,</p>
12	III	CO (ITB-HC-3016)	<p>Upon completion of this course the student will be able to:</p> <p>a. Understanding the structure and operations of components in Computer and CPU. Basic Computer Organization, CPU Organization. Simple Computer Levels of Programming Languages Assembly Language Instructions. Programming</p>	<p>1.Introduction</p>	<p>Remembering, Understanding, Applying,</p>
				<p>2.Register Transfer Logic</p>	<p>Remembering, Understanding, Applying,</p>

			<p>ability on Assembly language and basic Languages. Stack and Subroutines.</p> <p>b. Understand Pipeline – Instruction Pipeline. Multiprocessors: Characteristics of Multiprocessors – Interconnection Structures – Inter Processor Arbitration – Inter Processor Communication and Synchronization.</p> <p>c. Computer instructions Explain computer instructions and Control Discuss Timing and Control. Instruction cycle Define Instruction Cycle. Memory Reference Instructions, Explain memory and I/O instructions. Input – Output and Interrupt. Explain I /O Interrupt BB, Micro programmed Control: Control memory, Micro program example.</p> <p>d. Do cache mapping: associative, set-associative and direct mapping</p>	3.Processor logic design	Remembering, Understanding, Applying,
				4.Control logic design	Remembering, Understanding, Applying,
				5.I/O Subsystem	Remembering, Understanding, Applying,
				6.Memory subsystem	Remembering, Understanding, Applying,
13	III	DBMS (ITB-HC-3036)	<p>Upon completion of this course the student will be able to:</p> <p>a) Describe DBMS architecture, physical and logical database designs, database modeling, relational, hierarchical and network models.</p> <p>b) Identify basic database storage structures and access techniques such as file organizations, indexing methods including B-tree, and hashing.</p>	1.File structure	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2.Overview of Database Management System	Remembering, Understanding, Applying, analyzing, Evaluating, Creating

			<p>c) Learn and apply Structured query language (SQL) for database definition and database manipulation.</p> <p>d) Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.</p> <p>e) Understand various transaction processing, concurrency control mechanisms and database protection mechanisms.</p>	<p>3.Relational Models</p>	<p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p>
				<p>4.Database Design</p>	<p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p>
14	IV	<p>GE-4A: Theoretical Foundation of Computing (ITB-HG-4016)</p>	<p>Upon completion of this course the student will be able to:</p> <p>a) Understand the basic concepts of formal languages, automata and grammar types, as well as the use of formal languages and reduction in normal forms</p> <p>b) B)Demonstrate the relation between regular expressions, automata, languages and grammar with formal mathematical methods</p> <p>c) Design push down automata, cellular automata and Turing machines performing tasks of moderate complexity</p>	<p>1.Finite Automata</p>	<p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p>
				<p>2.Regular Languages and Regular Grammar</p>	<p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p>
				<p>3.Properties of Regular Languages</p>	<p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p>
				<p>4.Context free languages</p>	<p>Remembering, Understanding, Applying, analyzing,</p>

			<p>d) Analyze the syntax and formal properties, parsing of various grammars such as LL(k) and LR(k)</p> <p>e) Describe the rewriting systems and derivation languages</p>		Evaluating, Creating
				5.Pushdown Automata	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
15	IV	PROGRAMMING INJAVA ITB-HC-4016:	<p>Upon completion of this course the student will be able to:</p> <p>a. Understand the concept of OOPs as well as the purpose and usage principles of Inheritance, polymorphism, encapsulation etc.</p> <p>b. Understand the basic concepts of classes and objects.</p> <p>c. Understand JVM Concept , Data types and Operators, Strings</p> <p>d. Understand Internet Programming Using Java Applets & Graphic Programming & Make use of array, constructors, Inheritance, Packages and Interfaces.</p> <p>e. Understand the concept of Exceptional Handling/Event Handling & Java I/O Handling</p>	<p>1. Java language basics Classes & Objects Arrays Inheritance and Polymorphism I/O in Java</p> <p>2. Java applets</p> <p>3. Networking</p>	<p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p> <p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p> <p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p>

				4.Java Database Connectivity	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
16	IV	Software Engineering (ITB-HC-4026)	Upon completion of the course the student will be able to : a) Plan a software engineering process life cycle , including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements b) Able to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project c) Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology. d) Know how to develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice e) Able to use modern engineering tools necessary for software project management, time management and software reuse.	1. Introduction	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2. Software Project Planning	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				3. Software Design	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				4. Software Testing and Maintenance CASE tools	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
17	IV	ta Communication and Computer Networks	Upon completion of the course the student will be able to :	1.INTRODUCTION	Remembering, Understanding, Applying, analyzing,

		ITB-HC-4036)	a) Understand computer network basics, network architecture, and TCP/IP and OSI reference models.		Evaluating, Creating
			b) Identify and understand various techniques and modes of transmission	2.PHYSICAL LAYER	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
			c) Describe data link protocols, multi-channel access protocols and IEEE 802 standards for LAN		
			d) Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme	3.DATA LINK LAYER LLC MAC	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
			e) Discuss the elements and protocols of transport layer f) Understand network security and define various protocols such as FTP, HTTP, Telnet, DNS	4.NETWORK LAYER	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				5.TRANSPORT LAYER	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				6.APPLICATION LAYER	Remembering, Understanding, Applying, analyzing, Evaluating, Creating

18	IV	PHP Programming (ITB-SE-4024)	<p>Upon completion of this course the student will be able to:</p> <p>a. Analyze the construction of dynamic web page by combining PHP and HTML</p> <p>b. Introducing the software requirements and tools for running PHP code.</p> <p>c. Handling of HTML form with PHP</p> <p>d. Description of Various conditional events and loops(IF Else conditional statements, switch case, Do while</p> <p>e. PHP Functions ,string manipulations and regular expression</p> <p>f. Anatomy of array in PHP ,creating of index based and associative array</p>	1.Introduction to PHP	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2.Handling HTML form with PHP	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				3.PHP conditional events and Loops	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				4.PHP Functions	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				5.String Manipulation and Regular Expression	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				6.Array	Remembering, Understanding, Applying, analyzing,

					Evaluating, Creating
19	V	Compiler Design (ITB-HC-5016)	<p>Upon completion of this course the student will be able to:</p> <p>a. Acquire knowledge of different phases and passes of the compiler and also able to use the compiler tools like LEX, YACC, etc. Students will also be able to design different types of compiler tools to meet the requirements of the realistic constraints of compilers.</p> <p>b. Understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR, CLR, and LALR parsing table.</p> <p>c. Implement the compiler using syntax-directed translation method and get knowledge about the synthesized and inherited attributes.</p> <p>d. Acquire knowledge about run time data structure like symbol table organization and different techniques used in that</p> <p>e. Understand the target machine's run time environment, its instruction set for code generation and techniques used for code optimization</p>	<p>1.Introduction</p> <p>2.Lexical Analysis</p> <p>3.Syntax analysis</p> <p>4.Code generation</p> <p>5.Code Optimization</p>	<p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p> <p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p> <p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p> <p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p> <p>Remembering, Understanding, Applying, analyzing, Evaluating, Creating</p>

20	V	Web Technology (ITB-HC-5026)	<p>Upon completion of this course the student will be able to:</p> <p>a. Develop a dynamic webpage by the use of java script and DHTML.</p> <p>b. To write a well formed / valid XML document.</p> <p>c. To connect a java program to a DBMS and perform insert, update and delete operations on DBMS table.</p> <p>d. To write a server side java application called Servlet to catch form data sent from client, process it and store it on database.</p> <p>e. Write a server side java application called JSP to catch form data sent from client and store it on database.</p>	1.Internet Basics:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2.Client Server Model:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				3.Web Object Model: CORBA XML:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				4.Distributed Multitier Application	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				5.Application server J2EE 1.4 API	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				6.Web Security	Remembering, Understanding, Applying, analyzing,

					Evaluating, Creating
21	V	Object –oriented analysis and Design (ITB-HD-5026)	<p>Upon completion of this course the student will be able to:</p> <p>a) Understand how to gather the requirements for a software application distinguish between functional and nonfunctional requirements, and express the requirements in the form of use cases.</p> <p>b) Derive the appropriate classes from the requirements and define their responsibilities, behaviors, interrelationships, and internal structures.</p> <p>c) Draw UML use case, class, and sequence diagrams to document and communicate the analysis results. Object-oriented design:</p> <p>d) Apply the results of analysis to implement the classes and interfaces.</p>	1.Introduction to OOAD:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2.Object Modeling:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				3.Dynamic Modeling	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				4.Function Modeling	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				5.Design Methodology:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating

				6.Object Design:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
22	V	DSE-2A: Project Work / Dissertation (ITB-HD-5046)	<p>Upon completion of this course the student will be able to:</p> <p>a. <u>Computer science engineering projects</u> involve designing and development of various application-based software. Computer science project topics can be implemented by a number of tools such as Java, .NET, Oracle, etc.</p> <p>b. To design a project, the basics of HTML are mandatory. After that, students can employ the tags to make a text field, date, radio button, checkbox & other essential elements included in a form. Along with HTML, CSS can be used to get an enhanced look of a form as well as the webpage.</p> <p>c. Computer Science skills are a highly sought-after skillset in IT/ITeS and STEM-related job roles. Some of the most coveted Computer Science skills in the modern industry include coding, computation, data processing, network information security, web architecture, algorithm design, storage systems & management, and mobile development. Learning these skills opens up new and</p>		Understanding, Applying, analyzing, Evaluating, Creating

			exciting employment opportunities in the present and future workforce.		
23	VI	Microprocessor (ITB-HD-6016)	<p>Upon completion of this course the student will be able to:</p> <p>a) Understand the taxonomy of microprocessors and knowledge of contemporary microprocessors.</p> <p>b) Describe the architecture, bus structure and memory organization of 8085 as well as higher order microprocessors.</p> <p>c) Explore techniques for interfacing I/O devices to the microprocessor 8085 including several specific standard I/O devices such as 8251 and 8255.</p> <p>d) Demonstrate programming using the various addressing modes and instruction set of 8085 microprocessor</p> <p>e) Design structured, well commented , understandable assembly language program</p>	1.Internal Organization of 8085A microprocessor	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2.8085A microprocessor architecture	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				3.Assembly language programming in 8085A microprocessor	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				4. Interfacing	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				5. Interrupts	Remembering, Understanding, Applying, analyzing, Evaluating, Creating

24	VI	COMPUTERGRAPHICS ITB-HC-6026:	<p>Upon completion of this course the student will be able to:</p> <p>a. Understand the foundations of Computer graphics.</p> <p>b. Understand the concept of Geometric mathematical and algorithmic concepts necessary for programming computer graphics.</p> <p>c. Understand the comprehension of window clipping and view port object representation in relation to images displayed on screen.</p> <p>d. Understand the concepts of geometric and composite transformations on objects</p> <p>e. Understand the concepts of shading, surface Elimination on the objects</p>	1.Introduction Graphics Devices:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2.Output primitives	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				3.2D Geometric Transformations	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				4. 3D concepts	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				5.Visible surface detection	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
25	VI	Data Mining and Warehousing (ITB-HD-6026)	<p>Upon completion of this course the student will be able to:</p>	1.Data Warehousing:	Remembering, Understanding, Applying, analyzing,

			a. Get knowledge of:- Data preprocessing and data quality.- Modeling and design of data warehouses.-		Evaluating, Creating
			b. Algorithms- classification, clustering and association rule analysis for data mining skills.	2.Data Mining Introduction :	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
			c. Be able to design data warehouses.		
			d. Apply acquired knowledge for understanding data and select suitable methods for data analysis.	3.Clustering:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
			e. Develop of data warehouses and data analysis using data mining	4.Rule Mining:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				5.Decision Trees:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				6.Advanced Topics:	Remembering, Understanding, Applying, analyzing, Evaluating, Creating

26	VI	SYSTEM ADMINISTRATION USING LINUX ITB-HC-6016:	<p>Upon completion of this course the student will be able to:</p> <p>a. Demonstrate an understanding of the principles, practices and goals of system administration.</p> <p>b. Demonstrate an understanding of system components, the advantages of Unix-like and Windows-like OS</p> <p>c. Major networking models, network addressing and naming systems, network services. Demonstrate an understanding of the major approaches to computer management in the network environment.</p> <p>d. Demonstrate an understanding of the features of the Windows 2003 Server Operating System. 5</p> <p>e. Perform the installation of Windows 2003 OS and configure the server environment.</p> <p>f. Demonstrate an understanding of Active Directory and its key features.</p> <p>g. Perform user accounts management and implement security groups.</p> <p>h. Perform configuration, management, and troubleshooting of folders, files, and printing resources.</p>	1.What is System Administration	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				2.Basics of Linux file system	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				3.Program and Process	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
				4.Managing user accounts	Remembering, Understanding, Applying, analyzing, Evaluating, Creating

			<ul style="list-style-type: none"> i. Perform network services installation and management. j. Use server and network monitoring software tools. k. Describe the elements of an effective troubleshooting methodology and use a variety of software and hardware tools to diagnose problems. l. Demonstrate an understanding of network backup and recovery strategies and how to protect a network from viruses. 	5.IP address and IP address	Remembering, Understanding, Applying, analyzing, Evaluating, Creating
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Programme Outcomes: MSc Botany

Plant sciences is now an integration between basic and applied science. Conventional studies like plant identification is now being supplemented with molecular techniques like DNA Barcoding. The courses have been designed to benefit all Botany students to study various aspects of plant science including its practical applications. Keeping in mind that these students can take up teaching at different levels, research work in research institutes and or industry, doctoral work, environment impact assessment, biodiversity studies, entrepreneurship, scientific writing relevant topics have been included in the curriculum.

Programme Specific Outcomes

After completion of the Programme, the student will be able to:

1. On successful completion of the Program, the students will be well aware of different plant groups and different branches of Plant Sciences.
2. They will learn the techniques of studying plants- basic techniques as well as advance techniques.
3. The students will also become aware of physiology and metabolism of different plant groups and there uses for human welfare.
4. They become skilled in modern advance branches of biochemistry, cytogenetics, molecular biology etc. and at the same time they develop the skill of traditional branches of botany like taxonomy, ecology, genetics, physiology, palynology, anatomy etc.
5. The basic techniques of plant research like biostatistics, spectrometry, chromatography, microscopy, bioinformatics are also learned in the course.
6. Students also learn to write project reports by writing reports on field visits.
7. The course also helps in making a student responsible citizen well aware of need of environment conservation and ways to do so. As throughout the course, they are thought the importance of plants in human life and importance of plant resources and their conservation in situ (conservation ecology) as well as in vivo (tissue culture and gardens).

Course Outcomes

SL NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOME	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	BOT-1016 Diversity I (Algae, Fungi, Bryophytes)	<ol style="list-style-type: none"> 1. Understand the diversity among Algae, fungi, Bryophytes 2. To Understand the life cycle pattern of Algae. 3. Understand the useful and harmful activities of Algae and fungi 4. To explore various aspects related to diversity of bryophytes. 5. Understand the Microbial world. 	1. Algae	Knowledge, understanding, apply, create
				2. Fungi	Knowledge, understanding, application, analysis, creation
				3. Fungi	Knowledge, understanding, application, analysis, creation
				4. Lichen	knowledge, understanding, application, creation
				5. Virus and Bacterial cell	Knowledge, understanding, apply, create
				6. Bryophytes	Knowledge, understanding, application, creation
2	I	BOT- 1026 Diversity II (Pteridophytes, Gymnosperm and Angiosperm)	<ol style="list-style-type: none"> 1. Understand the morphological diversity of Pteridophytes and Gymnosperms 2. Know the taxonomic position occurrence, thallus structure, reproduction of Pteridophyte. 3. To understand the different concepts of paleobotany. 4. Gain knowledge of plant identification, concept of classification, principle and rules of nomenclature 5. Gain knowledge of origin and evolution of angiosperm and their evolutionary relationship 	1. Pteridophyta	Knowledge, understanding, application, creation
				2. Palaeobotany	Knowledge, understanding
				3. Gymnosperms	Knowledge, understanding, application, creation
				4. Angiosperms	Knowledge, understanding, application, creation
				5. Phylogeny and affinities of Angiosperms	Knowledge, understanding, application, analysis, creation

				6. Morphology	Knowledge, understanding, application,
3	I	BOT-1036 Plant Ecology, Environment and Resource Management	<ol style="list-style-type: none"> 1. Understand the inter-relationship between the living world and environment. 2. Understand the concept of ecology and its specification 3. Understands Ecosystem and its components. 4. Gain knowledge about different approaches of bio-diversity 5. Understands the principles, endemism, biomes and phytogeographical divisions of India 	1. The Environment	Knowledge, understanding, application, analysis, creation
				2. Characteristics of a population	Knowledge, understanding, application, analysis
				3. Biodiversity	Knowledge, understanding, application, analysis
				4. Environmental pollution	Knowledge, understanding, application, analysis
				5. Origin, evolution, botany, cultivation and uses of economically important plants	Knowledge, understanding, application, analysis
				6. Dynamic phytogeography and its basic principles	Knowledge, understanding, application, analysis
4	I	BOT-1044 (Practical Paper)- Algae, Fungi, Bryophytes and Pteridophytes	<ol style="list-style-type: none"> 1. Study of range of thallus organization and reproductive structures of Algae. 2. Study of morphological and anatomical features of fungi, bryophytes and lichens. 3. Study of some important fossil and living members of major groups of Pteridophytes 4. Collection and study of symptoms of virus infected plants. 5. Gram staining, flagella staining, capsule staining and acid-fast staining of bacteria 		Knowledge, understanding, application, creation

5	I	BOT-1054 (Practical) Gymnosperms, Angiosperms, Plant Ecology and Resource Management	<ol style="list-style-type: none"> 1. Quadrature method of studying plant ecology 2. Estimation of dissolved oxygen 3. Estimation of biomass 4. Morpho anatomical study of hydrophytes and xerophytes 5. Study and identification of angiospermic plant and preparation of herbarium specimens 6. Morpho anatomical study of Gymnosperm and economically important angiospermic plants 		Knowledge, understanding, application, creation
6	II	BOT-2016 Cytogenetics, PantBreeding and Evolution	<ol style="list-style-type: none"> 1. Know about the genomic organization or living organisms, study of genes genome, chromosome etc. 2. Gain knowledge of transcription in prokaryotes and eukaryotes. 3. Understanding the organizations and function of intracellular organelles and chromosomes. 4. Gain knowledge about hybridization, back cross methods, breeding and heritability. 5. To know about DNA damage and repair and metabolic pathways of inborn errors and inherited diseases. 6. Understanding different evolutionary concepts. 	<ol style="list-style-type: none"> 1. Structural organization and function of intracellular organelles 2. Genome and chromosome 3. Molecular basis of transcription, translation and mutation 4. DNA damage and repair mechanism, inborn error of metabolism, inherited diseases and metabolism. 	<p>Knowledge, understanding, application, analysis</p> <p>Knowledge, understanding, application, analysis</p> <p>Knowledge, understanding, application, analysis</p> <p>Knowledge, understanding, application, analysis</p>

				5. Principle of plant breeding and hybridization, heritability.	Knowledge, understanding, application, analysis
				6. Evolution and related concept.	Knowledge, understanding, application, analysis
7	II	BOT-2026 Microbiology and Plant Pathology	<ol style="list-style-type: none"> 1. Understand the scope and importance of Plant Pathology and to know the prevention and control measures of plant diseases and its effect on economy of crops. 2. Know the terminologies in plant pathology. 3. Use of microbes in agriculture, fermented foods and dairy products, industry and biowaste management. 4. Understanding species and strain, microbiome concept. 5. To know about microbiology of soil, water and air. 6. Understanding sterilization techniques, population estimation, pure culture techniques. 7. To know about genetic recombination and mode of reproduction, nutrition, growth conditions and different metabolic pathway of microbes 8. Knowing about immunity and its types, antibodies and different immune diseases and cancer biology. 	<ol style="list-style-type: none"> 1. Microbial diversity 2. Microbial techniques 3. Microbial Genetics and Physiology 4. Plant Pathology 5. Immunology 6. Applied Microbiology 	<ol style="list-style-type: none"> Knowledge, understanding, application, analysis Knowledge, understanding, application Knowledge, understanding, application, analysis Knowledge, understanding, application Knowledge, application Knowledge, understanding, application, creation

8	II	BOT-2036 Plant Physiology and Biochemistry	<ol style="list-style-type: none"> 1.To know the structure of biological membrane and related concept. 2.Principle, regulation and mechanism of enzyme catalysis. 3.Concept related to photosynthesis and respiration. 4.To know about different plant hormone and its mechanism of action. 5.To know concept related to sensory photobiology 6.To know about the mechanism of solute transport and photo assimilate translocation. 	1. Membrane structure and dedication	Knowledge, understanding, application, creation
				2. Enzymes	Knowledge, understanding, application
				3. Photosynthesis	Knowledge, understanding, application
				4. Plant hormones	Knowledge, understanding, application
				5.Sensory photobiology	Knowledge, understanding, application
				6.translocation in plants	Knowledge, understanding, application
9	II	BOT-2044 (Practical) Microbiology, Plant Pathology and Cytogenetics	<ol style="list-style-type: none"> 1. Gain knowledge about isolation, identification, characterization of pure culture of microbes 2. Estimation of water quality, bacterial growth by spectrophotometric method 3. To study plant pathogenic fungi from disease specimen with spore measurement and camera lucida diagram. 4. To study on chromosome behaviour in mitosis and meiosis. <p>To study techniques and procedures of emasculation</p>		Knowledge, understanding, application, analysis

10	II	BOT-2054 (Practical) Plant Physiology and Biochemistry.	<ol style="list-style-type: none"> 1. To prepare different concentrations of solutions. 2. To estimate protein, carbohydrate, lipid and reducing sugars, secondary metabolites by standard protocols. 3. To study estimation of chlorophyll a, b and total chlorophyll in C3, C4 and CAM plants. 4. To understand chromatographic techniques. 		Knowledge, understanding, application, analysis
11	III	BOT-3016 Reproductive and Developmental Biology, Biostatistics.	<ol style="list-style-type: none"> 1. To understand reproductive development of angiospermic plant. 2. Understand the pollination and fertilization mechanism 3. Gain knowledge embryo, endosperm, seed, structure and their development 4. To know about apomixis and polyembryony, apospory. 5. To understand origin and activities of periderm. 6. To understand organization and development of shoot, root and flower. 	1. Basics concepts of development.	Knowledge, understanding, application, analysis
				2. Sporogenesis and Gametogenesis in plants	Knowledge, understanding, application, analysis
				3. Morphogenesis and organogenesis in plants	Knowledge, understanding, analysis
				4. Periderm	Knowledge, understanding
12	III	BOT-3026 Molecular Biology, Plant Biotechnology and Bioinformatics	<ol style="list-style-type: none"> 1. To understand processes of replication, synthesis and processing of DNA and RNA. 2. To understand concepts of various cell receptors and its mechanisms 3. To gain knowledge about organogenesis, somatic embryogenesis, somatic hybridization, protoplast fusion and cell culture methods. 4. To understand the molecular mechanism and regulation of light perception, floral development, signal transduction. 	1. Physical properties of DNA and associated concepts.	Knowledge, understanding, analysis
				2. Cell signalling.	Knowledge, understanding
				3. Principle of genetic engineering and its ethical issues.	Knowledge, understanding, application, analysis

			<p>5.To know about the biological databases, data retrieval, sequence alignment.</p> <p>6. To understand about application of various bioinformatical software and packages.</p>	<p>4. Plant Tissue culture and its role in crop improvement</p>	<p>Knowledge, understanding, application, analysis</p>
				<p>5. Molecular basics of plant growth and development</p>	<p>Knowledge, understanding</p>
				<p>6. An introduction to bioinformaticsC</p>	<p>Knowledge, understanding, application</p>
13	III	BOT-3036 Research Methodology and Bioinstrumentation	<p>1.To gain knowledge about different types of research, dissertation and publications.</p> <p>2.To understand different techniques and measures for sampling.</p> <p>3.To understand different concepts of solution</p> <p>4.To know about techniques and functions of microscopy and herbarium.</p> <p>5.To gain knowledge on Principles and applications of different types of Spectrophotometers.</p> <p>6.To understand principles and techniques of PCR, Electrophoresis and Centrifugation.</p>	<p>1. Research and Publications</p> <p>2. Sample and Sampling</p> <p>3. Reagent preparation</p> <p>4. Microscopy</p> <p>5. Spectrophotometry and chromatography</p> <p>6. PCR and Electrophoresis techniques.</p>	<p>Knowledge, understanding, application, analysis</p> <p>Knowledge, understanding, application, analysis</p> <p>Knowledge, application</p> <p>Knowledge, application</p> <p>Knowledge, understanding, application, analysis</p> <p>Knowledge, understanding, application, analysis</p>

14	III	BOT-3044 (Practical) Anatomy, Reproductive and Developmental Botany, Biostatistics.	<ol style="list-style-type: none"> 1. To study anomalous secondary growth of angiosperms and developmental stages of leafs, stamen and root. 2. To understand microsporogenesis, megasporogenesis, embryosacs and endosperms. 3. To prepare pollen grains slide by different techniques and permanent slides by microtome techniques. 4. To work out mean, mode, median, standard errors and standard deviation. 		Knowledge, application understanding,
15	III	BOT-3054 Practical - Molecular Biology, Plant Biotechnology & Bioinformatics	<ol style="list-style-type: none"> 1. To understand protein isolation, DNA isolation and gel electrophoresis 2. To know about Restriction digestion and mapping, PCR reaction and gel electrophoresis. 3. To regenerate plantlets through tissue culture. 4. To culture Mushroom 5. Sequence (protein/DNA) downloading from databases, alignment and homologous sequence search 9. Sequence BLAST, annotation and gene prediction with the help of bioinformatical tools. 6. Protein modeling and structure prediction. 		Knowledge, application, analysis understanding,

15	III	BOT-3054 Practical - Molecular Biology, Plant Biotechnology & Bioinformatics	<ol style="list-style-type: none"> 1. To understand protein isolation, DNA isolation and gel electrophoresis 2. To know about Restriction digestion and mapping, PCR reaction and gel electrophoresis. 3. To regenerate plantlets through tissue culture. 4. To culture Mushroom 5. Sequence (protein/DNA) downloading from databases, alignment and homologous sequence search 9. Sequence BLAST, annotation and gene prediction with the help of bioinformatical tools. 6. Protein modeling and structure prediction. 		Knowledge, understanding, application, analysis
14	IV	BOT 4015 (Angiosperm Taxonomy) Special Paper	<ol style="list-style-type: none"> 1. To understand different classificatory systems, its concepts and development. 2. To gain knowledge on Taxometrics method. 3. To understand concepts of Cladistics Taxonomy. 4. To understand different concepts of Taxa and Characters 5. To know about different rules of Botanical Nomenclature. 	1. Basics of Taxonomy	Knowledge, understanding, application, analysis
				2. Phenetics methods	Knowledge, understanding, analysis
				3. Phylogenetic methods	Knowledge, understanding, analysis
				4. Taxonomic structures	Knowledge, understanding, analysis
				5. Material basics of Taxonomy	Knowledge, understanding, application, analysis
				6. Botanical Nomenclature	Knowledge, understanding, application, analysis

15	IV	BOT-4025	<ol style="list-style-type: none"> 1. To understand different sources of taxonomic characters. 2. To gain knowledge on different molecular approaches and biosystematics. of taxonomy 3. To understand different forms of taxonomic literature. 4. To know about different herbarium techniques, botanical gardens and herbaria.in India and world. 5. To know about presentation of data, preparation of flora and construction of botanical keys. 	1. Sources of Taxonomic characters.	Knowledge, application, analysis	understanding,
				2. Modern approaches to taxonomy	Knowledge, application, analysis	understanding,
				3. Taxonomic literature	Knowledge, application	understanding,
				4. Processes of identification	Knowledge, application	understanding,
				5. Botanical exploration.	Knowledge, application, analysis	understanding,
16	IV	BOT-4035	<ol style="list-style-type: none"> 1. To understand different concepts of phytochoria, centers of origin, endemism, plant introduction and acclimatization. 2. To gain knowledge about characteristics of flora of North-East India with reference to Endemic, Exotics and RET Plants. 3. To know about activities and publications of BSI 4. To understand origin and evolutionary trends in angiosperms. 5. To gain knowledge about phylogeny and evolution of different orders of angiosperms. 	1. Phytogeography	Knowledge, application, analysis	understanding,
				2. Flora of North-east India.	Knowledge, understanding	
				3. Botanical Survey of India	Knowledge, understanding	
				4. Origin and Evolution	Knowledge, application, analysis	understanding,
				5. Phylogeny and Evolution of angiospermic Taxa.	Knowledge, application, analysis	understanding,

17	IV	BOT-4045	To represent taxonomical data based on field survey and experimental analysis.	Dissertation	Knowledge, application, analysis	understanding,
18	IV	BOT-4054	<ol style="list-style-type: none"> Floristic studies of locally available angiospermic plants in a given area. Practices on Nomenclatural problems To plot various centers of BSI, Botanical Gardens and Herbaria in different regions of India. To practice identification of taxa and herbarium specimens. 		Knowledge, application, analysis	understanding,
19	IV	BOT-4165 (Microbiology) Special Paper	<ol style="list-style-type: none"> Interactions of microbes with plants, animals To understand bioremediation and its related concept. To know about agriculturally important and harmful microbes and their roles. To explore industrially important microbes and their role in production of different industrial products. To gain concept regarding IPR and its Ethics. 	1. Microbial ecology	Knowledge, application, analysis	understanding,
				2. Soil ecology	Knowledge, application, analysis	understanding,
				3. Agricultural microbiology	Knowledge, application, analysis	understanding,
				4. Industrial microbiology	Knowledge, application, analysis	understanding,
				5. Food microbiology	Knowledge, application, analysis	understanding,
				6. IPR	Knowledge, understanding	
20	IV	BOT- 4175	<ol style="list-style-type: none"> To know about the different concept related to microbial genetics. To understand the conjugation, transduction and transformation of bacteria. To gain knowledge on concept of lac operon and its related mechanism. To explore about gene regulation mechanism in both Prokaryotic and Eukaryotic cells. 	1. Microbial genetics	Knowledge, application, analysis	understanding,
				2. Gene regulation and its interaction.	Knowledge, application, analysis	understanding,
				3. Microbial growth conditions and growth curves.	Knowledge, application, analysis	understanding,
				4. Genetic engineering	Knowledge, application, analysis	understanding,

			<p>5. To know about different growth conditions and growth curves alongwith different glucose catabolic pathways.</p> <p>6. To gain knowledge on tools and techniques of genetic engineering.</p>	5. Microbial biotechnology	Knowledge, understanding, application, analysis
21	IV	BOT- 4185	<p>1. To know about different diagnosis and control of human diseases caused by different microbes.</p> <p>2. To explore different control methods of microbes and mode of action of antibiotics.</p> <p>3. To gain knowledge on different types of immunity, antigens, antibodies and their processing and synthesis.</p> <p>4. To understand antigens and antibodies reactions, autoimmunity, hybridoma techniques</p> <p>5. To understand different aspects of Cancer biology.</p>	1. Laboratory diagnose and control of Human disease caused by microbe and virus.	Knowledge, understanding, application, analysis
				2. Control of microorganisms	Knowledge, understanding, application, analysis
				3. Immunology	Knowledge, understanding
				4. Molecular basics of antibody	Knowledge, understanding, application, analysis
				5. Cancer biology	Knowledge, understanding, application, analysis
22	IV	BOT- 4195	To gain knowledge on experimental works on microbiology.	Dissertation	Knowledge, understanding, application, analysis
23	IV	BOT- 4204	<p>1. Bacteriological water analysis</p> <p>2. Isolation of specific microorganisms using specific media</p> <p>3. Methylene blue reductase/ Phosphatase test for milk</p> <p>4. Fermentation of carbohydrates</p> <p>5. Biochemical tests for identification of bacteria (catalase, IMViC, peroxidase, nitrate reductase, oxidase, etc)</p>		Knowledge, understanding, application, analysis

6. Programme Outcomes: MSc Chemistry

- The chemistry postgraduates are expected to gain an advanced level of knowledge in area of chemistry like organic, inorganic, physical, analytical, quantum, green, environmental and supramolecular chemistry in molecular level.
- To achieve critical thinking ability in order to design, carry out, record and analyse the results of chemical reactions performed in the laboratory.
- Knowledge for safe handling of chemicals and apparatus in laboratory.
- Understand the concept of practical techniques & different analytical procedures so they can easily involve themselves in laboratory-based research activities.

Course Outcomes

SL NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOME	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	CH101: INORGANIC CHEMISTRY-1	Students will be able to explain/critically examine the chemistry of transition metals, structure and bonding.	Descriptive Inorganic Chemistry	Understand and Remember
				Introduction to Solid State Chemistry	Understand and Remember
				Organometallic Chemistry	Understand and Remember
2	I	CH102: ORGANIC CHEMISTRY-1	Students will be able to appreciate/demonstrate/explain the unique features of organic reactions mechanism, reaction intermediates and	Kinetics and Energetics of Reaction Mechanism	Understand and Remember
				Reaction Mechanisms & Intermediates: Structure & Reactivity I	Understand and Remember

			stereochemistry, and solve related problems.	Reaction Mechanisms & Intermediates: Structure & Reactivity II	Understand and Remember
				Stereochemistry	Understand, Remember and Apply
3	I	CH103: PHYSICAL CHEMISTRY-1	Students will be able to explain the fundamentals of equilibrium and non-equilibrium thermodynamics, statistical mechanics, polymer chemistry and apply the concepts to solving problems.	Equilibrium and Non-equilibrium Thermodynamics	Understand and Remember
				Statistical Thermodynamics	Understand and Remember
				Polymer Chemistry	Understand and Remember
				Sampling and Data Analysis	Understand, Remember and Apply
4	I	CH104: QUANTUM CHEMISTRY	Students will be able to explain the theoretical basis of quantum chemistry, and critically examine/interpret the theories/principles. Students will be able to compare various approximate formalisms and their validity in explaining experimental phenomena.	Wave packets and Operators	Understand and Remember
				Solution of Eigenvalue Equations	Understand and Remember
				Approximate Methods	Understand and Remember
				Born Oppenheimer Approximation	Understand and Remember
5	I	CH105: SPECTROSCOPY-1	Students will be able to identify/explain the theoretical basis of different spectroscopic techniques, and show their application in analysing/interpreting experimental data.	Introduction	Understand and Remember
				Rotational, Vibrational and Raman Spectroscopy	Understand and Remember
				Electronic Spectroscopy and CD/ORD	Understand and Remember
6	I	CH106: SYMMETRY AND GROUP THEORY IN CHEMISTRY	Students will be able to explain/describe/rationalize molecular structure and bonding using group theory.	Groups and Matrices	Understand, Remember and Apply
				Molecular Symmetry and the Symmetry Groups	Understand, Remember and Apply

				Representation of Groups	Understand, Remember and Apply
				Chemical Applications of Group Theory	Understand, Remember and Apply
				Crystallographic Symmetry	Understand, Remember and Apply
7	I	CH107: PRACTICAL ORGANIC CHEMISTRY	Students will be able to perform qualitative and quantitative analysis of organic compounds and mixtures, implement multi-step organic synthesis and operate common/sophisticated instruments.	Qualitative analysis	Apply, Analyse and Evaluate
				Chromatography experiments	Apply, Analyse and Evaluate
				Synthesis (2-steps)	Apply, Analyse and Evaluate
				Experiments on Natural products	Apply, Analyse and Evaluate
				Quantitative analysis	Apply, Analyse and Evaluate
8	II	CH201: INORGANIC CHEMISTRY-2	Students will be able to apply their knowledge of inorganic and solid state chemistry in explaining, interpreting and critically examining bonding/structure/reactivity of metal complexes and organometallic compounds.	Bonding in Inorganic and Coordination Compounds	Understand and Remember
				Electronic Spectra of Transition Metal Complexes	Understand and Remember
				Magnetic Properties	Understand and Remember
				Mechanism of Inorganic Reactions	Understand and Remember
				Inorganic Photochemistry	Understand and Remember
				Nuclear and Radiochemistry	Understand and Remember
9	II	CH202: ORGANIC CHEMISTRY-2	On the completion of the course students will acquire the detailed knowledge on	Organic Photochemistry	Understand and Remember
				Oxidation Reactions	Understand and Remember

			photochemical, pericyclic, oxidation and reduction reactions.	Reduction Reactions	Understand and Remember
				Pericyclic Reactions	Understand and Remember
10	II	CH203: PHYSICAL CHEMISTRY-2	Students will be able to describe/examine the concepts and theories of chemical kinetics and electrochemistry, and the applications of molecular dynamics, fast reactions and energy storage.	Chemical Kinetics	Understand and Remember
				Molecular Reaction Dynamics	Understand and Remember
				Study of Fast Reactions	Understand and Remember
				Theories of Unimolecular Reactions	Understand and Remember
				Dynamic Electrochemistry	Understand and Remember
				Theories of Electrical Interface	Understand and Remember
				Electro-analytical Techniques	Understand and Remember
				Systems for Electro-Chemical Energy Storage & Conversion	Understand and Remember
11	II	CH204: SPECTROSCOPY-2	Students will be able to explain the basic working principle of magnetic resonance and mass spectroscopic techniques and their application in chemistry analysis.	NMR Spectroscopy	Understand, Remember and Apply
				ESR Spectroscopy	Understand, Remember and Apply
				Mass Spectrometry	Understand, Remember and Apply
				Mossbauer Spectroscopy	Understand, Remember and Apply
12	II	CH205: GREEN CHEMISTRY	Students will be able to describe/compare relationships between Green Chemistry and chemical laboratory and industry,	The Essentials of Green Chemistry	Understand and Remember
				Applying the 12 Principles of Green	Understand and Remember

			particularly in the design of safer chemicals and processes.	Chemistry; Green Chemistry Metrics	
				Waste: production, problems and prevention	Understand, Remember and Apply
				Catalysis and green chemistry; Green Chemistry and Sustainability; Green Chemistry to Health and Environment	Understand and Remember
				Feedstock chemicals, Chemicals from Biomass, Concept of platform molecules	Understand and Remember
				Adverse Effects of Chemicals on Health and the Environment; Green Chemistry Problems	Understand and Remember
				Real World Solutions	Understand, Remember and Apply
				Introduction to Sustainability; Aspects of Sustainability Ethics; Designing Sustainable Solutions	Understand and Remember
13	II	CH206: PRACTICAL INORGANIC CHEMISTRY	Students will be able to demonstrate experimental skills encompassing synthesis, characterization of different inorganic materials, set-up experiments and use analytical equipments.	Qualitative and Quantitative analysis, Solution phase synthesis of coordination compounds, Synthesis of coordination compounds through	Apply, Analyse and Evaluate

				<p>ligand synthesis and spectroscopic characterization, Solid phase synthesis of coordination compounds, Isomerism in coordination compounds, Preparation of metal(II) isonicotinate tetrahydrates, characterization, use as precursors to metal oxides, Synthesis of metal nanoparticles, characterization and investigation of their optical properties, Synthesis and characterization of semiconductor nanocrystals, Preparation of polyoxometallate, Quantitative determination of components in food, Introduction to computational chemistry of simple molecules.</p>	
14	III	CH301: BIOCHEMISTRY	Students will be able to describe and interpret the chemical and physical processes of living organisms.	Introduction	Understand and Remember
				Biophysical chemistry	Understand and Remember

				Bioorganic chemistry	Understand and Remember
				Bioinorganic chemistry	Understand and Remember
15	III	CH302: MODERN METHODS OF ANALYSIS	Students will be able to explain/demonstrate the application of different analytical techniques in chemistry.	Characterization of inorganic molecules	Understand and Remember
				Characterization of organic molecules	Understand and Remember
				Microscopy	Understand and Remember
				Thermal Methods	Understand, Remember and Apply
				Diffraction Techniques	Understand, Remember and Apply
				Separation Techniques	Understand, Remember and Apply
				Analytical Spectroscopic Methods	Understand, Remember and Apply
16	III	CH303: FOUNDATIONS OF ORGANIC SYNTHESIS	Students will be able to identify/explain the concept of selectivity in organic reactions, and describe the stages of synthetic planning in the synthesis of complex molecules.	Dynamic stereochemistry	Understand, Remember and Apply
				Carbon-carbon bond formation	Understand and Remember
				Retrosynthetic Analysis	Understand and Remember
				Protecting Groups	Understand and Remember
				Introduction to heterocycles	Understand and Remember
17	III	CH304: SEMINAR COURSE	On successful completion of this course students will acquire better communication and presentation skills.		Analyse and Evaluate
18	III	CH305: PRACTICAL PHYSICAL CHEMISTRY	From this course, the students will understand physical chemistry from experimental point of view. Moreover, they will learn some modern methods of analysis required in different area of research.	Experiments on Chemical Kinetics, Conductometric titrations, spectrophotometry and pH metric Titrations,	Apply, Analyse and Evaluate

				Electrochemical experiments: Cyclic voltammetry, Adsorption-desorption on porous materials, Equilibrium study, kinetic study, thermodynamic studies, Experiments of Theoretical Chemistry and Miscellaneous Experiments	
19	III	CH306: SOLID STATE & MATERIALS CHEMISTRY	Students will be able to examine/differentiate between different materials, and design/plan novel materials for applications.	Introduction to Materials	Understand and Remember
				Solid State Chemistry	Understand and Remember
				Organic Solid State Chemistry	Understand and Remember
				Materials Design	Understand and Remember
20	III	CH308: ENVIRONMENTAL CHEMISTRY	Students will be able to demonstrate an understanding of environmental chemistry, viz. air, water and soil chemistry and identify the relationships between atmosphere, solar radiation and ozone formation.	Environmental Chemistry: An Introduction	Understand and Remember
				Chemistry of the atmosphere	Understand and Remember
				Soil Environmental Chemistry	Understand and Remember
				Environmental Chemistry of Water	Understand and Remember
21	IV	CH406: ADVANCED BIOINORGANIC CHEMISTRY	Students will learn the role of metal ions in functioning of biological systems, toxicity due to metal ions, the role in a diseases and therapy.	Metal ion storage and transport	Understand and Remember
				Chemistry of dioxygen	Understand and Remember
				Electron transport systems	Understand and Remember

				Metalloenzymes	Understand and Remember
				Metal -Nucleic acid interaction	Understand and Remember
				Metals in clinical radiology	Understand and Remember
22	IV	CH407: SUPRA-MOLECULAR CHEMISTRY	Students will be able to classify/critically examine supramolecular systems, explicate the underlying principles, with regard to concepts of molecular recognition, self-assembly, catalysis and devices.	Introduction to Supramolecular Chemistry	Understand and Remember
				Synthesis, structure and their applications in recognitions	Understand, Remember and Analyse
				Self-Assembly of molecules	Understand, Remember and Analyse
				Supramolecular Catalysis	Understand, Remember and Analyse
				Molecular Devices	Understand, Remember and Analyse
23	IV	CH408: ORGANO-METALLIC CHEMISTRY	Students will be able to discuss/explain the synthesis, structure, & reactivity of organometallic compounds, reagents, demonstrate/plan their use industrially important reactions.	Review of organometallic compounds, and reaction mechanisms	Understand and Remember
				Physical methods in organometallic chemistry	Understand, Remember and Analyse
				Main group organometallic compounds	Understand and Remember
				d-block organometallic compounds	Understand and Remember
				Organometallic catalysis	Understand and Remember
24	IV	CH411: PROJECT DISSERTATION	Following the completion of this course, students should be able demonstrate ability		Analyse, Evaluate and Create

			<p>to plan and strategize a scientific research problem, and implement it within a reasonable time-frame. It is expected that after completing this project dissertation, students will learn to work independently and how to keep accurate/readable record of their experimental work.</p> <p>In addition, students will be able to handle laboratory equipment and chemicals. Also, students will be able to utilize sophisticated instruments for analysis, data collection and interpretation.</p> <p>Subsequently, the students should be able to critically examine research articles, and improve their scientific writing/communication skills.</p>		
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7. Programme Outcomes: MA/MSc Geography

To understand the basic principles of Geomorphology, physical geography, climatology and biogeography, geographical thought, geographical of environment and development, population and settlement geography, quantitative and cartographic methods, remote sensing, GIS and GPS, Social, cultural and political geography, environmental and climate change along with regional geography of Bhutan, Myanmar and Bangladesh using sophisticated modes and techniques with space-time dimensions through various laboratory experiments and field studies.

Course Outcomes

SL NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOME	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	GGY 1016 Nature of Geography	Through understanding of the basics of the subject. Understanding of sophisticated models and techniques. Interdisciplinary field – a field that crosses traditional boundaries between academic disciplines or schools of thought.	Defining the field of Geography	Understand, Remember
				Place of Geography in the classification of knowledge	Understand, Remember
				Geography as a spatial science	Understand, Remember
				Basic Branches and Approaches in Geography	Understand, Remember
				Place/Region/Territory and scale factor	Understand, Remember
				Geography	Understand, Remember
				Scientific Methods in Geography	Understand, Remember
				Modes of explanations in Geography	Understand, Remember

				Hagget's Integrated Approaches in Geography	Understand, Remember
				Pattern-Process Model for geographic enquiry	Understand, Remember
2	I	GGY 1026 Geomorphology	Understanding of Principles and Concepts in Geomorphology. Application of geomorphic concepts and techniques in the field. Knowledge enrichment of glacial, fluvial and Aeolian processes.	History of development of geomorphic ideas; recent trends in Geomorphology	Understand, Remember
				Theoretical bases of Geomorphology	Understand, Remember
				Concepts and techniques in applied geomorphology	Understand, Remember
				Threshold concepts and applications in geomorphology	Understand, Remember
				Quantitative methods and techniques in geomorphology	Understand, Remember
				Geomorphic processes	Understand, Remember
				Relationship of climate, vegetation and soil with geomorphic processes	Understand, Remember
				Morphogenetic regions	Understand, Remember
				Development of slopes	Understand, Remember

				Methods and techniques of geomorphic process study	Understand, Remember
3	I	GGY 1036 Climatology and Biogeography	Knowledge about different phenomena of weather and climate specially vagaries of Indian monsoon and techniques of weather forecasting. Deeper understanding of plant-animal association in varying habitats and environments. Practical utility in the field while carrying out research on issues of climate and biogeography	Defining the field of Climatology; Importance of Climatology in geographical studies	Understand, Remember
				Climate and Weather	Understand, Remember
				Insolation	Understand, Remember
				Atmospheric Pressure and Global Wind System	Understand, Remember
				Air masses and Fronts	Understand, Remember
				Climatic disturbances	Understand, Remember
				Classification of World Climate	Understand, Remember
				Monsoons	Understand, Remember, Analyze
				Techniques of weather forecasting	Understand, Remember
				Global warming and climate change and associated impacts and challenges	Understand, Remember
				Defining the field of Biogeography	Understand, Remember
				Bio-energy cycles and food-chain	Understand, Remember
				Soil characteristics and their significance	Understand, Remember

				Habitat, Environment and Ecosystem	Understand, Remember
				Concept of Bio-diversity	Understand, Remember
				National forest and environment policies	Understand, Remember
4	I	GGY 1046 Economic Geography	Understanding of location, distribution and spatial organization of economic activities across the world. Knowledge of geographical and other factors which influence man's productivity. Knowledge of different farming techniques and modernization of agriculture. Practical utility in the field while carrying out research on agriculture and economic geography.	Field of Economic Geography	Understand, Remember
				Approaches to Economic Geography	Understand, Remember
				Concepts and Models in Economic Geography	Understand, Remember
				Technology and Economic Development	Understand, Remember
				Economic Geography of Primary activity	Understand, Remember
				Modernization of Agriculture	Understand, Remember
				Economic geography of power resources	Understand, Remember
				Economic Geography of manufacturing	Understand, Remember
				Economic geography of International trade in selected commodities	Understand, Remember
5	I	GGY 1054 Practical on Geomorphology, Climatology and Economic Geography	Practical utility in the field while carrying out research on geomorphology, climatology and economic geography.	Morphometric Analysis, Analysis of Basin Morphology, Area-Height Relationship, Climograph,	Understand, Remember, Apply, analyze

				Hythergraph and Ergograph, Rainfall dispersion graph, rainfall variability and equipluve maps, Water deficiency and surplus graphs, Spatial variation in landuse and cropping pattern of North-East India using pie graph, Trend analysis of production of different commodities with the help of band graph and using moving average and least squares methods, Analysis of landholding and income pattern, Choropleth mapping of cropping intensity of N.E. India, Determination of the levels of economic development using simple composite index, Spatial analysis of crop concentration in N.E. India and Assam	
6	II	GGY 2066 Geographic Thought	Develop a comprehensive understanding of the discipline. Apply the historic and contemporary perspective to explain and	Geography through the ages	Understand, Remember
				Foundations of modern geography	Understand, Remember

			approach the real world geographic problems.	Evolution of geographic thought	Understand, Remember
				Emergence of New Geography	Understand, Remember
				Postmodern geography	Understand, Remember
				Models in Geography and their applications	Understand, Remember
				Present trend in Indian Geography	Understand, Remember
				Postmodern perspective in Indian Society	Understand, Remember
7	II	GGY 2076 Geography of Environment and Development	It provides the scope to develop a better understanding of environment from local to global perspectives. Increasing awareness towards environment and to equip with the methodologies of need based sustainable developmental plan.	Meaning of environment	Understand, Remember
				Defining Environmental Geography	Understand, Remember
				Man-Environment Relationship	Understand, Remember
				Ecosystem	Understand, Remember
				Man and Atmosphere	Understand, Remember
				Development processes	Understand, Remember
				Environment and Development	Understand, Remember
				Global Environmental Problems	Understand, Remember
				Environmental Pollution	Understand, Remember
				Environmental Hazards and Disaster	Understand, Remember

				Environmental Management	Understand, Remember
8	II	GGY 2086 Population and Settlement Geography	The course enables the students to understand population issue in spatial dimension to diagnose the problem issue arises out of population growth. Understanding the settlement, both in urban and rural context equip students to prepare need based sustainable settlement plans and policies.	Defining the field of Population Geography	Understand, Remember
				Population theories	Understand, Remember
				Population Data	Understand, Remember
				Components of population growth	Understand, Remember
				Demographic and socio-economic characteristics of population and associated issues	Understand, Remember
				Population- resource relationship	Understand, Remember
				Defining the field of settlement of geography	Understand, Remember
				Origin and growth of rural and urban settlements	Understand, Remember
				Morphology of rural and urban settlements	Understand, Remember
Rural-urban relationship	Understand, Remember				
9	II	GGY 2096 Geography of Regional Development of India with Special Reference to North-East India	Development of a better spatial perspective of a country like India with greater physical and social disparity. Such issues have both utilitarian and applied aspects in a broader context.	India as a geographical entity	Understand, Remember
				Physical background of regional development	Understand, Remember
				Mineral and power resources and development	Understand, Remember

				Population and development issues	Understand, Remember
				Regional disparities in economic development	Understand, Remember
				India's geo-economic position in Asia and the world	Understand, Remember
				North-East India	Understand, Remember
				Physical characteristics and their relation to development	Understand, Remember
				Natural resources, their utilization and development	Understand, Remember
				Population and development	Understand, Remember
				Agriculture and development	Understand, Remember
				Spatial pattern of socio-economic development	Understand, Remember

10	II	GGY 2104 Practical on Population and Settlement Geography and Regional Development of India and N.E. India	Practical on these issues help the students to portray problems as well as resource based in spatial perspectives and encourage the students to accommodate the significance of dimension in planning and policy making.	Population concentration and density pattern in North East India and Assam. Trend of population growth. Determination of spatial mean center of population, spatial mean center of urban population and settlements of selected areas. Distribution pattern of services/economic activities/settlements using Nearest Neighbour Analysis. Determination of settlement hierarchy using centrality index. Population Density Gradient Analysis Mapping volume and direction of population migration in North East India. Analysis of trend of population growth and food production in India. Spatial pattern of population density in Assam. Mapping of population distribution of North-	Understand, Remember, Apply, analyze
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				East India and analysis of its relationship with relief. Analysis of connectivity and centrality of transport networks in North East India. Determination of levels of infrastructural development in North East India using simple composite index. Flow pattern of selected commodities of India and N.E. India using standard carto-statistical techniques	
11	III	GGY 3116 Quantitative and Cartographic Methods in Geography	Understand what methods to use for geographical data analysis. Understand the principles of surveying and mapping.	Methodological developments in geography	Understand, Remember, Apply
				Geographic data matrix	Understand, Remember, Apply
				Sampling and its need in geographical data collection	Understand, Remember
				Application of inferential statistics in hypothesis testing	Understand, Remember
				Significance of cartography in geography	Understand, Remember
				Principles of surveying	Understand, Remember, Apply
				Principles of mapping	Understand, Remember, Apply

				Thematic mapping	Understand, Remember
				Techniques of physical and socio-economic data representation and mapping	Understand, Remember
12	III	GGY 3123 Fundamentals of Remote Sensing, GIS and GPS	Understand the rationale behind use of remotely sensed data its advantages and disadvantages. Understand how GIS/GPS methodologies can be used to address spatial analysis from the theoretical perspective.	Basic Concepts and Principles of Remote Sensing	Understand, Remember
				Significance of remote sensing in geography as spatial data acquisition tool	Understand, Remember
				Airborne and Satellite Remote Sensing	Understand, Remember
				Remote Sensing Data Interpretation	Understand, Remember
				Application of Remote Sensing in geomorphology	Understand, Remember, Apply
				Field of GIS	Understand, Remember
				Data type and structure of GIS	Understand, Remember
				Spatial analysis techniques and thematic representation of data in GIS	Understand, Remember
				GIS Softwares	Understand, Remember
				Introduction to GPS technology	Understand, Remember
				GPS elements and types of signals	Understand, Remember

13	III	GGY 3133 Research Methodology in Geography	This course will help students how to proceed with tackling a research problem and the steps one should adopt and the tools and craft a geographer usually employs.	Application areas of GPS in geographical study	Understand, Remember, Apply
				Meaning of research and geographic research	
				Formulation of a research problem	Understand, Remember, Apply
				Research design	Understand, Remember, Apply
				Inductive and deductive approaches in geographic research	Understand, Remember, Apply
				Questionnaire design, data collection, data processing and analysis	Understand, Remember, Apply
Research write-up	Understand, Remember, Apply				
14	III	GGY 3146 Social, Cultural and Political Geography	To understand how language, religion, ethnicity tangent with lebensraum, frontiers and boundaries and influence the geography of a region.	Defining the field of social geography	Understand, Remember
				Concept of social space, social group, social structure, social differentiation, social diversity, plurality	Understand, Remember
				Sauer's Morphology of Landscape School	Understand, Remember
				Themes and concepts in cultural geography	Understand, Remember
				Defining the field of political geography and its significance	Understand, Remember

				Historical development of political geography	Understand, Remember
				Approaches to the study of political geography	Understand, Remember
				Concepts in political geography	Understand, Remember
				International relations	Understand, Remember
				Geopolitical problems in global and Indian context	Understand, Remember
15	III	GGY3156 (4) Geography of Rural Development	Understand rural-urban disparities. Understand the diffusion of development and the spatial dimensions of rural settlements	Rural Development	Understand, Remember
				Rural Characteristics	Understand, Remember
				Rural-Urban relations, Diffusion of development	Understand, Remember
				Evolution, size and spacing of rural settlement	Understand, Remember
				Components of rural development process	Understand, Remember
				Infrastructure of rural development, sustainable development, plans & policies	Understand, Remember
				Problems of rural development- inequalities, social and environmental	Understand, Remember
16	III	GGY 3156 (5)		Remote Sensing System/technology	Understand, Remember, Apply

		Geoinformatics	Derive a comprehensive understanding of the use of RS/GIS/GPS techniques and their integration	Electromagnetic spectrum, energy radiation principles	Understand, Remember, Apply
				Fundamentals of aerial photography	Understand, Remember, Apply
				Geometric characteristics of aerial photographs	Understand, Remember, Apply
				Remote Sensing Systems	Understand, Remember, Apply
				Earth models, datum, coordinate systems, UTM zones	Understand, Remember, Apply
				Satellite data products from USA, ESA and India	Understand, Remember, Apply
				Defining the field of GIS	Understand, Remember, Apply
				Data input, storage and maintenance	Understand, Remember, Apply
				GIS data models and spatial data structure	Understand, Remember, Apply
				Raster and vector data	Understand, Remember, Apply
				GIS databases	Understand, Remember, Apply
				Integration of remote sensing data and GIS	Understand, Remember, Apply
17	III	GGY3156 (7) Regional Development Planning	Derive and understanding of regional development, its approaches, regionalization techniques and the need for conservation and management of resources for development.	The Concept of region and regional development	Understand, Remember
				Identification of regions	Understand, Remember
				Conservation and management of	Understand, Remember

				resources for regional development	
				Approaches to regional planning: Synoptic, functional and ad-hoc or specific	Understand, Remember
				Theories of spatial distribution	Understand, Remember
				Methods of regionalization and techniques of regional planning	Understand, Remember
				Decentralization and Multi-level planning	Understand, Remember
				Town and Country Planning	Understand, Remember
18	III	GGY 3164 Practical on Quantitative and Cartographic Methods	Students will be able to learn the different quantitative, cartographic and surveying techniques and its applications in geographical studies	Application of elementary matrix algebra in multivariate data analysis, Application of probability distributions, Application of relevant hypothesis testing techniques, Simple and multiple correlation and regression analysis, Spatial interaction, population potential surface, spatial diffusion, shape index, Techniques of multivariate analysis in	Understand, Remember, Apply, Analyze

				areal classification and regionalisation, Data Grouping Techniques for Choropleth mapping and Accuracy Assessment, Traversing and topographic surveying with the help of prismatic compass and theodolite, Contouring and profile levelling with the help of dumpy level, Construction of map projections, Map reading and analysis, preparation of base map, Representation of physical and socio-economic data using band graph, pie graph, sphere diagram, flow chart, iso lines and transect chart, Representation of land and population by topological space diagram (grid cells) for comparative study	
18	IV	GGY4176 Environment and Climate Change	The course will sensitize the student about the mechanism of climate and its drivers. Learners will explore the impacts on various sectors viz. hydrosphere, cryosphere, and	Introduction to ecology and the scientific methods Ecology and society	Understand, Remember Understand, Remember

			biosphere. Students further learn different organizational setup and policies related to climate change.	Ideologies of environmentalism, Issues of environment and equity	Understand, Remember
				Environment of land, water and forest in North east India	Understand, Remember
				Traditional Ecological Knowledge and belief system	Understand, Remember
				Anthropogenic	Understand, Remember
				Atmospheric circulation, El Niño Southern Oscillation	Understand, Remember
				Evaluation of climate models, climate projection and prediction	Understand, Remember
				Climate change	Understand, Remember
				Organization and policies	Understand, Remember
19	IV	GGY 4186 Geography of Bhutan, Bangladesh and Myanmar	Students will learn the scope of south-east Asian countries in regional collaboration, cooperation, in sustainable environmental and resource management.	Location and situation of Bhutan	Understand, Remember
				Physical Framework	Understand, Remember
				Socio-Cultural Background	Understand, Remember
				Economic Geography	Understand, Remember
				Location and situation of Bangladesh	Understand, Remember
				Physical Framework	Understand, Remember
				Socio-Cultural Background	Understand, Remember
				Economic Geography	Understand, Remember

				Location and situation of Myanmar	Understand, Remember
				Physical Framework	Understand, Remember
				Socio-Cultural Background	Understand, Remember
				Economic Geography	Understand, Remember
20	IV	GGY4193 Remote Sensing and GIS	The students will learn and acquire the skills in applying the advanced techniques of Remote Sensing, GIS and GPS in their study and research, which will lead them to quality research.	Fundamentals of Photogrammetry	Understand, Remember, Apply
				Interpretation of aerial photographs and preparation of land use map	Understand, Remember, Apply
				Interpretation of satellite imagery and preparation of land use/ land cover	Understand, Remember, Apply
				Digitization of different layers of spatial information	Understand, Remember, Apply
				Study of changing land use and river course using remote sensing and GIS techniques	Understand, Remember, Apply
				GPS data collection	Understand, Remember, Apply
21	IV	GGY4206 (4) Geography of Rural Development	The students will have the knowledge how a region can attain development through proper and rational utilization of its resources.	Trends in Rural development in India	Understand, Remember
				Inequalities of rural development in India	Understand, Remember
				Inequality in rural development in N.E. India	Understand, Remember

				Rural development practices in Israel, Indonesia and Bangladesh	Understand, Remember
				Indicators of rural development and determination of level rural development in India at state level	Understand, Remember
				Strategies for balanced rural development in India	Understand, Remember
22	IV	GGY4214 (4) Geography of Rural Development (Practical)	The students will be able to know the methods associated with the analysis of different geography of rural development. The students will also learn the problems and prospects of geography of rural development in a region with some practical exposure trips.	Size and spacing of rural areas: application of rank-size rule and nearest neighbour statistic, Identification of complimentary areas of central places: Application of Gravity Model and Central Place Model, Mapping of rural infrastructure: road network by applying Nearest Neighbour Statistic; distribution of services – education, post and telegraph, medical facilities, etc, Mapping of Rural Development Patterns: agricultural development, industrial development,	Understand, Remember, Apply

				development of trade and commerce by applying suitable statistical techniques, Mapping of rural inequalities: income and social well-being by applying suitable statistical techniques including Z-scores	
23	IV	GGY 4223(4) Geography of Rural Development (Dissertation)	Students will write a dissertation on suitable topic related to special paper applying all required methodology and dissertation writing procedure.	Each student will have to prepare a dissertation under the guidance of respective teacher as per specialization following appropriate methodology, data base and literature review	Understand, Apply, Analyze, Create
24	IV	GGY4206 (7) Regional Development Planning	The students will acquire applied knowledge how any region can be development through proper planning of the resources and other potentials.	Regional Development Planning for sustainable development	Understand, Remember
				Development indicators	Understand, Remember
				Pattern of World economic development	Understand, Remember
				Regional Planning in India in relation to Five Year Plans	Understand, Remember
				Regional development perspectives in Israel,	Understand, Remember

				Netherlands, Indonesia	
				Urban policy and urban planning in India	Understand, Remember
				Planning for problems areas, depressed regions	Understand, Remember
				Case studies of regional development planning exercises	Understand, Remember
25	IV	GGY4214 (7) Regional Development Planning (Practical)	The students will be able to know the methods associated with the analysis of different regional development planning. The students will also learn the problems and prospects of regional development planning in a region with some practical exposure trips.	Regionalization, Network analysis, Delimiting influence areas of nodal centers using Breaking point method, Gravity potential method, Application of input- output analysis for prediction of short- range change in regional development, Exercises on shift share analysis for regional studies	Understand, Remember, Apply
26	IV	GGY 4223 (7) Regional Development Planning (Dissertation)	Students will write a dissertation on suitable topic related to special paper applying all required methodology and dissertation writing procedure.	Each student will have to prepare a dissertation under the guidance of respective teacher as per specialization following appropriate methodology, data	Understand, Apply, Analyze, Create

				base and literature review	
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8. Programme Outcomes: MSc Zoology

- Students will be able to identify the major groups of organisms with an emphasis on animals and be able to classify them within a phylogenetic framework also using bioinformatics tools. Students will be able to compare and contrast the characteristics of animals that differentiate them from other forms of life.
- Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped animal morphology, physiology, life history, and behaviour.
- Students will be able to explain how organisms function at the level of the gene, genome, cell, tissue, organ and organ -system. Drawing upon this knowledge, they will be able to give specific examples of the physiological adaptations, development, reproduction and behavior of different forms of life.
- Students will be able to explicate the ecological interconnectedness of life on earth by tracing energy and nutrient flows through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems
- Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within biology
- Students will be able to demonstrate proficiency aquaculture management practices, induced breeding, insect culture etc
- Students will use current biochemical and molecular techniques to plan and carry out experiments. They will generate and test hypotheses, analyze data using statistical methods where appropriate, and appreciate the limitations of conclusions drawn from experimental data. Troubleshooting will be stressed in classes and labs.

Course Outcomes

SL NO.	SEMESTER	PAPER CODE & TITLE	COURSE OUTCOME	UNIT/CHAPTER	BLOOM'S TAXONOMY LEVELS
1	I	ZOO-1014 Biosystematics and Biostatistics	<p>To identify the major groups of organisms with an emphasis on animals and be able to classify them within a phylogenetic framework also using bioinformatics tools. Students can compare and contrast the characteristics of animals that differentiate them from other forms of life.</p> <ul style="list-style-type: none"> • To use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They can use specific examples to explicate how descent with modification has shaped animal morphology, physiology, life history, and behavior. • To explain how organisms function at the level of gene, genome, cell, tissue, organs and organ-systems. Drawing upon this knowledge, they can provide specific examples of the physiological adaptations, development, reproduction and behavior of different forms of life • To explicate the ecological interconnectedness of life on earth by tracing energy and nutrient flows through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems 	1, 2	Remembering, understanding, analyzing

			<ul style="list-style-type: none"> • To demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within biology • To demonstrate proficiency aquaculture management practices, induced breeding, insect culture etc • To use current biochemical and molecular techniques to plan and carry out experiments. They can generate and test hypotheses, analyze data using statistical methods where appropriate, and appreciate the limitations of conclusions drawn from experimental data. 		
		ZOO-1024 Bioinformatics and Instrumentation	<p>Students will acquire knowledge to:</p> <ul style="list-style-type: none"> • Explain which type of data is available from the most common protein sequence and structure databases (UniProt, GenBank, Protein Data Bank, CATH). • Explain the theories underlying the most common methods for sequence searches and sequence alignments, and in particular knows the principle and main steps for pairwise and multiple sequence alignments; • Explain and is able to apply the main steps of dynamic programming for simple alignments of short sequences; • List methods to uncover structure-function relationship in proteins and knows their underlying principles; • Explain the principles of computational methods for the prediction of secondary structure elements from protein sequence, prediction and modeling of three-dimensional protein structures (homology modeling, threading and ab initio methods). 	1, 2	Understanding, Analyzing, Applying

			<ul style="list-style-type: none"> • Select and apply the most appropriate method for aligning sequences, visualizing and analyzing protein structures, predicting secondary structure elements and modeling protein structures from sequence. • Understand the principle and uses of the instrument in the analysis of different biological samples • Implement the knowledge of instrument in analyzing the sample. 		
		ZOO-1034 Evolution and Chronobiology	<p>Students will acquire knowledge to:</p> <ul style="list-style-type: none"> • Understand the biological evolution of the organisms that inhabit the Earth today are different from those that inhabited it in the past. • Understand that natural selection is one of the several processes that can bring about evolution, although it can also promote stability rather than change • Understand that the four propositions underlying Darwin's theory of evolution through natural selection are: (1) more individuals are produced than can survive; (2) there is therefore a struggle for existence; (3) individuals within a species show variation; and (4) offspring tend to inherit their parents' characters. • Understand that the three necessary and sufficient conditions for natural selection to occur are: (1) a struggle for existence; (2) variation; and (3) inheritance. • Handle chronobiological terminology. • Critically study the chronobiological publications. 	1, 2	Understanding, Remembering, Analyzing, Applying

			<ul style="list-style-type: none"> • Adequately summarize and present chronobiological information. • Apply chronobiological principles in biological and medical-biological science. 		
		ZOO-1044 Genetics and Cytogenetics	<p>Students will acquire knowledge to</p> <ul style="list-style-type: none"> • Get a broad understanding of core molecular genetics concepts including molecular biology, genetics. • Acquire working knowledge in a defined skill set of molecular biology and biotechnology protocols, including PCR, genetic mapping, gene isolation and cloning, DNA sequencing, and sequence analysis. • Set key concepts of genome organization and manipulation in depth, such as assembly of physical maps of genomes, sequencing methods and strategies, genome annotation and bioinformatics, comparative genomics, global gene expression profiling. 	1, 2	Understanding, analyzing, applying
		ZOO-1054 Ecology and Environmental Biology	<p>Students will acquire knowledge</p> <ul style="list-style-type: none"> • To understand how individuals interact with members of their own species and with organisms of another species • To explain how populations of a species grow, change and are distributed across the range of their suitable habitats • To appreciate how communities of species are assembled and how they interact on an ecosystem level, across short and geological time-scales • To apply the underlying theory and basic principles of ecology learned throughout the course to understand the changes that are occurring as a result of human activity 	1, 2	Remembering, Understanding

			<ul style="list-style-type: none"> • To demonstrate that understanding biological and ecological principles can be used to solve real-world problems that we are facing 		
		ZOO-1064 Biochemistry	<p>Students will acquire knowledge</p> <ul style="list-style-type: none"> • On the synthesis of proteins, lipids, nucleic acids, and carbohydrates and their role in metabolic pathways along with their regulation at the epigenetic, transcriptional, translational, and post-translational levels including RNA and protein folding, modification, and degradation. Regulation by non-coding RNAs will be tied to the developmental and physiological functioning of the organism. • To understand the mechanism of Enzyme action and their regulation in biochemical pathway. • To understand the thermodynamic principle of biological systems and bioenergetics. 	1, 2	Understanding, Analyzing
2	II	ZOO-2014 Biodiversity	<p>Students will acquire knowledge to</p> <ul style="list-style-type: none"> • Understand the concepts and theory in biodiversity science and management from interdisciplinary perspectives and at an advanced level; • Assess the modes through which conservation builds and extends power and describe in detail the factors that explain the emergence and performance of different governance modes; • Appreciate the role of ethics, values and norms in producing culturally attuned and effective conservation interventions; • Understand new technological forces for the future of biodiversity science and management; 	1, 2	Understanding, Remembering, Analyzing

			<ul style="list-style-type: none"> • Link theory, hypothesis, methods, data and field work so as to identify and develop advanced research questions and design dissertation research that is identifiable with a professional research approach 		
		ZOO-2024 Endocrinology	<p>Students will acquire knowledge to</p> <ul style="list-style-type: none"> • Understand the role, metabolic function of various endocrines, its specific secretions and also the disorder and pathophysiology. • Understand the mechanism of hormone action, signal transduction system • Understand the role and function of neurosecretory hormones of insects and crustacean 	1, 2	Understanding, Analyzing
		ZOO-2034 Development Biology	<p>Students will acquire knowledge to</p> <ul style="list-style-type: none"> • Understand and master basic concepts of developmental biology • Understand how fertilization and cleavage occur • Understand the process and consequence of gastrulation • Understand mesoderm induction and neural induction • Understand basic concepts of organogenesis • Understand basic concepts of growth, regeneration and aging • Understand basic concepts of gene expression and regulation 	1, 2	Understanding, Remembering, Analyzing
		ZOO-2044 Animal cell culture and genetic engineering	<p>Students are able to:</p> <ul style="list-style-type: none"> • Understand theoretical concept to maintain cultures of animal cells and established cell lines with good viability, minimal contamination and appropriate documentation. • Understand the episodic tasks relevant to cell culture, including preparation and evaluation 	1, 2	Understanding, Analyzing, Applying

		<p>of media, cryopreservation and recovery, and assessment of cell growth/health.</p> <ul style="list-style-type: none"> • Able to recognize and troubleshoot problems common to routine cell culture. • Understand the importance of plasmids and viruses to genetic engineering. • Know the natural function of restriction endonucleases and how a normal bacterial cell protects its DNA from their activity. • Understand how “sticky ends” are formed and their importance to gene technology. <p>Describe how a chimeric genome is constructed.</p> <ul style="list-style-type: none"> • Explain the four steps of genetic engineering experiments. • Distinguish between the techniques of selection and screening of clones. • Explain how to screen for clones that contain a desired gene fragment. • Understand the value of and the processes involved with the polymerase chain reaction (PCR). • Describe techniques used to characterize DNA. • Discuss the different applications of gene technology. 		
	ZOO-2054 Animal Behaviour	<p>By the completion of this course, students set a comprehensive understanding of the behavior of animals. They will understand the proximate controls of behavior including the role of hormones, the animal’s genotype and the animal’s environment in the development of behavior. Much of our work will take an evolutionary approach, consequently, students will have a comprehensive understanding of</p>	1, 2	Understanding, Remembering

			the adaptive significance of behavior, emphasizing animal communication, social behavior, territoriality, sexual selection and mating systems.		
		ZOO-2064 Animal Physiology	<p>Student sets knowledge on:</p> <ul style="list-style-type: none"> • Cellular mechanisms of solute and water transport used by animals living in different environments • The different energy requirements of an animal at rest and during exercise, and how this is reflected in the functioning of the oxygen transporting systems • How the cardiovascular and respiratory systems are integrated and controlled • How animals use aerobic and anaerobic forms of metabolism for ATP production. • How animals move with muscles and navigate their movement by the neural control. The basic control processes of the nervous and endocrine systems • How animals have adapted to their environment with different ways of urine formation to excrete nitrogen wastes and water • Carry out physiological studies in the laboratory • Interpret physiological data and phenomena critically 	1, 2	Understanding, Analyzing, Applying
3.	III	ZOO-3014 Cell Biology	This course help to understand the biology of cells of prokaryote and higher organisms: The structure, function, and biosynthesis of cellular membranes and organelles; cell growth and oncogenic transformation; transport, receptors, and cell signaling; the cytoskeleton, the extracellular matrix, and cell movements;	1, 2	Understanding, Analyzing

			chromatin structure, cell cycle, regulation of cell cycle, apoptosis, regulation of gene expression in prokaryotes and eukaryotes and RNA editing.		
		ZOO-3024 Immunology, Microbiology and Parasitology	Understand the structural features of the components of the immune system as well as their functions, lymphoid organs, monoclonal antibody , structure of antibody, antigen antibody interaction <ul style="list-style-type: none"> • Understand the microbial diversity, microbial pathogeneses and applied microbiology • Understand the concept of parasitism, life cycle of economically important parasites of man and domesticated 	1, 2	Understanding, Analyzing, Applying
		ZOO-3034 Reproductive Biology	Understand the comparative structure and function of the male and female reproductive systems <ul style="list-style-type: none"> • Understand the physiology of gametogenesis, embryogenesis, pregnancy, parturition and lactation • Understand the endocrine, neuro-endocrine and environmental factors regulate reproduction • strategies for the management of reproduction and fertility in animals; including the application of assisted reproductive technologies 	1, 2	Understanding, Remembering
		ZOO-3044 Entomology and Aquatic Biology	Understand the economic importance of insects <ul style="list-style-type: none"> • Insect vectors, pest • Role of insects in ecosystem. • Concept of pest management. •Understand the limnology, aquatic resources of North East India, major threats of fresh water ecosystem, fish germplasm diversity of North East India 	1, 2	Understanding, Remembering, Application

		ZOO-3056 Integrative Biology	Understand the concept NET/SLET and Gate oriented question and approach to tackle the question and their concepts. recombination and population genetics has been provided via this paper.	1	Understanding, Analyzing, Applying
4.	IV Special Paper: Entomology	ZOO-4014 Insect Structure and Function	Students understand details of insect morphology, origin, locomotion and molecular phylogeny	1,2,3,4,5,6,7	Understanding, Remembering
		ZOO-4024 Insect Ecology	Students set knowledge to <ul style="list-style-type: none"> • Apply the basics of insect ecology to the development of the research • Identify insect specimen up to their order and able to use identification keys for further to more detail levels. 	1,2,3,4,5,6,7	Understanding, Remembering, Applying
		ZOO-4034 Insect Physiology	Able to describe the influence of the exoskeleton on physiological functions of insects. <ul style="list-style-type: none"> • Able to describe the hormonal and neuronal regulatory systems. • Able to describe the communication and sensory system of insects. • Use the acquired knowledge gained in the course for designing experiments in insects. 	1,2,3,4,5,6,7	Understanding, Analyzing
		ZOO-4044 Agricultural and Forest Entomology and Pest Control	At the end of the course, the student knows the bases of the insect morphology and anatomy and the biology and behaviour of the most harmful insects for different plant species. <ul style="list-style-type: none"> • Can understand the agro-forestry environment in the view of the management of the insect populations and plant protection. 	1,2,3,4,5,6,7	Understanding, Remembering

		ZOO-4054 Medical, Veterinary and Forensic Entomology	Students learn to identify and understand the life cycles, morphology, and behavior of mosquitoes, ticks, mites, lice, flea s, and other disease vectors. Students also learn about major arthropod-transmitted disease cycles, including malaria, Lyme disease, leishmaniasis. The interaction between the disease-causing pathogen and the arthropod vector discovered, including biological and mechanical transmission of pathogens as well as the mechanical damage that a parasite inflicts on its host.	1,2,3,4,5,6,7	Understanding, Remembering, Analyzing, Applying
		Zoo-4066 Dissertation	Acquire practical knowledge and get the hands on practice in the various aspects of insect biology and entomology as a whole.		Applying
5	IV Special Paper: Animal Physiology and Biochemistry	Zoo-4014 Biochemistry and Proteomics	Students understand the advanced level of Biochemistry, proteomics and their applications deals with a rapidly evolving scientific area that introduces students into genomes, proteomes and databases that store various data about genes, proteins, genomes and proteomes.	1, 2	Understanding, Analyzing, Applying
		Zoo-4024 Enzymology and Recombinant Technology	the major classes of enzyme and their functions in the cell <ul style="list-style-type: none"> • role of co enzyme co factor in enzyme catalyzed reaction; • Differentiate between equilibrium and steady state kinetics and analyzed simple kinetic data and estimate important parameter (Km, Vmax, Kcatetc) 	1, 2	Understanding, Applying, Analyzing

			<ul style="list-style-type: none"> • Define and describe the properties of enzymes in and regulates biochemical pathways (inhibition, Allosteric) • Understand the basis of current molecular biologic and genomic technologies and be able to contrast the structures of eukaryotic and prokaryotic genes and genomes, • Understand the complex nature of protein molecules including antibodies and the inherent issues that need to be considered when attempting to produce them in recombinant form, describe the events involved in generating recombinant DNA molecules, to include cDNA generation, expression vectors and the choice of host cell, discuss protein engineering, including protein tagging and mutagenesis-based strategies for generating recombinant proteins with modified properties 		
		Zoo -4034 Physiology and Adaptational Biology	Understand the advanced level physiology of animals and their system a comparative account. • Also able to understand the adaptation physiology of human and animal	1, 2	Understanding, Applying
		Zoo- 4044 Endocrinology and Reproductive Biology	Able to understand the molecular mechanism of endocrinology mechanisms and about the various events and mechanism of reproductive system.	1, 2	Understanding, Analyzing
		Zoo- 4054 Immunology	Understand advanced knowledge of the underlying principles of immunology and its application in solving problems in biological	1, 2	Understanding, Analyzing

			systems. • Have an awareness of some current research activities in the field and possible applications of this knowledge.		
		Zoo-4066 Dissertation	Acquire the practical knowledge and get the hands on practice in the subject of biochemistry, physiology, reproductive biology and immunology.		Applying