



Estd. 1954

প্ৰাগজ্যোতিষ মহাবিদ্যালয়

PRAGJYOTISH COLLEGE

**Affiliated to Gauhati University and
Recognized under Sections 2(f) and 12(B) of the U.G.C. Act, 1956**

Annual Quality Assurance Report (AQAR) 2021-2022

CRITERIA 2.6.1

**PROGRAMMES AND COURSE OUTCOMES FOR ALL THE
PROGRAMMES OFFERED BY THE INSTITUTION**

Third Cycle NAAC Accreditation

Submitted to



THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

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Pragjyotish College is a constituent college under Gauhati University, Guwahati and the college strictly follows the syllabus prescribed by the University.

Programme Outcome: B.A.

A graduate student in Arts is expected to achieve the following qualities:

- Acquire analytical skills to assess literature and social problems, appreciate their strengths, and suggest improvements for better outcomes.
- Comprehend the fundamental principles, basic concepts, and diverse theories within the mentioned subjects.
- Develop into a versatile individual who is self-reliant, capable of earning a living, and creating opportunities to do so.
- Cultivate different communication skills such as reading, listening, speaking, etc., to effectively express ideas and perspectives.
- Understand the impact of literature on social science issues and how literature can offer solutions to these issues.
- Acknowledge that social issues are not fixed and are greatly influenced by political and economic changes.
- Understand that the pursuit of knowledge is an ongoing process, and success is achieved through relentless effort and a positive mindset.
- Becomes a responsible citizen with active participation in social and cultural aspects of societal development.

Programme Outcome: B.Sc.

Post-completion of graduation in B.Sc. programme, the students are expected to acquire the following attributes:

- Develop observational skills and the ability to draw logical conclusions based on scientific experiments.
- Recognize the significance of an interdisciplinary approach in generating effective solutions and new ideas for sustainable development.
- Comprehend the fundamental principles, basic concepts, and scientific theories associated with various scientific phenomena and their practical applications in everyday life.
- Cultivate a scientific outlook that extends beyond scientific subjects to encompass all aspects of life.
- Obtain knowledge through factual information and data related to different subjects in the field of pure sciences.
- Acquire proficiency in utilizing scientific instruments, planning and conducting laboratory experiments.
- Realize that the pursuit of knowledge is a lifelong endeavor, and combining persistent efforts with a positive attitude and other necessary qualities leads to a successful life.
- Critically and systematically analyze provided scientific data and draw objective conclusions.

Programme Outcome: B.Com.

After completing graduation in Commerce, the students are expected to attain following attributes:

- Become employable, demonstrate a strong entrepreneurial spirit, and serve as a role model for ethical and principled business practitioners.
- Utilize theories, principles, and methodologies to conduct business transactions efficiently.
- Gain the necessary understanding of the promising opportunities in the field of business.

- Develop analytical abilities in engaging in commercial endeavors and assess the advantages and disadvantages of pursuing trade and trade-related activities through comprehensive understanding.
- Comprehend the real-life problems and difficulties faced by the business community.

Programme Outcome: BBA

Post-completion of BBA programme, following qualities shall be developed by the students:

- The capability to utilize technological expertise to drive business progress.
- Acquire a broad understanding of business operations.
- Display maturity, professionalism, and proficient teamwork abilities.
- Capacities to analyze, examine, and resolve significant business challenges.
- Specialized abilities to address specific issues of concern within a particular area.

Programme Outcome: BCA

A BCA graduate student is expected to have the following attributes:

- Comprehensive comprehension of the nature, extent, and practical utilization of computers and programming languages.
- Foster an interdisciplinary approach among the students to encourage collaboration and integration of knowledge from multiple disciplines.
- Utilize established software engineering practices and strategies within an open source programming environment for the development of software projects, aiming to deliver a high-quality product that contributes to the success of businesses.

Programme Outcome: MA

After completing MA programme, students will be able to:

- Attain mastery on the subject matter of the discipline pursued.
- Develop a mature personality and broader outlook towards life.
- Gain advance skills and become more desirable for employability.
- Specialises in a particular theme area of the discipline and attain further knowledge in the field through research.
- Enhances the ability to critically think and reason.
- Gather a greater sense of creativity.

Programme Outcome: MSc.

Post completion of MSc programme, the students will have:

- Ability to respond maturely to the problems and different events in life.
- Acquired proficiency in employing research intelligence in conducting investigations and fostering innovations.
- Achieve desired talent to actively work in myriads of domains and deliver best outputs.
- Becomes an expert in a specific thematic area within the discipline and expands their knowledge in the field through research.
- Improves the capacity for critical thinking and logical reasoning.
- Acquire professional ethics to serve the nation.
- Become skillful and productive.
- Become a responsible citizen and a resource towards economic development of the nation.

Department of Anthropology

Programme Specific Outcome (B.A/B.Sc in Anthropology) (CBCS)

The Programme Specific Outcome of the syllabus prescribed for the Honours students of Anthropology is mentioned below:

- PS01: It will help the students in understanding the concept of Anthropology
- PS02: They will be aware of the relationship that Anthropology shares with other disciplines and sub-disciplines along with the scope of the discipline
- PS03: It will help the students to understand the biological, cultural and prehistoric aspects related to human beings
- PS04: The practical undertaken will help the students to understand, and apply the methods and techniques used in field research and laboratory research
- PS05: They will also be equipped to carry out fieldworks, conduct interviews, review ethnographies and write reports by analyzing the data.
- PS06: Help inculcate the traits of problem solving aptitude, teamwork, develop analyzing and writing skills.

COURSE OUTCOME

B.A./B.Sc. in Anthropology (Honours) Syllabus (CBCS)

I Semester

Paper Name: Introduction to Biological Anthropology

Paper Code: ANT-HC-1016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> • Will learn about the genesis and development of Biological Anthropology • Understand the aspects from which evolution and variation is studied 	Unit I: History of Physical Anthropology and development of modern biological anthropology	Remember, Understand
	Unit II: History and Development of Understanding Human Variation and Evolutionary Thought	Remember, Understand
	Unit III: Non human primate in relation to human evolution	Remember, Understand, Analyse, Apply
	Unit IV: Great division of Humanity	Remember, Understand
	Unit V: Elementary genetics	Remember, Understand

Paper Name: Introduction to Socio-Cultural Anthropology

Paper Code: ANT-HC-1026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> • The basic theoretical knowledge about Social and Cultural Anthropology can be achieved. • The knowledge of first-hand field data collection and analysis can be gained. 	Unit I: Anthropological perspective and orientation	Remember, Understand
	Unit II: Concepts of Society and Culture	Remember, Understand
	Unit III: Social Institution	Remember, Understand
	Unit IV: Concept of Supernaturalism	Remember, Understand
	Unit V: Theory and practice of ethnographic fieldwork	Remember, Understand, Analyse, Apply
	Practical Report to be written by applying methods and techniques of social Anthropology.	Understand, Remember, Analyse, Apply

Paper Name: Introduction to Biological Anthropology

Paper Code: ANT-HG-1016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be	Unit I: History of Physical Anthropology and Development of	Remember, Understand

able to : <ul style="list-style-type: none"> Students will learn about the genesis and development of biological Anthropology Learn about the aspects from which evolution and variation in studies. 	modern Biological anthropology, aim, scope and its relationship with allied disciplines.	
	Unit II: History and development of understanding human variation and evolutionary thought.	Remember, Understand
	Unit III: Non-human primates in relation to Human Evolution	Remember, Understand
	Unit IV: Great division of Humanity	Remember, Understand
	Unit V: Elementary genetics	Remember. Understand
	Unit V: Mendelian inheritance in man	Remember, Understand
	Practical 1. Students should prepare a practical notebook on somatometric measurement. 2. Students should Prepare a practical note book On somatometric observation	Remember, Understand, Apply, Analyse

II Semester

Paper Name: Archaeological Anthropology

Paper Code: ANT-HC-2016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> Student will be acquainted with archaeo-metrical background of prehistoric and historic evolution of human culture Students will have practical understanding of prehistoric culture through tool technology and pottery technology. 	Unit I: Introduction	Remember, Understand
	Unit II: Methods of Studying archaeological anthropology	Remember, Understand
	Unit III: Methods of Estimation of Time and Reconstruction of the past	Remember, Understand
	Unit IV: Geochronology of Pleistocene Epoch	Remember, Understand
	Unit V: Typo- Technological Study of the Prehistoric tools	Remember, Understand
	Practical A practical drawing copy of tools of various prehistoric periods should be prepared by the students.	Remember, Understand, Analyse, Apply

Paper Name: Fundamentals of Human Origin and Evolution

Paper Code: ANT-HC-2026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the	Unit I: Non human primates in	Remember, Understand

<p>course, the students will be able to :</p> <ul style="list-style-type: none"> Students will learn about the stages of human evolutionary development. Will know about the fossil finds on the basis of which the evolutionary stages are identified. 	relation to human evolution	
	Unit II: Primate origins and evolution with special reference to Eocene, Oligocene and Miocene	Remember, Understand
	Unit III: Human origin on the basis of interpretation of fossil evidences	Remember, Understand
	Unit IV: The emergence of Archaic Homo sapiens	Remember, Understand
	Unit V: Origin of modern humans (<i>Homo Sapiens sapiens</i>) and their dispersal	Remember, Understand

Paper Name: Introduction to Socio-Cultural Anthropology

Paper Code: ANT-HG-2016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of the course, the students will be able to :</p> <ul style="list-style-type: none"> The basic theoretical knowledge about Social and Cultural Anthropology can be achieved. The knowledge of First –Hand field data collected and analysis can be gained 	Unit I: Anthropological perspective and orientation	Remember, Understand
	Unit II: Concept of Society and Culture	Remember, Understand
	Unit III: Social Institution	Remember, Understand
	Unit IV: Anthropological Concept of Religion	Remember, Understand
	Unit V: Theory and practice of ethnographic field work	Remember, Understand
	Practical Students should prepare a project report by applying secondary or primary data	Remember, Understand, Analyse, and Apply

III Semester

Paper Name: Tribes and Peasants in India

Paper Code: ANT-HC-3016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of the course, the students will be able to :</p> <ul style="list-style-type: none"> The anthropological knowledge and approach to study of tribes, villages and peasantry can be gained. The problems. Prospect, development and government policies for tribal, villages and peasants can be 	Unit I: Anthropological Concept of Tribe	Remember, Understand
	Unit II: Tribes and Wider World	Remember, Understand
	Unit III: Anthropological Concept of Village	Remember, Understand
	Unit IV: Ethnicity issues ,Tribal and Peasant movements: Identity issues	Remember, Understand
	Practical 1. Students should prepare a ethnography report by reading ethnographies 2. Prepare a Museum report	Remember, Understand, Analyse

achieved	
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Paper Name: Human Ecology: Biological and Cultural Dimensions

Paper Code: ANT-HC-3026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> The knowledge on human adaptation in ecology will be gained The knowledge on urbanization and industrialization in human societies will be achieved. 	Unit I: Definition and concept of the term ecology, human ecology, eco sensitivity, adaptation, acclimation, acclimatization, biotic and abiotic component.	Remember Understand,
	Unit II: Bio-cultural adaptation to environmental stresses	Remember, Understand
	Unit III: Impact of Urbanization and Industrialization on Man	Remember, Understand, Analyse, Apply
	Unit IV: Bio – Cultural Factors influencing the diseases and nutritional status.	Remember, Understand
	Unit V: Culture as a Tool for adaptation	Remember, Understand
	Unit VI: Ecological Themes of State formation	Remember, Understand
	Unit VII: Agriculture and Peasantry	Remember, Understand
	Practical 1. Students should prepared a practical note book based on Biological Dimension on Indices and cardiovascular function 2. students should make a project on environmental problems	Remember, Understand, Analyse, Apply

Paper Name: Biological Diversity in Human Population

Paper Code: ANT-HC-3036

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> The students will learn about markers for understanding biological diversity, Classical markers use for classifying races Classification of Indian population 	Unit I: Concept of Biological Variability, Sources of Genetic Variation, interpretation of Human Variation, Genetic Polymorphism	Remember, Understand
	Unit II: Different approaches of classifying human population:	Remember, Understand
	Unit III: Pre and Proto historic racial elements in India	Remember, Understand
	Unit IV: Genetic Diversity among Indian Population	Remember, Understand
	Unit V: Recent Understanding of Human Biological categories in the context of research	Remember, Understand
	Unit VI: Demographic Perspective	Remember, Understand
	Practical Students should prepare a practical	Remember, Understand, Analyse, Apply

	note book on craniometric measurement	
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Paper Name: Tourism Anthropology

Paper Code: ANT-SE-3014

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to: <ul style="list-style-type: none"> The Students will learn about the socio-cultural background of developing tourism. The students will learn the basics of eco-tourism and heritage tourism in the current situation. 	Unit I: Tourism- aspects and prospects	Remember, Understand
	Unit II: Study of Socio-cultural impact of tourism,	Remember, Understand
	Unit III: Understand the implication of tourism as a major mechanism of cross- cultural interaction.	Remember, Understand
	Unit IV: Contemporary tourism and sustainable	Remember, Understand
	Unit V: New Directions in the Anthropology of Tourism.	Remember, Understand

Paper Name: Introduction to Archaeological Anthropology

Paper Code: ANT-HG-3016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to: <ul style="list-style-type: none"> Student will be acquainted with archeo-metrical background of Prehistoric and historical evolution of human culture. Students will have practical understanding of prehistoric culture , technology and pottery technology 	Unit I: Introduction	Remember, Understand
	Unit II: Methods of Studying Archaeological anthropology	Remember, Understand
	Unit III: Methods of estimation of time	Remember, Understand
	Unit IV: Geochronology of Pleistocene Epoch	Remember, Understand
	Unit V: Typo-technological study of the prehistoric tools	Remember Understand
	Unit VI: Bronze age culture in Indus Basin	Remember, Understand
	Unit VII: Megalithic Culture	Remember, Understand
	Practical Students Should draw tools of various prehistoric cultural periods	Remember, Understand, Apply, Analyse

IV Semester

Paper Name: Theories of Culture and Society

Paper Code: ANT-HC-4016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the	Unit I: Emergence of Anthropology	Remember. Understand

<p>course, the students will be able to:</p> <ul style="list-style-type: none"> The knowledge of the basic theories of culture in Anthropology can be gained The knowledge of the basic theories of society in anthropology can be gained 	interface with evolutionary theory and colonialism	
	Unit II: Durkheim and Social integration, Functionalism and Structural- functionalism and British Social Anthropology	Remember, Understand, Analyse
	Unit III: Structuralism	Remember, Understand, Analyse
	Unit IV: Culture and Personality	Remember, Understand, Analyses
	Unit V: Symbolic and interpretative approach	Remember, Understand, Analyse.
Practical Students should prepare a report on critical analysis of theories of culture and society.	Remember, Understand, Analyse	

Paper Name: Human Growth and Development

Paper Code: ANT-HC-4026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> Students will learn about concepts related with growth and stages of growth. Students will learn bio-cultural factors that influence growth and development. Students will learn human body composition. 	Unit I: Concept of human growth, development, differentiation and maturation.	Remember, Understand
	Unit II: Prenatal and postnatal period of growth, Pattern of normal growth curves, ethnic and gender differences in growth curves, secular trend.	Remember, Understand
	Unit III: Bio-cultural factors influencing patterns of growth and variation, methods and techniques to study growth. Significance /applicability of Growth studies.	Remember, Understand
	Unit IV: Concept of Ageing	Remember, Understand
	Unit V: Nutritional epidemiology- concept of balanced diet, impact of malnutrition with special reference to obesity, Kwashiorkor and Marasmus, Assessment of nutritional	Remember, Understand
	Practical Students should prepare a practical note book on growth status, Somatometry, Obesity, Nutritional assessment	Understand, Analyse

Paper Name: Research Methods

Paper Code: ANT-HC-4036

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
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<p>After the completion of the course, the students will be able to :</p> <ul style="list-style-type: none"> The Knowledge on formulation of research design, application of methods and techniques in data collection will be obtained. The ethics of research will be understood for an affective research study. 	Unit I: Research design	Remember, Understand
	Unit II: Field work tradition in Anthropology	Remember, Understand
	Unit III: Tools and techniques of data collection	Remember, Understand
	Unit IV: Ethnics and politics of Research	Remember, Understand
	Unit V: Analysis and Writing up	Remember, Understand, and Analyse.
	Unit VI: Bio-Statistics	Remember, Understand, Analyse
	Practical Preparation of Project Report by applying field methods on any social problems	Understand, Analyse and Apply

Paper Name: Public Health and Epidemiology

Paper Code: ANT-SE-4014

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of the course, the students will be able to :</p> <ul style="list-style-type: none"> Understand and assess the different aspects of health, disease and principles of Epidemiology 	Unit I: Principles of Epidemiology in Public Health	Remember, Understand
	Unit II: Statistical Methods for Health Science	Understand, Analyse and Apply
	Unit III: Environmental Health	Remember, Understand, Analyse
	Unit IV: Psychological, Behavioural and Social Issues in Public Health	Remember, Understand, Analyse
	Unit V: Management of Health Care Program and Service Organisations	Remember, Understand
	Unit VI: Epidemiology of Disease	Remember, Understand
	Practical Project Report on Issues related to Public Health and Epidemiology	Understand, Analyse and Apply

Paper Name: Anthropology in Practice

Paper Code: ANT-HG-4026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of the course, the students will be able to :</p>	Unit I: Academic Anthropology	Remember, Understand
	Unit II: Role of Anthropology in Development	Remember, Understand

<ul style="list-style-type: none"> Acquire knowledge about Applied, Action and Development Anthropology Gain knowledge on Recent trends of Anthropology 	Unit III: Future Dynamics in Anthropology	Remember, Understand
	Unit IV: Constitutional Perspective and Human Rights	Remember, Understand
	Practical Project Reports on NGO/Corporate office/ Panchayat office/ Census office visits. Report on Constitutional Provision Report on Religious Tourism/ Tribal Tourism/ Health Tourism/ Fashion/ Human Rights/ Eco Tourism	Understand and Apply

V Semester

Paper Name: Human Population Genetics

Paper Code: ANT-HC-5016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> Learn about mechanisms which create variation in gene frequency The method of assessing gene frequency variation Learn how ecological factors which help maintain gene frequencies 	Unit I: Essentials of Genetics	Remember, Understand
	Unit II: Ecological Genetics and Polymorphism	Remember, Understand
	Unit III: Hardy-Weinberg Principle	Remember, Understand
	Unit IV: Mechanism for dynamics in gene Frequency	Remember, Understand
	Unit V: Population Structure and Admixture in Human Populations	Remember, Understand
	Practical Laboratory work on ABO and Rh blood groups; Colour Blindness Test; PTC test	Remember, Understand, Analyse and Apply

Paper Name: Anthropology in Practice

Paper Code: ANT-HC-5026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> Acquire knowledge about Applied, Action and Development Anthropology Gain knowledge on Recent trends of Anthropology 	Unit I: Academic Anthropology	Remember, Understand
	Unit II: Role of Anthropology in Development	Remember, Understand
	Unit III: Future Dynamics in Anthropology	Remember, Understand
	Unit IV: Constitutional Perspective and Human Rights	Remember, Understand
	Practical Project Reports on NGO/Corporate office/ Panchayat office/ Census office visits. Report on Constitutional Provision Report on Religious Tourism/ Tribal	Understand, Analyse, Apply

	Tourism/ Health Tourism/ Fashion/ Human Rights/ Eco Tourism	
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Paper Name: Indian Archaeology

Paper Code: ANT-HE-5016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> Understand about the prehistoric past of India 	Unit I: Prehistoric India	Remember, Understand
	Unit II: Character, distribution and Interpretation of Habitat and Economy of the Prehistoric Cultures of India	Remember, Understand
	Unit III: Bronze Age Culture in Indus Basin	Remember, Understand
	Unit IV: Megalithic Cultures in India with special reference to Northeast India	Remember, Understand
	Unit V: Important Excavated Archaeological Sites of North East India	Remember, Understand
	Practical Identification of tools. Application of Remote Sensing and GIS in Prehistoric Archaeology	Understand, Apply

Paper Name: Anthropology of Religion, Politics and Economy

Paper Code: ANT-HE-5026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> learn about Anthropological theories of Religion, Economy and Political Institutions Knowledge on the interrelationship between religion, economy and politics 	Unit I: Anthropological Approaches to understand Religion	Remember, Understand
	Unit II: Economic Institutions	Remember, Understand
	Unit III: Political Institutions	Remember, Understand
	Unit IV: Interrelationship between Religion, Politics and Economy	Remember, Understand
	Practical Case study of any of the Social Institute (Religion, Economic and Political) with respect to Culture Perspective	Understand, Analyse

VI Semester

Paper Name: Forensic Anthropology

Paper Code: ANT-HC-6016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be	Unit I: Introduction to Forensic Anthropology	Remember, Understand

able to : <ul style="list-style-type: none"> • Distinguishing human from non-human skeletal remains • Techniques of making personal identification 	Unit II: Basic Human Skeletal Biology, Identification of Human and Non-Human Skeletal Remains	Remember, Understand, Apply
	Unit III: Personal Identification, Complete and Partial Identification, Methods of Identification in Living Persons	Remember, Understand, Analyse, Apply
	Unit IV: Serology	Remember, Understand, Analyse, Apply
	Unit V: Individualization	Remember, Understand, Analyse, Apply
	Practical Study of Human Long Bones, Estimation of Age, Sex, Stature Somatometric and Somatoscopic Observation Dermatoglyphics	Understand, Analyse, Apply

Paper Name: Anthropology of India

Paper Code: ANT-HC-6026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> • Learn about racial, linguistic and ethnic dimensions of Indian Society • Will be familiar with the anthropological situation of the country 	Unit I: Origin, history, development of Anthropology in India	Remember, Understand
	Unit II: Contribution of Contemporary Biological, Social and Archaeological Anthropologists	Remember, Understand
	Unit III: Tribal Situation in India	Remember, Understand
	Unit IV: Problems of Exploitation and Deprivation of Scheduled Caste/ Tribe and	Remember, Understand
	Practical 1. Students should prepare a practical report on racial classification 2. Students should prepare a book review on social structure such as caste, religion, tribe or rural population. 3. Students should prepare a practical report on considering atleast five genetic traits. 4. Students should prepare a report on two contemporary Indian Anthropologist	Remember. Understand, Analyse, Apply

Paper Name: Dissertation

Paper Code: ANT-HE-6016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
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<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • The knowledge of conducting fieldwork by applying anthropological methods will be gained. • The knowledge of data analysis and writing based on the collected data will be learned. 	<p>Students should prepare a dissertation or project work by applying primary data.</p>	<p>Remember, Understanding, Analyse, Apply</p>
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Paper Name: Demographic Anthropology

Paper Code: ANT-HE-6036

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • Know about the basic of demography and demographical theories. • Students will learn about the tools used for population change. 	Unit I: Demographic Anthropology	Remember, Understand
	Unit II: Population Theories	Remember, Understand
	Unit III: Tools of Demographic Data	Remember, Understand
	Unit IV: Population of India	Remember, Understanding
	Unit V: National policies	Remember, Understand
	Practical Students should prepare a demographic report by applying primary data or secondary data	Remember, Understand, Analyse, Apply

Department of Anthropology

Programme Specific Outcome (B.A/B.Sc in Anthropology) (Non - CBCS)

The Programme Specific Outcome of the syllabus prescribed for the Major students of Anthropology is mentioned below:

- It will help the students in understanding the concept of Anthropology
- They will be aware of the relationship that Anthropology shares with other disciplines and sub-disciplines along with the scope of the discipline
- It will help the students to understand the biological, cultural and prehistoric aspects related to human beings
- The practical undertaken will help the students to understand, and apply the methods and techniques used in field research and laboratory research
- They will also be equipped to carry out fieldworks, conduct interviews, review ethnographies and write reports by analyzing the data.
- Help inculcate the traits of problem solving aptitude, teamwork, develop analyzing and writing skills.

COURSE OUTCOME

TDC Semester Syllabus in Anthropology (Major/Generic) Syllabus (Non - CBCS)

5th Semester (Major)

Paper Name: Physical Anthropology (Human Evolution)

Paper Code: M 501

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> Understand physical anthropology with reference to human evolution including theories of evolution, origin of evolution, fossil studies etc. and also the ecological adaptation of man. 	Unit I : Theories of life	Remember, Understand
	Unit II : Origin and evolution of primate	Remember, Understand
	Unit III : Origin and evolution of man	Remember, Understand
	Unit IV : General study of the following fossil forms : Solo Man, Heiderberg Man, Wadjak Man,	Remember, Understand
	Unit V : Mesolithic people : Mugem Man, Teviec Man, Ofnet Man.	Remember, Understand
	Unit VI : Ecological adaptation of Man.	Remember, Understand

5th Semester (Major)

Paper Name: Prehistoric Archaeology (1st half: Methods and Principle)

Paper Code: M 502

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> Will be able to apply methods and principal of prehistoric anthropology such as Chronology and dating methods, palaeoecology, post Pleistocene to understand hominid culture development in Europe and Africa. 	Unit 1: Chronology and Dating Methods	Remember, Understand
	Unit II : Palaeoecology : Concept of palaeoecology	Remember, Understand
	Unit III : Post –pleistocene climatic changes and its impact on prehistoric lifeways in Northern and Western Europe.	Remember, Understand

5th Semester (Major)

Paper Name: Prehistoric Archaeology (2nd Half: Hominid Cultural Development in Europe and Africa)

Paper Code: M 502

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> • Will be able to apply methods and principal of prehistoric anthropology such as Chronology and dating methods, palaeo-ecology, post Pleistocene to understand hominid culture development in Europe and Africa. 	Unit 1: Palaeolithic Cultural development in in East Africa : Oldowan.	Remember, Understand
	Unit II: Lower Palaeolithic Cultural development in Europe.(Abbeville and Acheulean)	Remember, Understand
	Unit III : Middle palaeolithic Cultural development in Europe. (Mousterian culture)	Remember, Understand
	Unit IV : Upper Palaeolithic Cultural development in Europe. (Aurignacian, Solutrean and Magdalenian culture)	Remember, Understand
	Unit V : Upper palaeolithic Art in Europe ; cave art and home art	Remember, Understand
	Unit VI : Mesolithic Cultural development in Northern and Western Europe	Remember, Understand

5th Semester (Major)

Paper Name: Social Anthropology (Indian Anthropology and Anthropology of Religion)

Paper Code: M 503

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> • Understand Indian Anthropology and Anthropology of Religion 	Unit I : Religion	Remember, Understand
	Unit II : Supernaturalism : Basic concepts :	Remember, Understand
	Unit III : Indian Society : Tribes, castes and peasants in India	Remember, Understand

5th Semester (Major)

Paper Name: Social Anthropology (Field Methodology, Tribes of North East India)

Paper Code: M 504

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> To understand the field methodology of Anthropology along with brief history, Field work tradition in Anthropology and also ethnographic account of various tribal of North East India 	Unit I : Field -Methodology	Remember, Understand
	Unit II : Tribal communities of NE India :	Remember, Understand

5th Semester (Major)

Paper Name: Physical Anthropology

Paper Code: M 505 (Practical)

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> To understand and apply the knowledge of Physical Anthropology 	Unit I : Comparative anatomy Drawing, description and identification of skulls of (i) Gorilla (ii) Chimpanzee (iii) Orangutan (iv) Gibbon	Understand, Analyse, Apply
	Unit II : Fossil Man (i) Pithecanthropus (ii) Heidelberg jaw (iii) Neanderthal and (iv) Cromagnan	Understand, Analyse, Apply
	Unit III : Dermatoglyphics	Understand, Analyse, Apply
	Unit IV : Physiological anthropology	Understand, Analyse, Apply

5th Semester (Major)

Paper Name: Prehistory (Part I)

Paper Code: M 506 (Practical)

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> To understand, analyse and apply the various methods of data 	Unit I : Tools Students have to draw and describe 10 Neolithic tools	Understand, Analyse, Apply
	Unit II: Pottery – Ceramic Technology – Draw and Describe	Understand, Analyse, Apply

collection, conduct field work, learn professional ethics and human value		
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5th Semester (Major)

Paper Name: Social Anthropology (Part II: Museum Method and Project on Field Methods)

Paper Code: M 506

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> To understand, analyse and apply the various methods of data collection, conduct field work, learn professional ethics and human value 	Unit I : Museum Method	Understand, Analyse, Apply
	Unit II : Project work on application of field methods:	Understand, Analyse, Apply

5th Semester (General)

Paper Name: Social Anthropology

Paper Code: E 501

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> Understand Religion, tribal societies and applied aspects of Social Anthropology 	Unit I: Religion and Magic	Remember, Understand
	Unit II: Indian Society : Tribes, castes and peasants in India	Remember, Understand
	Unit III: Tribal communities of NE India :	Remember, Understand
	Unit IV: Applied Social Anthropology .	Remember, Understand

5th Semester (General)

Paper Name: Physical and Prehistory

Paper Code: E 502 (Practical)

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
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After the completion of the course, the students will be able to : <ul style="list-style-type: none"> To understand, analyse and apply the methods of Physical Anthropology and Prehistory 	Part I Physical Anthropology Unit – I: Technique of taking finger prints : Identification of finger ball pattern - whorl, loop and arch	Understand, Analyse, Apply
	Unit – II: Osteometry. Measurements of the human bones on osteometric board	Understand, Analyse, Apply
	Unit – III : Craniometry	Understand, Analyse, Apply
	Part II: Prehistory Draw and describe the stone tools of different cultural period	Understand, Analyse, Apply

6th Semester (Major)

Paper Name: Physical Anthropology (Human Genetics)

Paper Code: M 601

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> To understand knowledge about human genetics, methods of studying human heredity, population genetics, heredity and environmental mechanism of human variation and concept of growth. 	Unit I : Human genetics : its scope,	Remember, Understand
	Unit II : Methods of studying human heredity : twin method, pedigree method	Remember, Understand
	Unit III : Mendelian principles of heredity, single factor inheritance : a	Remember, Understand
	Unit IV : Population genetics, Hardy-weinberg Law and its importance in population genetics.	Remember, Understand
	Unit V : Ma, heredity and environment. Influence of heredity and environment on man with special reference to stature, weight, skin colour, head form, ABO Blood groups and finger patterns.	Remember, Understand
	Unit VI : Mechanism of Human variation ; mutation, selection, gene flow and genetic drift.	Remember, Understand
	Unit VII : Concept of growth and development.	Remember, Understand

6th Semester (Major)

Paper Name: Prehistoric Anthropology (1st Half: Methods and Principle)

Paper Code: M 602

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> To understand methods and principal of prehistory, origin and development of prehistoric archaeology, field archaeology methods of reconstruction of prehistoric life ways along with hominid cultural development in India. 	Unit I: Origin and Development of Prehistoric Archaeology; scientific Basis of Prehistoric Archaeology; Ethno archaeology; New archaeology.	Remember, Understand
	Unit II : Field Archaeology (methods of data recovery) – methods and techniques in archaeological exploration.	Remember, Understand
	Unit III : Methods of Reconstruction of Prehistoric lifeways.	Remember, Understand

6th Semester (Major)

Paper Name: Prehistoric Anthropology (2nd Half: Hominid Cultural Development in India)

Paper Code: M 602

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> To understand methods and principal of prehistory, origin and development of prehistoric archaeology, field archaeology methods of reconstruction of prehistoric life ways along with hominid cultural development in India 	Unit I : Lower Palaeolithic Cultural development in India (Sohanian and Madrasian culture)	Remember, Understand
	Unit II : Middle Palaeolithic Cultural development in India (Nevasian culture)	Remember, Understand
	Unit III : Upper Palaeolithic Cultural Development in India.	Remember, Understand
	Unit IV : Mesolithic cultural development in India.	Remember, Understand
	Unit V : Neolithic Cultural Development	Remember, Understand
	Unit VI : Copper- bronze age culture in India	Remember, Understand
	Unit VII : Megalithic culture in Northeast India	Remember, Understand

6th Semester (Major)

Paper Name: Social Anthropology (Indian Anthropology)

Paper Code: M 603

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> Impart the knowledge of Indian Society and Indian Anthropology including 	Unit I: Indian Society: Tribes, Castes and Peasants in India	Remember, Understand
	Unit II: Indian Anthropology	Remember, Understand

unity and diversity of human social system basic nature traditional Indian system, caste system of Indian Anthropology.		
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6th Semester (Major)

Paper Name: Applied Anthropology

Paper Code: M 604

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> Understand the application of Social and Physical Anthropology 	Unit I: Applied Social Anthropology	Remember, Understand
	Unit II: Applied Physical Anthropology	Remember, Understand

6th Semester (Major)

Paper Name: Physical Anthropology

Paper Code: M 605 (Practical)

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> provided the knowledge about practical aspects of physical anthropology including craniometric measurements and angles, blood grouping and Rh factor. 	Unit I : Craniometry : Measurements and Angles	Understand, Analyse, Apply
	Unit II : Determine the ABO blood group and Rh factor of five subjects by open slide method	Understand, Analyse, Apply

6th Semester (Major)

Paper Name: Social Anthropology (Technology and Fieldwork)

Paper Code: M 606 (Practical)

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to :	A.Technology - Study of implements illustrative of material culture and subsistence economy of the	Understand, Analyse, Apply

<ul style="list-style-type: none"> enhance the knowledge of practical aspects of social anthropology specially technology and field work. 	tribal and non-tribal people of North East India with special reference	
	B. Fieldwork - The fieldwork should be carried out under the supervision of teacher (s) in any rural (tribe or caste) area on a specific community at least for 15 days	Understand, Analyse, Apply

6th Semester (General)

Paper Name: Physical Anthropology

Paper Code: E 601

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none"> to understand the aspects of Human Origin, fossils, evolution understand the prehistoric culture of the World 	Part I : Physical Anthropology Unit – I Theories of organic evolution	Remember, Understand
	Unit – II Descent of man	Remember, Understand
	Unit - III Fossil primates	Remember, Understand
	Unit – IV Evolutionary stages of man in the light of the following fossil evidence :- Australopithecus, pithecanthropus, Sinanthropus, Neanderthalman and Cro-magnon	Remember, Understand
	Unit – V Mesolithic races : Mugem, Tevic & Offnet	Remember, Understand
	Part II : Prehistory Unit I : Dating method	Remember, Understand
	Unit II : Lower Paleolithic in East Africa & Europe	Remember, Understand
	Unit III : Lower Paleolithic in India	Remember, Understand
	Unit IV : Mesolithic development in western Asia (Middle east – Natufian), in Europe (Azilian, Terdenoisian, Maglemoscan)	Remember, Understand
	Unit V : Neolithic Revolution : Neolithic Cultural Pattern in India	Remember, Understand
	Unit VI : Megalithic culture in India	Remember, Understand
	Unit VII : Indus valley civilization	Remember, Understand

6th Semester (General)

Paper Name: Technology & Museum Methods

Paper Code: E 602 (Practical)

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of the course, the students will be able to : <ul style="list-style-type: none">• understand, apply the knowledge of Social Anthropology	A. Technology	Understand, Analyse, Apply
	B. Museum methods	Understand, Analyse, Apply
	C. Fieldwork	Understand, Analyse, Apply

Department of Assamese MA

Programme Specific Outcome

After completing MA Assamese programme, students will be able to,

- Enhance their descriptive, analytical and conceptual abilities.
- Develop a coherent and systematic knowledge of Assamese Literature, Language and Culture.
- Gain introductory knowledge of World Literature, Comparative Literature.

COURSE OUTCOME

MA in Assamese Syllabus (CBCS)

- The Syllabus contains different categories of Assamese literature like Oral literature,

Literature of Pre Vaishnavite period, Vaishnavite Period, Post Vaishnavite Period, Romantic Literature, Modern Literature, Post Modern Literature, Growth And Development of Languages, Ariyan and Non Ariyan Languages, Assamese Language, Its origin and Development. Scripts History and Assamese Scripts, Script Reading, Culture, and different categories of culture, Socio culture, Socio Linguistics, Comparative Studies of different literature of various New Indo-Ariyan Languages with Assamese Literature, Background of Assamese religion and its significant and Indian context tradition. This Syllabus also covers the translation studies and its practices also.

- This syllabus will give the specific idea about the languages, literature, culture and formation of Assamese. Student will find a specific idea about the language, Culture, Literature, Religion of Assamese Back ground.
- This syllabus will also help to know on the development of Indian literature and tradition through the comparative part of the syllabus.
- From the Translation part of the syllabus Student will know the trend and development of

world literature.

COURSE OUTCOME

M A in Assamese Syllabus (CBCS)

1st Semester

Paper Name : Rise and Development of the Assamese Language

Paper Code : ASM 1016

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none">Reconstruct the social history of Assam in the light of the rise of Assamese language.Justify the relationship between tradition of religion and formation of Assamese language.Compare and contrast the social history of early Assamese form of language with that of the Modern Assamese language.	Unit I :Emergence of regional languages in India, spoken words versus literary language, language and religion, polity and language:Inscriptions, Charyapada.	Remember, Understand, Analysis
	Unit II :Assamese as a literary language; royal patronage and reproduction of epics in Assamese; early Assamese texts: Hem Saraswati'sPrahad Charit and Madhav Kandali's Ramayana.	Remember, Understand, Analysis
	Unit III :Cultural and linguistic encounters: Emergence of Brajabali; emergence of Assamese prose, Buranjis and CharitPuthis.	Remember, Understand, Analysis
	Unit IV :Colonialism and Modern Assamese: Shaping of Modern Assamese language, the roles of Missionaries and Assamese intellectuals, print media and the language; standardization of the language.	Remember, Understand, Analysis, Apply
Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able	Unit I :Salient features of Mafizuddin Ahmad Hazarika's poetry,	Understand, Analysis, Apply

<p>to,</p> <ul style="list-style-type: none"> Trace the phases of Romantic and Modern Assamese literature. 	<p>Salient features of Bhabananda Datta's criticism of poetry, Salient features of Bhaben Barua's poetry, Salient features of Jnan Pujari's poetry.</p>	
	<p>Unit II :Salient features of Nakul Chandra Bhuyan's plays, Salient features of Atul Chandra Hazarika's plays, Salient features of Himendra Barthakur's plays.</p>	Understand, Analysis, Apply
	<p>Unit III :Salient features of Dandinath Kalita's novels, Salient features of Umakanta Sarma's novels, Salient features of Yeshe Dorje Thongchi's novels, Salient features of Arupa Patangia Kalita's novels.</p>	Understand, Analysis, Apply
	<p>Unit IV : Salient features of Roma Das's short stories, Salient features of Birendra Kumar Bhattacharya's short stories, Salient features of Silabhadra's short stories, Salient features of Bipul Khataniar's short stories.</p>	Understand, Analysis, Apply

Paper Name : Study of Culture of Assam

Paper Code : ASM 1036

Course Outcome	Unit with Name	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to,</p> <ul style="list-style-type: none"> Trace the phases of Assamese Culture. Reconstruct religious belief of the people of Ancient Assam and compare it with that of the rest of ancient India 	<p>Unit I :Definition, classification and scope of culture with special reference to culture of Assam.</p>	Remember, Understand, Analysis
	<p>Unit II :Culture of Assam in early period (from the pre-historical times to the tenth century CE) People of Assam and their ethnic groups, architecture, sculpture, inscription, religion (magico-religious beliefs, Kairataja dharmamat) and tradition.</p>	Remember, Understand, Analysis
	<p>Unit III :Culture of Assam in the medieval period (from the eleventh century CE to the eighteenth century CE) History of religions of medieval Assam Religious institutions: Temple, monastery, satra, namghar, mosque,</p>	Remember, Understand, Analysis

	pir-dargah Art, artifacts, architecture and music.	
	Unit IV : Culture of Assam in the modern period (From the nineteenth century CE till the present time) Socio-cultural institution and organization, cultural assimilation, acculturation, de-Sanskritization, trans-culturalization, preservation of cultural item, and globalization.	Remember, Understand, Analysis

Paper Name : History of Sanskrit Literature: History, Features and Genres

Paper Code : ASM 1046

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none"> Trace the history and heritage of Indian literary tradition. Describe the features of Sanskrit Literature which is considered as the mother of all regional Literature including Assamese. Grasp the Indianness in Indian Literature. 	Unit I : Poetry : Mahakavya and Khandakavya	Remember, Understand, Analysis
	Unit II : Drama and Campu : Theories of origin, features, types and chronological history	Remember, Understand, Analysis
	Unit III : Prose : Features, genres and introduction to prose works	Remember, Understand, Analysis
	Unit IV : Sanskrit writing in Assam : Pre-Sankaradeva, Sankaradeva and Post Sankaradeva periods: Chronological history and features	Remember, Understand, Analysis

Paper Name : Creative Writing (Value Added Course)

Paper Code : ASM 1054

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none"> Compare and contrast the genres of creative writing on the basis of imitation and imagination. Create a piece of literature 	Unit I : Imitation Imagination Anatomical components of poetry, drama and fiction.	Remember, Understand, Analysis, Apply
	Unit II : Trends in poetry, drama and fiction Language of modern poetry and modern novel.	Remember, Understand, Analysis
	Unit III : Performance (Traditional and experimental) Functional writing.	Remember, Understand, Analysis
	Unit IV : Project.	Remember, Understand,

and justify its quality. • Describe the experience of reading a piece of literature.		Analysis, Apply
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2nd Semester

Paper Name : Assamese Poetry : 1889-2015

Paper Code : ASM 2016

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none"> • Categorise Assamese poetry (1889-2015) in groups of Romantic and Modern Phases. • Describe experience of reading Romantic and Modern Assamese Poetry. • Identify the difference between Romantic and Modern Poetry. • Develop intellectual history of Assam with the help of knowledge of stone inscriptions and copperplates. • Enumerate the institutions and describe their role in preserving Assamese culture. 	Unit I :Romantic Poetry (First Wave) : Chandra Kumar Agarwala: Ajeya, Hem Chandra Goswami: Puwa, Lakshminath Bezboroa: Malati.	Remember, Understand, Analysis
	Unit II :Romantic Poetry (Second Wave) : Raghunath Chaudhury: Giri Mallika Ambikagiri Raychoudhury: Mor Bina Devakanta Barua: Aprakarsh.	Remember, Understand, Analysis
	Unit III :Modern Poetry (First Wave) : Hem Barua: Poharatkoi Endhar Bhal, Navakanta Barua: Samratar para, Ajit Barua: Dukhar Kabita, Nilmoni Phookan: Olami Thaka Golapi Jamur Lagna.	Remember, Understand, Analysis
	Unit IV :Modern Poetry (Second Wave) : Hirendra Nath Dutta: Chhayamoya, Anis Uz Zaman: Ai Tor Andharar Hatkhan Bhangi Dilon, Sameer Tanti:Mor Pratito Din Aru Pratito Ratir Arombhani, Anubhav Tulasi: Cihnajatnar Keitiman Jalamagna Drisya, Nilim Kumar: Guwahati.	Remember, Understand, Analysis

Paper Name : Assamese Prose : 1846-2015

Paper Code : ASM 2026

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none"> Trace the development of Assamese prose from 1846 to 2015. Interpret the changes occurring in Assamese prose. State the present features of Assamese prose. 	Unit I :Anandaram Dhekial Phukan: Asam Deshar Sangkhep Katha, Nidhi Lebi Farwel: Bidya aru Gyan Labhor Phol Ki, Ratneswar Mahanta: Manobritti.	Remember, Understand, Analysis
	Unit II :Mor Jivan Sowaran: Lakshminath Bezbaroa (Chapters I and II), Satyanath Bora: Bor Lokar Charitra Adhyayan, Kaliram Medhi: Sankardev aru Chaitanyadev.	Remember, Understand, Analysis
	Unit III :Banikanta Kakati: Soundarjyar Pratarana, Krishna Kanta Handique: Biswa Sahityar Patabhumit Asamiya Sahitya, Trailokyanath Goswami: Prachin Aru Adhunik Sahitya.	Remember, Understand, Analysis
	Unit IV :Atul Chandra Baruah: Samaj, Krisi aru Gaonor Itibritta, Hiren Gohain: Mahan Oupanyasik Birinchi Kumar Barua, Homen Borgohain: Asamiya Chutigalpa (1940-1970).	Remember, Understand, Analysis

Paper Name : Assamese Drama and Performance : 1857-2015

Paper Code : ASM 2036

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none"> Reconstruct the history of Assamese drama and performance since 1857. Describe the experience of viewing a play Enumerate the trends of Assamese Drama since 1857. 	Unit I :Trends in Assamese Drama: 1857-2015 With special emphasis on amateur theatre, mobile theatre and radio plays.	Remember, Understand, Analysis
	Unit II :Rudraram Bordoloi: Bangal Bangalani, Padmanath Gohain Barua: Gaonburha, Lakshminath Bezbaroa: Chakradhwaj Sinha, Jyotiprasad Agarwala: Karengar Ligiri.	Remember, Understand, Analysis
	Unit III :Mahendra Borthakur: Saraguri Chapori, Arun Sarma: Sri Nibaran Bhattacharyya, Karuna Deka: Luitkanya.	Remember, Understand, Analysis
	Unit IV : Proscenium Theatre in Assam, Brechtian influence on Assamese Theatre, Recent experimental theatres of Assam.	Remember, Understand, Analysis

Paper Name : Indian Criticism**Paper Code : ASM 2046**

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none"> Describe the Indian systems of evaluating Literature. Trace the thought systems of ancient Indian Literary critics. Interpret Literature from Indian point of view. 	Unit I :Sabdashakti (Words and meaning; power of word) Dhvani: Concept, evolution and application Vakrokti: Concept and application.	Remember, Understand, Analysis
	Unit II : Rasa: Concept, evolution and application Guna andRiti: Concept and application .	Remember, Understand, Analysis
	Unit III :Bhaktivadi rhetoricians of medieval India.	Remember, Understand, Analysis
	Unit IV : Nativism Western native, Indian features, origin and development	Remember, Understand, Analysis

Paper Name : Editing (Value Added Course)**Paper Code : ASM 2054**

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none"> Trace the phases of book history in India. Critique a manuscript. Tell the philosophy behind the book-editing 	Unit I : The philosophy and objectives of book-editing General book editing.	Remember, Understand, Analysis, Apply
	Unit II :Acquisition and evaluation of manuscripts	Remember, Understand, Analysis, Apply
	Unit III : Copy-editing, Book making, Style, Proof, Production and printing.	Remember, Understand, Analysis, Apply
	Unit IV :Relationship between editorial and other departments of publishing.	Remember, Understand, Analysis, Apply

3rd Semester**Paper Name : Assamese Novel: 1890-2015****Paper Code : ASM 3016**

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this	Unit I :Trends of Assamese novel	Remember,

<p>course, the students will be able to,</p> <ul style="list-style-type: none"> • Categorise the Assamese novels into different trends. • Explain the effects of the socio-political development on Assamese novels. • Design a spectrum of different themes used in Assamese novels. 		Understand, Analysis
	Unit II : Rajanikanta Bordoloi: Rahdai Ligiri, Rasna Barua: Seuji Patar Kahini, Medini Choudhury: Banduka Behar.	Remember, Understand, Analysis
	Unit III : Debendranath Acharya: Jangam, Mamani Roysom Goswami: Nilakanthi Braja, Homen Borgohain: Pitaputra.	Remember, Understand, Analysis
	Unit IV : Bhupendranarayan Bhattacharya: Marudyan, Debabrat Das: Dhusaratar Kabya.	Remember, Understand, Analysis

Paper Name : Translation : Theory and Practice

Paper Code : ASM 3026

Course Outcome	Unit with Name	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to,</p> <ul style="list-style-type: none"> • Illustrate the linguistic and cultural aspects of translation. • State the problems of different kinds of translation. • Justify the quality of different texts of translation. 	Unit I : Linguistic aspects of translation with special attention to Roman Jakobson's essay 'On Linguistic Aspects of Translation'.	Remember, Understand, Analysis
	Unit II : Cultural aspects of translation and Translation and nationalism with special attention to Krishnakanta Handique's essay 'Anubadar Katha'.	Remember, Understand, Analysis
	Unit III : Equivalence in translation, loss and gain in translation, faithful translation. Ad-verbatim translation, semantic translation, idiomatic translation. Translation of scientific and literary texts, transcreation, adaptation, translation through apps.	Remember, Understand, Analysis, Apply
	Unit IV : Evaluation of translated works (to examine the standard of translation): Comparison of the English Mrityunjay and the original Assamese Mrityunjay, Comparison between the poems in Ancient Gongs and their original Assamese versions available in Hiren Bhattacharyar Kabita: Prathamara Para Ataibor, Comparison between Ahar Mahar Edin and the original Hindi Ashadh Ka Ek Din.	Remember, Understand, Analysis, Evaluate, Apply

Paper Name : Varieties of Assamese Language**Paper Code : ASM 3066**

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none"> Describe different varieties of the Assamese Language in the context of contemporary Linguistics. Organize geographical and social varieties of Assamese Language. 	Unit I :Dialectology: Isogloss, Diaglossia; Dialect Geography: Methods of Regional Dialect Study; Regional Varieties in Assam: Upper Assam, Darangi, Morigayan and Lower Assam (Kamrupi, Goalporia).	Remember, Understand, Analysis, Apply
	Unit II :Social Varieties: Methods of Social Dialect study, Social Varieties in Assam: Language forms of the Kaivartas and Moriyas.	Remember, Understand, Analysis, Apply
	Unit III :Ethnic Varieties: Ethnicity and Language Variation, Methods of Ethnic Dialect Study, Ethnic varieties in Assam: Rabhamese, Mishing-Asamiya and Hajong-Asamiya.	Remember, Understand, Analysis, Apply
	Unit IV :Contemporary Assamese: Print and Electronic Media	Remember, Understand, Analysis, Apply

Paper Name : Assamese Vaisnavite, Saiva and Sakta Literature**Paper Code : ASM 3096**

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none"> Categorise religious literature of Assam and compare Assamese Vaisnavite literature with Assamese Saiva –Sakta literature. Elaborate the concept of Vaishnavism, Saivism and Saktism and Organize literary products under titles like Vaishnava, Sakta, and Saiva literature. Interpret religious beliefs i.e. Vaishnava, Saiva and Sakta with keeping in mind 	Unit I :History, Philosophy and Background of Vaisnavite Movement in India with special reference to Assam.	Remember, Understand, Analysis
	Unit II :Concept of Vaisnavism (Bhaktibad) and Assamese Vaisnavite literature Sankaradeva: Kirtan Ghosa, Madhavadeva: Namghosa.	Remember, Understand, Analysis
	Unit III :Concept of Saivism, history of Saivism in Assam and Assamese Saiva literature Rudra Sinha: Siva Purana.	Remember, Understand, Analysis
	Unit IV :Concept of Saktism, history of Saktism in Assam and Assamese sakta literature Ruchinath Kandali: Sri Sri Chandi.	Remember, Understand, Analysis

their humanitarian outlook. • Generate human values out of the religious outlook prevalent in Assam.		
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Paper Name : Structure of the Assamese Language

Paper Code : ASM 3106

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, • Describe the intricate structure of the Assamese Language. • Analyse language in sync with contemporary linguistics. • Design a synchronic study of the structure of Assamese Language.	Unit I :Phonology: Assamese Phonology and Morphophonemic Alternation; Assamese Phones and Allophones; Stress and Juncture of Assamese Language.	Remember, Understand, Analysis
	Unit II :Morphology: Classification of Assamese Morphemes; Inflection: Number, Gender, Person and Case; Declension: Verb system and Conjugation.	Remember, Understand, Analysis
	Unit III :Syntax: Introduction to Generative Grammar; Universal Grammar; Lexical and Functional Categories; Constituency and structural relations; Phrase Structure Rules.	Remember, Understand, Analysis
	Unit IV :Semantics: The principal of compositionality; the different dimensions of meaning (assertion, presupposition, and implicature).	Remember, Understand, Analysis

4th Semester

Paper Name : Textual Criticism and Manuscript Reading

Paper Code : ASM 4016

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to,	Unit I :Introduction: Definition, aims and objectives of Textual Criticism.	Understand, Analysis
	Unit II :Theory of Textual Criticism and its application.	Understand, Analysis, Apply, Evaluate

<ul style="list-style-type: none"> • Explain the Manuscript tradition in different part of the world. • Explain mutilated text is restrod. • Generate interest in preservation and restoration of intellectual heritage of a nation. 	Unit III :History of Textual Criticism in Assam.	Understand, Analysis, Evaluate
	Unit IV : Manuscript and features, Assamese manuscripts including illustrated manuscripts, Manuscript reading, History of Assamese Script and Evaluation	Understand, Analysis, Apply, Evaluate

Paper Name : Applied Linguistics

Paper Code : ASM 4026

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none"> • Explain computational linguistics. • Plan to review literature applying discourse analysis. • State the tools for analyzing the Assamese language. 	Unit I :Computational Linguistics: Natural Language Processing: analyzing and using co-occurrences of words in text; context-free grammars and parsing.	Remember, Understand, Analysis, Apply
	Unit II : Discourse Analysis: The structure of discourse; Narrative Analysis; Conversation Analysis.	Remember, Understand, Analysis, Apply
	Unit III :Lexicography: Analysis of the lexicon: relations between words, levels of the lexicon, lexical borrowing, lexical norm, linguistic purism; different types of dictionaries and different types of lexicographic design, electronic dictionaries, parts of the lexicographic entry, the microstructure and macrostructure of the dictionary.	Remember, Understand, Analysis, Apply
	Unit IV :Application of linguistic knowledge for first and second language teachingmethods:Difference between first and second language learning, language teaching methods, Application of Descriptive Linguistics, Sociolinguistics and Psycholinguistics in language teaching.	Remember, Understand, Analysis, Apply

Paper Name : Assamese Short Story : 1889-2015

Paper Code : ASM 4046

Course Outcome	Unit with Name	Bloom's Taxonomy Level
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<p>After the completion of this course, the students will be able to,</p> <ul style="list-style-type: none"> Trace the development of the major trends of Assamese short stories. Describe the emotional effect of reading a few significant Assamese short stories. Interpret a short story. 	<p>Unit I :Trends of Assamese Short Stories Lakshminath Bezbaroa: Jayanti, Lakshidhar Sarma : Byarthatar Dan, Syed Abdul Malik: Pran Powar Pichatare.</p>	Remember, Understand, Analysis
	<p>Unit II :Sourav Kumar Chaliah:Ahat Daba, Mohim Bora: Chakrabat, Bhabendranath Saikia: Grahan, Nirupama Borgohain: Anthropologyr Saponar Pachat.</p>	Remember, Understand, Analysis
	<p>Unit III : Nagen Saikia: Bandha Kothat Dhumuha, Pranab Jyoti Deka: Bewaris Las, Apurba Sarma: Baghe Tapur Rati.</p>	Remember, Understand, Analysis
	<p>Unit IV :Jehirul Hussain: Rang KukurarTupi, Monoj Kumar Goswami: Nirbandhav.</p>	Remember, Understand, Analysis

Paper Name : Assamese Criticism

Paper Code : ASM 4096

Course Outcome	Unit with Name	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to,</p> <ul style="list-style-type: none"> Grasp the history and trends of Assamese criticism. Trace the influence of western and Indian criticism on Assamese criticism. Produce a criticism of a text. 	<p>Unit I :History and Trends of Assamese Criticism, Banikanta Kakati: 'Dahikatara', Tirthanath Sarma: 'Rahasyik Madhavadeva'.</p>	Remember, Understand, Analysis
	<p>Unit II :Birinchi Kumar Barua: Preface to Ankiya Nat(From Ankia Nat), Satyendra Nath Sarma: Adhunik Kabyar Unmesh(From Asamiya Kahini Kabyar Prabhah).</p>	Remember, Understand, Analysis
	<p>Unit III :Hiren Gohain:Aitihya aru Jibanar Batat, Jengrai 1963: Bhaben Baruah.</p>	Remember, Understand, Analysis
	<p>Unit IV :Sailen Bharali: 'Samalochak Banikanta Kakoti', Gobinda Prasad Sarma: 'Andre Maurois'r Ariel: Akhon Natun Jivanir Rasaswadan', Ranjit Kumar Dev Goswami: 'Haramohanar Samajik Tatporya', Pradip Acharya:'Asamiya Kabitar Kurita Bachar'.</p>	Remember, Understand, Analysis

Paper Name : Tibeto Burman Languages

Paper Code : ASM 4116

Course Outcome	Unit with Name	Bloom's Taxonomy Level
After the completion of this course, the students will be able to, <ul style="list-style-type: none">• Illustrate the Linguistics features of Tibeto Burman Language of Assam.• Trace the differences among Rabha, Boro, Mising, Karbi communities and compare the Tibeto Burman Languages with Assamese and other Indio-Aryan Language.• Describe the influence of Tibeto Burman Language on the Assamese Language and vise-versa.	Unit I :A general introduction to Tibeto-Burman Languages: Distribution and their status in North East.	Remember, Understand, Analysis
	Unit II :General characteristics of Tibeto- Burman languages in the context of Tibeto- Burman languages: Originality and changes in the Tibeto-Burman languages of Assam; Mutual impact of Assamese language and Tibeto-Burman languages.	Remember, Understand, Analysis
	Unit III :Phonological structure of Tibeto-Burmanlanguages (Any of the following languages: Bodo, Rabha, Karbi, Mishing and Garo).	Remember, Understand, Analysis
	Unit IV :Morphological and Syntactic Structure of Tibeto-Burma languages (Any of the following languages: Bodo, Rabha, Karbi, Mishing and Garo).	Remember, Understand, Analysis

PROGRAMME OUTCOMES OF ASSAMESE HONOURS COURSE

- A study of the history of Assamese Language and Literature will enrich their knowledge of the Assamese Language, Literature and Culture from the beginning.
- They will also learn the socio cultural and political knowledge of the period.
- It gives knowledge on the life of famous poets and authors as well as their famous works.
- They will also know about research works by their field project.
- Student will be able to engage themselves in the teaching and other jobs like Reporter, Proofreader, and News -reader.

Course Specific Outcome

ASM-HC-1016

- Trace the divisions of the History of Assamese Literature and observe the characteristics of the age of the literature common to Assamese and Bengali, the Pre-Sankaradeva Age and the Sankaradeva Age.

ASM -HC-1026

- Illustrate the backgrounds of the Post-Sankaradeva Age, the Pre-Arunodoi Age and the Arunodoi Age and evaluate the literary works of the important writers of these ages.

ASM-HG-1016

- Propagate the concept of the development of the Assamese language.

ASM-HC-2016

- Discuss the different branches, levels and types of language analysis on the basis of linguistics and introduction to the history of language studies.

ASM -HC-2026

- Re-examination of certain aspects of Eastern and Western Literary Criticism.

ASM -HG-2016

- Discuss the backgrounds of the Pre-Sankaradeva period, the Sankaradeva period and the Post-Sankaradeva period along with introduction to significant literary works of these ages.

ASM -HC-3016

- Appraise selected Creative and Critical writings in Assamese.

ASM-HC-3026

- Give an idea of Assamese poetry from the Pre-Sankaradeva period to the Modern Period.

ASM-HC-3036

- Know about the composition of the greater Assamese race and sketch the outline of folk practices, religious traditions, festivals, performance art, sculpture, and painting in the context of Assam.

ASM-SE-3014

- Enhance different skills in using the Assamese language which will enable students to have more job opportunities.

ASM-HG-3016

- Analyze folk drama, proscenium, and alternative stage and appraise various aspects of the stage and acting.

ASM -HC-4016

- Grasp the characteristics of comparative literature and sketch the outline of Indian literature.

ASM-HC-4026

- Analyze the relationships of the Assamese language with the pan-Magadhan and the local non-Aryan languages.

ASM -HC-4036

- Introduction to Assamese prose, starting from Sankaradeva's plays to the prose of the *Buranjis*.

ASM -SE-4014

- Import knowledge about writing poetry and short fiction.

ASM -HG-4016

- Grasp the characteristics of modern Assamese lyrics.

ASM -HC-5016

- Sketch the Outline of the Literary of Assamese drama changed idea performing..... frame the beginning to the eighteenth century.

ASM-HC-5026

- Analyze the grammatical characteristics of the Assamese language on the basis of Higher Grammar.

ASM -HE-5016

- Familiarize with concept of folk literature and works of Assamese folk literature.

ASM -HE-5036

- Acquaint the students with the Borgeets, poetry and drama of Sankaradeva.

ASM -HC-6016

- Track the trends of short story and novel in Assamese and appreciate significant short stories and novels in the language.

ASM -HC-6026

- Recognize the significance of the phases of the development of Assamese script.

ASM-HE-6046

- Identify the regional and social varieties of the Assamese dialects and give an idea of literary application of these dialects in creative literature.

ASM-HE-6056:

- Prepare a project on any of the following topics:
 - a. An Important Place
 - b. Festivals
 - c. Folk Customs and Rituals
 - d. Folk Performing Art
 - e. Folk Literature
 - f. Folk Speech

COURSE OUTCOME

B.A Assamese (Honours) Syllabus (CBCS)

I Semester

Paper Name: Axamiya Xahityar Buranji (Charjyapada-Sankari Yug)

Paper Code: ASM-HC-1016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none">Trace the divisions of the History of Assamese Literature.observe the characteristics of the age of the literature common to Assamese and Bengali,Characterized the specific features of the Pre-Sankaradeva Age and the Sankaradeva Age.	Unit-I : Axamiya Sahityar Yug Bibhazon	Remember, Understand, Analysis.
	Unit- II : Arombhoni Kalor Axamiya Xahitya	Remember, Understand, Analysis.
	Unit- III : Prak-Sankari Yug	Remember, Understand, Analysis.
	Unit-IV : Sankari Yug	Remember, Understand, Analysis.

Paper Name: Axamiya Xahityar Buranji (Uttar-Sankari Yug-Arunodoi Yug)

Paper Code: ASM-HC-1026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none">Illustrate the backgrounds of the Post-Sankaradeva Age, the Pre-	Unit-I : Uttar- Sankari Yug	Remember, Understand, Analysis.
	Unit- II : Uttar-Sankari Yugar Xahitya	Remember, Understand, Analysis.
	Unit- III : Prak-Arunodoi aru Arunodoi Yug (Unabinsha	Remember, Understand, Analysis.

<p>Arunodoi Age and the Arunodoi Age.</p> <ul style="list-style-type: none"> Evaluate the literary works of the important writers of these ages. Describe the features of this period's literature. 	Satika)	
	Unit-IV : Prak-Arunodoi aru Arunodoi Yugar Sahitya	Remember, Understand, Analysis.

2nd Semester (Honours)

Paper Name: Bhasha Bigyan Parichay

Paper Code: ASM-HC-2016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Define the different branches, levels and types of language analysis on the basis of linguistic study. Introduce to the history of language studies. 	Unit-I: Bhashabigyanar Sadharan Parichay	Remember, Understand, Analysis.
	Unit- II : Bhashabigyanar Shakha-Prashakha	Remember, Understand, Analysis.
	Unit-III : Bhashabigyanar Adhayanar Stor	Remember, Understand, Analysis, Apply.
	Unit-IV: Bhasha Samparkiya Chinta-Chorcha aru Adhyanar Itihash	Remember, Understand, Analysis

Paper Name: Sahitya-Shamalochana

Paper Code: ASM-HC-2026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Know the various aspects of Eastern and Western Literary 	Unit-I: Bhashabigyanar Sadharan Parichay	Remember, Understand, Analysis.
	Unit- II : Bhashabigyanar Shakha-Prashakha	Remember, Understand, Analysis.

<p>Criticism.</p> <ul style="list-style-type: none"> Design a frame of various types of literature with the help of mentioned literary aspects. 	Unit-III : Bhashabigyanar Adhayanar Stor	Remember, Understand, Analysis, Apply.
	Unit-IV: Bhasha Samparkiya Chinta-Chorcha aru Adhyanar Itihash	Remember, Understand, Analysis

3rd Semester (Honours)

Paper Name: Ashomiya Sahitya-Prabesh

Paper Code: ASM-HC-3016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Trace the various forms of Romantic and Modern Assamese Literature. Know the various forms of Assamese literature as example poems, short story, novel, article, bibliography etc. Identify the specialty of renowned Assamese literature. 	Unit-I: Shadhukatha, Kabita aru Galpa	Remember, Understand, Analysis.
	Unit- II : Prabandha aru Somalochana	Remember, Understand, Analysis.
	Unit-III : Atmajiwani, Jiwani aru Upanyash	Remember, Understand, Analysis, Apply.
	Unit-IV: Bhakti Shahitya aru Byaktigoto Rochona	Remember, Understand, Analysis

Paper Name: Ashomiya Kabitar Chaneki

Paper Code: ASM-HC-3026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Trace the phases of Pre-Sankari and 	Unit-I: Madhav Kandali aru Durgaborar Kabita	Remember, Understand, Analysis.
	Unit- II : Sankardev aru Ram Saraswatir Kabita	Remember, Understand, Analysis.

<p>Sankari period of Assamese Poem.</p> <ul style="list-style-type: none"> Trace the phases of Romantic and Modern period of Assamese Poem. 	<p>Unit-III: Chandrakumar Agarwala, Raghunath Choudhary aru Debokanta Baruar Kabita.</p>	<p>Remember, Understand, Analysis, Apply, Create.</p>
	<p>Unit-IV: Navakanta Baruah, Ajit Baruah aru Nilamoni Phukanar Kabita.</p>	<p>Remember, Understand, Analysis, Create.</p>

Paper Name: Ashomor Sanskriti

Paper Code: ASM-HC-3036

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Learn about the folklore, religious traditions, festivals, landscape arts, architecture, sculpture and painting of Assamese culture. Get a glimpse of the diverse Assamese culture. 	<p>Unit-I: Sanskritir Sangya aru Swarup</p>	<p>Remember, Understand.</p>
	<p>Unit- II : Samajik Lokachar, Dharmiya Parampara aru Utsav-Parbon</p>	<p>Remember, Understand, Analysis, Evaluate.</p>
	<p>Unit-III: Ashamiya Paribeshya kola aru Pormporagoto Khel-Dhemali.</p>	<p>Remember, Understand, Analysis, Apply.</p>
	<p>Unit-IV: Ashamar Sthapatya aru Chitrakola</p>	<p>Remember, Understand, Analysis, Create.</p>

Paper Name: Byaboharik Ashamiya

Paper Code: ASM-SE-3014

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Enhance different skills in using the Assamese language which will enable students to have more job opportunities 	<p>Unit-I: Arhi Path: Padhati aru Koushal</p>	<p>Remember, Understand, Analysis, Evaluate, Create.</p>
	<p>Unit-II: Chopa aru Boidyutin Madhayamar babe Bigyapan Lekhan, Engraji Hindi Bigyapanar Ashamiya Anubad.</p>	<p>Remember, Understand, Analysis, Apply, Create.</p>
	<p>Unit-III: Anubad: Sangbad, Prabandha, Shakhyatkar</p>	<p>Remember, Understand, Analysis, Apply, Create.</p>
	<p>Unit-IV: Chitranatya Nirman: Shahityar Chitrayan.</p>	<p>Remember, Understand, Analysis, Create.</p>

4th Semester (Honours)

Paper Name: Tulonamulak Bharatiya Shahitya

Paper Code: ASM-HC-4016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Trace the phases of Indian Comparative literature and illustrate the linguistic and cultural aspects of translation. State the verity of different kinds of translation. Introduce with the modern Indian comparative literature. 	Unit-I: Tulonamulok Shahityar Parichay	Remember, Understand, Analysis.
	Unit-II: Tulonamulok Bharatiya Shahityar Parichay.	Remember, Understand, Analysis.
	Unit-III: Chutigalpa.	Remember, Understand, Analysis, Evaluate.
	Unit-IV: Upanyash.	Remember, Understand, Analysis, Evaluate.

Paper Name: Ashamiya Bhashar Shamaharan: Arya Bhasha aru Arya Bhinna Bhasha

Paper Code: ASM-HC-4026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Learn about the historical evolution of the Assamese Language. Justify the relationship between Aryan and Non-Aryan languages of Assam. Learn about the Aryan and Non-Aryan elements in the contemporary Assamese Language. 	Unit-I: Udbhavkalin Ashamiya Bhasha.	Remember, Understand, Analysis.
	Unit-II: Bharatiya Arjya Bhashar logot Ashamiya Bhashar Shambandha.	Remember, Understand, Analysis, Apply.
	Unit-III: Arjya-Bhinna Bhashar logot Ashamiya Bhshar Shambandha.	Remember, Understand, Analysis, Apply.
	Unit-IV: Sampratik Ashamiya Bhashat Arjya aru Arjya-Bhinna Bhshar Upadan.	Remember, Understand, Analysis, Apply.

Paper Name: Ashamiya Gadya Shahitya (Arambhanir pora Astadosh Shatikaloi)

Paper Code: ASM-HC-4036

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Trace the formation and development of Assamese prose starting from Sankardev's plays to the prose of Buranji. Know the changes occurring in Assamese prose. 	Unit-I: Sankardev aru Madhavdevar Angkiya Nat	Remember, Understand, Analysis.
	Unit-II: Bhattadev, Gopalcharan Dwij aru Raghunath Mahantar Gadya..	Remember, Understand, Analysis.
	Unit-III: Katha Gurucharit aru Satsari Ashom Buranji.	Remember, Understand, Analysis.
	Unit-IV: Byaboharik Sahitya.	Remember, Understand, Analysis.

Paper Name: Srijanimulok Sahitya**Paper Code: ASM-SE-4014**

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Import knowledge about writing poetry and short fiction on the basis of imitation and imagination. 	Unit-I: Kalpanar Sangya, Parishar aru Prayojaniyata.	Remember, Understand.
	Unit-II: Adhunik Kabita: Sangya, Boishistya. Patabhumi aru Adhunik Kabitar Bhasha.	Remember, Understand.
	Unit-III: Galapar Bij Ropan, Khetra Adhyan, Niraman.	Remember, Understand, Analysis, Apply, Create.
	Unit-IV: Kabita aru Galpar Arhi Prastutkaran.	Remember, Understand, Analysis, Apply, Create.

5th Semester (Honours)**Paper Name: Ashamiya Natok aru Paribeshan Soili (Arambhanir pora Astadash Shatikaloi)****Paper Code: ASM-HC-5016**

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Reconstruct the history of Assamese Drama and performance. Describe the 	Unit-I: Ashamiya Natokar Chamu Itihash.	Remember, Understand.
	Unit-II: Angkiya Nat aru Paribeshan.	Remember, Understand.
	Unit-III: Prakswadhinata Yugar Ashamiya Natok aru Paribeshan.	Remember, Understand, Analysis, Apply, Create.
	Unit-IV: Uttar-Swadhinata	Remember, Understand,

<p>experience of viewing a play.</p> <ul style="list-style-type: none"> Enumerate the trends of Assamese Drama. 	Yugar Ashamiya Natok aru poribeshan.	Analysis, Apply, Create.
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Paper Name: Ashamiya Byakaran

Paper Code: ASM-HC-5026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Know details of Assamese Grammar, its history of development, classification, elements etc. 	Unit-I: Ashamiya Byakaranr Itihash, Byakaranr Srenibibhag, Byakaranr Upadan.	Remember, Understand.
	Unit-II: Ashamiya Bhashar Dhwanitattwa.	Remember, Understand, Analysis, Apply.
	Unit-III: Ashamiya Bhashar Rupertattwa.	Remember, Understand, Analysis, Apply..
	Unit-IV: Ashamiya Bhashar Bakyatattwa.	Remember, Understand, Analysis, Apply.

Paper Name: Ashamiya Loka-Sahitya Adhyan

Paper Code: ASM-HE-5016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Trace the phases of Assamese Folk-Literature. Categories Assamese Folk-Literature of Ancient phases. Categories the Assamese Folk-Literature and Folk-Culture into different trends. 	Unit-I: Lokashahityar Prakriti Bishar aru Sreni Bibhag.	Remember, Understand, Analysis.
	Unit-II: Prawad Patantar, Janashruti-Shadhukatha, Mantrashahitya, Nichukoni Geet aru Khel-dhemalir Geet-mat.	Remember, Understand, Analysis.
	Unit-III: Malita aru Khini Geet.	Remember, Understand.
	Unit-IV: Anusthanmulok, Utsavkendrik, Stutimulok, Dharmakendrik, Prem aru Birah Bishayak.	Remember, Understand, Analysis, Apply, Create.

Paper Name: Sankardev

Paper Code: ASM-HE-5036

Course Outcome	Unit/Topic	Bloom's Taxonomy Level

<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Acquaint the students with the Borgeets, poetry and drama of Sankaradeva. Know about the early history of Assamese Literature. 	Unit-I: Sankardevar Shahityar Parichay aru Patabhumi.	Remember, Understand.
	Unit-II: Borgeet, Kirtanghosh.	Remember, Understand.
	Unit-III: Harichandra Upakhyan.	Remember, Understand.
	Unit-IV: Parijatharan Nat.	Remember, Understand.

6th Semester (Honours)

Paper Name: Ashamiya Chutigalapa aru Upanyash

Paper Code: ASM-HC-6016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Trace the development of the trends of Assamese Short Story and Novels. Define the difference between short story and novel though they are same. Know the specific or popular short story and novel of Assamese Literature. 	Unit-I: Ashamiya Chutigalpar Dhara.	Remember, Understand.
	Unit-II: Ashamiya Upanyashar Dhara.	Remember, Understand.
	Unit-III: Chutigalpa: Lakhmidhar Sarma, Jogesh Das, Purabi Barmudoi.	Remember, Understand, Analysis, Create.
	Unit-IV: Upanyash: Mamoni Roysam Goswami.	Remember, Understand, Analysis, Create.

Paper Name: Ashamiya Lipir Itihash

Paper Code: ASM-HC-6026

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Explain the Manuscript tradition in different part of the 	Unit-I: Lipir Parichay aru Bharatiya Lipi; Ashamiya Lipir Udbhav aru Bikash.	Remember, Understand, Analysis.
	Unit-II: Ashamar Shilalipi.	Remember, Understand.
	Unit-III: Ashamar Tamralipi.	Remember, Understand.

<p>world.</p> <ul style="list-style-type: none"> • Explain mutilated text is restored. • Generate interest in preservation and restoration of intellectual heritage of a nation. 	<p>Unit-IV: Ashamiya Hatelikha Puthir Lipi.</p>	<p>Remember, Understand, Analysis, Apply, Create.</p>
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Paper Name: Ashamiya Bhashar Upabhasha

Paper Code: ASM-HE-6046

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Know about the regional and social dialect of Assamese Language on the basis of dialectology. • .Learn the implementation of Assamese dialect in Assamese Literature. 	<p>Unit-I: Upabhashar Sangya aru Swarup.</p>	<p>Remember, Understand.</p>
	<p>Unit-II: Ashamiya Bhashar Bhinnata.</p>	<p>Remember, Understand, Analysis.</p>
	<p>Unit-III: Ashamiya Bhashar Anchalik Upabashaborar Bhashik Boishitya.</p>	<p>Remember, Understand, Analysis, Apply.</p>
	<p>Unit-IV: Ashamiya Shahityat Upabhashar Prayog.</p>	<p>Remember, Understand, Analysis, Apply, Create.</p>

Paper Name: Prakalpa

Paper Code: ASM-HE-6056

Course Outcome	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Prepare a Project applying research methodology. 	<p>Understand, Analysis, Apply, Evaluate, and Create.</p>

Department of Bengali

Programme Specific Outcome (B.A in Bengali) (CBCS)

- **Objectives:**
 - # Educate students in both the artistry and utility of the Bengali language through the study of literature.
 - # Provide students with the critical faculties necessary in an academic environment, on the job, and in an interdependent world.
 - # Graduate students, who are capable of performing research, analysis and criticism of literary texts from different historical periods and genres.
 - # Assist students in the development of intellectual flexibility, creativity and cultural literacy, so that they may engage in life-long learning.
- The literature of medieval period incorporated in the syllabus gives an opportunity to the learners to know the glorious chapter of History, religion & socio- cultural conditions etc of the people of the country especially of Bengal.
- The Golden age of Bengali literature (Reminiscence /Biography / children literature of 19th-20th century), based on the values that guide the students to discriminate between right and wrong. It is very important for the students to understand the basic principles of morality so that the students may play a responsible role in any kind of undesirable situations of the society. Child literature that included in the course opens up the world of fantasy that are already in young age.
- History of Bengali literature: Old, Medieval, Modern is totally informative. The multidimensional knowledge of the subject contained in this part of the syllabus has a great importance in today's society.
- History of language and modern Bengali poems incorporated in the syllabus has a tranquilizing effect which generates peace in the minds of the readers.
- Project paper included in the syllabus enhances students writing capacity, self-confidence, which helps the learners to explore more and more new ideas.
- The talents of the writers reflected in their compositions of the Bengali, Assamese and Oriya poets acquaint the learners with the life and literature of the neighboring states.
- Students should be familiar with representative literary and cultural texts within a significant number of historical, political, geographical and cultural contexts.
- Students should be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
- Students should be able to identify, analyze, interpret and describe the critical ideas, values and themes that appear in different literary texts.
- Students should be able to write analytically in variety of formats including descriptive writing, research papers and reflective writing.

- Students should be able to ethically gather and synthesize informations from a variety of written and electronic sources.
- Students should be able to synchronise technology with literature.

COURSE OUTCOME

B.A Bengali (Honours) Syllabus (CBCS)

Semester (Hons.)	Course Code	Course/Paper Name	Unit & Topic	Course Outcome	Bloom's Taxonomy Level
I	BEN-HC-1016 CO ₁	প্রাগাধুনিক সাহিত্য পাঠ ১	Unit I> চর্যাপদ কবি পরিচিতি , কাহ্ন , ভুসুকু) ,(ঢেগঢণ , শবরীপদের অন্তর্গত শব্দার্থ বিচার ও কাব্যমূল্য নির্ণয়	<ul style="list-style-type: none"> ● বাংলা সাহিত্যের ক্রমবিকাশের পরিচয় লাভ সাহিত্যের শিক্ষার্থীদের কাছে অত্যন্ত গুরুত্বপূর্ণ। একটির সঙ্গে অন্যটির পার্থক্য বা যোগাযোগ কোথায় তা বলতে পারবে তারা। 	Remembering Understanding
			Unit II> শ্রীকৃষ্ণকীর্তনকাব্য জন্মখণ্ড	<ul style="list-style-type: none"> ● সেই ক্রমবিকাশের পথে 	Remembering Understanding
			Unit III> বৈষ্ণব পদাবলি (চণ্ডীদাস ,বিদ্যাপতি)	<ul style="list-style-type: none"> আদি ও মধ্যযুগের সাহিত্যধারা সম্পর্কে জ্ঞানার্জনের লক্ষ্যপূরণে এই পাঠক্রম তৈরি করা হয়েছে। ● শিক্ষার্থীরা এখানে প্রাক্ চৈতন্য যুগের পদ রচনার সঙ্গে পরিচিত হবে। এর শ্রেণিবিভাগ ও ব্যাখ্যা করতে পারবে। 	Remembering Understanding
I	BEN-HC-1026 CO ₂	প্রাগাধুনিক সাহিত্য পাঠ ২	<Unit I> বৈষ্ণব কবিতা (চৈতন্য ও চৈতন্যোত্তর যুগ) (জ্ঞানদাস/গোবিন্দদাস)	<ul style="list-style-type: none"> ● পরিচয়ের দ্বিতীয় পর্বে চৈতন্যোত্তর বৈষ্ণব পদাবলি, অন্নদামঙ্গল কাব্য আর শান্ত্রপদের বিষয়ে জানবে। 	Remembering Understanding
			Unit II> অন্নদামঙ্গল কাব্য 'গ্রন্থ সূচনা' থেকে 'ব্যাসের প্রতি দৈববাণী' পর্যন্ত।	<ul style="list-style-type: none"> ● বাঙালির সমাজ, ধর্ম ও সংস্কৃতির বিবর্তনের গতিরেখা অনুধাবন করতে পারবে এই পাঠক্রম সম্পূর্ণ করার পর। 	Remembering Understanding
			<Unit III> শান্ত্রপদাবলী (আগমনি/বিজয়া) (রামপ্রসাদ/কমলাকান্ত)	<ul style="list-style-type: none"> ● বাংলা সাহিত্যের মধ্যযুগ পর্বের সঙ্গে পরিচিত হবে 	Remembering Understanding
I	BEN-AE-1014 CO ₃	ব্যবহারিক বাংলা	<Unit I> প্রয়োগে বাংলা বানান	<ul style="list-style-type: none"> ● বাংলা ভাষা চর্চার ক্ষেত্রে অত্যন্ত গুরুত্বপূর্ণ বিষয় ভাষা 	Remembering Understanding Applying

			Unit II> প্রয়োগমূলক ব্যাকরণ	গঠন প্রক্রিয়া সম্বন্ধে সম্যক জ্ঞান। ● এই পাঠক্রম শিক্ষার্থীদের সেই সুযোগ এনে দেবে।	Remembering Understanding Applying
			Unit III> বিবিধ রচনা	শিক্ষার্থীরা ভাষা জ্ঞান অর্জনের সঙ্গে তাকে বিভিন্ন কর্মক্ষেত্রে যথোপযুক্ত ভাবে প্রয়োগ করতে সক্ষম হবে। ● পড়ার সঙ্গে সঙ্গে নির্ভুল ভাবে লেখার অভ্যাস গড়ে তুলতে পারবে শিক্ষার্থীরা।	Remembering Understanding Applying
II	BEN-HC-2016 CO 4	বাংলা ভাষা পরিচয়	<Unit I>বাংলা ভাষার ইতিহাস	● সাহিত্যের শিক্ষার্থী হিসাবে বাংলা ভাষাতত্ত্বের ধারণা তৈরি করবে, ● ধ্বনিতত্ত্ব সম্পর্কে ধারণা তৈরি করবে, ● শব্দতত্ত্ব সম্পর্কে ধারণা তৈরি করবে এই পাঠক্রম।	Remembering Understanding
			<Unit II>ধ্বনি প্রকরণ		Remembering Understanding
			<Unit III>শব্দ প্রকরণ		Remembering Understanding
II	BEN-HC-2026 CO 5	বাঙালির সামাজিক ও সাংস্কৃতিক পরিচয়	<Unit I>বাঙালির ইতিহাস	● বাংলাভাষার উদ্ভবের কাল থেকে ঔপনিবেশিক কাল পর্যন্ত জাতির সামাজিক ও সাংস্কৃতিক বিকাশের গতিরেখার সঙ্গে শিক্ষার্থীদের পরিচয় ঘটানোই এই পাঠক্রমের উদ্দেশ্য। ● বাঙালির ইতিহাস, জনজীবন গড়ে ওঠার প্রবণতাগুলো সম্পর্কে এখানে জানা যাবে। ● বাঙালির ‘কালচার’ সম্পর্কে গভীর ধারণা অর্জন করবে।	Remembering Understanding
			<Unit II>বাঙালার জনজীবন		Remembering Understanding
			<Unit III>বাঙালির সংস্কৃতি পরিচয়		Remembering Understanding
III	BEN-HC-3016 CO 6	লোকসংস্কৃতি ও লোকসাহিত্য	<Unit I>লোকসাহিত্যের সংজ্ঞা ও স্বরূপ, প্রবাদছড়া , ও ধাঁধা, লোককথা	● বাঙালি ও তার সংস্কৃতিকে জানতে গেলে লোকসংস্কৃতি ও লোকসাহিত্যের পাঠ গ্রহণ জরুরি। ● বাংলার সমৃদ্ধ লোকঐতিহ্যের থেকে নির্বাচিত কয়েকটি প্রসঙ্গ এখানে পড়ুয়াদের চর্চার জন্য রাখা হয়েছে। ● বাংলার লোকসংস্কৃতি	Remembering Understanding
			<Unit II>লোকগান		Remembering Understanding
			<Unit III>ব্রতকথা		Remembering Understanding

				সম্পর্কে এই পাঠক্রম শিক্ষার্থীদের মনে আগ্রহ তৈরি করবে ও ক্ষেত্র ভিত্তিক গবেষণায় উৎসাহিত করবে।	
III	BEN-HC-3026 CO 7	ছন্দঅলঙ্কার ও প্রাচ্য কাব্যতত্ত্ব	<Unit I> ছন্দ	<ul style="list-style-type: none"> ● সাহিত্যের শিক্ষার্থীদের কবিতার ছন্দ, অলঙ্কার এবং ভারতীয় কাব্যতত্ত্ব সম্বন্ধে জ্ঞান থাকা আবশ্যিক। এই পাঠক্রম সেই প্রয়োজনীয়তা স্বীকার করে। ● এই পাঠক্রম তাদের কাব্যবোধ ও রুচিকে গড়ে তুলবে। ● কাব্য কী – এই জিজ্ঞাসা শিক্ষার্থীদের মনে জাগবে এবং তারা সমালোচনা করতে সমর্থ হবে। 	Remembering Understanding Applying
			<Unit II> অলঙ্কার		Remembering Understanding Applying
			<Unit III> প্রাচ্যকাব্যতত্ত্ব-		Remembering Understanding
III	BEN-HC-3036 CO 8	বাংলা সাহিত্যের ইতিহাস (প্রাচীন ও মধ্যযুগ)	<Unit I> সাধারণ পরিচয়	<ul style="list-style-type: none"> ● বাংলা ভাষা ও সাহিত্যের উদ্ভবের কাল থেকে বিভিন্ন ধারার সঙ্গে শিক্ষার্থীদের পরিচয় ঘটবে এই পাঠক্রমো ● সাহিত্যের রসাস্বাদনের পর এর প্রধান প্রধান ধারাগুলো সম্বন্ধে একটি স্পষ্ট ধারণা দেবে এই পাঠক্রম। ● বাংলার প্রাচীন ও মধ্যযুগের সাহিত্যের কালপরম্পরা সম্পর্কে ধারণা তৈরি হবে 	Remembering Understanding
			<Unit II> বাংলা মঙ্গল কাব্যের ধারাপ্রাক চৈতন্য ও - চৈতন্যোত্তর		Remembering Understanding
			<Unit III> বাংলা অনুবাদ কাব্যের ধারাপ্রাক চৈতন্য ও - চৈতন্যোত্তর		Remembering Understanding
III	BEN-SE-3014 CO 9	পাণ্ডুলিপি প্রস্তুতি	<Unit I> পাণ্ডুলিপি তৈরির বিভিন্ন পর্যায়, বিরাম চিহ্ন সহ অন্যান্য চিহ্নের ব্যবহার, তথ্যসূত্র নির্মাণ, MLA ও CMS Style, উল্লেখপঞ্জি ও গ্রন্থপঞ্জি	<ul style="list-style-type: none"> ● সাহিত্য ও প্রযুক্তির মেলবন্ধন ঘটিয়ে তার কর্মবিস্তারে কর্মসংস্থানের সম্ভাবনা বৃদ্ধি করার লক্ষ্যে এই পাঠক্রমের পরিকল্পনা করা হয়েছে। ● সাহিত্য চর্চার পাশাপাশি মুদ্রণ ও প্রকাশনা সংক্রান্ত ধারণা গড়ে উঠবে শিক্ষার্থীদের। ● ব্যবহারিক জ্ঞান প্রয়োগে সমর্থ হবে 	Understanding, Applying, Analyzing, Evaluating
			Unit II> MS Word ও Pagemaker এর ব্যবহার সম্বন্ধে জ্ঞান		Understanding, Applying, Analyzing, Evaluating
IV	BEN-HC-4016 CO 10	বাংলা সাহিত্যের ইতিহাস ঃ আধুনিক যুগ	<Unit I> বাংলা গদ্যের বিকাশ ও সাময়িক পত্র	<ul style="list-style-type: none"> ● বাংলা ভাষা ও সাহিত্যের উদ্ভবের কাল থেকে বিভিন্ন ধারার সঙ্গে শিক্ষার্থীদের পরিচয় ঘটবে এই পাঠক্রমো ● সাহিত্যের রসাস্বাদনের পর 	Remembering Understanding
			<Unit II> বাংলা কবিতা ও নাটকের ধারা		Remembering Understanding
			<Unit III> বাংলা উপন্যাস		Remembering

			ও ছোটগল্পের ধারা	এর প্রধান প্রধান ধারাগুলো সম্বন্ধে একটি স্পষ্ট ধারণা দেবে এই পাঠক্রম। ● বাংলার আধুনিক যুগের সাহিত্যের কালপরম্পরা সম্পর্কে ধারণা তৈরি হবে	Understanding
IV	BEN-HC-4026 CO ₁₁	আধুনিক বাংলা সাহিত্য : সূচনা পর্ব	<Unit I মহাকাব্য (মেঘনাদবধ কাব্য)	● উপনিবেশিক আধুনিকতার সংস্পর্শে এসে আমাদের	Remembering Understanding
			<Unit II রসরচনা- (বঙ্কিমচন্দ্র)	চিন্তা-চেতনা ও জীবনমান সাহিত্যে যে আধুনিকতার সঞ্চার করেছিল, তার সঙ্গে শিক্ষার্থীদের এখানে পরিচয় ঘটবে।	Remembering Understanding
			<Unit III উনিশ শতকের নির্বাচিত গীতিকবিতা	● মহাকাব্য, গীতিকাব্য, নস্রা জাতীয় রচনা ও যুক্তিনিষ্ঠ প্রবন্ধ সাহিত্যে কীভাবে এই আধুনিক চিন্তার প্রতিফলন ঘটেছে, তা শিক্ষার্থীরা আয়ত্ত করতে পারবে। ● সাহিত্যে প্রতিফলিত আধুনিকতার স্বরূপ অনুধাবন করতে পারবে।	Remembering Understanding
IV	BEN-HC-4036 CO ₁₂	রবীন্দ্রসাহিত্য	<Unit I কবিতা (সঞ্চয়িতা)	● বাংলা সাহিত্যের শিক্ষার্থীদের কাছে রবীন্দ্রনাথ ঠাকুর প্রবাদপ্রতিম ব্যক্তিত্ব। এশিয়া মহাদেশে সাহিত্যের প্রথম নোবেল প্রাপক এই কৃতি ব্যক্তিত্বের সৃষ্টিরাজিকে সংক্ষেপে পরিক্রমা করে নেবার সুযোগ আছে এই পাঠক্রমে।	Remembering Understanding
			<Unit II উপন্যাস (যোগাযোগ)	● মূলত বাংলা ছোটো গল্পের স্রষ্টা, অসংখ্য কবিতার রচয়িতা ও উপন্যাসের রূপকার রবীন্দ্রনাথ এখানে শিক্ষার্থীদের কাছে প্রতিভাত হবেন।	Remembering Understanding
			<Unit III ছোটো গল্প (গল্পগুচ্ছ ১ম ভাগ)	● এই সৃষ্টিরাজি অবলম্বনে শিক্ষার্থীদের রবীন্দ্র-দর্শন অনুধাবন করা সম্ভব হবে।	Remembering Understanding
IV	BEN-SE-4014 CO ₁₃	ফ্রফ সংশোধন	<Unit I ফ্রফ সংশোধন সংশ্লিষ্ট বিষয়ের জ্ঞান, ফ্রফ সংশোধনের বিভিন্ন স্তর, বিভিন্ন সংশোধনী চিহ্নের জ্ঞান ও ব্যবহার।	● সাহিত্য ও প্রযুক্তির মেলবন্ধন ঘটিয়ে তার ক্রমবিস্তারে কর্মসংস্থানের সম্ভাবনা বৃদ্ধি করার লক্ষ্যে এই পাঠক্রমের পরিকল্পনা করা হয়েছে।	Understanding, Applying, Analyzing, Evaluating

			ব্যবহারিক প্রকৃৎ সংশোধন	<ul style="list-style-type: none"> ● লেখার ভুল সংশোধন প্রক্রিয়া সম্বন্ধে জেনে বিভিন্ন প্রকাশন সংস্থায় দক্ষ কর্মী হিসাবে গড়ে তোলার সুযোগ আছে এই পাঠক্রমে। ● প্রায়োগিক অভিজ্ঞতা অর্জন করতে পারবে 	Understanding, Applying, Analyzing, Evaluating
V	BEN-HC-5016 CO 14	আধুনিক বাংলা সাহিত্য : প্রাক্ স্বাধীনতা পর্ব	<Unit I নির্বাচিত কবিতা (মধুসূদন-গীতিকবিতা/রবীন্দ্রনাথ-ক্ষণিকা/বুদ্ধদেব বসু-বাংলা আধুনিক কবিতা)	<ul style="list-style-type: none"> ● আধুনিক বাংলা গীতিকবিতার স্বরূপ সম্বন্ধে জানবে, ● উপন্যাস সম্রাট বঙ্কিমচন্দ্রের হাতে সৃষ্ট উপন্যাস পড়ার মাধ্যমে শিক্ষার্থীরা বাংলা উপন্যাস সাহিত্য সম্পর্কে ধারণাকে পুষ্টি করবে, 	Remembering Understanding
			Unit II> (কথাসাহিত্য: রজনী উপন্যাস)	উপন্যাস সাহিত্য সম্পর্কে ধারণাকে পুষ্টি করবে,	Remembering Understanding
			<Unit III প্রবন্ধ (দুশো বছরের বাংলা প্রবন্ধ সাহিত্য)	<ul style="list-style-type: none"> ● সূচনা ও বিকাশ পর্বের বাংলা প্রবন্ধ পাঠে স্বাধীনতাপূর্ব কালের বাংলা সাহিত্য সম্পর্কে সম্যক জ্ঞান অর্জন করবে। 	Remembering Understanding
V	BEN-HC-5026 CO 15	আধুনিক বাংলা সাহিত্য : স্বাধীনোত্তর পর্ব	Unit I> নির্বাচিত কবিতা : বাংলা আধুনিক কবিতা - বুদ্ধদেব বসু/ কবিতা সংগ্রহ – শক্তিপদ ব্রহ্মচারী/ উৎসবের টেবিল – সঞ্জয় চক্রবর্তী	<ul style="list-style-type: none"> ● আধুনিক সময়ের জটিলতা, ব্যষ্টি ও সমষ্টির দ্বন্দ্ব, প্রাচীন ও নবীনের সংঘাত, নরনারীর প্রেম-সঙ্কট ইত্যাদি সম্পর্কে জ্ঞানার্জনের সুযোগ রয়েছে বর্তমান পাঠক্রমে। 	Remembering Understanding
			<Unit II ছোটগল্প (একশ বছরের সেরা গল্প: সমরেশ মজুমদার সম্পা.)	<ul style="list-style-type: none"> ● আধুনিক জীবনযাত্রার নানা প্রবণতা সম্পর্কে 	Remembering Understanding
			<Unit III নাটক-		

			সাজানো বাগান	শিক্ষার্থীদের ধারণা গড়ে উঠবে। ● প্রাচীন ও আধুনিক কালের দ্বন্দ্বিক পরিস্থিতি অনুধাবন করবে।	Remembering Understanding
V	BEN-HE-5016 CO 16	শিশু ও কিশোর সাহিত্য	Unit I> ছড়া (আবোল তাবোল)	● বাংলা শিশু-কিশোর সাহিত্যের সুগভীর ঐতিহ্য রয়েছে। বর্তমান পাঠক্রমে এই বিশেষ সাহিত্য ধারার বৈশিষ্ট্য জানার সুযোগ রয়েছে। ● কয়েকটি নির্বাচিত পাঠ অবলম্বন করে শিক্ষার্থীরা বাংলা শিশু সাহিত্যের আঙ্গিকগুলো সম্পর্কে জ্ঞানার্জন করবে। ● কল্পবিজ্ঞান এবং ফ্যান্টাসি জাতীয় রচনার সঙ্গেও তারা পরিচিত হবে।	Remembering Understanding
			<Unit II গদ্য কাহিনি (নালক)		Remembering Understanding
			<Unit III উপন্যাস (পদিপিসীর বর্মীবাক্স)		Remembering Understanding
V	BEN-HE-5026 CO 17	জীবনী সাহিত্য ও স্মৃতিকথা	<Unit I জীবনী (অজানা অচেনা বিবেকানন্দ)	● বাংলা সাহিত্যের জনপ্রিয় ধারাগুলোর মধ্যে অন্যতম হল জীবনী, আত্মজীবনী ও স্মৃতিকথা। বর্তমান পাঠক্রমে শিক্ষার্থীরা এই ধারা সম্পর্কে একটি সুনির্দিষ্ট ধারণা গড়ে তুলতে পারবে। ● ব্যক্তি বিবেকানন্দ ও রবীন্দ্রনাথ ঠাকুরের ব্যক্তি জীবনের একটি বিশেষ পর্বকে জানার সঙ্গে সঙ্গে উপেন্দ্রনাথ রচিত স্মৃতিচিত্রে ভারতের স্বাধীনতা সংগ্রামের এক বিশেষ অধ্যায় সম্পর্কেও জ্ঞান লাভ করবে। ● মনীষীদের জীবন সম্পর্কে ধারণা তৈরি	Remembering Understanding
			<Unit II আত্মজীবনী (ছেলেবেলা)		Remembering Understanding
			<Unit III স্মৃতিকথা (নির্বাসিতের আত্মকথা)		Remembering Understanding

				হবে।	
VI	BEN-HC-6016 CO 18	সাহিত্যের সংজ্ঞা ও সংরূপ	<Unit Iমহাকাব্য	<ul style="list-style-type: none"> ● সাহিত্যের নানা সংরূপের (Genre) আঙ্গিক ও প্রকাশভঙ্গি সম্পর্কে জ্ঞানার্জন করতে পারবে, ● শিক্ষার্থীরা সমালোচনা সাহিত্যের বিবর্তন সম্পর্কেও অবহিত হতে পারবে। ● শিক্ষার্থীরা সাহিত্যের আঙ্গিক সম্বন্ধে ধারণা গঠন করে সমালোচক হিসাবে নিজেদের গড়ে তুলতে সক্ষম হবে। 	Remembering Understanding
			<Unit IIগীতিকাব্য ও ব্যালাড		Remembering Understanding
			<Unit IIIউপন্যাস, ছোটগল্প, নাটক		Remembering Understanding
VI	BEN-HC-6026 CO 19	পাশ্চাত্য সাহিত্যতত্ত্ব ও সমালোচনা	<Unit Iপাশ্চাত্য সাহিত্যতত্ত্ব-১	<ul style="list-style-type: none"> ● আধুনিক সাহিত্য সমালোচনা ও রচনার বোধ অসম্পূর্ণ থাকে পাশ্চাত্য সমালোচনা রীতি সম্পর্কে উপযুক্ত জ্ঞান না থাকলে। সেই লক্ষ্য পূরণে এই পাঠক্রমে পাশ্চাত্য সমালোচনা রীতি ও ধারা সম্বন্ধে প্রাথমিক জ্ঞান অর্জনে সক্ষম হবে শিক্ষার্থীরা। ● বিভিন্ন পাশ্চাত্য দর্শন সম্বন্ধে জ্ঞান অর্জন করবে, ● সাহিত্য সমালোচনা পদ্ধতি শিখে প্রয়োগ করতে পারবে। 	Remembering Understanding
			<Unit IIপাশ্চাত্য সাহিত্যতত্ত্ব-২		Remembering Understanding
			Unit III> সমালোচক ও সমালোচনা পদ্ধতি		Remembering Understanding
VI	BEN-HE-6016 CO 20	উত্তরপূর্বের বাংলা সাহিত্য	Unit I> নাটক (গুণধরের অসুখ)	<ul style="list-style-type: none"> ● ভারতের উত্তরপূর্বে বাঙালিদের বসবাসের একটি প্রাচীন ইতিহাস রয়েছে। পরিস্থিতির সঙ্গে খাপ খাইয়ে তাঁরা 	Remembering Understanding
			<Unit IIনির্বাচিত ছোটগল্প		Remembering Understanding
			Unit III> উপন্যাস		Remembering Understanding

			(বিলোরিস)	<p>বেঁচে থাকার লড়াইয়ে মগ্ন। এই লড়াইকে অনুধাবন করতে পারবে শিক্ষার্থীরা।</p> <ul style="list-style-type: none"> ● এতদঞ্চলের পরিবেশ তথা মানুষজন, সংস্কৃতি, রাজনীতি ও ভৌগোলিক অর্থনীতির একটি বিশেষ পরিসর বাংলা সাহিত্যে গড়ে দিতে কবি, কথাসাহিত্যিক ও নাট্যকারেরা সক্ষম হয়েছেন। শিক্ষার্থীরা এই পরিচয় অনুধাবন করতে পারবে। ● শিক্ষার্থীরা নির্বাচিত পাঠ অবলম্বনে তাকে জানার সঙ্গে সঙ্গে এই অঞ্চলের সাহিত্য নিয়ে গবেষণার অবকাশকে সমৃদ্ধ করতে পারবে। 	Remembering Understanding
VI	BEN-HE-6026 CO 21	প্রতিবেশী সাহিত্য	Unit I> অসমিয়া (লক্ষ্মীনাথ বেজবর্মার নির্বাচিত রচনা)	<ul style="list-style-type: none"> ● ভারতীয় সাহিত্য চর্চা সম্পর্কে স্তানার্জন এই পাঠক্রমের উদ্দেশ্য। ● বাংলা সাহিত্যকে জানার পাশাপাশি সমকালীন ভারতীয় সাহিত্য, বিশেষ করে অসমিয়া, ওড়িয়া এবং হিন্দি সাহিত্যের নির্বাচিত পাঠে এ-সম্পর্কে প্রাথমিক ধারণা গড়ে উঠবে, ● শিক্ষার্থীদের তুলনামূলক অধ্যয়নে আগ্রহ তৈরি হবে ও প্রস্তুতি নিতে পারবে। 	Remembering Understanding
			Unit II> ওড়িয়া (ছ মণ আঠ গুণ্ঠ)	<ul style="list-style-type: none"> ● বাংলার সাহিত্যিক জানার পাশাপাশি সমকালীন ভারতীয় সাহিত্য, বিশেষ করে অসমিয়া, ওড়িয়া এবং হিন্দি সাহিত্যের নির্বাচিত পাঠে এ-সম্পর্কে প্রাথমিক ধারণা গড়ে উঠবে, ● শিক্ষার্থীদের তুলনামূলক অধ্যয়নে আগ্রহ তৈরি হবে ও প্রস্তুতি নিতে পারবে। 	Remembering Understanding
			Unit III> হিন্দি (প্রেমচন্দ্রের গল্পগুচ্ছ)	<ul style="list-style-type: none"> ● শিক্ষার্থীদের সাহিত্যিক গবেষণা সম্পর্কে আগ্রহ গড়ে তোলার পাশাপাশি 	Remembering Understanding
VI	BEN-HE-6036 in lieu of HE-6026 CO 22	গবেষণামূলক সন্দর্ভ লিখন যে কোনো ১টি ইউনিট থেকে ১টি	<Unit Iউনিশ ও কুড়ি শতকের বাংলা সাময়িক পত্র	<ul style="list-style-type: none"> ● শিক্ষার্থীদের সাহিত্যিক গবেষণা সম্পর্কে আগ্রহ গড়ে তোলার পাশাপাশি 	Understanding, Applying, Analyzing, Evaluating

		প্রকল্প তৈরি করতে হবে	<Unit IIকুড়ি শতকের সাহিত্য ব্যক্তিত্ব: কবিতা, প্রবন্ধ	বিভিন্ন বিষয়-ভাবনাকে সূষ্ঠ ও নির্দিষ্ট নিয়ম মেনে বিশ্লেষণ করতে সাহায্য করবে। ● আধুনিক বাঙালির চিন্তা-চেতনার বাহক হিসাবে বাংলা সাময়িক পত্রের ভূমিকা সম্বন্ধে গভীর অধ্যয়নের পাশাপাশি কথাসাহিত্যের গতিপ্রকৃতি নিয়ে নিজস্ব মতামত গড়ে তুলতে সক্ষম হবে। ● গবেষণার রীতি-পদ্ধতির প্রায়োগিক পরীক্ষণ সম্ভব হবে।	Understanding, Applying, Analyzing, Evaluating
			<Unit IIIকুড়ি শতকের সাহিত্য ব্যক্তিত্ব : গল্পউপন্যাস ,	Understanding, Applying, Analyzing, Evaluating	

Department of Bodo

Programme Specific Outcome (B.A in Bodo) (CBCS)

The programme specific outcome of the syllabus prescribed for the major students of 'subject/department' is mentioned below:

- The course in Bodo will inculcate in the Bodo students an appreciation of Bodo literature. Through a study of Bodo Poetry, Drama, Novel, Short Story and Prose. it will provide skill in creative writing.
- Students will gain competence over the Bodo language will be able to enhance their communicative skill.
- After completion of this course students will gain information about Bodo Literature, culture and tradition .

COURSE OUTCOME

B.ABodo (Honours) Syllabus (CBCS)

I Semester

Paper Name: History of Bodo Literature (Early Period)

Paper Code: BOD-HC-1016

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about the contribution of the Missionaries • Come to know about the contribution of the Native speakers 	Unit I: Missionary contribution in Bodo Literature	Remember, Understand
	Unit II: Bodo Literature (Post Missionary to Pre- Bihar)	Remember, Understand
	Unit III: Writing in Bihar Magazine	Remember, Understand
	Unit IV: Writing in Hathorkhi Hala and Olongbar	Remember, Understand

Paper Name: Litrary Criticism (western)

Paper Code: BOD-HC-1026

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about the concept of literary criticism • Come to know about the different 	Unit I: Theory and concept of literary criticism	Remember, Understand
	Unit II: Poetry and Drama	Remember, Understand
	Unit III: Novel and Short story	Remember, Understand
	Unit IV: New literary theory (With	Remember, Understand

genres of literature	special reference to Modernism, post modernism, Feminism and Eco feminism)	Analyse
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2nd Semester (Honours)

Paper Name: History of Bodo Literature (Modern Period, 1952 to 2015)

Paper Code: BOD-HC-2016

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about the beginning of modern period of Bodo literature • New trend development in Bodo literature 	Unit I: An introductory note on historical developments of modern Bodo literatue	Remember, Understand
	Unit II: Bodo Poetry	Remember, Understand
	Unit III: Bodo Novel and Short story	Remember, Understand
	Unit IV: Bodo Drama	Remember, Understand

Paper Name: Literary Criticism (Eastern)

Paper Code: BOD-HC-2026

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about theory and concept of eastern literary criticism • Come to know about the uses of Rasa , Chanda , Alangkar , with special reference to Bodo literature 	Unit I: History and development of eastern literary criticism	Remember, Understand
	Unit II: Rasa	Remember, Understand
	Unit III: Chanda	Remember, Understand
	Unit IV: Alangkar	Remember, Understand

3rd Semester (Honours)

Paper Name: Introduction to language and linguistics

Paper Code: BOD-HC-3016

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Can gather general idea about language and linguistics • Can learn about different level of linguistics analysis 	Unit I: Language :Definition of language,Characteristics of language , Why study language	Remember, Understand
	Unit II: Linguistics : Definition , Linguistics as a science , Branches of linguistics , Scope of linguistics , Level of linguistics analysis	Remember, Understand Analyse
	Unit III: Introduction to Phonetics, Phonology and Morphology	Remember, Understand
	Unit IV: Introduction to Syntax , Semantics and Vocabulary	Remember, Understand

Paper Name: Bodo poetry (Early period)

Paper Code: BOD-HC-3026

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about the trend of old Bodo poetry • Come to know about the mystic and romantic poems composed during the period • About the poems composed to bring social awareness among the mass 	Unit I: Trend of Bodo poetry (from inception to 1952)	Remember, Understand
	Unit II: Angni Kwina , Khathi Gasa, Dani Boro Fisa , Mwdwi	Remember, Understand
	Unit III: Thwinay, Baidi mwjang Khwrang, Habilash, Bathu bwraya Makhu Khurjidwng	Remember, Understand
	Unit IV: Eroino Din Thanga , Sikhando, Zakhando, Angni Simang	Remember, Understand

Paper Name: Introduction to culture

Paper Code: BOD-HC-3036

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about the general concept of culture 	Unit I: Definition of culture, Characteristics of culture, Society and culture, Culture and civilization, Language and culture	Remember, Understand
	Unit II: Folklore and Folk society , Folklore and its sub genres	Remember, Understand

<ul style="list-style-type: none"> • The relation between folklore and society • About diffusion , Acculturation and assimilation of culture 	Unit III: Folk religion , Folk belief and superstition (analysis may be done from the folklorist point of view	Remember, Understand
	Unit IV: Process of cultural diffusion, acculturation and assimilation	Remember, Understand

4th Semester (Honours)

Paper Name: Modern Bodo poetry (From -1952 to 2015)

Paper Code: BOD-HC-4016

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about the trend of modern Bodo poetry • About new symbol and technique use by the poets 	Unit I: Trend of Modern Bodo poetry	Remember, Understand
	UnitII:poem- Mahabudhani toposhya, Zibraltarni onthai , Sangrema , Jiu Swnai	Remember, Understand
	Unit III: poem- Gufur daothua dabw gabw , Sangrema jiu , Amen , Sase badari mwntham saogari	Remember, Understand
	Unit IV: poem – Bishnu prasad, Halua , No , Ang da daina	Remember, Understand

Paper Name: Bodo language

Paper Code: BOD-HC-4026

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about origin, concentration and development of the Bodo language , • Present status of the Bodo language 	Unit I: The term Bodo, Origin and development of the Bodo language, demographic composition and concentration of the bodos	Remember, Understand
	Unit II: Characteristics and present status of the Bodo language	Remember, Understand
	Unit III: Linguistics impact of other language on Bodo in case of Phonology, Morphology , Syntax and Vocabulary	Remember, Understand Analyse
	Unit IV: Language variation (in this unit topics like idiolect , dialect , Difference between dialect and idiolect , Standard language process	Remember, Understand Analyse

	of standardization are to be included	
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Paper Name: Bodo Culture

Paper Code: BOD-HC-4036

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about Bodo society and Culture • Come to know about Cultural elements of the Bodos 	Unit I: The Bodo society and trait of Bodo Folk- culture, its traditionalism and prospect of continuity	Remember, Understand
	Unit II: Food habit of the Bodos	Remember, Understand
	Unit III: Material culture	Remember, Understand
	Unit IV: Social folk customs , fair and festival of the Bodos	Remember, Understand

5th Semester (Honours)

Paper Name: Manaranjan Lahary

Paper Code: BOD-HC-5016

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about life and literary works of Manaranjan Lahary 	Unit I: Life and works of Manaranjan Lahary	Remember, Understand
	Unit II: Poems and essays of Manaranjan Lahary	Remember, Understand
	Unit III: Fictions of Manaranjan Lahary	Remember, Understand
	Unit IV: Dramas of Manaranjan Lahary	Remember, Understand

Paper Name: Structure of Bodo language

Paper Code: BOD-HC-5026

Course Outcome	Unit/ Topic	Blooms taxonomy level
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After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about Phonology of Bodo language • Come to know about the Structure of Morphology, Syntax and vocabulary of Bodod language 	Unit I: Phonological analysis (Phoneme and its description, distribution of Phonemes, use of tone and syllables	Remember, Understand Analyse
	Unit II: Morphological analysis (With special reference to system of number, gender, numeral classifiers, use of personal pronouns, case marker, structure of verb, application of tense and tense marker)	Remember, Understand Analyse
	Unit III: Syntactic analysis (types of sentences, IC analysis of Bodo sentence , Word order	Remember, Understand Analyse
	Unit IV: Vocabulary(Introduction to Bodo vocabulary, Mutual impact of lexis between the Bodo and other languages, Basic structure of Bodod word	Remember, Understand Analyse

6th Semester (Honours)

Paper Name: Contribution of women writers in Bodo literature

Paper Code: BOD-HC-6016

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Come to know about women writings in Bodo • Contribution of women writers in in different genres of literature 	Unit I: Why is women literature, Significance of women literature	Remember, Understand
	Unit II: Women contribution in Bodo poetry	Remember, Understand
	Unit III: women contribution in Bodo short story	Remember, Understand
	Unit IV: Women contribution in Bodo Novel	Remember, Understand

Paper Name: Cognate language of the Bodo

Paper Code: BOD-HC-6026

Course Outcome	Unit/ Topic	Blooms taxonomy level
After the completion of this course, the students will be able to:	Unit I :Bodo group of language, common characteristics and concentration of this group of people	Remember, Understand

<ul style="list-style-type: none"> • Come to know about Bodo group of language and their common characteristics • Come to know about Phonology, Morphology, vocabulary of Bodo group of language 	Unit II: Comparative phonology of Bodo, Garo, Dimasa, Kokborok and tiwa with special reference to Vowel, Consonant, and use of syllable and Tone (Glottal stop where tone is note available)	Remember, Understand
	Unit III: Comparative Morphology of Boro, Garo, Dimasa, Rabha, Kokborok and tiwa with special reference to Structure of Noun, Pronoun, Number, Gender, Verb, Tence and Adjective	Remember, Understand
	Unit IV: Comparative Vocabulary of Bodo, Garo, Rabha, Dimasa, Kokborok and tiwa language with introduction to the structure of basic vocabulary and the loan words available in this language	Remember, Understand

Department of Botany

Programme Specific Outcome (B.Sc in Botany) (CBCS)

The programme specific outcome of the syllabus prescribed as per Gauhati University for the Honours students of Botany is mentioned below:

- **PSO1:** Critical evaluation of the ideas and arguments by collection of relevant information about plants, to recognize the position of plant in the broad classification and phylogenetic level.
- **PSO2:** Identify problems and independently propose solutions using creative approaches, acquired through interdisciplinary experiences, and a depth and breadth of knowledge/expertise in the field of Plant Identification.
- **PSO3:** Accurate interpretation of collected information and use taxonomical information to evaluate and formulate a position of plant in taxonomy.
- **PSO4:** Students will be able to apply the scientific method to questions in botany by formulating testable hypotheses, collecting data that address these hypotheses, and analyzing those data to assess the degree to which their scientific work supports their hypotheses.
- **PSO5:** Students will be able to present scientific hypotheses and data both orally and in writing in the formats that are used by practicing researchers/ scientists.
- **PSO6:** Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.
- **PSO7:** Students will be able to apply fundamental mathematical tools (statistical analysis, SPSS) and physical principles (physics, chemistry) to the analysis of relevant biological situations.
- **PSO8:** Students will be able to identify the major groups of organisms with an emphasis on plants and be

able to classify them within a phylogenetic framework. Students will be able to compare the characteristics of plants, algae, and fungi that differentiate them from each other and from other forms of life.

- **PSO9:** 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 plant morphology, physiology, and life history.
- **PSO10:** Students will be able to explain how Plants function at the level of the gene, genome, cell, tissue, Flower development. Drawing upon this knowledge, they will be able to give specific examples of the physiological adaptations, development, reproduction and mode of life cycle followed by different forms of plants.
- **PSO11:** Students will be able to explain the ecological interconnectedness of life on earth by tracing energy and nutrient flow through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems.
- **PSO12:** Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within biology.

COURSE OUTCOME

B.Sc. in Botany (Honours) Syllabus (CBCS)

I Semester

Paper Name: Phycology and Microbiology

Paper Code: BOT-HC-1016

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain level
1. Understand the microbial diversity along with its mode of nutrition, reproduction and its economic importance.	Unit 1: Introduction to microbial world Scope of microbes in industry and environment; Microbial nutrition, growth and metabolism.	Remember, Understand
2. Know the role of microbe in the maintenance of the ecological imbalance.	Unit 2: Viruses Discovery, physiochemical and biological characteristics; classification (Baltimore), general structure with special reference to viroids and prions; replication (general account), DNA virus (T-phage), lytic and lysogenic cycle; RNA virus (TMV). Economic importance of viruses with reference to vaccine	Remember, Understand, Apply
3. Know the importance of microbes in modern research		

and its application.	production, role in research, medicine and diagnostics, as causal organisms of plant diseases.	
4. Knowledge on the systematics of viruses, algae, bacteria and their various metabolic processes.	Unit 3: Bacteria Discovery, general characteristics; Types-archaeobacteria, eubacteria, actinomycetes, mycoplasma, rickettsia, chlamydiae and sphaeroplasts); Cell structure; Nutritional types; Reproduction-vegetative, asexual and recombination (conjugation, transformation and transduction). Economic importance of bacteria with reference to their role in agriculture and industry (Alcohol and Antibiotic production).	Remember, Understand, Apply, Evaluate
5. Understand the difference between beneficial and harmful viruses or bacteria.		
6. Understand the high industrial application of microbes based on the metabolite it develops which are useful for the human application in various fields of medicine and nutrient.	Unit4: Algae General characteristics; Ecology and distribution; range of thallus organization; Cell structure and components; cell wall, pigment system, reserve food (of only groups represented in the syllabus), flagella; methods of reproduction; Classification; Evolutionary significance of <i>Prochloron</i> ; criteria, system of Fritsch, and evolutionary classification of Lee (only upto groups); Role of algae in the environment, agriculture, biotechnology and industry, Economic importance of Diatoms.	Remember, Understand, Apply
7. Role of beneficial or harmful viruses in research, medicine and diagnostics, as causal organisms of plant diseases.		
8. To know the various economic benefits of algae and use of them in day today life.		
9. Distribution, morphology and life cycle of various algae.	Unit5: Cyanophyta and Xanthophyta Ecology and occurrence; Range of thallus organization; Cell structure; Reproduction, Morphology and life-cycle of Nostoc and Vaucheria.	Remember, Understand, Apply
	Unit6: Chlorophyta, Charophyta and Bacillariophyta General characteristics; Occurrence; Range of thallus organization; Cell structure; Reproduction. Morphology and life-cycles of <i>Volvox</i> , <i>Oedogonium</i> , <i>Coleochaete</i> , <i>Chara</i> . General Account of Bacillariophyta.	Remember, Understand, Apply
	Unit7: Phaeophyta and Rhodophyta Characteristics; Occurrence; Range of thallus organization; Cell structure; Reproduction. Morphology and life-cycles of <i>Ectocarpus</i> , <i>Fucus</i> and <i>Polysiphonia</i> .	Remember, Understand, Apply
1. Develop the practical knowledge on models of	Practical: Microbiology	Understand, Evaluate, Apply

<p>viruses and their life cycles by having a clear observation of the models.</p> <p>2. Practical knowledge on the structure, reproduction of bacteria and its know the staining of the gram positive and gram negative bacteria, thus further help in the differentiation among them.</p> <p>3. Practical understanding of soil microflora and its isolation procedure.</p> <p>4. Develop the practical knowledge on different forms of algae and their life cycles by having a clear observation of the forms.</p>	<p>1. Electron micrographs/Models of viruses – T-Phage and TMV/ Line drawings/ Photographs of Lytic and Lysogenic Cycle.</p> <p>2. Types of Bacteria to be observed from temporary/permanent slides/photographs. Electron micrographs of bacteria, binary fission, endospore, conjugation, root Nodule.</p> <p>3. Gram staining.</p> <p>4. Isolation of soil microflora.</p> <p>5. Endospore staining with malachite green using the (endospores taken from soil bacteria).</p> <p>Phycology</p> <p>1. Study of vegetative and reproductive structures of <i>Nostoc</i>, <i>Volvox</i>, <i>Oedogonium</i>, <i>Chara</i>, <i>Vaucheria</i>, <i>Ectocarpus</i>, <i>Fucus</i> and <i>Polysiphonia</i>, <i>Prochloron</i> through electron micrographs, permanent slides.</p>	
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Paper Name: Biomolecules and Cell Biology

Paper Code: BOT-HC-1026

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain level
<p>1. Knowledge on the different bonding pattern among the chemical compounds and further understand the polar compounds.</p> <p>2. Understand the significance of pH, buffers and their role in biological metabolism.</p> <p>3. Understand the structure, types and importance of different biomolecules (Lipids, Carbohydrates, Nucleic Acids, Protein)</p> <p>4. Develop the concept on various bioenergetic reactions and its mechanism under various conditions.</p> <p>5. Understand the different redox reactions and the mechanism of ATP serving as</p>	<p>Unit 1: Biomolecules</p> <p>Types and significance of chemical bonds; Structure and properties of water; pH and buffers.</p> <p>Carbohydrates: Nomenclature and classification; Monosaccharides; Disaccharides; Oligosaccharides and polysaccharides.</p> <p>Lipids: Definition and major classes of storage and structural lipids; Fatty acids structure and functions; Essential fatty acids; Triacyl glycerols structure, functions, and properties; Phosphoglycerides.</p> <p>Proteins: Structure of amino acids; Levels of protein structure-primary, secondary, tertiary and quaternary; Protein denaturation and biological roles of proteins.</p> <p>Nucleic acids: Structure of nitrogenous bases; Structure and function of nucleotides; Types of nucleic acids; Structure of A, B, C, D, Z types of DNA; Types of RNA.</p>	<p>Remember, Understand</p>
	<p>Unit 2: Bioenergetics</p>	<p>Remember,</p>

<p>the currency molecule.</p> <p>6. The students will be able to understand the fundamental biochemical principles of enzymes, such as the structure and function of enzymatic process in living system.</p>	<p>Laws of thermodynamics, concept of free energy, endergonic and exergonic reactions, coupled reactions, redox reactions. ATP: structure, its role as a energy currency molecule.</p>	<p>Understand</p>
<p>7. Understand the structure and chemical composition of chromatin and concept of cell division.</p> <p>8. Gain knowledge about “Cell Science”</p>	<p>Unit 3: Enzyme Structure of enzyme: holoenzyme, apoenzyme, cofactors, coenzymes and prosthetic group; Classification of enzymes; Features of active site, substrate specificity, mechanism of action (activation energy, lock and key hypothesis, induced - fit theory), Michaelis – Menten equation, enzyme inhibition and factors affecting enzyme activity.</p>	<p>Remember, Understand, Evaluate</p>
<p>9. Understand Cell wall Plasma membrane, Cell organelles and cell division.</p>	<p>Unit4: The Cell Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell (Endosymbiotic theory).</p>	<p>Remember, Understand, Apply</p>
	<p>Unit5: Cell wall and plasma membrane Chemistry, structure and function of Plant cell wall. Overview of membrane function; fluid mosaic model; Chemical composition of membranes; Membrane transport – Passive, active and facilitated transport, endocytosis and exocytosis.</p>	<p>Remember, Understand</p>
	<p>Unit6: Cell organelles Nucleus: Structure-nuclear envelope, nuclear pore complex, nuclear lamina, molecular organization of chromatin; nucleolus. Cytoskeleton: Role and structure of microtubules, microfilaments and intermediary filament. Chloroplast, mitochondria and peroxisomes: Structural organization; Function; Semiautonomous nature of mitochondria and chloroplast. Endomembrane system: Endoplasmic Reticulum – Structure, targeting and insertion of proteins in the ER, protein folding, processing; Smooth ER and lipid synthesis, export of proteins and lipids; Golgi Apparatus – organization, protein glycosylation, protein sorting and export from Golgi Apparatus; Lysosomes</p>	<p>Remember, Understand</p>
	<p>Unit7: Cell division Phases of eukaryotic cell cycle,</p>	<p>Remember, Understand, Evaluate</p>

	mitosis and meiosis; Regulation of cell cycle-checkpoints, role of protein kinases.	
<ol style="list-style-type: none"> Gain practical knowledge to detect the presence of different biomolecules and differentiate among them through various qualitative tests based on their color variation. Understand the different staining procedure of various cells and know the usage of different stains. Understand the types of cells and their structure. Knowledge on the physiological phenomenon of cells in different osmotic conditions Practical observation of different stages of cell division and gain a clear concept on the cell cycle and its various steps. 	<p>Practical</p> <ol style="list-style-type: none"> Qualitative tests for carbohydrates, reducing sugars, non-reducing sugars, lipids and proteins. Study of plant cell structure with the help of epidermal peel mount of Onion/<i>Rhoeo/Crinum</i>. Demonstration of the phenomenon of protoplasmic streaming in <i>Hydrilla</i> and <i>Vallisnaria</i> leaf. Counting the cells per unit volume with the help of haemocytometer. (Yeast/pollen grains). Cytochemical staining of : DNA-Feulgen and cell wall in the epidermal peel of onion using Periodic Schiff's (PAS) staining technique. Study the phenomenon of plasmolysis and deplasmolysis. Study different stages of mitosis and meiosis (Demonstration). 	Understand, Evaluate, Apply

2nd Semester (Honours)

Paper Name: Mycology and Phytopathology

Paper Code: BOT-HC-2016

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
<ol style="list-style-type: none"> Identify true fungi and demonstrate the principles and application of plant pathology in the control of plant disease. Demonstrate skills in laboratory, field and glasshouse work related to mycology and plant pathology. 	<p>Unit 1: Introduction to Fungi General characteristics; Status of Fungi in living system; Thallus organization, modification of hyphae; Cell and Cell wall composition; Nutrition, flagella, septum, homothallism and heterothallism, cell division. History of Classification (Hidetta <i>et al.</i> 2007); Classification of Fungi (Ainsworth, 1973, Webster 1977) up to sub-division with diagnostic characters and examples. General characteristics of Myxomycota, Oomycota, Zygomycota, Ascomycota, Basidiomycota and Deuteromycota.</p>	Remember, Understand, Apply
<ol style="list-style-type: none"> Develop an understanding of microbes, fungi and lichens 	<p>Unit 2: Mastigomycotina (Chytridiomycetes and Oomycetes) Characteristic features; Reproduction; Life cycle with reference to <i>Synchytrium</i>, <i>Phytophthora</i> and <i>Albugo</i>.</p>	Remember, Understand, Apply

and appreciate their adaptive strategies.	Unit 3: Zygomycotina Characteristic features; Reproduction; Life cycle with reference to <i>Rhizopus</i> .	Remember, Understand, Apply
4. Identify the common plant diseases according to geographical locations and device control measures	Unit4: Ascomycotina General characteristics (asexual and sexual fruiting bodies); Life cycle, Heterokaryosis and parasexuality; Life cycle and classification with reference to <i>Saccharomyces</i> , <i>Aspergillus</i> , <i>Penicillium</i> , <i>Neurospora</i> and <i>Peziza</i> .	Remember, Understand, Apply
	Unit5: Basidiomycotina General characteristics; Life cycle and Classification with reference to black stem rust on wheat <i>Puccinia</i> (Physiological Specialization), loose and covered smut (symptoms only), <i>Agaricus</i> ; Bioluminescence, Fairy Rings and Mushroom Cultivation.	Remember, Understand, Apply
	Unit6: Deuteromycotina (Fungi Imperfecti) General characteristics; Thallus organization; reproduction; classification with special reference to <i>Alternaria</i> and <i>Colletotrichum</i> .	Remember, Understand, Apply
	Unit7: Allied Fungi- Myxomycota General characteristics; Status of Slime molds, Classification; Occurrence; Types of plasmodia; Types of fruiting bodies.	Remember, Understand, Apply
	Unit 8: Symbiotic associations Lichen – Occurrence; General characteristics; Range of thallus organization; Internal structure and nature of associations of algal and fungal partners; Reproduction. Mycorrhiza- Ectomycorrhiza, Endomycorrhiza and their significance.	Remember, Understand, Apply
	Unit 9: Applied Mycology Role of fungi in biotechnology; food industry (Flavour & texture, Fermentation, Baking, Organic acids, Enzymes, Mycoproteins); Pharmaceutical (Secondary metabolites); Agriculture (Biofertilizers); Mycotoxins; Biological control (Mycofungicides, Mycoherbicides, Mycoinsecticides, Myconematicides); Medical mycology.	Remember, Understand, Apply
	Unit 10: Phytopathology Terms and concepts; General symptoms; Geographical distribution of diseases; Etiology; Symptomology; Host-Pathogen relationships; Disease cycle and environmental relation;	Remember, Understand

	<p>prevention and control of plant diseases, and role of quarantine. Bacterial diseases – Citrus canker and angular leaf spot of cotton. Viral diseases – Tobacco Mosaic viruses, vein clearing. Fungal diseases – Early blight of potato, Black stem rust of wheat, White rust of crucifers.</p>	
<ol style="list-style-type: none"> 1. Practically understanding the various morphological and reproductive structures of various fungal groups. 2. Hands on practice of collection, preservation and isolation of fungi. 3. Practical knowledge on the theory studied in regarding various plant pathogens and their symptoms in different plants. 4. Field study knowledge on collection and identification of various plant pathogens in different plants. 5. Understand the symbiotic relationship between microbes i.e. Lichen and its importance in the ecological maintenance. 	<p>Practical</p> <ol style="list-style-type: none"> 1. <i>Rhizopus</i>: study of asexual stage from temporary mounts and sexual structures through permanent slides. 2. <i>Aspergillus</i> and <i>Penicillium</i>: study of asexual stage from temporary mounts. Study of Sexual stage from permanent slides/photographs. 3. <i>Peziza</i>: sectioning through ascocarp. 4. <i>Alternaria</i>: Specimens/photographs and temporary mounts. 5. <i>Puccinia</i>: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves; sections/ mounts of spores on wheat and permanent slides of both the hosts. 6. <i>Agaricus</i>: Specimens of button stage and full grown mushroom; sectioning of gills of <i>Agaricus</i>, fairy rings and bioluminescent mushrooms to be shown. 7. Study of phaneroplasmodium from actual specimens and /or photograph. Study of <i>Stemonitis</i> sporangia. 8. <i>Albugo</i>: Study of symptoms of plants infected with <i>Albugo</i>; asexual phase study through section/ temporary mounts and sexual structures through permanent slides. 9. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose) on different substrates. Study of thallus and reproductive structures (soredia and apothecium) through permanent slides. Mycorrhizae: ectomycorrhiza and endomycorrhiza (Photographs) 10. Phytopathology: Bottle specimens, Herbarium specimens should be made of bacterial diseases, Viral diseases, Fungal diseases (Locally available). 11. Applied mycology: Photographs of Mycorrhizae, Fungi used in 	<p style="text-align: center;">Understand, Evaluate, Apply</p>

	<p>medicine (Cylindriocarpon, Tolyposporium, Ganoderma, Cephalosporium – any one), fungi used as biological control agents (fungi used in control of seedling, soil borne, post-harvest diseases and in control of nematodes, insects and weeds – any one), photographs/mounts of spores of fungi causing human infections (Aspergillus, Candida, Cryptococcus, Histoplasma, Microsporium, Trichophyton – any one).</p>	
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Paper Name: Archegoniate

Paper Code: BOT-HC-2026

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
<p>1. Demonstrate an understanding of archegoniate, Bryophytes, Pteridophytes and Gymnosperms</p> <p>2. Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms</p> <p>3. Understanding of plant evolution and their transition to land habitat.</p> <p>4. Demonstrate proficiency in the experimental techniques and methods of appropriate analysis of Bryophytes, Pteridophytes, and Gymnosperms</p>	<p>Unit 1: Introduction Unifying features of archegoniate; Transition to land habit; Alternation of generations.</p>	Remember, Understand,
	<p>Unit 2: Bryophytes General characteristics; Adaptations to land habit; Classification; Range of thallus organization.</p>	Remember, Understand, Apply
	<p>Unit 3: Type Studies- Bryophytes Classification, morphology, anatomy and reproduction of <i>Riccia</i>, <i>Marchantia</i>, <i>Anthoceros</i>, <i>Sphagnum</i> and <i>Polytrichum</i>; Reproduction and evolutionary trends in <i>Riccia</i>, <i>Marchantia</i>, <i>Anthoceros</i>, <i>Sphagnum</i> and <i>Polytrichum</i>. Ecological and economic importance of bryophytes.</p>	Remember, Understand, Apply
	<p>Unit4: Pteridophytes General characteristics; Classification; Early land plants (<i>Cooksonia</i> and <i>Rhynia</i>).</p>	Remember, Understand, Apply
	<p>Unit5: Type Studies- Pteridophytes Classification, morphology, anatomy and reproduction of <i>Psilotum</i>, <i>Lycopodium</i>, <i>Selaginella</i>, <i>Equisetum</i>, <i>Pteris</i> and <i>Marsilea</i>. Apogamy and apospory, heterospory and seed habit, telome theory, stelar evolution; Ecological and economic importance.</p>	Remember, Understand, Apply
	<p>Unit6: Gymnosperms General characteristics, classification (up to family), morphology, anatomy and reproduction of <i>Cycas</i>, <i>Pinus</i>,</p>	Remember, Understand, Apply

	<i>Ginkgo</i> and <i>Gnetum</i> ; Ecological and economic importance.	
<p>1. Develop critical understanding by visual analysis of morphology, anatomy and reproductive structure of Bryophytes, Pteridophytes and Gymnosperms.</p> <p>2. Demonstrate proficiency in the experimental techniques and methods of appropriate analysis of Bryophytes, Pteridophytes, and Gymnosperms.</p>	<p>Practicals</p> <p>1. Riccia – Morphology of thallus.</p> <p>2. Marchantia- Morphology of thallus and reproductive parts; vertical and transverse section of thallus; vertical section of Gemma cup, Antheridiophore and Archegoniophore. Sphagnum- Morphology of plant, whole mount of leaf.</p> <p>3. Sphagnum- Morphology of plant; whole mount of leaf.</p> <p>4. Polytrichum- Morphology of vegetative and reproductive parts; Transverse Section of rhizome, whole mount of leaf; Longitudinal Section through antheridial and archegonial heads; L.S. of capsule.</p> <p>5. Lycopodium- Morphology of plant, whole mount of leaf; transverse section of stem; Longitudinal Section of strobilus; morphology of sporophyll.</p> <p>6. Selaginella- Morphology of plant, whole mount of leaf with ligule, transverse section of stem and rhizophore; longitudinal section of strobilus; morphology of sporophyll.</p> <p>7. Equisetum- Morphology of plant, transverse section of internode, longitudinal and transverse section of strobilus, whole mount of sporangiophore and spore.</p> <p>8. Pteris- Morphology of plant, transverse section of rachis, vertical section of leaflets through sorus; whole mount of prothallus with sex (permanent slide).</p> <p>9. Marsilea- Morphology of plant, transverse section of rhizome and petiole; vertical transverse and vertical longitudinal section of sporocarp.</p> <p>10. Cycas- Morphology of plant; morphology and transverse section of coralloid roots; transverse section of leaflets; Longitudinal Section of male and female cone; morphology of microsporophyll and megasporophyll; Longitudinal section of ovule (permanent slide).</p>	<p>Understand, Apply</p>

	<p>11. Pinus- Morphology of plant; transverse section of Needle; longitudinal section of male cone and female cone; whole mount of Microspores.</p> <p>12. Ginkgo- Morphology of plants and reproductive structures (only photographs).</p> <p>13. Gnetum- Morphology of plant; Morphology of male and female strobilus; vertical section of ovule (permanent slide).</p>	
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3rd Semester (Honours)

Paper Name: Morphology and Anatomy of Angiosperms

Paper Code: BOT-HC-3016

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
1. Develop an understanding of concepts and fundamentals of plant anatomy	Unit 1: Morphology Morphology of inflorescence, stamens and carpel, fruit; Telome theory, phyllode theory; Role of morphology in plant classification.	Remember, Understand
2. Examine the internal anatomy of plant systems and organs	Unit 2: Introduction and scope of plant Anatomy Application in systematics, forensics and pharmacognosy.	Remember, Understand, Apply
3. Develop critical understanding on the evolution of concept of organization of shoot and root apex.	Unit 3: Structure and Development of Plant Body Internal organization of plant body: The three tissue systems, types of cells and tissues. Development of plant body: Polarity, Cytodifferentiation and organogenesis during embryogenic development.	Remember, Understand, Apply
4. Analyze the composition of different parts of plants and their relationships	Unit4: Tissues Classification of tissues; Simple and complex tissues (no phylogeny); cytodifferentiation of tracheary elements and sieve elements; Pits and plasmodesmata; Wall ingrowths and transfer cells, adcrustation and incrustation, Ergastic substances. Hydathodes, cavities, lithocysts and laticifers.	Remember, Understand, Apply
5. Evaluate the adaptive and protective systems of plants	Unit5: Apical meristems Evolution of concept of organization of shoot apex (Apical cell theory, Histogen theory, Tunica Corpus theory, continuing meristematic residue,	Remember, Understand, Apply

	<p>cytological zonation); Types of vascular bundles; Structure of dicot and monocot stem. Origin, development, arrangement and diversity in size and shape of leaves; Structure of dicot and monocot leaf, Kranz anatomy. Organization of root apex (Apical cell theory, Histogen theory, Korper-Kappe theory); Quiescent centre; Root cap; Structure of dicot and monocot root; Endodermis, exodermis and origin of lateral root.</p>	
	<p>Unit6: VascularCambium and Wood Structure, function and seasonal activity of cambium; Secondary growth in root and stem. Axially and radially oriented elements; Types of rays and axial parenchyma; Cyclic aspects and reaction wood; Sapwood and heartwood; Ring and diffuse porous wood; Early and late wood, tyloses; Dendrochronology. Development and composition of periderm, rhytidome and lenticels.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit7: Adaptive and Protective Systems Epidermal tissue system, cuticle, epicuticular waxes, trichomes (uni-and multicellular, glandular and nonglandular, two examples of each), stomata (classification); Adcrustation and incrustation; Anatomical adaptations of xerophytes and hydrophytes.</p>	<p>Remember, Understand, Apply</p>
<ol style="list-style-type: none"> 1. Knowing various angiosperms in real life and exploring their various features. 2. Understanding the phyllotaxy, aestivation and floral arrangement in various plant species. 3. Develop practical knowledge of various cell structures and their arrangements present in plant systems 4. Practically exploring various staining techniques available for plant cells. 	<p>Practical</p> <ol style="list-style-type: none"> 1. Study of special types of inflorescence – Cyathium, Hypanthodium, Verticillaster, Hypanthium. 2. Study of special types of fruits- Superior fruits (<i>Dillenia</i>); Aggregate fruits (Custard apple, <i>Michelia</i>, Periwinkles, <i>Polyalthia</i>); Multiple fruits (Pine apple, Jack fruits). 3. Study of anatomical details through permanent slides/temporary stain mounts / macerations / museum specimens with the help of suitable examples. 4. Apical meristem of root, shoot and vascular cambium. 5. Epidermal system: cell types, stomata types; trichomes: non-glandular and glandular. 	<p>Understand, Evaluate, Apply</p>

	<p>6. Root: monocot, dicot, secondary growth.</p> <p>7. Stem: monocot, dicot - primary and secondary growth; periderm; lenticels.</p> <p>8. Leaf: isobilateral, dorsiventral, C4 leaves (Kranz anatomy).</p> <p>9. Adaptive Anatomy: xerophytes, hydrophytes.</p> <p>10. Secretory tissues: cavities, lithocysts and laticifers.</p>	
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Paper Name: Economic Botany

Paper Code: BOT-HC-3026

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
<p>1. Understand core concepts of Economic Botany and relate with environment, populations, communities, and ecosystems</p> <p>2. Develop critical understanding on the evolution of concept of organization of apex new crops/varieties, importance of germplasm diversity, issues related to access and</p> <p>3. Ownership</p> <p>4. Develop a basic knowledge of taxonomic diversity and important families of useful plants</p> <p>5. Increase the awareness and appreciation of plants & plant products encountered in everyday life</p> <p>6. Appreciate the diversity of plants and the plant products in human use.</p>	<p>Unit 1: Origin of Cultivated Plants Centres of Origin, their importance with reference to Vavilov's work. Introductions, domestication and loss of crop genetic diversity; evolution of new crops/varieties, importance of germplasm diversity.</p>	Remember, Understand
	<p>Unit 2: Cereals Wheat and Rice (origin, morphology, processing & uses); Brief account of millets.</p>	Remember, Understand, Apply
	<p>Unit 3: Legumes Origin, morphology and uses of Chick pea, Pigeon pea and fodder legumes. Importance to man and ecosystem.</p>	Remember, Understand, Apply
	<p>Unit 4: Sources of sugars and starches Morphology and processing of sugarcane, products and by-products of sugarcane industry. Potato – morphology, propagation & uses.</p>	Remember, Understand
	<p>Unit 5: Spices Listing of important spices, their family and part used. Economic importance with special reference to fennel, saffron, clove and black pepper.</p>	Remember, Understand, Apply
	<p>Unit 6: Beverages Tea, Coffee (morphology, processing & uses).</p>	Remember, Understand, Apply
	<p>Unit 7: Sources of oils and fats General description, classification, extraction, their uses and health implications groundnut, coconut, linseed, soybean, mustard and coconut (Botanical name, family & uses). Essential Oils: General account,</p>	Remember, Understand, Apply

	extraction methods, comparison with fatty oils & their uses.	
	Unit 8: Natural Rubber Para-rubber: tapping, processing and uses.	Remember, Understand, Apply
	Unit 9: Drug-yielding plants Therapeutic and habit-forming drugs with special reference to Cinchona, Digitalis, Papaver and Cannabis; Tobacco (Morphology, processing, uses and health hazards).	Remember, Understand, Apply
	Unit 10: Timber plants General account with special reference to teak and pine.	Remember, Understand, Apply
	Unit 11: Fibers Classification based on the origin of fibers; Cotton, Coir and Jute (morphology, extraction and uses).	Remember, Understand, Apply
<ol style="list-style-type: none"> 1. Acquiring of the real-life knowledge of economically important plants of their locality. 2. Practically study the economically important parts of plants. 3. Students will understand the various medicinally important plants and their parts. 	<p>Practicals</p> <ol style="list-style-type: none"> 1. Cereals: Study of useful parts: Rice/Bean (habit sketch, study of paddy and grain, starch grain, micro-chemical test). 2. Legumes: Bean, Groundnut, (habit, fruit, seed structure, micro-chemical tests). 3. Beverages: Tea (plant specimen, tea leaves), Coffee (plant specimen, beans). 4. Sources of oils and fats: Coconut and Mustard. 5. Rubber: Specimen, photograph/model of tapping, samples of rubber products. 6. Test for alkaloids: Neem, <i>Vinca rosea</i>. 7. Fiber-yielding plants: Cotton (specimen, whole mount of seed to show lint and fuzz; whole mount of fiber and test for cellulose), Jute (specimen, transverse section of stem, test for lignin). 	Understand, Evaluate, Apply

Paper Name: Genetics

Paper Code: BOT-HC-3036

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
1. Have conceptual understanding of laws of inheritance, genetic basis of loci and alleles and their linkage.	Unit 1: Mendelian genetics and its extension Mendelism: History; Principles of inheritance; Chromosome theory of inheritance; Autosomes and sex chromosomes; Probability and pedigree	Remember, Understand, Evaluate

<p>2. Comprehend the effect of chromosomal abnormalities in numerical as well as structural changes leading to genetic disorders.</p>	<p>analysis; Incomplete dominance and codominance; Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Recessive and Dominant traits, Penetrance and Expressivity, Numericals; Polygenic inheritance.</p>	
<p>3. Develop critical understanding of chemical basis of genes and their interactions at population and evolutionary levels.</p>	<p>Unit 2: Extrachromosomal Inheritance Chloroplast inheritance: Variegation in Four o'clock plant; Mitochondrial in yeast; Maternal effects-shell coiling in snail; Kappa particles in Paramecium.</p>	<p>Remember, Understand</p>
<p>4. Analyze the effect of mutations on gene functions and dosage.</p>	<p>Unit 3: Linkage, crossing over and chromosome mapping Linkage and crossing over-Cytological basis of crossing over; Recombination frequency, two factor and three factor crosses; Interference and coincidence; Numericals based on gene mapping; Sex Linkage.</p>	<p>Remember, Understand</p>
<p>5. Examine the structure, function and replication of DNA.</p>	<p>Unit4: Variation in chromosome number and structure Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy.</p>	<p>Remember, Understand</p>
	<p>Unit5: Gene mutations Types of mutations; Molecular basis of Mutations; Mutagens – physical and chemical (Base analogs, deaminating, alkylating and intercalating agents); Detection of mutations: CIB method. Role of Transposons in mutation. DNA repair mechanisms.</p>	<p>Remember, Understand</p>
	<p>Unit6: Fine structure of gene Classical vs molecular concepts of gene; Ciston, Racon, Muton, rII locus</p>	<p>Remember, Understand, Apply</p>
	<p>Unit7: Population and Evolutionary Genetics Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection, mutation, genetic drift. Genetic variation and Speciation.</p>	<p>Remember, Understand, Apply</p>
<p>1. Practical knowledge on various stages of cell division 2. Practical knowledge on the chromosomal study of organisms using karyotyping. 3. Gain knowledge on the interactions of gene controlling different quantitative traits</p>	<p>Practical 1. Meiosis through temporary squash preparation. 2. Mendel's laws through seed ratios. 3. Chromosome mapping using point test cross data. 4. Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4). 5. Permanent Slides showing Translocation Ring, Photograph showing Laggards and Inversion</p>	<p>Understand, Analysis, Apply</p>

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Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
1. Environmental awareness and Carbon Footprint reduction 2. Self-employment through the acquired knowledge of garden and nursery development. 3. Employment generation through entrepreneurship skills. 4. Knowledge on Compost making	Unit 1: General account about the microbes used as biofertilizer – Rhizobium – isolation, identification, mass multiplication, carrier-based inoculants, Actinorrhizal symbiosis.	Remember, Understand, Apply
	Unit 2: Azospirillum: isolation and mass multiplication – carrier-based inoculant, associative effect of different microorganisms. Azotobacter: classification, characteristics – crop response to Azotobacter inoculum, maintenance and mass multiplication.	Remember, Understand, Apply
	Unit 3: Cyanobacteria (blue green algae), Azolla and Anabaena azollae association, nitrogen fixation, factors affecting growth, blue green algae and Azolla in rice cultivation.	Remember, Understand, Apply
	Unit4: Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield – colonization of VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.	Remember, Understand, Apply
	Unit5: Organic farming – Green manuring and organic fertilizers, Recycling of bio-degradable municipal, agricultural and Industrial wastes – biocompost making methods, types and method of vermicomposting – field Application.	Remember, Understand, Analyze, Apply

Paper Name: Biofertilizers-I (SEC I)

Paper code: BOT-SE-3014

4th Semester (Honours)

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
<p>1. Understand the structures and chemical properties of DNA and RNA through various historic experiments.</p> <p>2. Differentiate the main types of prokaryotes through their grouping abilities and their characteristic</p> <p>3. Evaluate the experiments establishing central dogma and genetic code.</p> <p>4. Gain an understanding of various steps in transcription, protein synthesis and protein modification.</p>	<p>Unit 1: Nucleic acids: Carriers of genetic information Historical perspective; DNA as the carrier of genetic information (Griffith's, Hershey & Chase, Avery, McLeod & McCarty, Fraenkel-Conrat's experiment).</p>	<p>Remember, Understand</p>
	<p>Unit 2: The Structures of DNA and RNA / Genetic Material DNA Structure: Miescher to Watson and Crick- historic perspective, DNA structure, Salient features of double helix, denaturation and renaturation, cot curves; Organization of DNA- Prokaryotes, Viruses, Eukaryotes. Organelle DNA -- mitochondria and chloroplast DNA. The Nucleosome Chromatin structure- Euchromatin, Heterochromatin- Constitutive and Facultative heterochromatin.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit 3: The replication of DNA Chemistry of DNA synthesis (Kornberg's discovery); General principles – bidirectional, semi-conservative and semi discontinuous replication, RNA priming; Various models of DNA replication, including rolling circle, θ (theta) mode of replication, replication of linear ds-DNA; Enzymes involved in DNA replication.</p>	<p>Remember, Understand</p>
	<p>Unit4: Central dogma and genetic code Key experiments establishing-The Central Dogma (Adaptor hypothesis and discovery of mRNA template), Genetic code (deciphering & salient features).</p>	<p>Remember, Understand</p>
	<p>Unit5: Transcription Transcription in prokaryotes and eukaryotes. Principles of transcriptional regulation; Prokaryotes: Regulation of lactose metabolism and tryptophan synthesis in <i>E. coli</i>. Eukaryotes: transcription factors, heat shock proteins, steroids and peptide hormones; Gene silencing.</p>	<p>Remember, Understand</p>

	<p>Unit6: Processing and modification of RNA Split genes-concept of introns and exons, removal of introns, spliceosome machinery, splicing pathways, group I and group II intron splicing, alternative splicing eukaryotic mRNA processing (5' cap, 3' poly A tail); Ribozymes; RNA editing and mRNA transport.</p>	Remember, Understand
	<p>Unit7: Translation Ribosome structure and assembly, mRNA; Charging of tRNA, aminoacyl tRNA synthetases; Various steps in protein synthesis, proteins involved in initiation, elongation and termination of polypeptides; Fidelity of translation; Inhibitors of protein synthesis; Post-translational modifications of proteins.</p>	Remember, Understand
<ol style="list-style-type: none"> 1. Various molecular techniques of isolation and quantification of plant DNA. 2. Understanding various molecular events related to the DNA replication and enzymes responsible for the event. 3. Acquiring knowledge on molecular structure of RNA polymerase present in different types of cells 	<p>Practical</p> <ol style="list-style-type: none"> 1. DNA isolation from any plant material. 2. DNA estimation by diphenylamine reagent/UV Spectrophotometry (Demonstration). 3. Study of DNA replication mechanisms through photographs (Rolling circle, Theta replication and semi-discontinuous replication). 4. Study of structures of prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photographs. 5. Study of the following through photographs: Assembly of Spliceosome machinery; Splicing mechanism in group I & group II introns; Ribozyme and Alternative splicing. 	Understand, Analysis, Apply

Paper Name: Plant Ecology and Phytogeography

Paper Code: BOT-HC-4026

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
<ol style="list-style-type: none"> 1. Understand core concepts of biotic and abiotic 2. Classify the soils on the basis of physical, chemical and 	<p>Unit 1: Introduction Basic concepts; Levels of organization. Inter-relationships between the living world and the environment, the components and dynamism, homeostasis.</p>	Remember, Understand, Evaluate
	<p>Unit 2: Soil</p>	Remember,

<p>biological components</p> <p>3. Analysis the phytogeography or phytogeographical division of India</p> <p>4. Evaluate energy sources of ecological system</p> <p>5. Assess the adaptation of plants in relation to light, temperature, water, wind and fire.</p> <p>6. Conduct experiments using skills appropriate to subdivisions.</p>	<p>Importance; Origin; Formation; Composition; Physical; Chemical and Biological components; Soil profile; Role of climate in soil development.</p> <p>Unit 3: Water Importance: States of water in the environment; Atmospheric moisture; Precipitation types (rain, fog, snow, hail, dew); Hydrological Cycle; Water in soil; Water table.</p> <p>Unit4: Adoption of plants to various environmental factors Light, temperature, wind and fire</p> <p>Unit5: Biotic interaction Trophic organization, basic source of energy, autotrophy, heterotrophy; symbiosis, commensalism, parasitism; food chains and webs; ecological pyramids; biomass, standing crop.</p> <p>Unit6: Population ecology Population characteristics, Growth curve, population regulation, r and k selection. Ecological speciation: Allopatric/ Sympatric and Parapatric speciation.</p> <p>Unit7: Plant communities Concept of ecological amplitude; Habitat and niche; Characters: analytical and synthetic; Ecotone and edge effect; Dynamics: succession – processes, types; climax concepts.</p> <p>Unit 8: Ecosystem Structure; Processes; Trophic organisation; Food chains and Food webs; Ecological pyramids.</p> <p>Unit 9: Functional aspects of ecosystem Principles and models of energy flow; Production and productivity; Ecological efficiencies; Biogeochemical cycles; Cycling of Carbon, Nitrogen and Phosphorus.</p> <p>Unit 10: Phytogeography Principles; Continental drift; Theory of tolerance; Endemism; Brief description of major terrestrial biomes (one each from tropical, temperate & tundra); Phytogeographical division of India; Vegetation types of NE India with special reference to Assam.</p>	<p>Understand, Apply</p> <p>Remember, Understand, Apply</p> <p>Remember, Understand, Evaluate</p> <p>Remember, Understand, Evaluate</p> <p>Remember, Understand, Apply</p> <p>Remember, Understand, Evaluate</p> <p>Remember, Understand, Evaluate</p> <p>Remember, Understand, Evaluate</p> <p>Remember, Understand, Apply</p>
<p>1. Practical knowledge on how to measure the abundance,</p>	<p>Practical 1. Study of instruments used to measure microclimatic variables: Soil</p>	<p>Understand, Analysis, Apply</p>

<p>frequency of a species, population or community using quadrat method.</p> <p>2. Knowledge on the biological oxygen content of polluted and non-polluted water; thereby understand the demand of oxygen in a particular ecosystem for the organisms present.</p> <p>3. To do soil sample test for checking nutrient availability and deficiency.</p>	<p>thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter.</p> <p>2. Determination of pH of various soil and water samples using pH meter.</p> <p>3. Analysis for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency from two soil samples by rapid field tests.</p> <p>4. Determination of organic matter of different soil samples by Walkley & Black rapid titration method.</p> <p>5. Determination of dissolved oxygen of water samples from polluted and unpolluted sources.</p> <p>6. (a). Study of morphological adaptations of hydrophytes and xerophytes (four each).</p> <p>(b). Study of biotic interactions of the following: Stem parasite (<i>Cuscuta</i>), Root parasite (<i>Orobancha</i>) Epiphytes, Predation (Insectivorous plants).</p> <p>7. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus, by species area curve method (species to be listed).</p> <p>8. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law.</p> <p>9. Quantitative analysis of herbaceous vegetation for density and abundance in the college campus.</p> <p>10. Field visit to familiarise students with ecology of different sites.</p>	
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Paper Name: Plant Systematics
Paper Code: BOT-HC-4036

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
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<p>1. Classify Plant systematics and recognize the importance of herbarium and Virtual herbarium</p> <p>2. Evaluate the Important herbaria and botanical gardens</p> <p>3. Interpret the rules of ICN in botanical nomenclature</p> <p>4. Assess terms and concepts related to Phylogenetic Systematics</p> <p>5. Generalize the characters of the families according to Bentham and Hooker's system of classification</p>	<p>Unit 1: Significance of Plant Systematics Introduction to systematics; Plant identification, Classification, Nomenclature. Evidences from palynology, cytology, phytochemistry and molecular data. Functions and importance of Herbarium; Important herbaria and botanical gardens of the world and India; Virtual herbarium; E-flora; Concept of taxa (family, genus, species); Categories and taxonomic hierarchy.</p>	<p>Remember, Understand, Evaluate, Apply</p>
	<p>Unit 2: Botanical Nomenclature Principles and rules (ICN); Ranks and names; Typification, author citation, Effective and valid publication, rejection of names, principle of priority and its limitations; Names of hybrids.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit 3: Systems of Classification Major contributions of Theophrastus, Bauhin, Tournefort, Linnaeus, Adanson, de Candolle, Bessey, Hutchinson, Takhtajan and Cronquist; Classification systems of Bentham and Hooker (upto series) and Engler and Prantl (upto series); Brief reference of Angiosperm Phylogeny Group (APG) classification.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit4: Numerical taxonomy and cladistics Characters; Variations; OTUs, character weighting and coding; Cluster analysis; Phenograms, cladograms (definitions and differences).</p>	<p>Remember, Understand, Apply</p>
	<p>Unit5: Phylogeny of Angiosperms Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence, monophyly, Paraphyly, polyphyly and clades). Origin and evolution of angiosperms; Co-evolution of angiosperms and animals; Methods of illustrating evolutionary relationship (phylogenetic tree, cladogram).</p>	<p>Remember, Understand</p>
	<p>Unit6: Angiospermic Families Detail study of the following families: Magnoliaceae, Fabaceae, Asteraceae, Solanaceae, Acanthaceae, Lamiaceae, Euphorbiaceae, Orchidaceae, Musaceae, Zingiberaceae, Poaceae.</p>	<p>Remember, Understand</p>
<p>1. Understand in details with</p>	<p>Practical</p>	<p>Understand,</p>

<p>practical knowledge of the morphology of different types of inflorescences.</p> <p>2. Practical knowledge on taxonomy through field study and methods to identify the plant species and further techniques of herbarium preparation.</p> <p>3. Practical understanding of distribution and habitat of angiosperms by field visit</p>	<p>1. Study of vegetative and floral characters of locally available angiospermic plants belonging to the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification): Fabaceae, Solanaceae, Acanthaceae, Lamiaceae, Euphorbiaceae, Musaceae, Orchidaceae.</p> <p>2. Field visit to familiarise students with vegetation of an area and identification of plant species / Visit to Academic or Research Institutions.</p> <p>3. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book).</p>	<p>Analysis, Apply</p>
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Paper Name: Nursery and gardening

Paper Code: BOT-SE-4014

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
<p>1. Practical knowledge on different gardening and nursery techniques.</p> <p>2. Self-employment through the acquired knowledge of garden and nursery development.</p> <p>3. Employment generation through entrepreneurship skills.</p>	<p>Unit 1: Nursery: definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit 2: Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy - Seed storage: Seed banks, factors affecting seed viability, genetic erosion – Seed production technology - seed testing and certification.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit 3: Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants – green house - mist chamber, shed root, shade house and glass house.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit 4: Gardening: definition, objectives and scope - different types of gardening - landscape and home gardening - parks and its components -</p>	<p>Remember, Understand, Apply</p>

	plant materials and design - computer applications in landscaping - Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting.	
	Unit 5: Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures.	Remember, Understand, Analyse, Apply

5th Semester (Honours)

Paper Name: Reproductive Biology of Angiosperms

Paper Code: BOT-HC-5016

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
1. Recall the history of reproductive biology of angiosperms & recognize the importance of genetic and molecular aspects of flower development	Unit 1: Introduction History (contributions of G.B. Amici, W. Hofmeister, E. Strasburger, S.G. Nawaschin, P. Maheshwari, B.M. Johri, W.A. Jensen, J. Heslop-Harrison) and scope.	Remember, Understand
2. Understand structure and functions of anther wall and pollen wall	Unit 2: Reproductive development Induction of flowering; flower as a modified determinate shoot. Flower development: genetic and molecular aspects.	Remember, Understand
3. Evaluate the special structures of Ovule	Unit 3: Anther and pollen biology Anther wall: Structure and functions, microsporogenesis, callose deposition and its significance.	Remember, Understand, Apply
4. Solve Self-incompatibility in Pollination and fertilization & relate between Embryo, Endosperm and Seed	Microgametogenesis; Pollen wall structure, MGU (male germ unit) structure, NPC system; Palynology and scope (a brief account); Pollen wall proteins; Pollen viability, storage and germination; Abnormal features: Pseudomonads, polyads, massulae, pollinia.	
5. Comprehend the causes of Polyembryony and apomixes with its classification	Unit 4: Ovule Structure; Types; Special structures—endothelium, obturator, aril, caruncle and hypostase; Female gametophyte—megasporeogenesis (monosporic, bisporic and tetrasporic) and megagametogenesis (details of	Remember, Understand, Apply

	<i>Polygonum</i> type); Organization and ultrastructure of mature embryo sac.	
	Unit5: Pollination and fertilization Pollination types and significance; adaptations; structure of stigma and style; path of pollen tube in pistil; double fertilization.	Remember, Understand
	Unit6: Self incompatibility Basic concepts (interspecific, intraspecific, homomorphic, heteromorphic, GSI and SSD); Methods to overcome self- incompatibility: mixed pollination, bud pollination, stub pollination; Intra-ovarian and <i>in vitro</i> pollination; Modification of stigma surface, parasexual hybridization; Cybrids, <i>in vitro</i> fertilization.	Remember, Understand, Evaluate
	Unit 7: Embryo, Endosperm and Seed Structure and types; General pattern of development of dicot and monocot embryo and endosperm; Suspensor: structure and functions; Embryo-endosperm relationship; Nutrition of embryo; Unusual features; Embryo development in <i>Paeonia</i> . Seed structure, importance and dispersal mechanisms.	Remember, Understand
	Unit 8: Polyembryony and Apomixis Introduction; Classification; Causes and applications.	Remember, Understand
<ol style="list-style-type: none"> 1. Practical observation of the morphology and types of pollen grains of different plant species under palynological studies. 2. Embryological understandings of the different types of ovules, anthers and hands on training of the different techniques to study the pollen grains and further differentiate among them 3. Practical knowledge on the various developmental stages of male and female reproductive organs. 	<p>Practical</p> <ol style="list-style-type: none"> 1. Anther: Wall and its ontogeny; Tapetum (amoeboid and glandular); MMC, spore tetrads, uninucleate, bicelled and dehisced anther stages through slides/micrographs, male germ unit (MGU) through photographs and schematic representation. 2. Pollen grains: Fresh and acetolyzed showing ornamentation and aperture, psuedomonads, polyads, pollinia (slides/photographs, fresh material), ultrastructure of pollen wall(micrograph); Pollen viability: Tetrazolium test.germination: Calculation of percentage germination in different media using hanging drop method. 3. Ovule: Types-anatropous, 	Understand, Analyse, Apply

	<p>orthotropous, amphitropous/campylotropous, circinotropous, unitegmic, bitegmic; Tenuinucellate and crassinucellate; Special structures: Endothelium, obturator, hypostase, caruncle and aril (permanent slides/specimens/photographs).</p> <p>4. Female gametophyte through permanent slides/ photographs: Types, ultrastructure of mature egg apparatus.</p> <p>5. Intra-ovarian pollination; Test tube pollination through photographs.</p> <p>6. Endosperm: Dissections of developing seeds for endosperm with free-nuclear haustoria.</p> <p>7. Embryogenesis: Study of development of dicot embryo through permanent slides; dissection of developing seeds for embryos at various developmental stages.</p>	
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Paper Name: Plant Physiology

Paper Code: BOT-HC-5026

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
1. Understand Water relation of plants with respect to various physiological processes.	<p>Unit 1: Plant-water relation Water Potential and its components, water absorption by roots, aquaporins, pathway of water movement, symplast, apoplast, transmembrane pathways, root pressure, guttation. Ascent of sap– cohesion-tension theory. Transpiration and factors affecting transpiration, antitranspirants, mechanism of stomatal movement. Plant response to water stress.</p> <p>Unit 2: Mineral nutrition Essential and beneficial elements, macro and micronutrients, methods of study and use of nutrient solutions, criteria for essentiality, mineral deficiency symptoms, roles of essential elements, chelating agents, Ion antagonism and toxicity.</p> <p>Unit 3: Nutrient Uptake Soil as a nutrient reservoir, transport of ions across cell membrane, passive</p>	Remember, Understand
2. Explain chemical properties and deficiency symptoms in plants		
3. Classify aerobic and anaerobic respiration		
4. Explain the significance of Photosynthesis and respiration	Remember, Understand, Evaluate	
5. Assess dormancy and germination in plants.		
		Remember, Understand

	absorption, electrochemical gradient, facilitated diffusion, active absorption, role of ATP, carrier systems, proton ATPase pump and ion flux, uniport, co-transport, symport, antiport.	
	Unit4: Translocation in the phloem Experimental evidence in support of phloem as the site of sugar translocation. Pressure–Flow Model; Phloem loading and unloading; Source–sink relationship.	Remember, Understand
	Unit5: Plant growth regulators Discovery, chemical nature (basic structure), bioassay and physiological roles of Auxin, Gibberellins, Cytokinin, Abscisic acid, Ethylene, Brassinosteroids and Jasmonic acid.	Remember, Understand
	Unit6: Physiology of flowering Photoperiodism, flowering stimulus, florigen concept, vernalization, seed dormancy.	Remember, Understand, Analyze
	Unit 7: Phytochrome, cryptochromes and phototropins Discovery, chemical nature, role in photomorphogenesis, low energy responses (LER) and high irradiance responses (HIR), mode of action.	Remember, Understand
<ol style="list-style-type: none"> 1. Know the various physiological processes of plants through practicals 2. Determination of OP, WP and stomatal index 3. To know the effect of light on transpiration 4. To know the effect of carbon dioxide on rate of photosynthesis 5. Histochemical tests for various phytochemical contents. 6. Acquire knowledge on fruit ripening or rooting from cuttings 	<p>Practical</p> <ol style="list-style-type: none"> 1. Determination of osmotic potential of plant cell sap by plasmolytic method. 2. Determination of water potential of given tissue (potato tuber) by weight method. 3. Study of the effect of light on the rate of transpiration in excised twig/leaf. 4. Calculation of stomatal index and stomatal frequency from the two surfaces of leaves of a mesophyte and xerophyte. 5. To study the effect of different concentrations of IAA on Gram/Pea/Moong root (IAA Bioassay). 6. To study the induction of amylase activity in germinating Maize/Bean grains. 7. Effect of carbon dioxide concentration on the rate of photosynthesis. <p>Demonstration experiments:</p> <ol style="list-style-type: none"> 1. To demonstrate suction due to transpiration. 	Understand, Analyse, Apply

	2. Fruit ripening/Rooting from cuttings (Demonstration).	
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Paper Name: Natural Resource management

Paper Code: BOT-HE-5016

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
<p>1. Understand the concept of different natural resources and their utilization.</p> <p>2. Critically analyze the sustainable utilization land, water, forest and energy resources.</p> <p>3. Evaluate the management strategies of different natural resources.</p> <p>4. Reflect upon the different national and international efforts in resource management and their conservation</p>	<p>Unit 1: Natural resources Definition and types</p>	Remember, Understand
	<p>Unit 2: Sustainable utilization Concept, approaches (economic, ecological and socio-cultural).</p>	Remember, Understand
	<p>Unit 3: Land Utilization (agricultural, pastoral, horticultural, silvicultural); Soil degradation and management.</p>	Remember, Understand, Apply
	<p>Unit4: Water Fresh water (rivers, lakes, groundwater, aquifers, watershed); Marine; Estuarine; Wetlands; Threats and management strategies.</p>	Remember, Understand, Apply
	<p>Unit5: Biological Resources Biodiversity-definition and types; Significance; Threats; Management strategies; Bio-prospecting; IPR; CBD; National Biodiversity Action Plan).</p>	Remember, Understand
	<p>Unit6: Forest Definition, Cover and its significance (with special reference to India); Major and minor forest products; Depletion; Management.</p>	Remember, Understand, Evaluate
	<p>Unit 7: Energy Renewable and non-renewable sources of energy.</p>	Remember, Understand
	<p>Unit 8: Contemporary practices in resource management EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint, Resource Accounting; Waste management.</p>	Remember, Understand
	<p>Unit 9: National and international efforts in resource management and conservation</p>	Remember
<p>1. Estimation of solid waste generated by a domestic system and impact of it in the environment.</p>	<p>Practical 1. Estimation of solid waste generated by a domestic system (biodegradable and non-biodegradable) and its impact on land degradation.</p>	Understand, Analyse, Apply

2. Data collection techniques for forest area.	2. Collection of data on forest cover of specific area.	
3. Quantitative analysis of ecological footprint.	3. Measurement of dominance of woody species by DBH (diameter at breast height) method.	
4. Various geographical indexing techniques for plant managements.	4. Calculation and analysis of ecological footprint. 5. Uses of GPS and GIS (Mapping of an area).	

Paper Name: Horticultural Practices and Post-Harvest Technology

Paper Code: BOT-HE-5026

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain
1. Understand the concept of different types of horticultural crops, their conservation and management	Unit 1: Introduction Scope and importance, Branches of horticulture; Role in rural economy and employment generation; Importance in food and nutritional security; Urban horticulture and ecotourism.	Remember, Understand
2. Examine the various branches of horticulture, fruit and vegetable crops, floriculture, medicinal and aromatic plants.	Unit 2: Ornamental plants Types, classification (annuals, perennials, climbers and trees); Identification and salient features of some ornamental plants [rose, marigold, gladiolus, carnations, orchids, poppies, gerberas, tuberose, sages, cacti and succulents (opuntia, agave and spurges)] Ornamental flowering trees (Indian laburnum, gulmohar, Jacaranda, Lagerstroemia, fishtail and areca palms, semul, coraltree).	Remember, Understand, Analyse, Apply
3. Critically evaluate different cultivation practices and disease management		
4. Reflect upon different Landscaping practices and garden design	Unit 3: Fruit and vegetable crops Production, origin and distribution; Description of plants and their economic products; Management and marketing of vegetable and fruit crops; Identification of some fruits and vegetable varieties (citrus, banana, mango, chillies and cucurbits).	Remember, Understand, Apply
	Unit4: Horticultural techniques Application of manure, fertilizers, nutrients and PGRs; Weed control; Biofertilizers, biopesticides; Irrigation methods (drip irrigation, surface irrigation, furrow and border irrigation); Hydroponics; Propagation Methods: asexual (grafting, cutting, layering, budding), sexual (seed propagation), Scope and limitations.	Remember, Understand, Apply

	<p>Unit5: Landscaping and garden design Planning and layout (parks and avenues); gardening traditions - Ancient Indian, European, Mughal and Japanese Gardens; Urban forestry; policies and practices.</p>	<p>Remember, Understand, Analyse</p>
	<p>Unit6: Floriculture Cut flowers, bonsai, commerce (market demand and supply); Importance of flower shows and exhibitions.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit 7: Post-harvest technology Importance of post-harvest technology in horticultural crops; Evaluation of quality traits; Harvesting and handling of fruits, vegetables and cut flowers; Principles, methods of preservation and processing; Methods of minimizing loses during storage and transportation; Food irradiation - advantages and disadvantages; food safety.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit 8: Disease control and management Field and post-harvest diseases; Identification of deficiency symptoms; remedial measures and nutritional management practices; Crop sanitation; IPM strategies (genetic, biological and chemical methods for pest control); Quarantine practices; Identification of common diseases and pests of ornamentals, fruits and vegetable crops.</p>	<p>Remember, Understand, Evaluate</p>
	<p>Unit 9: Horticultural crops - conservation and management Documentation and conservation of germplasm; Role of micropropagation and tissue culture techniques; Varieties and cultivars of various horticultural crops; IPR issues; National, international and professional societies and sources of information on horticulture.</p>	<p>Remember, Understand, Analyse</p>
	<p>Unit 10: Field trip Field visits to gardens, standing crop sites, nurseries, vegetable gardens and horticultural fields at suitable locations.</p>	<p>Remember, Understand, Analyse, Evaluate, Apply</p>

Paper Name: Plant Metabolism**Paper Code: BOT-HC-6016**

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain level
1. Differentiate anabolic and catabolic pathways of metabolism 2. Recognize the importance of Carbon assimilation in photorespiration 3. Explain the ATP-Synthesis	Unit 1: Concept of metabolism Introduction, anabolic and catabolic pathways, regulation of metabolism, role of regulatory enzymes; classification, nomenclature and importance of enzyme; concept of coenzyme, apoenzyme and prosthetic group; enzyme inhibition (allosteric, covalent modulation and Isozymes).	Remember, Understand
4. Interpret the Biological nitrogen fixation in metabolism Remember, understand	Unit 2: Carbon assimilation Historical background, photosynthetic pigments, role of photosynthetic pigments (chlorophylls and accessory pigments), antenna molecules and reaction centres, photochemical reactions, photosynthetic electron transport, PSI, PSII, Q cycle, CO ₂ reduction, photorespiration, C ₄ -pathways; Crassulacean acid metabolism; Factors affecting CO ₂ reduction.	Remember, Understand
	Unit 3: Carbohydrate metabolism Synthesis and catabolism of sucrose and starch.	Remember, Understand, Apply
	Unit4: Carbon Oxidation Glycolysis, fate of pyruvate, regulation of glycolysis, oxidative pentose phosphate pathway, oxidative decarboxylation of pyruvate, regulation of PDH, NADH shuttle; TCA cycle, amphibolic role, anaplerotic reactions, regulation of the cycle, mitochondrial electron transport, oxidative phosphorylation, cyanide-resistant respiration, factors affecting respiration.	Remember, Understand, Apply
	Unit5: ATP synthesis Mechanism of ATP synthesis, substrate level phosphorylation, chemiosmotic mechanism (oxidative and photophosphorylation), ATP synthase, Boyers conformational model, Racker's experiment, Jagendorf's experiment; role of uncouplers.	Remember, Understand
	Unit6: Lipid metabolism Synthesis and breakdown of triglycerides, β -oxidation, glyoxylate cycle, gluconeogenesis and its role in mobilisation of lipids during seed	Remember, Understand, Evaluate

	germination, α oxidation.	
	Unit 7: Nitrogen metabolism Nitrate assimilation, biological nitrogen fixation (examples of legumes and non-legumes); Physiology and biochemistry of nitrogen fixation; Ammonia assimilation and transamination.	Remember, Understand
	Unit 8: Mechanisms of signal transduction Receptor-ligand interactions; Second messenger concept, Calcium calmodulin, MAP kinase cascade.	Remember, Understand
<ol style="list-style-type: none"> 1. Know the various chromatographic methods such as paper chromatography, TLC. 2. Separation of plant pigments through chromatography and quantitative analysis of absorption spectrum of the pigments. 3. Chemical tests for determination of sugar content 4. Protein estimation 5. Comparison of rate of respiration in different plant parts 	Practical <ol style="list-style-type: none"> 1. Chemical separation of photosynthetic pigments. 2. Estimation of sugar content by Somogyi method. 3. Determination of TAN in plant materials. 4. To compare the rate of respiration in different parts of a plant (Demonstration). 5. Estimation of protein in a sample by Biuret method. 6. Separation of amino acids by paper chromatography. 7. Demonstration of Thin layer chromatography (TLC). 8. Quantitative analysis of absorption spectrum of photosynthetic pigments. 	Understand, Analyse And Apply

Paper Name: Plant Biotechnology

Paper Code: BOT-HC-6026

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain
<ol style="list-style-type: none"> 1. Understand the core concepts and fundamentals of plant biotechnology and genetic engineering 2. Develop their competency on different types of plant tissue culture 3. Analyze the enzymes and vectors for genetic manipulations 4. Examine gene cloning and 	Unit 1: Plant Tissue Culture Historical perspective; Composition of media; Nutrient and hormone requirements (role of vitamins and hormones); Totipotency; Organogenesis; Embryogenesis (somatic and zygotic); Protoplast isolation, culture and fusion; Tissue culture applications (micropropagation, androgenesis, virus elimination, secondary metabolite production, haploids, triploids and hybrids; Cryopreservation; Germplasm	Remember, Understand, Apply

<p>evaluate different methods of gene transfer</p> <p>5. Critically analyze the major concerns and applications of transgenic technology</p>	<p>Conservation).</p> <p>Unit 2: Recombinant DNA Technology Restriction Endonucleases (History, Types I-IV, biological role and application); Restriction Mapping (Linear and Circular); Cloning Vectors: Prokaryotic (pUC 18 and pUC19, pBR322, Ti plasmid, BAC); Lambda phage, M13 phagemid, Cosmid, Shuttle vector; Eukaryotic Vectors (YAC).</p>	<p>Remember, Understand, Analyse</p>
	<p>Unit 3: Gene Cloning Recombinant DNA, Bacterial Transformation and selection of recombinant clones, PCR-mediated gene cloning; Gene Construct; construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by genetic selection; complementation, colony hybridization; PCR.</p>	<p>Remember, Understand, Analyse</p>
	<p>Unit4: Methods of gene transfer <i>Agrobacterium</i>-mediated, Direct gene transfer by Electroporation, Microinjection, Microprojectile bombardment; Selection of transgenics– selectable marker and reporter genes (Luciferase, GUS, GFP).</p>	<p>Remember, Understand, Apply</p>
	<p>Unit5: Application of Biotechnology Pest resistant (Bt-cotton); herbicide resistant plants (RoundUp Ready soybean); Transgenic crops with improved quality traits (Flavr Savr tomato, Golden rice); Improved horticultural varieties (Moondust carnations); Role of transgenics in bioremediation (Superbug); edible vaccines; Industrial enzymes (Aspergillase, Protease, Lipase); Genetically Engineered Products– Human Growth Hormone; Humulin; Biosafety concerns.</p>	<p>Remember, Understand, Apply</p>
	<p>Practical 1. (a) Preparation of MS medium. (b) Demonstration of <i>in vitro</i> sterilization and inoculation methods using leaf and nodal explants of tobacco, <i>Datura</i>, <i>Brassica</i> etc. 2. Study of anther, embryo and endosperm culture,</p>	<p>Understand, Analyse, Apply</p>
<p>1. Learn how to prepare culture media, tools and techniques of micropropagation including aseptic culture. 2. Use of computer in biological fields, in silico construction of restriction map. 3. Modern biotechnological and genetic engineering tools and</p>		

<p>techniques, their application and limitations.</p> <p>4. Know about various gene transfer methods.</p> <p>5. Isolation of plasmid DNA and protoplast.</p> <p>6. Restriction digestion and gel electrophoresis of plasmid DNA.</p>	<p>micropropagation, somatic embryogenesis & artificial seeds through photographs.</p> <p>3. Isolation of protoplasts.</p> <p>4. Construction of restriction map of circular and linear DNA from the data provided.</p> <p>5. Study of methods of gene transfer through photographs: <i>Agrobacterium</i>-mediated, direct gene transfer by electroporation, microinjection, microprojectile bombardment.</p> <p>6. Study of steps of genetic engineering for production of Bt cotton, Golden rice, Flavr Savr tomato through photographs.</p> <p>7. Isolation of plasmid DNA.</p> <p>8. Restriction digestion and gel electrophoresis of plasmid DNA.</p>	
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Paper Name: Industrial and Environmental Microbiology

Paper Code: BOT-HE-6016

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain level
1. Understand the concept and role of microbes in industry and environment.	Unit 1: Scope of microbes in industry and environment	Remember, Understand
2. Critically analyze the types of bioreactors and the fermentation process.	Unit 2: Bioreactors/Fermenters and fermentation processes Solid-state and liquid-state (stationary and submerged) fermentations; Batch and continuous fermentations. Components of a typical bioreactor, Types of bioreactors-laboratory, pilotscale and production fermenters; Constantly stirred tank fermenter, tower fermenter, fixed bed and fluidized bed bioreactors and air-lift fermenter. A visit to any educational institute/ industry to see an industrial fermenter, and other downstream processing operations.	Remember, Understand, Apply
3. Evaluate the role of microorganisms in industry and microbes in agriculture.		
4. Reflect upon different Landscaping practices and garden design		
5. Develop skills on the remediation process of contaminated soils.	Unit 3: Microbial production of industrial products Microorganisms involved, media, fermentation conditions, downstream processing and uses; Filtration, centrifugation, cell disruption, solvent extraction, precipitation and ultrafiltration, lyophilization, spray drying; Hands on microbial fermentations for the production and	Remember, Understand, Apply

	estimation (qualitative and quantitative) of Enzyme: amylase or lipase activity, Organic acid (citric acid or glutamic acid), alcohol (Ethanol) and antibiotic (Penicillin).	
	<p>Unit4: Microbial enzymes of industrial interest and enzyme immobilization</p> <p>Microorganisms for industrial applications and hands on screening microorganisms for casein hydrolysis; starch hydrolysis; cellulose hydrolysis. Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (glucose isomerase and penicillin acylase).</p>	Remember, Understand, Apply
	<p>Unit5: Microbes and quality of environment</p> <p>Distribution of microbes in air; Isolation of microorganisms from soil, air and water.</p>	Remember, Understand, Apply
	<p>Unit6: Microbial flora of water</p> <p>Water pollution, role of microbes in sewage and domestic waste water treatment systems. Determination of BOD, COD, TDS and TOC of water samples; Microorganisms as indicators of water quality, check coliform and fecal coliform in water samples.</p>	Remember, Understand, Analyse
	<p>Unit 7: Microbes in agriculture and remediation of contaminated soils</p> <p>Biological fixation; Mycorrhizae; Bioremediation of contaminated soils. Isolation of root nodulating bacteria, arbuscular mycorrhizal colonization in plant roots.</p>	Remember, Understand, Evaluate
<ol style="list-style-type: none"> Obtaining knowledge of principles and functioning of instruments in microbiology laboratory. Hands on training on techniques on sterilization and preparation of culture media. Obtaining knowledge on pure culture and various techniques of it. 	<p>Practical</p> <ol style="list-style-type: none"> Principles and functioning of instruments in microbiology laboratory Hands on sterilization techniques and preparation of culture media. Pure culture techniques. 	Understand, Analyse, Apply

Course Outcome	Unit No. and Topics	Bloom's Taxonomy Domain Level
<p>5. Explain the principles of Light microscopy, compound microscopy, Fluorescence microscopy and confocal microscopy</p> <p>6. Develop conceptual understanding of cell wall degradation enzymes and cell fractionation.</p>	<p>Unit 1: Imaging and related techniques Principles of microscopy; Light microscopy; Fluorescence microscopy; Confocal microscopy; Use of fluorochromes: (a) Flow cytometry (FACS); (b) Applications of fluorescence microscopy: Chromosome banding, FISH, chromosome painting; Transmission and Scanning electron microscopy – sample preparation for electron microscopy, cryofixation, negative staining, shadow casting, freeze fracture, freeze etching.</p>	<p>Remember, Understand, Apply</p>
<p>7. Classify different types of chromatography techniques.</p>	<p>Unit 2: Cell fractionation Centrifugation: Differential and density gradient centrifugation, sucrose density gradient, CsCl₂ gradient, analytical centrifugation, ultracentrifugation, marker enzymes.</p>	<p>Remember, Understand, Apply</p>
<p>8. Apply suitable strategies in data collections and disseminating research findings.</p>	<p>Unit 3: Radioisotopes Use in biological research, auto-radiography, pulse chase experiment.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit4: Spectrophotometry Principle and its application in biological research.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit5: Chromatography Principle; Paper chromatography; Column chromatography, TLC, GLC, HPLC, Ion-exchange chromatography; Molecular sieve chromatography; Affinity chromatography.</p>	<p>Remember, Understand, Analyze, Apply</p>
	<p>Unit6: Characterization of proteins and nucleic acids Mass spectrometry; X-ray diffraction; X-ray crystallography; Characterization of proteins and nucleic acids; Electrophoresis: AGE, PAGE, SDS-PAGE.</p>	<p>Remember, Understand, Apply</p>
	<p>Unit 7: Biostatistics Statistics, data, population, samples, parameters; Representation of Data: Tabular, Graphical; Measures of central tendency: Arithmetic mean, mode, median; Measures of dispersion: Range, mean deviation, variation, standard deviation; Chi-square test for goodness of fit.</p>	<p>Remember, Understand, Evaluate, Apply</p>
<p>1. Obtaining knowledge on various molecular techniques for blotting, DNA fingerprinting, sequencing etc.</p>	<p>Practical 1. Study of Blotting techniques: Southern, Northern and Western, DNA fingerprinting, DNA sequencing, PCR through photographs.</p>	<p>Understand, Analyze, Apply</p>

<p>2. Study of thin layer chromatography, column chromatography and its use in separation of various chemical compounds.</p> <p>3. Knowledge on separation and estimation of various macromolecules.</p>	<p>2. Demonstration of ELISA.</p> <p>3. To separate sugars by thin layer chromatography.</p> <p>4. Isolation of chloroplasts by differential centrifugation.</p> <p>5. To separate chloroplast pigments by column chromatography.</p> <p>6. To estimate protein concentration through Lowry's methods.</p> <p>7. To separate proteins using PAGE.</p> <p>8. To separation DNA (marker) using AGE.</p> <p>9. Study of different microscopic techniques using photographs/micrographs (freeze fracture, freeze etching, negative staining, positive staining, fluorescence and FISH).</p>	
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Department of Business Administration

Programme Specific Outcome BBA in Business Administration (CBCS)

The programme specific outcome of the syllabus prescribed for the major students of BBA Department of Business Administration is mentioned below:

- After successfully completing this program, students should be able to effectively manage and plan key human resource functions, within the organizations.
- Upon completion of the program, the individual should be able to demonstrate maturity, professionalism and team tea working skills.
- Upon completion of the program, the students will have a general idea of operation in business.

COURSE OUTCOME

BBA in Business Administration (Honours) syllabus (CBCS)

I Semester

Paper Name: BUSINESS COMMUNICATION

Paper Code: ENG-AE-1014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • The effective use of various types of oral, written and digital communication modes. • The planning, managing and communicating various business projects. • High level team work and analysis of team process. 	Unit I: Communication theory and types	Remember , Understand
	Unit II: Speaking skills	Remember , Understand
	Unit III: Reading and understanding	Remember , Understand
	Unit IV: Writing skills	Remember , Understand

Paper Name: PRINCIPLES OF MANAGEMENT

Paper Code: BBA-HC-1026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Students will learn the techniques and processes for managing employee and team performance within the organization. • Through the subjects they can understand their roles and contribution to effectively manage performance and conduct at work. • By the end of the subject, student will understand on how performance management systems can be effectively utilized to raise the performance of individuals and terms to attain the desired goals. 	Unit I: Evolution of Management	Remember , Understand
	Unit II: Management Concept	Remember , Understand
	Unit III: Management Principles	Remember , Understand
	Unit IV: Functions of Management	Remember , Understand
	Unit V: Concept of Coordination, MBO and MBE	Remember , Understand
	Unit VI: Emerging Horizons to Management	Remember , Understand

Paper Name: MANAGERIAL ECONOMICS

Paper Code: BBA-HC-1036

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Students will be able to demonstrate knowledge of the laws of supply and demand and equilibrium and also analysis responses of markets to external events. Proper concepts to explain and calculate price elasticity of demand and other elasticity. 	Unit I: Demand, Supply and Market equilibrium	Remember, Understand, Analyse
	Unit II: Producer and optimal production choice	Remember, Understand, Analyse
	Unit III: Theory of firm and market organization	Remember, Understand, Analyse

Paper Name: MATHEMATICAL TECHNIQUES IN BUSINESS**Paper Code: BBA-HG-1046**

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Define basic term in the areas of business calculus and financial mathematics. Explain basic methods of business calculus, types and methods of interest account and their basic application in practice. 	Unit I: Arithmetic progression	Remember, Understand, Analyse
	Unit II: Logarithms	Remember, Understand, Analyse
	Unit III: Set Theory	Remember, Understand, Analyse
	Unit IV: Determinants	Remember, Understand, Analyse
	Unit V: Functions	Remember, Understand, Analyse
	Unit VI: Calculus	Remember, Understand, Analyse

2nd Semester (Honours)**Paper Name: ENVIRONMENTAL SCIENCE****Paper Code: ENV-AE-2014**

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Understanding the various components of environment, their role and importance. Gather the knowledge of bio diversity, ecological balance 	Unit I: Introduction to Environmental Studies	Remember, Understand, Analyse
	Unit II: Ecosystems	Remember, Understand, Analyse
	Unit III: Natural Resources	Remember, Understand, Analyse
	Unit IV: Biodiversity and conservation	Remember, Understand, Analyse

and other effects of pollutions.	Unit V: Environmental pollution	Remember, Understand, Analyse
	Unit VI: Environmental policies & practices	Remember, Understand, Analyse
	Unit VII: Human Communities & the environment	Remember, Understand, Analyse
	Unit VIII: Field Work	Remember, Understand, Analyse

Paper Name: FINANCIAL ACCOUNTING

Paper Code: BBA-HC-2026

Course Outcome	Unit/ Topic	Bloom' Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Understand the basic theory, concepts and practice of financial accounting. Enable a student to understand information contained in the published financial statement. 	Unit I: Financial Accounting	Remember, Understand, Analyse
	Unit II: Double Entry System of Book-keeping	Remember, Understand, Analyse
	Unit III: Final Accounts of Sole Proprietorship Firms	Remember, Understand, Analyse
	Unit IV: Accounts for Non-Profit Organization	Remember, Understand, Analyse
	Unit V: Accounting Information	Remember, Understand, Analyse

Paper Name: STATISTICS FOR BUSINESS DECISIONS

Paper Code: BBA-HC-2036

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Produce appropriate graphical and numerical descriptive statistics for different types of data. Apply probability rules and concepts relating to continuous random variable 	Unit I: Measures of Central value	Remember, Understand, Analyse
	Unit II: Correlation Analysis	Remember, Understand, Analyse
	Unit III: Analysis of Time Series	Remember, Understand, Analyse
	Unit IV: Probability	Remember, Understand, Analyse

Paper Name: INDIAN ECONOMIC SCENERIO

Paper Code: BBA-HC-2046

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Understanding various aspects of Indian economy. 	Unit I: Business Environment	Remember ,Understand
	Unit II: GATT/WTO	Remember ,Understand
	Unit III: Foreign Collaboration, Role of Foreign	Remember ,Understand

<ul style="list-style-type: none"> Understanding on different problems and approaches to economic planning and development in India. 	Aid, Balance of Payment Concepts	
	Unit IV: Government Budget	Remember ,Understand
	Unit V: Planning in India	Remember ,Understand

Paper Name: COMPUTER FUNDAMENTALS

Paper Code: BBA-HG-2056

Course Outcome	Unit/ Topic	Bloom' Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Understand the terms and components of hardware and software. To know about the Microsoft applications and their use. 	Unit I: History of Development of Computers	Remember ,Understand
	Unit II: Criteria for using the computers	Remember ,Understand
	Unit III: Types of Computers	Remember ,Understand
	Unit IV: Operating System and Office Automation	Remember ,Understand
	Unit V: Basic commands in MS Office	Remember ,Understand
	Unit VI: Information Technology	Remember ,Understand

3rd Semester (Honours)

Paper Name: COST AND MANAGEMENT ACCOUNTING

Paper Code: BBA-HC-3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Demonstrate of costing system, cost management system, budgeting system and performance measures. Critical analyze to provide recommendations to improve the operations of organization 	Unit I: Meaning, Nature and Scope of Cost and Management Accounting	Remember ,Understand, Analyse
	Unit II: Cost elements	Remember ,Understand, Analyse
	Unit III: Standard Costing	Remember ,Understand, Analyse
	Unit IV: Budgets and Budgetary Control	Remember ,Understand, Analyse

Paper Name: HUMAN RESOURCE MANAGEMENT

Paper Code: BBA-HC-3026

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Provides understanding of personnel function and organizational goals, personnel management, job enrichment. Administering the qualities 	Unit I: HRM: Concept,functions,roles,skills	Remember ,Understand
	Unit II: Human Resource Planning	Remember ,Understand
	Unit III: Training: Concept, Needs, Methods	Remember ,Understand
	Unit IV: Industrial Relations	Remember ,Understand

of Recruitment, Performance monitoring and Appraisal Methods.		
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Paper Name: PERSONALITY AND PERSONAL SKILL DEVELOPMENT

Paper Code: BBA-HC-3036

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Develop and accurate sense of nurturing deep understanding of personal motivation. • An understanding and practice of personal and professional responsibility. 	Unit I: Personality	Remember ,Understand
	Unit II: Teams & groups	Remember ,Understand
	Unit III: Career development & planning	Remember ,Understand
	Unit IV: Business Etiquettes and manners	Remember ,Understand

Paper Name: OPERATIONS MANAGEMENT AND CONTROL

Paper Code: BBA-HG-3046

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Better understanding for clear concepts of production line, narrow bottleneck activities. • Provides thorough technical knowledge in production and industrial activities. • Civil and engineering related scheduling in production plants and various techniques in operation management and control techniques. 	Unit I: Production management	Remember ,Understand
	Unit II: Product design and analysis	Remember ,Understand
	Unit III: Facility location	Remember ,Understand
	Unit IV: Material management and inventory control	Remember ,Understand
	Unit V: Work study	Remember , Understand

Paper Name: COMPUTER APPLICATIONS

Paper Code: BBA-HE-3054

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the terminology of the computer networking and enumerate the layers of OSI model. • Acquire knowledge of 	Unit I: Word Processing	Remember , Understand
	Unit II: Database management System	Remember , Understand
	Unit III: System development life cycle	Remember , Understand
	Unit IV: Tally	Remember , Understand

computer application		
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4th Semester (Honours)

Paper Name: ORGANISATIONAL BEHAVIOUR AND INDUSTRIAL PSYCHOLOGY

Paper Code: BBA-HC-4016

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Focus on understanding the behavior of the employees working in the organization. • Enables of better understanding of Industrial-human psychology and coordination amongst various departmental levels of employee. • Managing how to face challenges in corporate-industrial conflict mgmt. 	Unit I: Introduction: Meaning and concept of OB, Key elements of OB, Nature and Scope of OB	Remember , Understand
	Unit II: Individual Behaviour	Remember , Understand
	Unit III: Interpersonal Behaviour	Remember , Understand
	Unit IV: Group Behaviour	Remember , Understand
	Unit V: Organizational Issues	Remember , Understand
	Unit VI: Industrial Psychology:	Remember , Understand

Paper Name: FINANCIAL MANAGEMENT

Paper Code: BBA-HC-4026

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Design the financial issues of determining the monetary resources needed by a business. • Knowledge of mix of these resources, the sources and use of funds, the benefit, risk and costs associated with it. 	Unit I: Nature of Financial Management	Remember ,Understand, Analyse
	Unit II: Long Term investment decisions	Remember ,Understand, Analyse
	Unit III: Capital Structures	Remember ,Understand, Analyse
	Unit IV: Working capital management	Remember ,Understand, Analyse

Paper Name: PRINCIPLES OF MARKETING

Paper Code: BBA-HC-4036

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • State the role and function of marketing research, pros and cons in maintaining professional abilities towards product and business growth. 	Unit I: Introduction: Nature, Scope and Importance of Marketing	Remember ,Understand
	Unit II: Segmentation, Targeting and Positioning	Remember ,Understand
	Unit III: : Product & Pricing Decisions	Remember ,Understand
	Unit IV: Promotion Mix	Remember ,Understand

<ul style="list-style-type: none"> Provides brief understanding towards professional approach on various market research activities, ways to approach based on environment. Enables to understand the presentation skills of marketing concepts, price, product, various promotional activities, when and where to approach. 		
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Paper Name: BUSINESS RESEARCH

Paper Code: BBA-HG-4046

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Knowledge of market research project, ways to design the project sampling techniques, synopsis of research proposal. Study of various scientific calculative techniques, survey instrument, manage data collection, conduct statistical analysis, questionnaire and sampling. 	Unit I: Nature and Scope of Marketing Research	Remember, Understand, Analyse
	Unit II: Research Design	Remember, Understand, Analyse
	Unit III: Primary Data Collection, Qualitative Research Tools	Remember, Understand, Analyse
	Unit IV: Sampling	Remember, Understand, Analyse

5th Semester (Honours)

Paper Name: LEGAL ASPECTS OF BUSINESS

Paper Code: BBA-HC-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Know rights and duties under various legal Acts. Understand consequences of applicability of various laws on business situations. Develop critical thinking through 	Unit I: The Indian Contract Act 1872	Remember, Understand
	Unit II: Sale of Goods Act 1930, Negotiable Instruments Act 1881	Remember, Understand
	Unit III: The Companies Act 2013, The Limited Liability Partnership Act 2008	Remember, Understand

the use of law cases.	Unit IV: Consumer Protection Act 1986, The Right to Information Act 2005	Remember, Understand
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Paper Name: SUMMER PROJECT (Duration 1st July to 15th August)

Paper Code: BBA-SE-5024

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Organise a way of project research process which is a mandated final year Industrial summer training dissertation project, field survey, Data collection, Use various scientific tools practical knowledge of marketing research process. 	Unit I:	Understand, Analyse, Apply
	Unit II:	Understand, Analyse, Apply
	Unit III:	Understand, Analyse, Apply
	Unit IV:	Understand, Analyse, Apply

Paper Name: CONSUMER BEHAVIOUR

Paper Code: BBA-HE-5036 (DSE – II)

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Able to explain the basic concepts and models of consumer behavior. Able to analyze the effects of psychological, socio-cultural and demographic factors on the consumer decision process with their results. Able to distinguish the relationship between consumer behavior and marketing practices. Able to define the importance of consumer behavior for businesses Able to compare the relationship between consumer behavior and other disciplines. Able to define the importance of group effects in consumer behaviour Able to explain the consumer purchasing 	Unit I: Consumer Behaviour: Nature, scope & application, Importance	Remember, Understand
	Unit II: Consumer Needs & Motivation	Remember, Understand
	Unit III: Group Dynamics & consumer reference groups	Remember, Understand
	Unit IV: Diffusion of Innovation	Remember, Understand

decision process. <ul style="list-style-type: none"> • Able to distinguish the digital age and its effects on consumer behavior 		
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Paper Name: MARKETING OF SERVICES

Paper Code: BBA-HE-5036 (DSE – II)

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the Concept of Services and intangible products • Discuss the relevance of the services Industry to Industry • Examine the characteristics of the services industry and the modus operandi • Analyse the role and relevance of Quality in Services • Visualise future changes in the Services Industry 	Unit I: The emergence of Service Economy	Remember, Understand
	Unit II: Marketing Mix	Remember, Understand
	Unit III: Service system positioning	Remember, Understand
	Unit IV: Service marketing strategy	Remember, Understand
	Unit V: Service quality	Remember, Understand

Paper Name: HUMAN RESOURCE DEVELOPMENT: SYSTEMS AND STRATEGIES

Paper Code: BBA-HE-5046 (DSE – III)

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Explain human resources development (HRD) and its theories, the difference between education, training, learning and the concept of the transfer of learning • Critique the relationship between organisational development (OD) and HRD contribution to organisational effectiveness • Evaluate the HRD role dealing with contemporary challenges. 	Unit I: HRD: Concept ,origin & need	Remember, Understand
	Unit II: HRD Process	Remember, Understand
	Unit III: HRD Interventions	Remember, Understand
	Unit IV: HRD Applications	Remember, Understand
	Unit V: Evaluating the HRD Effort; Data Gathering; Analysis and Feedback; Industrial relations and HRD. HRD Experience in Indian Organizations, International HRD experience, Future of HRD	Remember, Understand

Paper Name: MANAGEMENT OF INDUSTRIAL RELATIONS

Paper Code: BBA-HE-5046 (DSE – III)

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • The best possible integration of the employee at work and knowledge of their rights. • Better business organisation as regards its relation with employees. 	Unit I: Concept of Industrial Relations	Remember, Understand
	Unit II: Workers participation in management	Remember, Understand
	Unit III: Trade Union Act 1926, The Industrial Employment Act 1946, The Industrial Disputes Act 1947	Remember, Understand
	Unit IV: The Payment of Wages Act 1936, The Payment of Gratuity Act 1972, The Minimum Wages Act 1948, and The Payment of Bonus Act 1965	Remember, Understand
	Unit V: The Factories Act 1948, definition, approval, licensing and registration, health and welfare measures	Remember, Understand
	Unit VI: The Provident Fund and Miscellaneous Provisions Act 1952 and Employees Pension Scheme and Employees State Insurance Act 1948	Remember, Understand

6th Semester (Honours)**Paper Name: BUSINESS POLICY AND STRATEGY****Paper Code: BBA-HC-6016**

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Critically analyse the internal and external environments in which businesses operate and assess their significance for strategic planning. • Apply understanding for the theories, concepts and tools that support strategic management in organizations. • Build understanding of the nature and dynamics of strategy formulation and implementation processes at corporate and business level. • Have enhanced ability to identify strategic issues and design appropriate 	Unit I: Nature & importance of business policy & strategy	Remember, Understand
	Unit II: Environmental Analysis & Diagnosis	Remember, Understand
	Unit III: Formulation of competitive strategies	Remember, Understand
	Unit IV: Strategic Framework: Strategic analysis & choice, Strategic gap analyses, Portfolio analysis	Remember, Understand
	Unit V: The Factories Act 1948, definition, approval, licensing and registration, health and welfare measures	Remember, Understand
	Unit VI: The Provident Fund and Miscellaneous Provisions Act 1952 and Employees Pension Scheme and Employees State Insurance Act 1948	Remember, Understand

courses of action		
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Paper Name: TAXATION LAWS

Paper Code: BBA-HC-6026

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Identify the technical terms related to Income Tax • Determine the residential status of an individual and scope of total income • Compute income from salaries, house property, business/profession, capital gains and income from other sources • Discuss the various benefits/ deductions under Chapter VI-A of the Income tax act, 1961 • Compute the net total income of an individual 	Unit I: Law relating to Income Tax	Remember, Understand , Analyse
	Unit II: Heads of Income	Remember, Understand , Analyse
	Unit III: Computation of Gross Total Income and Total Income	Remember, Understand , Analyse
	Unit IV: Concept of Incidence, Impact and Shifting of Tax	Remember, Understand , Analyse
	Unit V: Goods and Services Tax (GST)	Remember, Understand , Analyse

Paper Name: RETAIL MANAGEMENT

Paper Code: BBA-HE-6036 (DSE – II)

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the Organised retail sector and its operations • Understand the various strategies involved with the retail sector <ul style="list-style-type: none"> • Learn how to deal with customers and understand their needs to sustain in the market • Understanding how to manage retail during crisis 	Unit I: Introduction to Retailing	Remember, Understand
	Unit II: Retail Formats	Remember, Understand
	Unit III: Store Planning	Remember, Understand
	Unit IV: Retail Marketing	Remember, Understand
	Unit V: Retail Merchandising	Remember, Understand
	Unit VI: Merchandise pricing	Remember, Understand
	Unit VII: Retail Operation	Remember, Understand

Paper Name: PERSONAL SELLING AND SALES FORCE MANAGEMENT

Paper Code: BBA-HE-6036 (DSE – II)

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Explain the concepts of sales management, personal selling and sales task • Summarize history of sale stages. • Explain the personal sale strategies and environmental factors that affect the personal sales • Explain the preparations before contact the customer, how and when salesperson deal with a customer, ways of identifying customer needs and submission of the product to the customer • Comprehend the stages of sales process in retail • Explain the preparations before contact the customer, how and when salesperson deal with a customer, ways of identifying customer needs and submission of the product to the customer • Recognize the formal and non-formal structures in sales organizations, what are the differences between them, the basic principles of organizations of sales force 	Unit I: Introduction to Personal Selling	Remember, Understand
	Unit II: Theories of Selling	Remember, Understand
	Unit III: The Selling Process	Remember, Understand
	Unit IV: Introduction to sales force management	Remember, Understand

Paper Name: TRAINING AND MANAGEMENT DEVELOPMENT**Paper Code: BBA-HE-6046 (DSE – III)**

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the evolution of training & development from a tactical to a strategic function • Provide an insight into what motivates adults to learn and the most appropriate methodologies to impart training • Understand the concept of training audit & training evaluation • Learn how design a training module and execute it • Understand the need for and concept of Performance Management 	Unit I: Organization vision & plans, assessment of training needs	Remember, Understand
	Unit II: Tasks of the training function	Remember, Understand
	Unit III: Training methods	
	Unit IV: Management Development	Remember, Understand

<ul style="list-style-type: none"> • Understand various strategies used by organizations to measure performance & reward for the same • Understand the concept of Learning Organizations & its benefits 	Programme Methods	
	Unit V: Organisational Development (OD)	Remember, Understand

Paper Name: PERFORMANCE AND COMPENSATION MANAGEMENT

Paper Code: BBA-HE-6046 (DSE – III)

Course Outcome	Unit/ Topic	Bloom's Taxonomy
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Understand the dynamics of performance appraisal and performance management to develop criteria and standards for performance assessment • Analyze how effective appraisal systems can be linked to managerial objectives and compensation • Comprehend the components of executive compensation and understand how jobs are priced to establish compensation levels • Understand incentive systems and non-economic rewards • Understand International aspects of Performance Appraisal and Compensation. 	Unit I: Introduction-Concept, Philosophy, History from performance appraisal to performance development; Objectives of performance management system; Performance Management process	Remember, Understand
	Unit II: Performance management and reward systems	Remember, Understand
	Unit III: Introduction to Job Evaluation; Methods of Job Evaluation; Company Wage Policy	Remember, Understand
	Unit IV: Incentives plans for production employees	Remember, Understand

	and for other professionals	
	Unit V: Wages in India; Methods of state regulation of wages	Remember, Understand

Department of Chemistry

Programme Specific Outcome (B.Sc in Chemistry) (CBCS)

- Understand the basic facts and concepts in Chemistry
- Understand the importance of Chemistry in daily life.
- Develop a better understanding and reasoning of facts.
- Skill-up for basic analytical tools.
- Skill-up for various laboratory techniques used in pharmaceutical laboratories and chemical industries.
- Make efficient for various spectrometric analyses

COURSE OUTCOME

B.Sc. in Chemistry (Honours) Syllabus (CBCS)

I Semester

Paper Name: Inorganic Chemistry I

Paper Code: CHE-HC-1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to:	Unit I: Atomic Structure	Remember, Understand
	Unit II: Periodicity	Remember, Understand, Analyze
• Give theoretical understanding about the basic constituents of matter.		

<ul style="list-style-type: none"> Develop a quantum mechanical concept on Structure and bonding. Introduce a concept of reactivity of chemical species based on their electron transfer affinity. Have an idea on periodic classification and variation of properties. Have hands-on experience of basic quantitative analytical techniques related to volumetric titrations. 	Unit III: Chemical bonding	Remember, Understand, Analyze
	Unit IV: Oxidation and reduction	Remember, Understand, Analyze
	Unit V: Practical (titration)	Analyze

Paper Name: Physical Chemistry I

Paper Code: CHE-HC-1026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Learn the kinetic theory of gases. Learn the qualitative treatment of the structure of liquid along with the physical properties of liquid. Learn the basic solid-state chemistry, application of x-ray crystallography for the determination of some very simple crystal structures. Also learn "ionic equilibria" in this course. Learn the practical on surface tension, viscosity, pH determination 	Unit I: Gaseous states	Remember, Understand
	Unit II: Liquid states	Remember, Understand, Analyze
	Unit III: Solid states	Remember, Understand, Analyze
	Unit IV: Ionic equilibrium	Remember, Understand, Analyze
	Unit V: Practical (Physical experiments)	Analyze

2nd Semester (Honours)

Paper Name: Organic Chemistry I

Paper Code: CHE-HC-2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Understand the basics of organic compounds, electron displacement, type of reagents and reaction intermediates. Learn the chemistry of aliphatic and aromatic hydrocarbon, conformational analysis of cycloalkanes and basic stereochemical phenomena. Learn different classes of organic compounds, their reactivities and mechanisms along with stereo chemical considerations. 	Unit I: Basics of Organic Chemistry	Remember, Understand
	Unit II: Stereochemistry	Remember, Understand, Analyze
	Unit III: Chemistry of aliphatic hydrocarbons	Remember, Understand, Analyze
	Unit IV: Cycloalkanes and conformational analysis	Remember, Understand, Analyze
	Unit V: Aromatic	Remember,

<ul style="list-style-type: none"> Learn simple purification technique of organic solvents and compounds 	hydrocarbons	Understand, Analyze
	Unit VI: Practical	Understand, Analyze

Paper Name: Physical Chemistry II

Paper Code: CHE-HC-2026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Learn laws of thermodynamics, thermochemistry, thermodynamic functions, relations between thermodynamic properties, Gibbs Helmholtz equation, Maxwell relations etc. Learn partial molar quantities, chemical equilibrium, solutions and colligative properties. Understand the chemical systems from thermodynamic point of view. Perform the experiments on determination of heat capacity and solubility 	Unit I: Chemical Thermodynamics	Remember, Understand
	Unit II: System of variable composition	Remember, Understand, Analyze
	Unit III: Chemical equilibrium	Remember, Understand, Analyze
	Unit IV: Solutions and colligative properties	Remember, Understand, Analyze
	Unit V: Practical	Analyze

3rd Semester (Honours)

Paper Name: Inorganic Chemistry II

Paper Code: CHE-HC-3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Have an idea on the basic principles of metallurgy so as to acquaint the students with the application Develop of concepts of protonic and non-protonic acids and bases. Acquaint with Periodic behaviour of s and p block elements related to their electronic structure and their reactivity is included the principles governing their reactivity. Know about the variety of compounds of the main group elements including oxides, hydrides, nitrides, interhalogens, noble gases and inorganic polymers. Explore other varieties of redox titration and prepare of simple inorganic compounds is introduced to give hands-on experience of inorganic synthesis. 	Unit I: General Principles of Metallurgy	Remember, Understand
	Unit II: Acid and bases	Remember, Understand, Analyze
	Unit III: Chemistry of p and s block	Remember, Understand, Analyze
	Unit IV: Noble gases and Inorganic Polymers	Remember, Understand, Analyze
	Unit V: Practical (titration and preparation)	Analyze

Paper Name: Organic Chemistry II**Paper Code: CHE-HC-3026**

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Learn different classes of organic compounds, including halogenated hydrocarbons, alcohols, phenols, epoxides, carbonyl compounds and carboxylic and sulfonic acids. Learn and differentiate between various organic functional groups; explain, analyze and design transformations between different functional groups. Synthesise various compounds by simple methodologies 	Unit I: Chemistry of Halogenated hydrocarbon	Remember, Understand
	Unit II: Alcohols, phenols, ethers and epoxides	Remember, Understand, Analyze
	Unit III: Carbonyl compounds	Remember, Understand, Analyze
	Unit IV: Carboxylic acids and their derivatives	Remember, Understand, Analyze
	Unit V: Sulphur containing compounds	Remember, Understand, Analyze
	Unit VI: Practical	Analyze

Paper Name: Physical Chemistry III**Paper Code: CHE-HC-3036**

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Learn phase rule and its application in some specific system Learn rate law, steady state approximation and experimental determination of rate law determination Understand different types of catalysts, efficiency of nanoparticles and catalyst and enzyme catalysis. Learn different types of surface adsorption phenomenon Perform on kinetics studies of different reactions and verify adsorption isotherms 	Unit I: Phase equilibria	Remember, Understand
	Unit II: Chemical kinetics	Remember, Understand, Analyze
	Unit III: Catalysis	Remember, Understand, Analyze
	Unit IV: Surface Chemistry	Remember, Understand, Analyze
	Unit V: Practical	Analyze

4th Semester (honours)**Paper Name: Inorganic Chemistry III****Paper Code: CHE-HC-4016**

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students	Unit I: Coordination	Remember,

<p>will be able to:</p> <ul style="list-style-type: none"> Gain the basic idea of coordination chemistry. Various aspects like nomenclature, structure, bonding, variety and reactivity of the coordination compounds are included for the students Have basic ideas of transition elements and their properties General idea on Lanthanides and actinides Acquaint on the useful and harmful aspects of metals in biological systems. Learn experiments related to gravimetric analysis, synthesis of coordination compounds and separation of metal ions using chromatography. This will provide various aspects of experiment design depending upon the requirements like synthesis, estimation or separation. 	Chemistry	Understand, Analyze
	Unit II: Transition elements	Remember, Understand, Analyze
	Unit III: Lanthanides and Actinides	Remember, Understand, Analyze
	Unit IV: Bioinorganic Chemistry	Remember, Understand, Analyze
	Unit V: Practical (Gravimetric estimation and preparation)	Analyze

Paper Name: Organic Chemistry III

Paper Code: CHE-HC-4026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Understand different classes of N-based compounds, including alkaloids and terpenoids and their potential application. Learn about different classes of N-based compounds; their structures, synthesis and reactivity. The above point can be written as Learn about structures, reactivity and synthesis of different classes of n based compounds Do Elemental analysis of organic compounds 	Unit I: Nitrogen Containing Functional Group	Remember, Understand
	Unit II: Polynuclear Hydrocarbons	Remember, Understand, Analyze
	Unit III: Heterocyclic compounds	Remember, Understand, Analyze
	Unit IV: Alkaloids and Terpenes	Remember, Understand, Analyze
	Unit V: Practical	Analyze

Paper Name: Physical Chemistry IV

Paper Code: CHE-HC-4036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Learn theories of conductance, molar 	Unit I: Conductance	Remember, Understand, Analyze
	Unit II:	Remember,

conductance, ionic motilities, application of conductance measurement and conductometric titrations <ul style="list-style-type: none"> • Know about Faraday's laws of electrolysis, chemical cells and application emf measurements, liquid junction potential, potentiometric titration and application of electrolysis. • Gain basic theoretical ideas electrical and magnetic properties of atoms and molecules. • Perform experiment on conductometry and potentiometry 	Electrochemistry	Understand, Analyze
	Unit III: Electrical and magnetic properties of atoms and molecules	Remember, Understand, Analyze
	Unit V: Practical)	Analyze

5th Semester (honours)

Paper Name: Organic Chemistry IV

Paper Code: CHE-HC-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Know about the nucleic acids, amino acids and pharmaceutical compounds. • Familiarized with the importance of nucleic acids, amino acids and develop basic understanding of enzymes, bioenergetics and pharmaceutical compounds. • Estimate various organic compounds 	Unit I: Nucleic Acid	Remember, Understand
	Unit II: Amino Acids, Peptides and proteins	Remember, Understand, Analyze
	Unit III: Enzymes and Lipids	Remember, Understand, Analyze
	Unit IV: Concept of energy in Biosystems	Remember, Understand, Analyze
	Unit V: Pharmaceutical Compounds	Remember, Understand, Analyze
	Unit VI: Practical	Analyze

Paper Name: Physical Chemistry V

Paper Code: CHE-HC-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Learn the postulates of quantum mechanics and the application of quantum mechanical ideas in some simple systems such as particle in a box, rigid rotor, simple harmonic oscillator etc. 	Unit I: Quantum Chemistry	Remember, Understand, Analyze
	Unit II: Molecular Spectroscopy	Remember, Understand, Analyze
	Unit III: Photochemistry	Remember, Understand, Analyze

<ul style="list-style-type: none"> • Know basic principles of rotational, vibrational, Raman, electronic, spin resonance, and electronic spectroscopy. • Understand the basic various types photochemical reactions • Learn to use colorimeter and spectrophotometer 	Unit VI: Practical on UV Visible Spectrophotometry	Analyze
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Paper Name: ANALYTICAL METHODS IN CHEMISTRY

Paper Code: CHE-HE-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Learn more about the qualitative/quantitative characterization and separation techniques. • Gives hands on experience using different instrumental techniques and chemical analysis. • Gain hands on experience of the discussed techniques. This will enable students to take judicious decisions while analysing different samples. 	Unit I: Qualitative and quantitative aspect of analysis	Remember, Understand, Analyze
	Unit II: Optical methods of analysis	Remember, Understand, Analyze
	Unit III: Thermal methods of analysis	Remember, Understand, Analyze
	Unit IV: Electroanalytical methods	Remember, Understand, Analyze
	Unit V: Separation Techniques	Remember, Understand, Analyze
	Unit VI: Practical	Analyze

Paper Name: INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS

Paper Code: CHE-HE-5066

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Gain the fundamental concepts/theory and application of different analytical techniques, as applied to chemistry. • Explain the theoretical basis of different analytical techniques, identify the experimental requirements and compare/analyze the data/results thereof. 	Unit I: Introduction to spectroscopic analysis	Remember, Understand, Analyze
	Unit II: Molecular Spectroscopy	Remember, Understand, Analyze
	Unit III: Separation Techniques	Remember, Understand, Analyze
	Unit IV: Elemental Analytical	Remember, Understand, Analyze
	Unit V: Separation Techniques	Remember, Understand, Analyze

	Unit VI: Practical	Analyze
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6th Semester (honours)

CHE-HC-6014: Inorganic Chemistry-V

Paper Code: CHE-HC-6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Get acquainted with the kinetic and thermodynamic factors governing the reaction path and stability of inorganic compounds. • Know about the importance of metal carbon bond to form complexes and their application as catalysts. • Learn factors leading to stability of organometallic compounds, their synthesis, reactivity and uses. • Give an idea and hands on experience of application of inorganic chemistry. • Learn how differential reactivity under different conditions of pH can be used to identify variety of ions in a complex mixture. • Synthesis and characterize the coordination compounds. 	Unit I: Mechanism of Inorganic reactions	Remember, Understand, Analyze
	Unit II: Organometallic compounds	Remember, Understand, Analyze
	Unit III: Transition metals in Catalysis	Remember, Understand, Analyze
	Unit IV: Theoretical Principles in Qualitative Analysis	Remember, Understand, Analyze
	Unit VI: Practical	Analyze

CHE-HC-6014: Organic Chemistry-V

Paper Code: CHE-HC-6026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Learn about the different spectroscopic techniques and their applications in organic chemistry. • Apprised with carbohydrate chemistry, dyes and polymers and their structure, reactivity and chemical properties. • Synthesise organic polymers, extraction of organic compounds 	Unit I: Spectroscopy	Remember, Understand, Analyze
	Unit II: Carbohydrates	Remember, Understand, Analyze
	Unit III: Dyes	Remember, Understand, Analyze
	Unit IV: Polymers	Remember, Understand, Analyze
	Unit VI: Practical	Analyze

Paper Name: Industrial Chemicals and Environment**Paper Code: CHE-HE-6026**

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Learn the various industrial gases and inorganic chemicals, their manufacturing processes, applications, storage and the hazards of handling them. Learn about metallurgy, energy generation in industry. Learn about the manufacture, applications and safe ways of storage and handling gaseous and inorganic industrial chemicals. Know about industrial metallurgy and the energy generation industry. Learn about environmental pollution by various gaseous, liquid wastes and nuclear wastes and their effects. Learn about industrial waste management, their safe disposal and the importance of "green chemistry" in chemical industry. 	Unit I: Industrial gases and Inorganic Chemicals	Remember, Understand, Analyze
	Unit II: Industrial Metallurgy	Remember, Understand, Analyze
	Unit III : Environment and its segment	Remember, Understand, Analyze
	Unit IV: Energy and Environment	Remember, Understand, Analyze
	Unit V: Biocatalysis	Remember, Understand, Analyze
	Unit VI: Practical	Analyze

Paper Name: Project**Paper Code: CHE-HE-6066**

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be skilled with research methodologies.	Unit I: Practical	Understand, Analyze

POs and Cos of Commerce

PROGRAM OUTCOME:- The Bachelor of Commerce (B.Com.) course is designed to provide competencies in basic commerce discipline as also impart requisite skills in problem solving, leadership, communications, decision making in organizations with appropriate subjects covering areas of economics, accounting, business management, human resource, taxation, marketing management and Information Technology.

Pragjyotish College affiliated under Gauhati University follows the Choice Based Credit System (CBCS) which is a proven, flexible mode of learning in higher education which facilitates a student to have guided freedom in selecting his/her own choices of courses in the curriculum for completing a degree program. This is

coupled with a focus on Project Based Learning to enable the students become eligible and fully equipped for employment in industries, higher studies or entrepreneurship.

The course structure will definitely equip the students to accept the challenges of globalization and constant change and will enable them to be well placed in business, academics and administration in the country as well as abroad.

PROGRAM SPECIFIC OUTCOME:- PSO₁ :

PSO 1: Students get adapted to rapid changes in courses, applications of different tools and technology

PSO 2: There is creation of an environment of continuous learning to improve good interpersonal skills as a leader in a team.

PSO 3: Students will prove themselves in different examinations like CA, CMA, CS.

PSO 4: Students will be acquired with the knowledge and skill in different areas of communication, decision making in day to day business activities.

PSO 5: The students understand the social responsibility for specific goal achievement, analytical and problem solving skills.

PSO 6: There is learning of communication skills, presentations in class rooms and conducting projects.

PSO 7: Students get used to Internal evaluations, tests, assignments, group discussions for analysing subjects and problems relating to subjects.

PSO 8: Students will able to play the roles of businessmen, entrepreneur and consultant which will help learners to possess knowledge and other soft skills, act promptly when confronted with critical decision making.

B.Com Semester-I

SUBJECT : Business Communication (English/Hindi/Assamese/Bengali).
Ability Enhancement Compulsory Course (AECC)-1

Paper Code : BCM-AE-1014

ENGLISH

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To enable the students	UNIT -1 To help the students to understand	Understanding

to acquire skills in reading, writing, comprehension and communication, and also to use electronic media for business communication	the basics and theories of communications.	
	UNIT -2 To acquire the knowledge of writing different business correspondence	Understand and Apply
	UNIT -3 To acquire the knowledge of writing different business correspondence.	Understand and Apply
	UNIT -4 To acquire the accuracies in English grammar.	Practice and apply
	UNIT -5 The soft skills and the presentation skills help the students to become professionally proficient and confident.	Practice and apply

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
The objective of this course is to develop effective business communication skills among the students	UNIT -1 Students will be able to know how to communicate in Hindi language at commercial and noncommercial sectors. It will help to understand the forms and classification of business communication in Hindi language.	Remember
	UNIT -2 students will be able to write various types of applications and business letters in Hindi language	Remember & Understand
	UNIT -3 Students will be able to write a report clearly and succinctly as possible with evidence about a topic, problem or any situation in Hindi language	Remember
	UNIT -4 Students will be able to use proper words and proper forms of sentences to write reports, agenda, notice, tender etc in Hindi language.	Understand
	UNIT -5 Equips the students to learn the effective way of communication so that they can communicate with confidence in the	Remember

	corporate world.	
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COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To equip students of B.Com (Hons) course effectively to acquire skills in reading, writing, comprehension and communication, also to use electronic media for business communication.	UNIT -1 In this unit the students will be benefited as they will know how to communicate in Assamese language at commercial and noncommercial sectors.	Remember
	UNIT -2 Students will be able to write various types of applications, and business letters in Assamese language.	Remember & Understands
	UNIT -3 The students will be able to write a report clearly and succinctly as possible with evidence a topic, problem or any situation in Assamese language.	Understand
	UNIT -4 They will be able to properly write applications, business reports, notice, agenda, job application letter, tender writing etc in Assamese language.	Understand
	UNIT -5 Presentation skills can help to develop students confidence.,	Remember

SUBJECT : **Financial Accounting (Core Course C-1)**

Paper Code : COM-HC-1026

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
Help students acquire	UNIT -1 To examine the qualitative aspect of the published financial statement and to analyse this statement in the light of	Evaluate

conceptual knowledge of the Financial Accounting and to impart skills for recording various kinds of business transactions	applicable accounting standards	
	UNIT -2 To apply basic knowledge on computerised accounting using Tally in preparing accounts.	Apply
	UNIT -3 To acquire the concept and measurement of business income	Understand
	UNIT -4 Able to prepare final accounts of non-corporate entities	Apply
	UNIT -5 To acquire knowledge to prepare accounts of some other forms of business	Understand and Apply

SUBJECT : Business Law (Core Course C-2)

Paper Code : COM-HC-1036

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To enable the students to apply the provision of business laws in business activities. To inculcate knowledge on various laws relating to business such as Partnership, LLP, Contract, Negotiable Instrument. To equip with proper knowledge of Contracts, Sales of Goods etc.	UNIT -1 understand basic concepts of contracts for making agreements	Understand and remember
	UNIT -2 be able to recognize and differentiate the special contracts	Understand and analyse
	UNIT -3 equip the students about the legitimate rights and obligations under the sale of goods act	Remember and understand
	UNIT -4 understand basic concepts about partnership and LLP.	Understand and remember
	UNIT -5 5 understand the fundamentals of Negotiable Instrument act	Understand and remember

SUBJECT : Micro Economics (Generic Elective (GE)-1)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
The objective of the course is to acquaint the students with the concept of Micro economics dealing with consumer behavior. The course also makes the students understand the supply side of the market through the production and cost behavior of firms.	UNIT -1 This unit will help students to understand the consumer behavior through the indifference curve analysis and its various tools and also acquire the knowledge of revenue.	Knowledge
	UNIT -2 This unit will help students to understand the production and cost behavior of the firms and how the resources are to be used in an optimal manner with minimum cost.	Ananalysis
	UNIT -3 This unit will help students to understand the market behavior of perfect competition market, and understand the stability condition in the context of partial and general equilibrium.	Evaluation
	UNIT -4 This unit will help students to learn the monopoly behavior of the firm and the industry and how the monopoly attains the equilibrium position in the short run and long run.	Understand
	UNIT -5 This unit will help students to learn the concept of imperfect competition of market like monopolistic and oligopoly. They will also understand the price- output decision of firms with economic efficiency.	Analysis

SUBJECT : Investing in Stock Markets (Generic Elective (GE)-2)

Paper Code : COM-GE-1046(B)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
It intends to provide basic skills to operate in stock markets and the ways of investing in it.	UNIT -1 Gaining the basic knowledge about stock market	Remember and understand
	UNIT -2 How online trading stocks are analysed and valued.	Analyse and understand
It enable the student to take up investment	UNIT -3 How investment in mutual funds is done.	Understand and apply

in stock markets independently.	UNIT -4 Understanding derivatives	Remember and understand
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Semester-II

SUBJECT : **Environmental Studies (Ability-Enhancement Compulsory Course (AECC)-2)**
 Paper Code : ENV-AE-2014

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To Impart basic knowledge about the environment and its allied problems. To furnish awareness among students about environmental Eco system, Natural Resources, Biodiversity and Conservation. Developing an attitude of concern for the environment. Acquiring skills to help the concerned individuals in identifying and solving environmental problems	UNIT -1: In this unit the students will get to know about multidisciplinary nature of environmental studies.	Remember and Understand
	UNIT -2 : In this unit the students will learn about Eco-system, their structure and functions, energy flows of eco system and food chains and food web and ecological succession.	Remember and Understand
	UNIT -3 : Through this unit the students will learn about different types of Resources (renewable and non-renewable)	Remember
	UNIT -4 : Through this unit the students will learn about the level of biodiversity, India as biodiversity nation, threats to biodiversity, eco system and diversity services.	Remember & Analyse
	UNIT -5 : In this unit the students will learn about types, causes, effects of pollution. Nuclear hazards and human health risks, pollution case studies.	Remember & Analyse
	UNIT 6: In this unit students will learn about climate changes, global warming, Ozone layer and its impact on human and agriculture and different environment protection laws.	Remember and Understand
	UNIT 7: This unit will describe about	Remember and Understand

	<p>impact of population growth on environment, disaster management, environmental movements, environmental ethics and public awareness.</p>	
	<p>UNIT 8: In this unit students will have to do field work and study about polluted sites, common plants and insects, birds and simple eco system.</p>	<p>Understand, Analyse, Apply</p>

SUBJECT : **Corporate Accounting (Core Course C-3)**
 Paper Code : COM-HC-2026

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To help students acquire the conceptual knowledge of the corporate accounting and to learn techniques of preparing the financial statements	UNIT -1 Provides knowledge on the various accounting procedures followed by the Companies Act 2013	Remember and Understand
	UNIT -2 To familiarise the concept of issue and redemption of shares and preparation of final account.	Create and evaluate
	UNIT -3 Provide detail knowledge about internal reconstruction of companies	Understand
	UNIT -4 To provide detailed knowledge about amalgamation of companies	Analyse and apply
	UNIT -5 Enables to prepare consolidated financial statements as per AS-21	Create and apply

SUBJECT : **Corporate Laws (Core Course C-4)**
 Paper Code : COM-HC-2036

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To impart basic knowledge of the provisions of the Companies Act 2013 and Depositories Act 1996	UNIT -1 know concepts, incorporation and formation of a company	Understand and remember
	UNIT -2 documents of a company	Understand and remember
	UNIT -3 know about management and various types company meetings	Remember and analyse
	UNIT -4 provisions relating to winding up of a company.	Understand and remember
	UNIT -5 depositories law	Remember and analyse

SUBJECT : **Macro Economics (Generic Elective (GE)-2)**
 Paper Code : COM-GE-2046(A)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
The course aims at providing the student with knowledge of basic concepts of the macro economics.	UNIT -1: This Unit include concept variables of macroeconomics and static macroeconomic analysis	Remember, Understand
	UNIT -2 : This unit will make the student understand the concept of IS-LM framework	Understand , Apply

The modern tools of macro-economic analysis are discussed and the policy framework is elaborated, including the open economy.	and fiscal and monetary policy in the IS-LM framework.	
	UNIT -3: This unit analyse inflation, unemployment and labour market and its interaction with production system.	Apply, Evaluate
	UNIT -4 : This unit makes the students understand the concept of open economy and gives the concept of flow of goods and capital, saving and investment in a small and a large open economy.	Understand, Application
	UNIT -5 : This unit will make the student to understand the behavioral foundation like investment, demand for money, and supply of money.	Apply, Evaluate

SUBJECT : **Insurance & Risk Management (Generic Elective (GE)-2)**
 Paper Code : COM-GE-2046(B)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To develop an understanding among students about identifying analyzing and managing various types of risk. Besides, the students will be in a position to understand principles of insurance and its usefulness in business along with its regulatory framework.	UNIT -1 Understanding concept of risk and gaining knowledge of tackling different types of risk.	Understand
	UNIT -2 Gives exposure regarding concept of insurance.	Apply, Analyze
	UNIT -3 To educate about the different types and principles of insurance.	Remember
	UNIT -4 To impart knowledge on regulatory framework of insurance.	Remember, Apply

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CATIONS IN BUSINESS (Core Course C-5)
 Paper Code : COM-HC 3016

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To provide computer skills and knowledge for commerce students and to enhance the student understands of usefulness of information technology tools for business operations.	UNIT -1 Through this unit students will learn concept about word processing, text formatting, tab paragraph formatting, inserting formatting a table, inserting pictures and videos, Mail Merge-including linking with database and printing documents.	Remember->Understand->Apply
	UNIT -2 This unit will help a students to learn how to creating a good and effective power point presentation using media design and transition.	Understand -> Apply
	UNIT -3 This unit will help students to understand worksheet applying different functions like mathematical, Statistical, financial, logical formulas, handling multiple worksheets, organizing graphs & charts	Remember -> Understand -> Apply
	UNIT -4 This unit help student to create payroll statements, Ration Analysis, capital budgeting using spreadsheet.	Understand->Apply
	UNIT -5 In this unit the students will learn about Database Management System for Accounting and Business Applications through initial design ER modeling, Basic queries in SQL, Applying DBMS in the areas of Accounting, Inventory and managing the data records of Employees, Customers, Suppliers.	Understand->Remember>Apply

SUBJECT : INCOME TAX LAW AND PRACTICE (Core Course C-6)
Paper Code : COM-HC 3026

Course Outcome	Course Outline	Blooms Taxonomy Level
To provide basic knowledge and equip students with application of principles and provisions of Income Tax Act 1961 and the	UNIT-1 To introduce the students with the basic concepts of income tax	Remember and apply
	UNIT-2 Enables to compute Income from Salaries and House Property	Apply
	UNIT-3 Helps in computation of income from Profits and Gains of business	Apply

relevant rules	UNIT-4 Students will know and learn to compute Total Income and tax liability	Apply
	UNIT-5 Acquire skills to file income tax return	Understand and apply

SUBJECT : Management Principles and Applications (**Core Course C-7**)
 Paper Code : COM-HC 3036

Course Outcome	Course Outline	Bloom's Taxonomy
The objective of the course is to provide the student with an understanding of basic management concepts, principles and practices.	Unit 1: Gain knowledge on the evolution of management thoughts	Remember, Understand
	Unit 2: Understand the strategic planning process in the organisation.	Understand, Apply
	Unit 3: Understanding the concept of organisation	Understand
	Unit 4: Demonstrate the ability to directing, leadership and communicate effectively.	Understand, Apply
	Unit 5: Analysis isolate issues and formulate best control methods	Understand, Apply

SUBJECT : Business Statistics (**Generic Elective (GE)-3**)
 Paper Code : COM-GE-3046 (A)

Course Outcome	Course Outline	Bloom's Taxonomy
To fameliarise the students with the basic statistical tools used for managerial decision-making.	Unit 1: To learn about statistical data and descriptive statistics and able to find average value in different ways.	Remember, Apply
	Unit 2: To acquire the concept of probability and probability distribution.	Remember, Apply, Evaluate
	Unit 3: To learn about simple correlation and regression analysis.	Remember, Apply, Understand
	Unit 4: To enable students to apply the knowledge of index numbers.	Remember, Apply, Understand
	Unit 5: To provide students with sufficient knowledge about time series analysis and to apply in different situations	Remember, Understand, Apply

	Unit 6: To understand sampling concepts, its distributions, estimations and testing of hypothesis and also to apply in different field study.	Remember, Apply, Evaluate, Understand
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SUBJECT : Operation Research in Business (**Generic Elective (GE)-3**)
 Paper Code : COM-GE-3046 (B)

Course Outcome	Course Outline	Bloom's Taxonomy
To help students acquire knowledge of business research and its application in problem solution	Unit 1: Formulate operation research models to solve business problems	Create
	Unit 2: Determine optimum levels of inputs for maximising profits, output and minimising losses by applying linear programming models	Apply
	Unit 3: Understand the different types of cost in inventory control	Understand
	Unit 4: Learn replacement problems	Remember
	Unit 5: Understand project management	Understand

SUBJECT : Entrepreneurship (**Skill-Enhancement Elective Course (SEC)-1**)
 Paper Code : COM-SEC-HC-3054 (A)

Course Outcome	Course Outline	Bloom's Taxonomy
The purpose of the paper is to orient the learner toward entrepreneurship as a career option and creative thinking and behavior.	Unit 1: Know about basics of entrepreneurship, types, and functions of entrepreneurs.	Understand
	Unit 2: Know about MSME, promotional agencies of entrepreneurship	Understand
	Unit 3: Be familiar with SHGs, angel investors, entrepreneurial development programs and relevant issues.	Understand
	Unit 4: : Understand different sources of business ideas and test of feasibility.	Understand, Apply, Create

	Unit 5: : Be familiar with mobilizing resources for startups	Remember, Understand, Create
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SUBJECT : New Venture Planning (**Skill-Enhancement Elective Course (SEC)-1**)
 Paper Code : COM-SEC-HC-3054 (B)

Course Outcome	Course Outline	Bloom's Taxonomy
The curriculum aims at giving exposure to students regarding different aspects of setting up a new business. After completing the course student should be able to develop an understanding of the process of identifying various sources of new business ideas of products and services.	Unit 1: To gain ideas regarding starting of a new ventures.	Understand, Apply, Create
	Unit 2: To know about the different methods of entering into a venture with its advantages and disadvantages.	Understand, Remember
	Unit 3: To know the legal challenges in setting up a business.	Understand, Apply
	Unit 4: To help in examining and evaluating the different sources of finance.	Understand, remember, Apply
	Unit 5: To understand the nature of marketing efforts required in new ventures.	Understand, Apply, Create
	Unit 6: To gain knowledge to develop a comprehensive business plan.	Understand, Create

Semester-IV

SUBJECT : Cost Accounting (**Core Course C-8**)
 Paper Code : COM-HC-4016

Course Outcome	Course Outline	Bloom's Taxonomy
To acquaint the students with basic concepts	Unit 1: To familiarise with the concept of cost and cost sheet	Remember

used in cost accounting, various methods involved in cost ascertainment and cost accounting book keeping systems	Unit 2: To acquaint the students with the different techniques of inventory control	Understand, Apply
	Unit 3: To understand accounting and control of labour cost	Understand
	Unit 4: To know and understand the classification, allocation, apportionment, and absorption of overheads	Remember, Understand
	Unit 5: Learn the methods of costing	Understand
	Unit 6: To understand book keeping in cost accounting	Understand

SUBJECT : Business Mathematics (Core Course C-9)

Paper Code : COM-HC-4026

Course Outcome	Course Outline	Bloom's Taxonomy
To familiarize the students with the basic financial mathematics tools with an emphasis on applications to business and economic situations	Unit 1: To learn about matrices and determinants and to apply in business and economics.	Remember, Understand , Apply
	Unit 2: To learn about functions and differentiations with its application in business relating to cost, revenue and profit.	Understand , Remember, Apply, Evaluate
	Unit 3: To learn the application of integration to marginal analysis in business	Remember, Understand, Apply
	Unit 4: To enable students to apply the simple interest and compound interest and annuities in different fields.	Remember, Understand, Apply
	Unit 5: To provide students with sufficient knowledge about time and work, profit, loss, discount, Ratio proportion, mixture in business and economics	Understand, Apply
	Unit 6: To learn about linear programming which are most frequently used operations Research Techniques. This technique is also applicable in every functional area of management, production planning and control, personal management, advertising etc.	Remember, Understand, Apply

SUBJECT : Human Resource Management (Core Course C-10)

Paper Code : COM-HC-4036

Course Outcome	Course Outline	Bloom's Taxonomy
The objective of the course is to acquaint students with the techniques and principles to manage human resource of an organization.	Unit 1: To know the basics of HRM, concept, objectives, scope, functions, importance and evaluation of HRM	Understand, Evaluate
	Unit 2: To know the process of recruitment, selection and placement of an employee.	Understand, Apply
	Unit 3: To understand the need for training and development of human resources.	Understand, Apply
	Unit 4: To highlight the methods of performance appraisal and wage payment.	Understand
	Unit 5: Be aware of areas of employee's health and safety measures.	Understand, Apply

SUBJECT : Indian Economy (**Generic Elective (GE)-4**)
Paper Code : COM-GE-4046 (A)

Course Outcome	Course Outline	Bloom's Taxonomy
This course seeks to enable the student to grasp the major economic problems in India and their solution.	Unit 1: This unit discusses the concept and measures and developments, underdevelopment and human development.	Understand, Apply
	Unit 2: This unit will the students to understand the concept of National income in India and agriculture and industrial structure of our Country.	Knowledge, Understand
	Unit 3: This unit enables the students to understand the evaluation of planning, economic reforms in India and monetary and fiscal policy with their implication on economy	Evaluation, Application
	Unit 4: This Unit analyse the experience of growth, development: structural change and	Understand, Apply

	policy regimes across sectors and regions.	
	Unit 5(A): This unit basically include agriculture sector in India and its policy regimes i.e green revolution, price policy and public distribution system.	Understand, Evaluation
	Unit 5(B): In this unit the students can learn industrialization of Northeastern region, Act East Policy, cross border trade, border area development.	Knowledge, Comprehension

SUBJECT : Micro Finance (Generic Elective (GE)-4)

Paper Code : COM-GE-4046 (B)

Course Outcome	Course Outline	Bloom's Taxonomy
To make the students understand the basic concepts of micro finance and its importance, institution structure, management of micro finance institutions and micro finance in indian context.	Unit 1: Micro Finance and its development in India	Understand, Remember
	Unit 2: Micro Finance Institutions and its structure	Remember, Understand
	Unit 3: Role of NABARD and problems and prospects of micro finance	Remember
	Unit 4: How to manage micro finance	Understand
	Unit 5: Regulatory framework of micro finance	Understand ,Apply

SUBJECT : E-Commerce (Skill-Enhancement Elective Course (SEC)-2)

Paper Code : COM-SEC-HC-4054 (A)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To enable the students to become familiar with the mechanism for conduction business transactions through the electronic means.	UNIT -1: Through this unit the students will learn meaning , Nature, concept, for transacting online, type of E-commerce, key elements of business model, technology used in E-commerce- designing, building and launching e-commerce website(a systematic approach involving hardware, software, outsourcing vs inhouse development of a website.	Remember->Understand
	UNIT -2: Through this unit the students will	Understand -> Remember

	learn about Security threats in E-Commerce Environment, Technology solutions (Encryption, security channels of communication, protecting networks and protecting servers and clients.	
	UNIT -3: Through this unit the students will learn about IT Act 2000-definition,Digital signature, Electronic governance, acknowledgement and dispatch of electronic records, Regulation of certifying authority, offences and cyber crimes	Remember -> Understand ->
	UNIT -4: Through this unit the students will learn about models and methods of e-payments, digital signature, payment gateway online banking-meaning, concept, EFT, risk involved in e-payments.	Understand ->Remember
	UNIT -5: Through this unit the students will learn the purpose, advantage and disadvantage of transacting online, Ecommerce applications in various industries, online services, auctions, online portals, online shopping etc.	Understand->Remember
	UNIT -6 : Through this unit the students will learn about HTML language, Tags and attributes, hypertext links, tables list, forms.	Understand->Apply

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Returns (Skill-Enhancement Elective Course (SEC)-2)

Paper Code : COM-SEC-HC-4054 (B)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To provide the students the concepts and practical knowledge about electronic filing of returns	UNIT -1: To understand the conceptual framework of e-filing	Remember
	UNIT -2: To provide knowledge about Income Tax and e-filing of ITRS	Understand, Apply
	UNIT -3 : To acquaint with TDS and e-filing of TDS returns	Apply
	UNIT -4 : To acquire knowledge of GST and e-filing of GST returns	Analyze, Apply

Semester-V

SUBJECT : Principles of Marketing (Core Course C-11)

Paper Code : COM-SEC-HC-5016

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
The objective of this course is to provide basic knowledge of concepts, principles, tools and techniques of marketing.	UNIT -1: To develop understanding of basics concept of marketing and environmental conditions effecting marketing decisions of a firm.	Understand, Apply, Create
	UNIT -2: Understand the dynamics of consumer behavior and process of market selection.	Understand
	UNIT -3: Understand and analyse the process of value creation through marketing decisions involving product development.	Understand, Apply
	UNIT -4: Understanding marketing decisions involving product pricing and its distribution.	Understand, Apply
	Unit 5 : Understanding marketing decisions involving product promotion and recent developments in marketing.	Understand, Apply

SUBJECT : Fundamentals of Financial Management (**Core Course C-12**)

Paper Code : COM-SEC-HC-5026

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To familiarise the students with the principles and practice of Financial Management	UNIT -1: To understand the concept of Financial Management and risk and return analysis	Remember
	UNIT -2: To acquaint with Investment Decision	Understand
	UNIT -3: To gain knowledge about financial decision	Apply
	UNIT -4: To learn the different theories of Dividend Decisions	Remember
	Unit- 5 : To familiarise the concept of Working Capital Decisions	Remember

SUBJECT : MANAGEMENT ACCOUNTING (**Discipline Specific Elective (DSE)**)

Paper Code : COM-DSE-HC-5036 (A)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
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To impart the students, knowledge about the use of financial, costs and other data for the purpose of managerial planning, control and decision making	UNIT -1: To understand the concept of management accounting and application of cost concept in managerial decision making	Analyse and apply
	UNIT -2: To equip with the techniques of financial statement analysis.	Evaluate and apply
	UNIT -3: Enable to prepare different kinds of budgets	Apply
	UNIT -4: To acquaint with Standard Costing and Variance Analysis	Understand
Unit- 5 : To provide knowledge on Marginal Costing and its techniques	Understand	

SUBJECT : ADVANCED FINANCIAL ACCOUNTING (**Discipline Specific Elective (DSE)**)
Paper Code : COM-DSE-HC-5036 (B)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
Aim to impart advanced knowledge on financial accounting applicable in business of special nature and on government accounting system	UNIT -1: To acquire knowledge for preparation of Royalty Account	Analyse and apply
	UNIT -2: To learn to prepare departmental accounts	Evaluate and apply
	UNIT -3: To gain knowledge on Accounting for Amalgamation and Dissolution of partnership firm	Apply
	UNIT -4: To acquire knowledge on the methods and procedures for the calculation of insurance claims	Understand
	Unit- 5 : To familiarise with government accounting	Understand

SUBJECT : ADVERTISING (**Discipline Specific Elective (DSE)**)
Paper Code : COM-DSE-HC-5036 (C)

COURSE	COURSE OUTLINE	BLOOM TAXANOMY
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OUTCOME		
The objective of this course is to familiarize the students with the basic concepts, tools and techniques of advertising used in marketing.	UNIT -1: : Have an idea about advertisement and advertising and other related issues.	Understand
	UNIT -2 Explain about advertising planning, development of advertising program and media in advertising.	Understand, Apply
	UNIT -3: To gain knowledge about advertising appeals and preparing ads for different media.	Understand, Apply, Create
	UNIT -4: Discuss about an effective advertisement and its features.	Understand
	Unit- 5 : Understanding about advertising agency and socio ethical and legal aspects of advertising in India.	Understand, Apply

SUBJECT : BANKING (**Discipline Specific Elective (DSE)**)
Paper Code : COM-DSE-HC-5036 (D)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
The course seeks to impart banking Knowledge and habit among the students.	UNIT -1: Imparting knowledge about bank, its origin developments and types.	Remember, Understand , Evaluate
	UNIT -2 : Understanding about banker-customer relationship, banking ombudsman scheme.	Remember, Understand
	UNIT -3 : Enhancing students about the employment of bank funds, loans and advances etc.	Remember, Understand ,Apply
	UNIT -4 : Understanding about Negotiable Instrument, its type	Remember, Understand, Apply
	Unit- 5 : Imparting Knowledge about Banking Regulation Act, Power of the RBI, Banking sector reforms etc.	Remember, Understand.

SUBJECT : Computerised Accounting System (**Discipline Specific Elective (DSE)**)
Paper Code : COM-DSE-HC-5036 (E)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
This course seeks to enhance the skills needed for computerized accounting system and to enable the students to develop simple accounting applications.	UNIT -1 : In this unit the students will learn Auditing in Computerized Accounting system.	Understand-> Remember
	UNIT -2 : In this unit students will learn about designing an accounting system using DBMS & SQL packages.	Understand-> Remember->Apply
	UNIT -3 : In this Unit the students will design Supplier and customers System for Accounting using Form, Query, Module, and Report; Designing Payroll System for Accounting using Form, Query, Module, and Report	Understand-> Remember->Apply

Semester-VI

SUBJECT : Auditing and Corporate Governance (**Core Course C-13**)
 Paper Code : COM-HC-6016

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To provide knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards and to give an overview of the principles of corporate governance and corporate social responsibility applications.	UNIT -1 : To provide basic knowledge of auditing and its principles and techniques	Remember
	UNIT -2: To acquaint with audit of companies.	Understand
	UNIT -3: To provide knowledge on special areas of audit.	Understand and remember
	UNIT -4: To familiarise with the concept of corporate governance.	Remember
	Unit- 5: To give an overview of Business Ethics.	Understand
	UNIT-6 : To know about Corporate Social Responsibility	Understand

SUBJECT : **Indirect Tax Laws (Core Co**

urse C-14)
 Paper Code : COM-HC-6026

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To provide basic knowledge and equip students with application of principles and provisions of Service Tax, VAT, Central Excise and Customs Laws	UNIT -1 : To provide knowledge on the basic concept of Indirect Tax and VAT	Understand and apply
	UNIT -2: To acquaint with Central Excise.	Understand and apply
	UNIT -3 : To provide an insight of Customs Law	Apply
	UNIT -4 : To acquire knowledge on the structure of GST in India	Understand
	Unit- 5 : To know how registration, levy and collection of tax under GST is done	Remember

SUBJECT : **Fundamentals of Investment (Discipline Specific Elective (DSE))**
 Paper Code : COM-DSE- HC-6036 (A)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To familiarise the students with different investment alternatives, introduced them to the framework of their analysis and valuation and highlight the role of investor protection	UNIT -1 : To gain knowledge on investment environment	Understand and remember
	UNIT -2: To understand about fixed income securities.	Remember and understand
	UNIT -3 : approaches to equity analysis	Understand and analyse
	UNIT -4 : portfolio analysis and financial derivatives	Analyse and create
	Unit- 5 : provisions relating to investor protection	Understand and apply

SUBJECT : **Consumer Affairs and Customer Care (Discipline Specific Elective (DSE))**
 Paper Code : COM-DSE- HC-6036 (B)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
This paper seeks to familiarize the students with of their rights as a consumer, the social framework of consumer rights and legal framework of protecting	UNIT -1 : To understand conceptual framework of markets, experiencing and voicing dissatisfaction.	Understand, Apply
	UNIT -2: To get awareness about Consumer Protection Act, 1986 and organizational setup under CPA.	Remember, Understand
	UNIT -3 To know about the grievance redressal mechanism under the CPA, 1986.	Understand, Apply

<p>consumer rights. It also provides an understanding of the procedure of redress of consumer complaints, and the role of different agencies in establishing product and service standards. The student should be able to comprehend the business firms' interface with consumers and the consumer related regulatory and business environment.</p>		
	UNIT -4 : To impart knowledge on industry regulators and consumer complaint redress mechanism.	Remember, Understand, Apply
	Unit- 5: To understand about quality and standardization: ISI, AG-MARK, Hallmarking etc role of BIS.	Remember, Understand

SUBJECT : Advanced Corporate Accounting (Discipline Specific Elective (DSE))
Paper Code : COM-DSE- HC-6036 (C)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To help the students acquire advanced knowledge of Corporate Accounting and to learn the techniques of preparing accounts and	UNIT -1 : To give an overview of Accounting Standards	Remember
	UNIT -2: To acquaint with Corporate Annual Report and analysis with case studies	Remember and analyse
	UNIT -3 To learn the preparation and	Understand and apply

statements under various corporate situations	presentation of financial statements of banking companies.	
	UNIT -4 : To enable to prepare accounts of Insurance Companies.	Understand
	Unit- 5 :To understand the preparation of Investment Accounts	Understand

SUBJECT : **Industrial Relations and Labour Laws (Discipline Specific Elective (DSE))**
 Paper Code : COM-DSE- HC-6036 (C)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
To enable the students to learn the concepts of industrial relations including trade unions, collective bargaining, discipline and various labor enactments.	UNIT -1: Have knowledge regarding concepts and theories of IR.	Remember, Understand
	UNIT -2: To know about the origin, growth and importance of trade Unions.	Remember, Understand
	UNIT -3: Analyze collective bargaining and Worker's participation in management.	Remember, Understand
	UNIT-4: Analyze Industrial conflict, grievances, provision for strikes and lockouts etc.	Remember, Understand
	Unit- 5: Understand objectives, provision and working of the factories Act, 1948 and Industrial disputes Act, 1947.	Remember, Understand, Apply

SUBJECT : **Business Research Methods and Project Work (Discipline Specific Elective (DSE))**
 Paper Code : COM-DSE- HC-6036 (C)

COURSE OUTCOME	COURSE OUTLINE	BLOOM TAXANOMY
This course aims at providing the general understanding of business research and the methods of business research. The	UNIT -1: To be familiar with the concept of Research and its types and hypothesis.	Remember, Understand, Apply
	UNIT -2: Understanding about problem identification and Research process.	Remember, Understand,

course will impart learning about how to collect, analyze, present and interpret data.		Apply, Create
	UNIT -3: Getting knowledge about different measurement scales and hypothesis testing: Parametric and Non Parametric.	Analyze, Evaluate, Create
	UNIT-4: To enable to prepare project report	Understand and create

Department of Computer Science

Programme Specific Outcome (B.Sc in Computer Science) (CBCS)

One of the most important benefits of taking computer courses is that the students will have more jobs available to them. The types of new jobs that will be available depend on what kind of courses they take, but every group of courses will open up new opportunities. Almost all jobs require that a worker has some computer skills. The number of positions available to those *who aren't comfortable using computers gets smaller each day*.

Students, who choose **B.Sc. Computer Science (Honours)** Programme (under **CBCS**), will 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 sector, Research field, Government sector, Business sector and Industry.

The program covers the various essential concepts in Computer Science. These are included as 14 core courses.

An exceptionally broad range of topics covering current trends and technologies in Computer Science are included in the course.

Hands on sessions in Computer Lab using various Programming languages and tools will enable students to deal with real life problems which will lead to better understanding of the topics and will also widen the horizon of students' self-experience. //

Completion of **B.Sc. Computer Science (Honours) Programme** (under **CBCS**) shall enable a student :-

- (1) To communicate technical information both orally and in writing.
- (2) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
- (3) 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.
- (4) To design, implement, and evaluate computer-based system, process, component, or program to meet desired needs by critical understanding, analysis and synthesis.
- (5) Identify applications of Computer Science in other fields in the real world to enhance the career prospects.
- (6) An ability to communicate effectively with a range of audiences
- (7) Realize the requirement of lifelong learning through continued education and research.
- (8) Use the concepts of best practices and standards to develop user interactive and abstract application.
- (9) Understand the professional, ethical, legal, security, social issues and responsibilities.
- (10) An ability to use current techniques, skills, and tools necessary for computing practice.

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COURSE OUTCOME

B.Sc. in Computer Science (Honours) Syllabus (CBCS)

I Semester

Paper Name : Programming Fundamentals using C/C++

Paper Code : CSC-HC-1016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>On successful completion of this subject the students have the Basic fundamental concepts of the Computer Programming ability in C/C++ Language.</p> <p>The first part of this paper helps students to inculcate knowledge on the basic concepts of C programming includes arrays, structures, function, strings, pointers and files.</p> <ul style="list-style-type: none"> • Understand the basic terminology used in computer programming. • Write, compile and debug programs in C language. • Create programs involving decision structures & unions, loops, strings and functions. • Design programs involving structures and pointers. <p>The second part of this paper helps students to inculcate knowledge on</p>	Unit-1: Introduction to C and C++	Remember, Understand Analysis, Evaluate
	Unit-2: Data Types, Variables, Constants, Operators and Basic I/O	Remember, Understand Analysis, Evaluate
	Unit-3: Expressions, Conditional Statements and Iterative Statements	Remember, Understand Analysis, Evaluate
	Unit-4: Functions and Arrays	Remember, Understand Analysis, Evaluate
	Unit-5: Derived Data Types (Structures and Unions)	Remember, Understand Analysis, Evaluate
	Unit-6: Pointers and References in C++	Remember, Understand Analysis, Evaluate
	Unit-7: Memory Allocation in C++	Remember, Understand Analysis, Evaluate
	Unit-8: File I/O, Preprocessor Directives	Remember, Understand Analysis, Evaluate
	Unit-9: Using Classes in C++	Remember, Understand Analysis, Evaluate
	Unit-10: Overview of Function Overloading and Operator Overloading	Remember, Understand Analysis, Evaluate
	Unit-11: Inheritance and Exception Handling	Remember, Understand Analysis, Evaluate

Paper Name : Computer System Architecture

Paper Code : CSC-HC-1026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>This paper includes 4 main topics :</p> <p>(1) Boolean Algebra,</p> <p>(2) Digital Logic</p>	Unit-1: Introduction	Remember, Understand Analysis, Evaluate
	Unit-2: Data Representation and Basic Computer Arithmetic	Remember, Understand Analysis, Evaluate

(3) Data Representation and Basic Computer Arithmetic (4) Computer Organization and Architecture Basic organization of computer and the underlying Architecture includes : <ul style="list-style-type: none"> On successful completion of this course, the students will be able to Master the binary and hexadecimal number systems including computer arithmetic. Understand the fundamentals of different instruction set 	Unit-3: Basic Computer Organization and Design	Remember, Understand, Analysis, Evaluate
	Unit-4: Central Processing Unit	Remember, Understand, Analysis, Evaluate
	Unit-5: Memory Organization	Remember, Understand, Analysis, Evaluate
	Unit-6: Input-Output Organization	Remember, Understand, Analysis, Evaluate

2nd Semester (Honours)

CORE PAPERS

Paper Name : Programming in JAVA

Paper Code : CSC-HC-2016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This paper inculcate knowledge on Java Programming concepts, Programming logic that enables the students to create wide range of Applications and Applets using Java by understanding Object Oriented Programming in Java, including defining methods, using class libraries, etc. It also includes the design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners, Graphic objects for drawing figures such as lines, rectangles, ovals,	Unit- 1: Introduction to Java	Remember, Understand, Analysis, Evaluate
	Unit- 2: Arrays, Strings and I/O	Remember, Understand, Analysis, Evaluate
	Unit- 3: Object-Oriented Programming Overview	Remember, Understand, Analysis, Evaluate
	Unit- 4: Inheritance, Interfaces, Packages, Enumerations, Autoboxing	Remember, Understand, Analysis, Evaluate
	Unit- 5: Exception Handling, Threading, Networking and	Remember, Understand, Analysis, Evaluate
	Unit- 6: Applets and Event Handling	Remember, Understand, Analysis, Evaluate

Paper Name : Discrete Structures

Paper Code : CSC-HC-2026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Helps to increase Students mathematical abilities. • Reason mathematically about basic discrete structures such as Numbers, Sets, used in computer science. • Familiarity with Growth of Functions, Recurrences, Graph Theory and Propositional Logic. //	Unit- 1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit- 2: Growth of Functions	Remember, Understand, Analysis, Evaluate
	Unit- 3: Recurrences	Remember, Understand, Analysis, Evaluate
	Unit- 4: Graph Theory	Remember, Understand, Analysis, Evaluate
	Unit- 5: Propositional Logic	Remember, Understand, Analysis, Evaluate

3rd Semester (Honours)

CORE PAPERS

Paper Name : Data Structure

Paper Code : CSC-HC-3016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Students will be able to implement linear and non-linear data structure, determine and analyze the complexity of give algorithm • Know about the basic concepts of Function, Recursion, Array and Link-list. • Understand how several fundamental algorithms work particularly those concerned with Stack, Queues, Trees, various Sorting algorithms and Hashing. //	Unit- 1: Arrays	Remember, Understand, Analysis, Evaluate
	Unit- 2: Stacks	Remember, Understand, Analysis, Evaluate
	Unit- 3: Linked Lists	Remember, Understand, Analysis, Evaluate
	Unit- 4: Queues	Remember, Understand, Analysis, Evaluate
	Unit- 5: Recursion	Remember, Understand, Analysis, Evaluate
	Unit- 6: Trees	Remember, Understand, Analysis, Evaluate
	Unit- 7: Searching and Sorting	Remember, Understand, Analysis, Evaluate
	Unit- 8: Hashing	Remember, Understand, Analysis, Evaluate

Paper Name : Operating System

Paper Code : CSC-HC-3026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
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<p>Enable student to get sufficient knowledge about the role of Operating System in their management policies and understand the process management policies.</p> <ul style="list-style-type: none"> To make students able to learn different types of operating systems along with concept of file systems, Directory structure and CPU scheduling algorithms used in operating system. To provide students knowledge of Process management, Memory management, I/O management and deadlock handling algorithms. Protection and Security is enforced by introducing Policy mechanism Authentication 	Unit- 1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit- 2: Operating System Organization	Remember, Understand, Analysis, Evaluate
	Unit- 3: Process Management	Remember, Understand, Analysis, Evaluate
	Unit- 4: File and I/O Management	Remember, Understand, Analysis, Evaluate
	Unit- 5: Protection and Security	Remember, Understand, Analysis, Evaluate

Paper Name : Computer Networks

Paper Code : CSC-HC-3036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> Help to get the knowledge on Networking concepts and the underlying technologies including the Wired (Guided) and Wireless (Unguided) media To explain how communication works in computer networks and to understand the basic terminology of computer networks To explain the role of protocols in networking and to analyze the services and features of the various layers in the protocol stack. To understand the working various internetworking devices such as Routers 	Unit- 1: Introduction to Computer Networks	Remember, Understand, Analysis, Evaluate
	Unit- 2: Data Communication Fundamentals and Techniques	Remember, Understand, Analysis,
	Unit- 3: Networks Switching Techniques and Access mechanisms	Remember, Understand, Analysis, Evaluate
	Unit- 4: Data Link Layer Functions and Protocol	Remember, Understand, Analysis,
	Unit- 5: Multiple Access Protocol and Networks	Remember, Understand, Analysis,
	Unit- 6: Networks Layer Functions and Protocols	Remember, Understand, Analysis,
	Unit- 7: Transport Layer Functions and Protocols	Remember, Understand, Analysis,
	Unit- 8: Overview of Application layer protocol	Remember, Understand, Analysis,

SKILL ENHANCEMENT COURSE (SEC)

Paper Name : HTML Programming

Paper Code : CSC-SE-3034

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>Upon completion of the course students will be able to:</p> <ul style="list-style-type: none">• Understood the fundamentals of Web design and how to program using Hypertext Markup Language (HTML), and Cascading Style sheets (CSS).• Use knowledge of HTML and CSS code and an HTML editor to create personal and/or business websites following current professional and/or industry standards.• Students will demonstrate competency in the use of common HTML code.	Unit- 1: The Basics	Remember, Understand Analysis, Evaluate
	Unit- 2: HTML Formatting	Remember, Understand Analysis, Evaluate
	Unit- 3: Links	Remember, Understand Analysis, Evaluate
	Unit- 4: Images	Remember, Understand Analysis, Evaluate
	Unit- 5: Tables	Remember, Understand Analysis, Evaluate
	Unit- 6: Forms	Remember, Understand Analysis, Evaluate

4th Semester (Honours)

CORE PAPERS

Paper Name : Design and Analysis of Algorithms

Paper Code : CSC-HC-4016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>In this paper Students will learn the following :</p> <ul style="list-style-type: none">• Basic Design and Analysis techniques of Algorithms, Correctness of Algorithm.• Algorithm Design Techniques such as Iterative techniques, Divide and Conquer, Dynamic Programming, Greedy Algorithms.• Various types of Sorting and Searching Techniques along with their complexity analysis.• Graphs Algorithms such as Breadth First Search (BFS), Depth First Search	Unit- 1: Introduction	Remember, Understand Analysis, Evaluate
	Unit- 2: Algorithm Design Techniques	Remember, Understand Analysis, Evaluate
	Unit-3: Sorting and Searching Techniques	Remember, Understand Analysis, Evaluate
	Unit- 4: Balanced Trees	Remember, Understand Analysis, Evaluate
	Unit- 5: Graphs	Remember, Understand Analysis, Evaluate
	Unit- 6: String Processing	Remember, Understand Analysis, Evaluate

Paper Name : Software Engineering

Paper Code : CSC-HC-4026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>On successful completion of this subject the students have the basic skill in the application of engineering discipline to the creation of software.</p> <p>A software engineer is responsible for developing and/or implementing the new features to improve the existing programs and software.</p> <p>//</p>	Unit- 1: Introduction	Remember, Understand Analysis, Evaluate
	Unit- 2: Requirement Analysis	Remember, Understand Analysis, Evaluate
	Unit- 3: Software Project Management	Remember, Understand Analysis, Evaluate
	Unit- 4: Risk Management	Remember, Understand Analysis, Evaluate
	Unit- 5: Quality Management	Remember, Understand Analysis, Evaluate
	Unit- 6: Design Engineering	Remember, Understand Analysis, Evaluate
	Unit- 7: Testing Strategies & Tactics	Remember, Understand Analysis, Evaluate

Paper Name : Database Management System

Paper Code : CSC-HC-4036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>To acquaint practical knowledge about creating and manipulating data in the Database. Student gets the knowledge create and populate a RDBMS for a real life applications with constrains and keys, using SQL. Students gain a good understanding of the architecture and functioning of database management systems as well as associated tools and techniques, principles of data modeling using entity relationship and develop a good</p>	Unit- 1: Introduction	Remember, Understand Analysis, Evaluate
	Unit- 2: Entity Relationship(ER) Modeling	Remember, Understand Analysis, Evaluate
	Unit- 3: Relation data model	Remember, Understand Analysis, Evaluate
	Unit- 4: Database design	Remember, Understand Analysis, Evaluate
	Unit- 5: Transaction processing	Remember, Understand Analysis, Evaluate
	Unit- 6: File Structure and Indexing	Remember, Understand Analysis, Evaluate

SKILL ENHANCEMENT COURSE (SEC)

Paper Name : PHP Programming

Paper Code : CSC-SE-4024

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Hypertext Preprocessor is Self-	Unit- 1: Introduction to	Remember, Understand,

<p>referentially short for PHP. It is an open source, server-side, HTML embedded scripting language used to create dynamic Web pages. In an HTML document, PHP.</p> <p>On Successful completion of the course the students should have:</p> <ul style="list-style-type: none"> • Front end Designing of the Website. • Understood the features like functions, forms in PHP, Files handling, • OOPs concepts, Cookies, Sessions 	PHP	Analysis, Evaluate
	Unit- 2: Handling HTML form with PHP	Remember, Understand, Analysis, Evaluate
	Unit- 3: PHP conditional events and Loops	Remember, Understand, Analysis, Evaluate
	Unit- 4: PHP Functions	Remember, Understand, Analysis, Evaluate
	Unit- 5: String Manipulation and Regular	Remember, Understand, Analysis, Evaluate
	Unit- 6: Array	Remember, Understand, Analysis, Evaluate

5th Semester (Honours)

CORE PAPERS

Paper Name : Internet Technologies

Paper Code : CSC-HC-5016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> • Helps to inculcate knowledge in two domains : <ul style="list-style-type: none"> ➤ Web Technological concepts and ➤ Functioning of the Internet. • It also Helps to Implement interactive Web Pages using HTML, Java-Script (Client-side programming), Java Server Pages (JSP), Java Beans, Java Database connectivity (JDBC) fundamentals and protocols in the workings of the web and web applications. // 	Unit- 1: Fundamentals	Remember, Understand Analysis, Evaluate
	Unit- 2: JavaScript	Remember, Understand Analysis, Evaluate
	Unit- 3: Java	Remember, Understand Analysis, Evaluate
	Unit- 4: JDBC	Remember, Understand Analysis, Evaluate
	Unit- 5: JSP	Remember, Understand Analysis, Evaluate
	Unit- 6: Java Beans	Remember, Understand Analysis, Evaluate

Paper Name : Theory of Computation

Paper Code : CSC-HC-5026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
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<p>This course focuses on the basic theory of Computer Science and formal methods of computation like automata theory, formal languages, grammars, finite automata and push down automata</p> <p>The student will be able to:</p> <ul style="list-style-type: none"> • Understand the basic properties of formal languages and grammars. • Differentiate regular, context-free and recursively enumerable languages. • Make grammars to produce strings from a specific language. • Acquire concepts relating to the theory of computation and computational 	Unit- 1: Languages	Remember, Understand, Analysis, Evaluate
	Unit- 2: Finite Automata and Regular	Remember, Understand, Analysis, Evaluate
	Unit- 3: Context free languages	Remember, Understand, Analysis, Evaluate

DISCIPLINE SPECIFIC ELECTIVES (DSE)

Paper Name : Microprocessor

Paper Code : CSC-HE-5016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> • A thorough understanding of the Intel 8085 microprocessor demands concepts and skills from two different disciplines : <ul style="list-style-type: none"> ➤ Hardware concepts from <i>Electronics</i> and ➤ Programming skills from <i>Computer Science</i>. • Introduction to the basic Architecture, Instruction sets and the Assembly Language Programming of the Intel 8085 microprocessor Kit. // 	Unit- 1: Internal Organization of 8085A microprocessor	Remember, Understand, Analysis, Evaluate
	Unit- 2: 8085A microprocessor architecture	Remember, Understand, Analysis, Evaluate
	Unit- 3: Assembly language programming in 8085A microprocessor	Remember, Understand, Analysis, Evaluate
	Unit- 4: Interfacing	Remember, Understand, Analysis, Evaluate
	Unit- 5: Interrupt	Remember, Understand, Analysis, Evaluate

Paper Name : Project Work / Dissertation

Paper Code : CSC-HE-5036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>At the end of this course student will:</p> <ul style="list-style-type: none"> Students should be able to design and construct a hardware and software system, component, or process to meet desired needs. Students are provided to work on multidisciplinary Problems. c) Students should be able to work as professionals, with portfolio ranging from data management, network configuration designing 	<ul style="list-style-type: none"> No Units Specified in this Paper <p>Guidelines :</p> <ul style="list-style-type: none"> The students will be allowed to work on any project based on the concepts studied in core / elective or skill based elective courses. The group size should be maximum of three (03) students. Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes. A maximum of Four (04) 	Remember, Understand, Analysis, Evaluate

6th Semester (Honours)

CORE PAPERS

Paper Name : Artificial Intelligence

Paper Code : CSC-HC-6016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>Presentation of artificial intelligence as a coherent body of ideas and methods to acquaint the student with the basic programs in the field and their underlying theory. Students will explore this through problem-solving paradigms, logic and theorem proving, language and image understanding, search and control methods and learning.</p> <p>In this paper Students will learn the following :</p> <p>(1) To conceptualize the basic ideas and techniques underlying the design of intelligent systems.</p>	Unit- 1: Introduction	Remember, Understand Analysis, Evaluate
	Unit- 2: Problem Solving and Searching	Remember, Understand Analysis, Evaluate
	Unit- 3: Knowledge Representation	Remember, Understand Analysis, Evaluate
	Unit- 4: Dealing with Uncertainty and Inconsistencies	Remember, Understand Analysis, Evaluate
	Unit- 5: Understanding Natural Languages	Remember, Understand Analysis, Evaluate

Paper Name : Computer Graphics

Paper Code : CSC-HC-6026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>To inculcate knowledge on Graphics concepts, Basic elements of Computer Graphics, its Applications and to apply the creativity of using algorithms.</p> <p>In this paper, Students will learn the following :</p> <ul style="list-style-type: none"> • Overview, working and the functions of the Graphics Hardware • Fundamental Techniques in Graphics, and their various algorithms // 	Unit- 1: Introduction	Remember, Understand Analysis, Evaluate
	Unit- 2: Graphics Hardware	Remember, Understand Analysis, Evaluate
	Unit- 3: Fundamental Techniques in	Remember, Understand Analysis, Evaluate
	Unit- 4: Geometric Modeling	Remember, Understand Analysis, Evaluate
	Unit- 5: Visible Surface determination	Remember, Understand Analysis, Evaluate
	Unit- 6: Surface rendering	Remember, Understand Analysis, Evaluate

DISCIPLINE SPECIFIC ELECTIVES (DSE)

Paper Name : Network Programming

Paper Code : CSC-HE-6016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>Upon completion of the course students will be able to:</p> <ul style="list-style-type: none"> • Learn the basics of computer networks and Internet programming. • Demonstrate advanced knowledge of programming for network communications • Have a detailed knowledge of the TCP/UDP Sockets. • Competency in the theoretical as well as the practical aspects of computer network programming 	Unit- 1: Transport Layer Protocols	Remember, Understand Analysis, Evaluate
	Unit- 2: Socket Programming	Remember, Understand Analysis, Evaluate
	Unit- 3: Network Applications	Remember, Understand Analysis, Evaluate

Paper Name : Data Mining

Paper Code : CSC-HE-6046

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
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<p>On Successful completion of the course the students will learn the following :</p> <ul style="list-style-type: none"> • To identify the scope and essentiality of Data Mining. • Identify appropriate data mining algorithms to solve real world problems • Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining • To analyze data, choose relevant models and algorithms for respective 	Unit- 1: Overview	Remember, Understand Analysis, Evaluate
	Unit- 2: Association Rule Mining	Remember, Understand Analysis, Evaluate
	Unit- 3: Clustering	Remember, Understand Analysis, Evaluate
	Unit- 4: Classification and regression technique	Remember, Understand Analysis, Evaluate

Bachelor of Computer Science (B.Sc. CSC, Generic) Programme :

(CBCS System under Gauhati University) :

Program Outcome (PO)	B.Sc. (General) Computer Science Programme could prepare the students for graduate training in some specialized area of computer science, to prepare students for jobs in industry, business or government, and to provide support courses for students in technology, mathematics and other fields requiring computing skills.
Program Specific Outcomes (PSOs)	Completion of B.Sc. Computer Science (Generic) Programme shall enable a student :– Graduates of the <u>Computer Technology Program</u> will, by the time of graduation, have the following knowledge, abilities, and appreciation of professional standards. (1) An ability to apply knowledge of computing and mathematics appropriate to the discipline. (2) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution. (3) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs. (4) An ability to function effectively on teams to accomplish a common goal. (5) An understanding of professional, ethical, legal, security and social issues and responsibilities. (6) An ability to communicate effectively with a range of audiences. (7) An ability to analyze the local and global impact of computing on individuals, organizations, and society. (8) Recognition of the need for and an ability to engage in continuing professional development. (9) An ability to use current techniques, skills, and tools necessary for computing practice. //

COURSE OUTCOME

B.Sc. in Computer Science (Generic) Syllabus (CBCS)

1st Semester (Generic)

Paper Name : Problem Solving using Computer

Paper Code : CSC-HG-1016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On successful completion of this subject the students have the Basic concept of the Computer Fundamentals and the Programming ability in Python Language by understand fundamentals and Basic concepts of Python programming includes arrays, structures, function, strings, Exceptions, pointers and files. <i>Advanced concepts of Python</i> includes : OOPs, Regular Expressions, Event Driven Programming, GUI Programming //	Unit- 1: Computer Fundamentals	Remember, Understand, Analysis, Evaluate
	Unit- 2: Basic Computer Organization	Remember, Understand, Analysis, Evaluate
	Unit- 3: Planning the Computer Program	Remember, Understand, Analysis, Evaluate
	Unit- 4: Techniques of Problem Solving	Remember, Understand, Analysis, Evaluate
	Unit- 5: Overview of Programming	Remember, Understand, Analysis, Evaluate
	Unit- 6: Introduction to Python	Remember, Understand, Analysis, Evaluate
	Unit- 7: Creating Python Programs	Remember, Understand, Analysis, Evaluate
	Unit- 8: Structures	Remember, Understand, Analysis, Evaluate
	Unit- 9: Introduction to Advanced Python	Remember, Understand, Analysis, Evaluate

2nd Semester (Generic)

Paper Name : Database Management System

Paper Code : CSC-HG-2026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
To acquaint practical knowledge about creating and manipulating data in the Database. Student gets the knowledge create and populate a RDBMS for a real life applications with constrains and keys, using SQL. //	Unit- 1: Introduction to Database Management Systems	Remember, Understand, Analysis, Evaluate
	Unit- 2: Entity Relationship and Enhanced	Remember, Understand, Analysis, Evaluate
	Unit- 3: Relational Data Model	Remember, Understand, Analysis, Evaluate
	Unit- 4: Database Design	Remember, Understand, Analysis, Evaluate

3rd Semester C.Sc. (Generic)

Paper Name : Computer Networks and Internet Technologies

Paper Code : CSC-HG-3026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>The first part of this paper helps students to inculcate knowledge on the basic concepts of Computer Networks :-</p> <ul style="list-style-type: none"> • Help to get the knowledge on Networking concepts and the underlying technologies used for data communication media. • To role of protocols in networking and to analyze the services and features of the various layers in the protocol stack. • To understand the working various internetworking. • Overview of the Application Layer protocols visible by the user. <p>The second part of this paper includes the basic concepts of Internet that helps to inculcate</p>	Unit- 1: Computer Networks	Remember, Understand, Analysis, Evaluate
	Unit- 2: Network Models	Remember, Understand, Analysis, Evaluate
	Unit- 3: Transmission Media	Remember, Understand, Analysis, Evaluate
	Unit- 4: LAN Topologies	Remember, Understand, Analysis, Evaluate
	Unit- 5: Network Devices	Remember, Understand, Analysis, Evaluate
	Unit- 6: Internet Terms	Remember, Understand, Analysis, Evaluate
	Unit- 7: Internet Applications	Remember, Understand, Analysis, Evaluate
	Unit- 8: Introduction to Web Design	Remember, Understand, Analysis, Evaluate
	Unit- 9: JavaScript Fundamentals	Remember, Understand, Analysis, Evaluate

4th Semester C.Sc. (Generic)

Paper Name : Web and E-Commerce Technologies

Paper Code : CSC-HG-4036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>Upon completing the course, the participants will be able to:</p> <ul style="list-style-type: none"> • Understand the various elements that are fundamental for a successful E-Commerce enterprise and develop a business plan for developing one such E-Commerce site. • Gain a comprehensive understanding of the E-Commerce landscape, current and emerging business 	Unit- 1: An introduction to Electronic commerce	Remember, Understand, Analysis, Evaluate
	Unit- 2: The Internet and WWW	Remember, Understand, Analysis, Evaluate
	Unit- 3: Internet Security	Remember, Understand, Analysis, Evaluate
	Unit- 4: Electronic Data Exchange	Remember, Understand, Analysis, Evaluate
	Unit- 5: Planning for Electronic Commerce	Remember, Understand, Analysis, Evaluate

<p>models, and the technology and infrastructure underpinnings of the business.</p> <ul style="list-style-type: none"> • Gain an understanding on how innovative use of the E-Commerce can help developing competitive advantage. • Develop an understanding on how internet can help business grow. // 	Unit- 6: Internet Marketing	Remember, Understand Analysis, Evaluate
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Paper Name : Computer System Architecture

Paper Code : CSC-HG-4046

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>This paper includes 4 main topics :</p> <p>(1) Boolean Algebra,</p> <p>(2) Digital Logic</p> <p>(3) Data Representation and Basic Computer Arithmetic</p> <p>(3) Computer Organization and Architecture</p> <p>Basic organization of computer and the underlying Architecture includes :</p> <ul style="list-style-type: none"> • On successful completion of this course, the students will be able to Master the binary and hexadecimal number systems including computer arithmetic. • Understand the fundamentals of 	Unit- 1: Introduction	Remember, Understand Analysis, Evaluate
	Unit- 2: Data Representation and Basic	Remember, Understand Analysis, Evaluate
	Unit- 3: Basic Computer Organization and Design	Remember, Understand Analysis, Evaluate
	Unit- 4: Central Processing Unit	Remember, Understand Analysis, Evaluate
	Unit- 5: Programming the Basic Computer	Remember, Understand Analysis, Evaluate
	Unit- 6: Input-output Organization	Remember, Understand Analysis, Evaluate

Department of Computer Science

Programme Specific Outcome for Bachelor of Computer Application (CBCS)

One of the most important benefits of taking computer courses is that the students will have more jobs available to them. The types of new jobs that will be available depend on what kind of courses they take, but every group of courses will open up new opportunities. Almost all jobs require that a worker has some computer skills. The number of positions available to those *who aren't comfortable using computers gets smaller each day*.

Students who choose **BCA Programme** (under **CBCS**), 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.

The program covers the various essential concepts in Computer Science. The course lays a structured foundation of Computer fundamentals, Numerical methods, Data structure, Algorithm and Complexity analysis, Software Engineering, Programming Concepts in various languages(C, C++, Java etc.), Computer Networking, System Administration, Operating System, Computer Architecture, Microprocessor, Web technology, Computer Graphics and Database management system etc.

An exceptionally broad range of topics covering current trends and technologies in computer science: Advanced web technology, Mobile application, Animation, Data mining etc. Also, to carry out the hand on sessions in Computer lab using various Programming languages and tools to have a deep conceptual understanding of the topics to widen the horizon of students' self-experience. //

The completion of the **BCA Programme** (under **CBCS**) shall enable a student 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
- (3) Computer science, to learn and develop sophisticated technical products independently.
- (4) To design, implement, and evaluate computer-based system, process, component, or program to meet desired needs by critical understanding, analysis and synthesis
- (5) Identify applications of Computer Science in other fields in the real world to enhance the career prospects
- (6) Realize the requirement of lifelong learning through continued education and research.
- (7) Use the concepts of best practices and standards to develop user interactive and abstract application
- (8) Understand the professional, ethical, legal, security, social issues and responsibilities. //

COURSE OUTCOME

B.C.A (Honours) Syllabus (CBCS)

1st Semester BCA (Honours)

CORE PAPERS

Paper Name : Introduction to C programming

Paper Code : BCA-HC-1016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>On successful completion of this subject the students have the Basic fundamental concepts of the Computer Programming ability in C Language.</p> <p>This paper helps students to inculcate knowledge on the basic concepts of C programming includes arrays, structures, function, strings, pointers and files.</p>	Unit- 1: Overview of C	Remember, Understand Analysis, Evaluate
	Unit- 2: Decision Making and Branching Statement	Remember, Understand Analysis, Evaluate
	Unit- 3 Arrays	Remember, Understand Analysis, Evaluate
	Unit- 4: Functions	Remember, Understand Analysis, Evaluate
	Unit- 5: Structures and Unions	Remember, Understand Analysis, Evaluate
	Unit- 6: Pointers	Remember, Understand Analysis, Evaluate

<ul style="list-style-type: none"> • Understand the basic terminology used in computer programming. • Write, compile and debug 	Unit- 7: File Management in C	Remember, Understand, Analysis, Evaluate
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Paper Name : Computer Fundamentals & ICT Hardware

Paper Code : BCA-HC-1026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Let students know about the basics and hardware components (internal and external to the system unit) of the computer system : <ul style="list-style-type: none"> • Familiarity with the history and development of modern computers • Familiarity with parts of computer • Understand the input and output devices. • Basic ideas of internal and external storage devices, microprocessors, 	Unit-1 : Evolution & Classification of Modern computer, and Personal Computer hardware	Remember, Understand Analysis, Evaluate
	Unit-2 : Hard Disk Drive, File system, and Hard disk Tools	Remember, Understand Analysis, Evaluate
	Unit-3 : Optical Media and their Technologies	Remember, Understand Analysis, Evaluate
	Unit-4 : Internal Computer Hardware (including Processor, Motherboard, Sockets, Slots, Power/Peripheral/Pin connectors,	Remember, Understand Analysis, Evaluate
	Unit-5 : SMPS, BIOS, Network Interface Card, Network cabling, I/O Box, Switches, RJ 45 connectors, Patch panel/cord	Remember, Understand Analysis, Evaluate

GENERIC ELECTIVE (GE)

Paper Name : Computer Based Accounting and Financial Management

Paper Code : BCA-HG-1016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Helps students to learn principles and concepts of accountancy <ul style="list-style-type: none"> • Understand basic concepts of Accounting. • Knowledge regarding how to create ledgers, journals and balance sheet. 	Unit-1: Accounting	Remember, Understand, Analysis, Evaluate
	Unit-2: Tally	Remember, Understand, Analysis, Evaluate
	Unit-3: Advanced Accounting	Remember, Understand, Analysis, Evaluate

2nd Semester BCA (Honours)

CORE COURSE

Paper Name : Mathematics –I

Paper Code : BCA-HC-2016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>Helps to increase Students mathematical abilities.</p> <ul style="list-style-type: none">Reason mathematically about basic discrete structures such as Determinants and Matrices.Intuitive idea about Limits and Derivatives	Unit-1: Determinants and Matrices	Remember, Understand, Analysis, Evaluate
	Unit-2: Complex Numbers	Remember, Understand, Analysis, Evaluate
	Unit-3: Limits and Derivatives	Remember, Understand, Analysis, Evaluate
	Unit-4: Calculus	Remember, Understand, Analysis, Evaluate

Paper Name : Digital Logic Fundamentals

Paper Code : BCA-HC-2026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>On completion of this course, students will understand :</p> <ul style="list-style-type: none">Digital circuits,The concept of various components to design stable analog, sequential, combinational circuitsMicroprocessor architecture,Interfacing of various components. //	Unit-1: Boolean Algebra and Logic Gates	Remember, Understand, Analysis, Evaluate
	Unit-2: Combinational Circuit	Remember, Understand, Analysis, Evaluate
	Unit-3: Sequential Circuit	Remember, Understand, Analysis, Evaluate
	Unit-4: Counters	Remember, Understand, Analysis, Evaluate
	Unit-5: Registers	Remember, Understand, Analysis, Evaluate

GENERIC ELECTIVE (GE)

Paper Name : Basic Electronics

Paper Code : BCA-HG-2016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On completion of this course, students will able to:	Unit-1: Circuit Concepts and Circuit Analysis	Remember, Understand, Analysis, Evaluate

<ul style="list-style-type: none"> Identify the unique vocabulary associated with electronics and explain the basic concepts of Semiconductor diodes such as P-N junction diode, Zener diode. To apply the basics of diode to describe the working of rectifier circuits such as Full and half wave rectifiers. Identify and explain the various current components in a transistor. // 	Unit-2: Analog Electronics	Remember, Understand, Analysis, Evaluate
	Unit-3: Digital Electronics	Remember, Understand, Analysis, Evaluate

3rd Semester BCA (Honours)

CORE COURSE

Paper Name : Software Engineering

Paper Code : BCA-HC-3016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>On successful completion of this subject the students have the basic skill in the application of engineering discipline to the creation of software.</p> <p>A software engineer is responsible for developing and/or implementing the new features to improve the existing programs and software.</p>	Unit-1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Software Project Planning	Remember, Understand, Analysis, Evaluate
	Unit-3: Software Design	Remember, Understand, Analysis, Evaluate
	Unit-4: Software Testing and Maintenance	Remember, Understand, Analysis, Evaluate

Paper Name : Data Structure and Algorithms

Paper Code : BCA-HC-3026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>Students will be able to implement linear and non-linear data structure, determine and analyze the complexity of give algorithm</p> <ul style="list-style-type: none"> Know about the basic concepts of Function, Recursion, Array and Link-list. 	Unit-1: Definition	Remember, Understand, Analysis, Evaluate
	Unit-2: Linked Structure	Remember, Understand, Analysis, Evaluate
	Unit-3: Stacks and Queues	Remember, Understand, Analysis, Evaluate
	Unit-4: Binary Trees	Remember, Understand, Analysis, Evaluate

<ul style="list-style-type: none"> Understand how several fundamental algorithms work particularly those concerned with Stack, Queues, Trees, various Sorting algorithms and Hashing. // 	Unit-5: Searching	Remember, Understand, Analysis, Evaluate
	Unit-6: Sorting	Remember, Understand, Analysis, Evaluate
	Unit-7: Analysis of Algorithm	Remember, Understand, Analysis, Evaluate

Paper Name : Database Management System

Paper Code : BCA-HC-3036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
To acquaint practical knowledge about creating and manipulating data in the Database. Student gets the knowledge create and populate a RDBMS for a real life applications with constrains and keys, using SQL. Students gain a good understanding of the architecture and functioning of database management systems as well as associated tools and techniques,	Unit-1: File Structure	Remember, Understand, Analysis, Evaluate
	Unit-2: Overview of Database Management System	Remember, Understand, Analysis, Evaluate
	Unit-3: Relational Models	Remember, Understand, Analysis, Evaluate
	Unit-4: Database Design	Remember, Understand, Analysis, Evaluate

SKILL ENHANCEMENT COURSE (SEC)

Paper Name : Web Technology

Paper Code : BCA-SE-3014

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> Helps students to inculcate knowledge in two domains : <ul style="list-style-type: none"> ➤ Web Technological concepts and ➤ Functioning of the Internet. It also Helps to Implement interactive Web Pages using HTML, Java-Script (Client-side programming), and protocols in the workings of the web and web applications 	Unit-1: Overview of the World Wide Web and the internet	Remember, Understand, Analysis, Evaluate
	Unit-2: Inside the firewall AND Linking database to the Web	Remember, Understand, Analysis, Evaluate
	Unit-3: HTML editors and tools	Remember, Understand, Analysis, Evaluate
	Unit-4: Java Script	Remember, Understand, Analysis, Evaluate

GENERIC ELECTIVE (GE)

Paper Name : Introduction to Indian History

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
At the end of the course the students will be able to learn : <ul style="list-style-type: none"> To realize the past glory of mother land. To appreciate the values of the life of the earlier people To impart knowledge on the Indian Heritage. To understand recent trends in history. To train the students to face the competitive examinations. //	Unit-1: Indus Valley Civilization, Vedic period, Maurya dynasty and Asoka's administration	Remember, Understand, Analysis, Evaluate
	Unit-2: Gupta Period: Samudragupta, Chandragupta II,	Remember, Understand, Analysis, Evaluate
	Unit-3: Muslim rule in India:, Rise of Mughal power in India.	Remember, Understand, Analysis, Evaluate
	Unit-4: Arrival of Europeans, British power after Battle of	Remember, Understand, Analysis, Evaluate
	Unit-5: Birth of Indian National Congress and Swadeshi Movement, Quit India Movement and independence	Remember, Understand, Analysis, Evaluate

4th Semester BCA (Honours)

CORE COURSE

Paper Name : Computer Organization and Architecture

Paper Code : BCA-HC-4016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On successful completion of this course, the students will be able to Master the following : <ul style="list-style-type: none"> Understand the fundamentals of different instruction set architectures and their relationship to the CPU design. Organization of the Input and Output. Organization of Memory Subsystem including the 	Unit-1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Register Transfer Logic	Remember, Understand, Analysis, Evaluate
	Unit-3: Processor Logic Design	Remember, Understand, Analysis, Evaluate
	Unit-4: Control Logic Design	Remember, Understand, Analysis, Evaluate
	Unit-5: I/O Subsystem	Remember, Understand, Analysis, Evaluate
	Unit-6: Memory Subsystem	Remember, Understand, Analysis, Evaluate

Paper Name : Mathematics-II

Paper Code : BCA-HC-4026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
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Helps to increase Students mathematical abilities that are commonly used in computer science. In particular Students will learn to : <ul style="list-style-type: none"> • Reason mathematically about Sets, Relations and Functions • Intuitive idea about Graph Theory and Matrices • Idea about Mathematical 	Unit-1: Sets, Relations and Functions	Remember, Understand, Analysis, Evaluate
	Unit-2: Graph theory	Remember, Understand, Analysis, Evaluate
	Unit-3: Combinatorics	Remember, Understand, Analysis, Evaluate
	Unit-4: Matrices	Remember, Understand, Analysis, Evaluate
	Unit-5: Logic	Remember, Understand, Analysis, Evaluate
	Unit-6: Vector Space	Remember, Understand, Analysis, Evaluate

Paper Name : Object Oriented Programming in C++

Paper Code : BCA-HC-4036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This paper helps students to inculcate knowledge on Object Oriented Programming concepts (OOPs) using C++ by understand fundamentals and basic concepts of object oriented programming concepts includes classes, objects, Functions, Operator overloading, inheritance, Streams, and File handling mechanism. //	Unit-1: Introduction to object oriented programming	Remember, Understand, Analysis, Evaluate
	Unit-2: Classes and objects	Remember, Understand, Analysis, Evaluate
	Unit-3: Function and operator overloading	Remember, Understand, Analysis, Evaluate
	Unit-4: Inheritance	Remember, Understand, Analysis, Evaluate
	Unit-5: Streams	Remember, Understand, Analysis, Evaluate
	Unit-6: Files	Remember, Understand, Analysis, Evaluate

SKILL ENHANCEMENT COURSE (SEC)

Paper Name : Advanced Web Technology

Paper Code : BCA-SE-4034

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> • Helps students to inculcate knowledge of Web Development Techniques in two most popular Server Side Scripting methods : <ul style="list-style-type: none"> ➤ PHP (Hypertext Preprocessor) 	Unit-1: Web Development Techniques <ul style="list-style-type: none"> • Server Side Scripting with PHP • Server Side Scripting with JSP • Intermediate Web Development Techniques 	Remember, Understand, Analysis, Evaluate

<ul style="list-style-type: none"> ➤ JSP (Java Server Page) • It also Helps students to get an overview of the Current Trends in Web Technology. // 	Unit-2: Current Trends in Web Technology	Remember, Understand, Analysis, Evaluate
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GENERIC ELECTIVE (GE)

Paper Name : Information Security and Cyber Laws

Paper Code : BCA-HG-4026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> • The course will cover the basics of information security & spread awareness of this field to help the Students to understand the importance of security in their daily lives in the IT field. • Students could maintain an appropriate level of awareness, knowledge and skill on the disciplines of technology, business and law to allow them to minimize the occurrence and severity of information security incidents. • The course bear a strong adherence to computer based technological skills and capabilities and thereby 	Unit-1: Course Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Digital Crime	Remember, Understand, Analysis, Evaluate
	Unit-3: Information Gathering Techniques	Remember, Understand, Analysis, Evaluate
	Unit-4: Risk Analysis and Threat	Remember, Understand, Analysis, Evaluate
	Unit-5: Introduction to Cryptography and Applications	Remember, Understand, Analysis, Evaluate
	Unit-6: Safety Tools and Issues	Remember, Understand, Analysis, Evaluate
	Unit-7: Cyber laws to be covered as per IT 2008	Remember, Understand, Analysis, Evaluate

5th Semester BCA (Honours)

CORE COURSE

Paper Name : Java Programming

Paper Code : BCA-HC-5016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This paper inculcate knowledge on Java Programming concepts, Programming logic that enables the students to create wide range of Applications using Java by understanding Object Oriented	Unit-1: JAVA language basics	Remember, Understand, Analysis, Evaluate
	Unit-2: Operators and Control Statements	Remember, Understand, Analysis, Evaluate
	Unit-3: Classes and Methods	Remember, Understand, Analysis, Evaluate

Programming in Java, including defining methods, using class libraries, etc.	Unit-4: Inheritance	Remember, Understand, Analysis, Evaluate
	Unit-5: Exception handling	Remember, Understand, Analysis, Evaluate

Paper Name : Operating System

Paper Code : BCA-HC-5026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>Enable student to get sufficient knowledge about the role of Operating System in their management policies and understand the process management policies.</p> <ul style="list-style-type: none"> To make students able to learn different types of operating systems along with concept of file systems, Directory structure and CPU scheduling algorithms used in operating system. To provide students knowledge of Process management, Memory management, I/O management and deadlock handling algorithms. At the end of the course, students will be able to implement various algorithms required for management, scheduling, allocation and communication used in Operating System. // 	Unit-1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Processes	Remember, Understand, Analysis, Evaluate
	Unit-3: Process Synchronization	Remember, Understand, Analysis, Evaluate
	Unit-4: Scheduling	Remember, Understand, Analysis, Evaluate
	Unit-5: Deadlocks	Remember, Understand, Analysis, Evaluate
	Unit-6: Memory management	Remember, Understand, Analysis, Evaluate
	Unit-7: File system	Remember, Understand, Analysis, Evaluate
	Unit-8: I/O management	Remember, Understand, Analysis, Evaluate

DISCIPLINE SPECIFIC ELECTIVES (DSE)

Paper Name : Project Work / Dissertation (Credit: 6)

Paper Code : BCA-HE-5016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
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<p>At the end of this course student will:</p> <ul style="list-style-type: none"> • Students should be able to design and construct a hardware and software system, component, or process to meet desired needs. • Students are provided to work on multidisciplinary Problems. • c) Students should be able to work as professionals, with portfolio ranging from 	<ul style="list-style-type: none"> • No Units Specified in this Paper <p><u>Guidelines</u> :</p> <ul style="list-style-type: none"> • The students will be allowed to work on any project based on the concepts studied in core / elective or skill based elective courses. • The group size should be maximum of three (03) students. Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes 	Remember, Understand, Analysis, Evaluate
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Paper Name : Data Mining & Warehousing

Paper Code : BCA-HE-5026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>On Successful completion of the course the students will learn the following :</p> <ul style="list-style-type: none"> • To identify the scope and essentiality of Data Warehousing and Mining. • Design data warehouse with dimensional modelling and apply OLAP operations. • Understand Data Warehouse fundamentals, Data Mining Principles • Identify appropriate data mining algorithms to solve real world problems • Compare and evaluate different data mining techniques like classification, prediction, clustering and association 	Unit-1: Introduction to Data Warehousing	Remember, Understand, Analysis, Evaluate
	Unit-2: Introduction to Data Mining Introduction	Remember, Understand, Analysis, Evaluate
	Unit-3: Clustering	Remember, Understand, Analysis, Evaluate
	Unit-4: Rule Mining	Remember, Understand, Analysis, Evaluate
	Unit-5: Classification	Remember, Understand, Analysis, Evaluate

6th Semester BCA (Honours)

CORE COURSE

Paper Name : System Administration using Linux

Paper Code : BCA-HC-6016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> • Students will be able to understand the basic commands of Linux operating system • Understand basics of various OS related concepts, from programmer's point of view, like files, directories, kernel, i-nodes, APIs, system calls, processes, signals, etc. • Able to write useful shell scripts for solving problems. Shell scripts will greatly and effectively enhance the usefulness of computers, from the point of view of programmers and application developers. • Use basic fundamental utilities which are required again and again on daily basis to 	Unit-1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Linux file system	Remember, Understand, Analysis, Evaluate
	Unit-3: Basic Linux Commands	Remember, Understand, Analysis, Evaluate
	Unit-4: Process Creation	Remember, Understand, Analysis, Evaluate
	Unit-5: General User Administration	Remember, Understand, Analysis, Evaluate
	Unit-6: Networking in Linux	Remember, Understand, Analysis, Evaluate

Paper Name : Computer Networks

Paper Code : BCA-HC-6026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<p>This paper helps students to inculcate knowledge on the basic concepts of Computer Networks :-</p> <ul style="list-style-type: none"> • Help to get the knowledge on Networking concepts and the underlying technologies used for data communication media. • To role of protocols in networking and to analyze the services and features of the various layers in the protocol stack. • To understand the working various internetworking. • Overview of the Application Layer protocols visible by the user. • To understand the over crucial 	Unit-1: Physical Layer	Remember, Understand, Analysis, Evaluate
	Unit-2: Digital Transmission	Remember, Understand, Analysis, Evaluate
	Unit-3: Data Link Layer	Remember, Understand, Analysis, Evaluate
	Unit-4: Network Layer	Remember, Understand, Analysis, Evaluate
	Unit-5: Transport Layer	Remember, Understand, Analysis, Evaluate
	Unit-6: Application layer & Network Security	Remember, Understand, Analysis, Evaluate

DISCIPLINE SPECIFIC ELECTIVES (DSE)

Paper Name : Automata Theory and Languages

Paper Code : BCA-HE-6016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
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<p>This course focuses on the basic theory of Computer Science and formal methods of computation like automata theory, formal languages, grammars, finite automata and push down automata</p> <p>The student will be able to:</p> <ul style="list-style-type: none"> • Understand the basic properties of formal languages and grammars. • Differentiate regular, context-free and recursively enumerable languages. • Make grammars to produce strings 	Unit-1: Finite Automata	Remember, Understand, Analysis, Evaluate
	Unit-2: Regular Languages and Regular Grammar	Remember, Understand, Analysis, Evaluate
	Unit-3: Properties of Regular Languages	Remember, Understand, Analysis, Evaluate
	Unit-4: Context Free languages	Remember, Understand, Analysis, Evaluate
	Unit-5: Pushdown Automata	Remember, Understand, Analysis, Evaluate

Paper Name : Microprocessor and Assembly Language Programming

Paper Code : BCA-HE-6056

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> • A thorough understanding of the Intel 8085 microprocessor demands concepts and skills from two different disciplines : <ul style="list-style-type: none"> ➤ Hardware concepts from <i>Electronics</i> and ➤ Programming skills from <i>Computer Science</i>. <p>Introduction to the basic Architecture, Instruction sets and the Assembly Language Programming of the Intel 8085 microprocessor Kit. //</p>	Unit- 1: Internal Organization of 8085A microprocessor	Remember, Understand, Analysis, Evaluate
	Unit- 2: 8085A microprocessor architecture	Remember, Understand, Analysis, Evaluate
	Unit- 3: Assembly language programming in 8085A microprocessor	Remember, Understand, Analysis, Evaluate
	Unit- 4: Interfacing	Remember, Understand, Analysis, Evaluate
	Unit- 5: Interrupt	Remember, Understand, Analysis, Evaluate

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Department of Education

Programme Specific Outcome (B.A in Education) Generic (CBCS)

3RDSEMESTER GENERIC

PAPER NAME: GUIDANCE AND COUNSELLING

PAPER CODE: EDU-HG-3016

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
<p>After the completion of this course the students will be able to understand-</p> <ul style="list-style-type: none">• The concept, nature, need and importance of guidance and counselling.• the need of guidance service and school guidance clinic and also enable the learners to understand the challenges faced by the teachers as guidance workers.	Unit-1 Introduction to Guidance	Remembering, Understanding,
	Unit-2 Introduction to Counselling	Remembering, Understanding
	Unit-3 Organization of guidance service	Remembering, Understanding, Application
	Unit-4 Guidance needs of students	Remembering, Understanding, Application
	Unit-5 School guidance programme	Remembering, Understanding, Application

Department of Education

Programme Specific Outcome (B.A in Education) Generic (CBCS)

4thSEMESTER GENERIC

PAPER NAME: HISTORY OF EDUCATION IN INDIA

PAPER CODE: EDU-HG-4016

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
<p>After the completion of this course the students will be able to understand-</p> <ul style="list-style-type: none">the education system during British period as well as the educational situation during the time of independence.The national policy of education in different times and develop understanding of the recent education development in India.	Unit-1 Education in British India	Remembering, Understanding,
	Unit-2 Raise of Nationalism and its impact on Education	Remembering, Understanding, Application
	Unit-3 Development of Indian Education: Post Independence I	Remembering, Understanding
	Unit-4 Development of Indian Education: Post Independence-II	Remembering, Understanding
	Unit -5 Recent Developments in Indian Education	Remembering, Understanding, Application

COURSE OUTCOME

B.A.in Education (Honours) Syllabus (CBCS)

I Semester

PAPER NAME: Principles of Education

PAPER CODE: EDU-HC-1016

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
<p>After the Completion of this course, the students will able to know-</p> <ul style="list-style-type: none">To build knowledge on concept, nature principles of education with reference to the latest trends and current educational thoughts.	UNIT I-Meaning and Concept of Education	Understand
	UNIT II- Aims of education	Remember, Understand
	UNIT III- Curriculum	Analyze
	UNIT IV- Discipline and Freedom	Remembering, Understand
	UNIT V- Democracy and	Understand, Application

	Education	
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PAPER NAME: Psychological Foundations of Education

PAPER CODE: EDU-HC-1026

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> To facilitate the students with the knowledge of Psychology in the educational Perspective such as Memory, Intelligence, Personality, Attitude, Interest, Learning and Motivation, Mental health and Adjustment, Mechanism. 	UNIT I- Psychology and Education	Remembering, Understand
	UNIT II- Learning and Motivation	Understand, Application
	UNIT III- Memory, Attention and Interest	Remembering, Understand
	UNIT IV- Intelligence, Creativity and personality	Understand, Application, Create
	UNIT V- Laboratory Practical	Understand, Application

PAPER NAME: Philosophical and Sociological Foundation of Education

PAPER CODE: EDU-HC-2016

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> To develop concept on knowledge of education in social perspectives with aim in view to build good habits among the students and to make them socially adjustable. 	UNIT I- Philosophy and Education	Remembering, Understand
	UNIT II- Various Indian Schools of Philosophy and Education	Understand, Application
	UNIT III- Various Western Schools of Philosophy and Education	Understand, Application
	UNIT IV- Sociology and Education	Remembering, Understand
	UNIT V- Socio-cultural Context of Education	Understand, Application

PAPER NAME: DEVELOPMENT OF EDUCATION IN INDIA-I

PAPER CODE: EDU-HC-2026

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> To develop understanding on ancient and medieval system of education in India and also to build knowledge on development of education in India during pre-independence and post-independence era. 	UNIT I- Education in Ancient and Medieval India	Remembering, Understanding
	UNIT II- Education in British India: The Beginning	Remembering, Understanding
	UNIT III- Education in British India: In 19th Century	Remembering, Understanding
	UNIT IV- Rise of Nationalism and its impact on education	Remembering, Understanding
	UNIT V- Education in British India: A Period of Experiment	Remembering, Understanding, Application

PAPER NAME: Development of Education in India-II

PAPER CODE: EDU-HC-3016

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> Developing an Understand the Educational situation during the time of Independence and able to know the recommendations and educational importance of different Education Commission and Committees in post Independent India Able t know about the National Policy on Education Accustom with the recent Educational Development in India. 	UNIT I- Development of Indian Education the post independence period	Remembering, Understanding
	UNIT II- Development of Secondary Education in the Post-Independent Period	Remembering, Understanding
	UNIT III- Indian Education Commission- 1964-66	Remembering, Understanding
	UNIT IV- National Policies on Education in Post Independent India	Remembering, Understanding, Application
	UNIT V- Recent Developments and	Remembering,

	programmes in Indian Education	Understanding, Application
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PAPER NAME: Educational Technology and Teaching Methods

PAPER CODE: EDU-HC-3026

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> Build knowledge on concept of educational technology in teaching learning process and different innovations in the field of education through technology and about various methods and devices of teaching and classroom management and to understand the strategies of effective. 	UNIT I- Educational technology	Remembering, Understanding
	UNIT II- ICT and Communication Technology in teaching-learning	Remembering, Understanding, Application
	UNIT III- Models of teaching	Remembering, Understanding, Application
	UNIT IV- Methods and techniques of teaching	Remembering, Understanding, Application
	UNIT V- Lesson Planning and Micro Teaching	Understanding, Application

PAPER NAME: Value and Peace Education

PAPER CODE: EDU-HC-3036

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> Develop an understanding on concept of value and peace education and to understand the strategies and skills in promoting peace education at institutional level. 	UNIT I- Overall concept of Value	Remembering, Understanding
	UNIT II- Types of values, their characteristics, functions and educational significance	Remembering, Understanding, Application
	UNIT III- Overall Concept of Value education	Remembering, Understanding
	UNIT IV- Overall Concept of Peace education	Remembering, Understanding
	UNIT V- Challenges of Peace	Understanding, Application

	education and Role of Different Organizations	
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PAPER NAME: Great Educational Thinkers

PAPER CODE: EDU-HC-4016

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> To make aware of the philosophies of great educators such as Rousseau, Froebel, John Dewey, Maria Montessori, Sankardeva, Rabindra Nath Tagore, A.P.J. Abdul Kalam. 	UNIT I- Educational Thoughts of Srimanta Sankardeva	Remembering, Understanding, Application
	UNIT II- Educational Thoughts of Mahatma Gandhi and Rabindranath Tagore	Remembering, Understanding, Application
	UNIT III- Educational Thoughts of A.P.J. Abdul Kalam	Remembering, Understanding, Application
	UNIT IV- Educational Thoughts of Rousseau and Froebel	Remembering, Understanding, Application
	UNIT V- Educational Thoughts of John Dewey and Madam Maria Montessori	Remembering, Understanding, Application

PAPER NAME: EDUCATIONAL STATISTICS AND PRACTICAL

PAPER CODE: EDU-HC-4026

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> Build knowledge on the basic concept of statistics and with different statistical procedures used in education and to develop the ability to represent educational data through graphs and familiarize the students about the normal probability curve and its 	UNIT I- Basics of Educational Statistics	Remembering, Understanding,
	UNIT II- Graphical presentations of data	Remembering, Understanding, Application
	UNIT III- Co-efficient of Correlation and Percentiles	Remembering, Understanding, Application
	UNIT IV- Normal	Remembering,

applications in education.	Probability Curve and Its Application	Understanding, Application
	UNIT V- Statistical Practical	Application

PAPER NAME: Emerging Issues in Education

PAPER CODE: EDU-HC-4036

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> Develop an understanding on Emerging Issues related with education such as, youth unrest, campus disturbance, exam anxiety and educated unemployment and to address the various problems and challenges of education in India at all levels and the concept of Liberalization, Privatization and Globalization of education. 	UNIT I- Social Inequality in Education and Constitutional Safeguards	Remembering, Understanding,
	UNIT II- Liberalization, Privatization and Globalization of Education	Remembering, Understanding
	UNIT III- Issues related to Students	Remembering, Understanding, Application
	UNIT IV- Environmental Education and Population Education	Remembering, Understanding, Application
	UNIT V- Multi-Cultural Education and Alternative Education	Application

PAPER NAME: Measurement and Evaluation in Education & Practical

PAPER CODE: EDU-HC-5016

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> Build knowledge on concept of measurement and evaluation in education. To develop understanding on different measurement tools and procedure of 	UNIT I- Measurement and Evaluation in Education	Remembering, Understanding,
	UNIT II- Test Construction	Remembering, Understanding,

constructing educational and psychological tests like Intelligence test, Personality test, Aptitude test, Interest Test and Achievement Test.		Application
	UNIT III- Educational Achievement Test	Remembering, Understanding, Application
	UNIT IV- Personality Test	Remembering, Understanding, Application
	UNIT V- Laboratory Practical	Application

PAPER NAME: Guidance and Counselling

PAPER CODE: EDU-HC-5026

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> To develop understanding on concepts, objectives, needs & importance and techniques of Guidance and Counselling. 	UNIT I- Introduction to Guidance	Remembering, Understanding,
	UNIT II- Introduction to Counselling	Remembering, Understanding
	UNIT III- Organization of guidance service	Remembering, Understanding, Application
	UNIT IV- Guidance needs of students	Remembering, Understanding, Application
	UNIT V- School guidance programme	Understanding, Application

PAPER NAME: Developmental Psychology

PAPER CODE: EDU-DSE-5026

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> To developing the understanding of the basic concepts relating to development and acquaint the students about heredity and environmental factors affecting pre-natal development Enable the students to understand the 	UNIT I- Introduction to Developmental Psychology	Remembering, Understanding,
	UNIT II- Concept of Infancy and its Developmental stages	Remembering, Understanding, Application
	UNIT III- Concept of	Remembering,

development aspects during Infancy, Childhood, and Adolescence. • Enable the students to understand the development aspects of adolescence, importance of adolescence period and problems associated with this stage.	Childhood and its Developmental stages	Understanding, Application
	UNIT IV- Concept of Adolescence and its Developmental stages	Remembering, Understanding, Application
	UNIT V- Social, Emotional and Personality Development of Adolescence	Understanding, Application

PAPER NAME: Teacher Education in India

PAPER CODE: EDU-HC-5046

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> • Enable to understand the Concept, Scope, Aims & Objectives and Significance of teacher education • To know the development of Teacher Education in India • Acquaint with the different organizing bodies of teacher education in India and their functions in preparation of teachers for different levels of education • Acquaint with the innovative trends and recent issues in teacher education, and be able to critically analyze the status of teacher education in India • Understand and conceive the qualities, responsibilities and professional ethics of teachers 	UNIT I- Conceptual Framework and Historical Perspectives of Teacher Education in India	Remembering, Understanding,
	UNIT II- Teacher Education For Different Levels of Education	Remembering, Understanding, Application
	UNIT III- Structure and Organizations of Teacher Education in India	Remembering, Understanding
	UNIT IV- Status of Teacher Education in India: Trends, Issues and Challenges	Remembering, Understanding, Application
	UNIT V- Quality, Responsibility and Professional Ethics of Teachers	Understanding, Application

PAPER NAME: EDUCATION AND DEVELOPMENT

PAPER CODE: EDU-HC-6016

COURSE OUTCOME	UNIT/TOPIC	Bloom's
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		taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> Develop an understanding on relation between education and development and the concept of educational development in the post globalization era. Moreover, to acquainted the students with the role of education in community development and education for human resource development and also the economic and political awareness through education. 	UNIT I- Basic Concepts of Education and Development	Remembering, Understanding,
	UNIT II- Education and Community Development	Remembering, Understanding
	UNIT III- Education and Human Resource Development	Remembering, Understanding, Application
	UNIT IV- Education and Economic Development	Remembering, Understanding, Application
	UNIT V- Education and Developing Political Awareness	Understanding, Application

PAPER NAME: PROJECT

PAPER CODE: EDU-HC-6026

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> Build knowledge on the process of conducting a project and to prepare a Project Report and to stimulate problem solving and skill of analyzing data through investigation in various fields of education by undertaking a project work. 	UNIT I- Explain the process of conducting a Project	Understanding, Application
	UNIT II- Prepare a Project Report.	Application

PAPER NAME: Special Education

PAPER CODE: EDU-DSC-6026

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level

After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> • Understand the meaning and importance of special education • Acquaint with the different policies and legislations of special education • Familiarize the students with the different types of special children with their characteristics • Enable the students to know about different issues, educational provisions and support services of special education 	UNIT I- Concept of Special Education	Remembering, Understanding,
	UNIT II- Physically Challenged Children	Remembering, Understanding
	UNIT III- Children with Intellectual Disability (Mental Retardation) and Gifted	Remembering, Understanding
	UNIT IV- Children with Learning Disability	Remembering, Understanding,
	UNIT V- Policies ,Legislation and Services	Understanding, Application

PAPER NAME: EDUCATIONAL MANAGEMENT

PAPER CODE: EDU-HC-6036

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the Completion of this course, the students will able to know- <ul style="list-style-type: none"> • Develop an understanding of the basic concept of educational management. • Enable the students to know about the various resources in education • Enable the students to understand the concept and importance of educational planning. • Enable the students to know about the financial resources and financial management in education. 	UNIT I- Introduction to Educational Management	Remembering, Understanding,
	UNIT II- Resources in Education	Remembering, Understanding
	UNIT III- Educational Planning	Remembering, Understanding
	UNIT IV- Institutional Planning	Remembering, Understanding
	UNIT V- Financing of Education and Recent Trends in Management	Understanding, Application

Department of Education

Programme Specific Outcome (B.A in Bengali) (CBCS)

1. To build knowledge on concept, nature and principles of education, various types of curriculum, relation between education and psychology, discipline and freedom and to create awareness among the students about the democratic idea of modern education.
2. To facilitate the students with the knowledge of psychology in the educational perspective such as memory, intelligence, emotional intelligence, attention, forgetting, personality, attitude, measurement, interest, and adjustment mechanism etc.
3. To develop understanding on concept of philosophy and its relationship with education and to understand the educational implications of different Indian schools as well as different Western schools of philosophy and also to develop understanding about the concept of educational sociology, social groups and socialization.
4. To acquainted the students with ancient and mediaeval system of education in India. Moreover it will help the students to understand the development of education in India during the British Period.
5. Develop an understanding on educational situation during the time of Independence and explain the recommendations and educational importance of different Education Commission and Committees in post Independent India. Moreover to develop the concept of National Policy on Education in different times and accustom with the recent Educational Development in India.
6. Build knowledge on concept of educational technology in teaching learning process and different innovations in the field of education through technology and about various methods and devices of teaching and classroom management and to understand the strategies of effective.
7. Develop an understanding on concept of value and peace education and to understand the strategies and skills in promoting peace education at institutional level.
8. To make aware of the philosophies of great educators such as Rousseau, Froebel, John Dewey, Maria Montessori, Sankardeva, Rabindra Nath Tagore, A.P.J. Abdul Kalam.
9. Build knowledge on the basic concept of statistics and with different statistical procedures used in education and to develop the ability to represent educational data through graphs and familiarize the students about the normal probability curve and its applications in education.
10. Develop an understanding on Emerging Issues related with education such as, youth unrest, campus disturbance, exam anxiety and educated unemployment and to address the various problems and challenges of education in India at all levels and the concept of Liberalization, Privatization and Globalization of education.

11. Build knowledge on concept of measurement and evaluation in education. To develop understanding on different measurement tools and procedure of constructing educational and psychological tests like Intelligence test, Personality test, Aptitude test , Interest Test and Achievement Test.
12. To develop understanding on concepts, objectives, needs & importance and techniques of Guidance and Counselling.
13. Develop an understanding on relation between education and development and the concept of educational development in the post globalization era. Moreover, to acquainted the students with the role of education in community development and education for human resource development and also the economic and political awareness through education.
14. Build knowledge on the process of conducting a project and to prepare a Project Report and to stimulate problem solving and skill of analyzing data through investigation in various fields of education by undertaking a project work.

PROGRAMME OUTCOME OF EDUCATION

(CBCS) GENERIC

1. Develop an understanding on the principles of education, gain knowledge about various Forms and Aims of Education and understand the concept and importance of Discipline and Freedom. Moreover the students will be able to acquire knowledge about the concept of emotional and national integration and international understanding.
2. Develop an understanding the period of adolescence, significance of the adolescence period in human life and to know about various problems associated with this stage. Apart from this to build the knowledge about the developmental aspects of adolescence, importance of adolescence period and problems associated with this stage.
3. To develop understanding on concepts, objectives, needs & importance and techniques of Guidance and Counselling.
4. Develop an understanding on concept of education system during British Period and to understand the educational situation during the time of Independence. And also to explain the recommendations and educational importance of different Education Commission and Committees in post Independent India.

COURSE OUTCOME

M.A. in Education Syllabus (CBCS)

I Semester

PAPER NAME: SOCIOLOGICAL FOUNDATION OF EDUCATION

COURSE CODE: 1016

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the completion of this course the students will be able to understand- <ul style="list-style-type: none"> The social context of education and its operational dimension ,culture and its relationship with social change,current social problems and issues in education. Social Groups and their relevance in society 	Unit-1 Sociology Of Education	Remember, Understand,
	Unit-2 Culture	Remember, Understand
	Unit-3 Socialization and Social Stratification	Remember, Understand
	Unit-4 Social Control and Social Order	Remember, Understand
	Unit-5 Social Organization and Social Disorganization	Remember, Understand, Apply

PAPER NAME: Psychological Perspective of Education

COURSE CODE: 1026

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
After the completion of this course the students will be able to understand- <ul style="list-style-type: none"> the learners with the process of Learning and Learning theories and the importance of motivation in learning the students with the traits and types of personality and some personality disorders as well as the students to understand the learners with Learning Disabilities (LD) and help them to acquire the techniques of teaching students with LD 	Unit-1 The Process of Learning	remember, Understand,
	Unit-2 Motivation in Learning	Remember, Understand
	Unit-3 Intelligence and Creativity	Remember, Understand, Apply,
	Unit-4 Understanding Personality	Remember, Understand, evaluate
	Unit-5 Learning Disabilities and Learner's Needs	Remember, Understand, Apply

PAPER NAME: Comparative Education

PAPER CODE: 1036

COURSE OUTCOME	UNIT/ TOPIC	BLOOMS TAXONOMY LEVEL

After the completion of this course the students will be able to- <ul style="list-style-type: none"> • Understand the need and importance of comparative education • Gain knowledge about the educational system of India and a few other countries. 	Unit-1 Comparative education	Remember, Understand, Apply
	Unit-2 England	Remember, Understand, Analyse
	Unit-3 Japan	Remember, Understand, Analyse
	Unit-4 USA	Remember , Understand, Analyse
	Unit-5 Germany	Remember, Understand, Analyse

PAPER NAME: EDUCATIONAL TECHNOLOGY

PAPER CODE: 1046

COURSE OUTCOME	UNIT/TOPIC	BLOOM'S TEXONOMY LEVEL
After the completion of this course the students will be acquaints themselves with..... <ul style="list-style-type: none"> ➤ Different innovations of educational technology . ➤ To know the use of Instructional media in the classroom. ➤ To know the effective use of educational technology in teaching-learning process. 	UNIT:1 Conceptual Bases of Educational Technology	Remember, Understand
	UNIT: 2 Programmed Instruction	Remember, Understand, Apply
	UNIT:3 The Fundamental Bases of Teaching and Learning	Remember, Understand
	UNIT:4 Micro Teaching and Classroom Interaction	Remember, Understand, Apply

	UNIT:5 Emerging Trends in Educational Technology	Remember, Understand, Apply
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PAPER

NAME: Social Psychology and Group Dynamics

PAPER CODE: 2016

Course Outcome	Unit/Topic	Blooms Texonomy level
After Completion of the course the students will be able to know- <ul style="list-style-type: none"> To enable the students to understand the concept of social psychology and group dynamics, nature of social conflict, processes of social interaction and its relevance in education To enhance self-awareness and self identity, to apply social psychology to the classroom and to positive well-being and education. 	Unit1-Social Psychology	Remember, understand Apply
	Unit-2 Social interaction and interpersonal perceptions	Understand, Apply, Analyze
	Unit-3 Beliefs and Attitudes	Remember, Understand, Apply
	Unit -4 Stereotypes, Prejudice and Discrimination	Understand, Analyze, Evaluate
	Unit-5 Social group and leadership	Remember, understand, Apply, Analyze

PAPER NAME: EDUCATIONAL PLANNING AND MANAGEMENT

PAPER CODE: 2026

COURSE OUTCOME	UNIT/TOPIC	BLOOM'S TAXONOMY LEVEL
After the completion of this course, the students will be able to- <ul style="list-style-type: none"> Developing the understanding of Educational Management. It also helps to understand the resource management in education. Understanding the issues and challenges of educational planning. Also to understand financial resources 	UNIT I- Educational Management – concept and nature	Remember, Understand
	UNIT II- Resource Management in Education	Understand, Apply
	UNIT III- Educational Planning	Understand, Apply
	UNIT IV- Educational	Understand, Apply,

and financial management in education. • Developing the understanding of recent issues in educational management.	Leadership, Supervision and Inspection	Create
	UNIT V- Contemporary issues in Educational Management	Understand, Apply, Analyze

PAPER NAME: Measurement and Evaluation in Education

PAPER CODE: 2036

COURSE OUTCOME	UNIT/ TOPIC	BLOOMS TAXONOMY LEVEL
After the completion of this course the students will be able to- • understand the concept of measurement and evaluation in the field of Education. • understand the principles of test construction and standardization • acquaint the students with the test of Intelligence, Personality and Aptitude and their importance in different fields	Unit-1- Concept of Measurement, Evaluation Test Construction and Standardisation	remember, Understand, Apply
	Unit-2 Measurement of Educational Achievement	understand, Analyse, Apply, Create
	Unit-3 Measurement of General Intelligence	remember, Understand, Apply
	Unit-4 Measurement of Personality	Understand, Apply, Evaluate,
	Unit-5 Measurement of Aptitude	Understand, Analyse, Apply,

PAPER NAME: Psychological Laboratory Practical

Nature of the Course – Core (Laboratory Practical)

PAPER CODE: 2046

COURSE OUTCOME	UNIT/ TOPIC	BLOOMS TAXONOMY LEVEL
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<p>After the completion of this course the students will be able to -</p> <ul style="list-style-type: none"> develop the understanding of the concept of Experimental Psychology. Understand the methods of conducting various Psychological Experiment Tests 	<p>Unit-1 Learning</p> <p>a) Maze Learning</p> <p>b) Mirror Drawing</p>	Understand, apply
	<p>Unit-2 Motivation & Fatigue</p> <p>a) Effect of Frustration on Performance</p> <p>b) Knowledge of Result</p> <p>c) Mental Work and Fatigue</p>	Understand , apply
	<p>Unit-3 Memory and Forgetting</p> <p>A)Proactive and Retroactive Inhibition</p> <p>b) Types of imagery</p>	Understand, apply
	<p>Unit-4 Attention, Thinking and Imagination</p> <p>a) Span of Apprehension</p> <p>b) Span of Attention</p> <p>c) Concept Formation</p> <p>d) Ink – Blot Test</p> <p>e) Free association and controlled association test</p>	Understand , apply
	<p>Unit-5 Personality – Interest, Intelligence, Aptitude and Reaction Time</p> <p>a) Personality Test of Introversion and Extroversion</p> <p>b) Simple Reaction Time</p> <p>c) Complex Reaction Time</p>	Understand , apply

PAPER NAME: Educational Statistics

PAPER CODE: 3016

COURSE OUTCOME	UNIT/TOPIC	BLOOM'S TAXONOMY LEVEL
<p>After the completion of this course, the students will be able to-</p> <ul style="list-style-type: none"> Developing the understanding of the different concepts of statistics. Developing the understanding various methods of Inferential Statistics. Developing the understanding of the application of different statistical methods in Research activities. 	UNIT I- The Normal Distribution	Understand, Apply
	UNIT II- Regression and Correlation	Understand, Apply
	UNIT III- The Significance of the Other Statistics and the Difference between Means	Understand, Apply
	UNIT IV- Analysis of Variances	Understand, Apply
	UNIT V- Chi-square Test	Understand, Apply

PAPER NAME: PROBLEMS AND ISSUES IN EDUCATION

PAPER CODE: 3026

COURSE OUTCOME	UNIT/TOPIC	BLOOM'S TAXONOMY LEVEL
<p>After the completion of this course, the students will be able to-</p> <ul style="list-style-type: none"> Developing the understanding of constitutional provision of education and their implementation Developing the understanding of various schemes of elementary education, Secondary education and various issues regarding the issues of Higher education. Understanding of value, peace education and human rights education. 	UNIT I- Educational provisions under Indian constitution and others Policy, Commission, Report & Act	REMEMBER, UNDERSTAND
	UNIT II- Secondary Education in India (Various Scheme, Commissions)	REMEMBER, UNDERSTAND
	UNIT III- Value Education, Peace Education and Human Rights Education	UNDERSTAND, APPLY
	UNIT IV- Structure of Higher Education in India	REMEMBER, UNDERSTAND
	UNIT V- Quality Assurance in Indian higher education	UNDERSTAND, APPLY

PAPER NAME: DEVELOPMENTAL PSYCHOLOGY

PAPER CODE: 3056

COURSE OUTCOME	UNITS/TOPICS	BLOOM,S TAXONOMY LEVEL
<p>After the completion of this course the students will be able to know...</p> <ul style="list-style-type: none"> ❖ Basic concept relating to growth and development. 	UNIT:1 Contents on Developmental Psychology.	Remember, Understand
	UNIT:2 Infancy, Childhood...its different characteristics.	Remember, Understand

<ul style="list-style-type: none"> ❖ Different stages of human development and its nature ❖ Problems of different stages. 		
	UNIT:3 Children and their Parents.	Remember, Understand
	UNIT:4 Adolescence	Remember, Understand
	UNIT:5 Personality Development during Adolescence	Remember, Understand

PAPER NAME: ENVIRONMENTAL EDUCATION

PAPER CODE: 3076

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy Level
<p>After the completion of this course the students will be able to understand -</p> <ul style="list-style-type: none"> • Importance of Environment and Environmental Education and the relationship between man and environment. • Acquaint the students with 	Unit-1 Concept of Environment	Remember, Understand,
	Unit-2 Environmental Awareness through Education	Remember, Understand, Apply
	Unit-3 Environmental Stressors and Conservation of Environment	Remember, Understand

<p>different natural and man induced environmental stressors and help to acquire environmental conservation strategies.</p> <ul style="list-style-type: none"> • Knowledge about demographic scenario in Indian population and impact of population growth on environment. 	Unit-4 Population and Quality of Life	Remember, Understand, Apply
	Unit-5 Environmental Ethics and Sustainable Development	Remember, Understand

PAPER NAME: PHILOSOPHICAL FOUNDATIONS OF EDUCATION

PAPER CODE: 4016

COURSE OUTCOME	UNIT/TOPIC	BLOOM'S TAXONOMY LEVEL
<p>After the completion of this course, the students will be able to-</p> <ul style="list-style-type: none"> • Developing the understanding of the concept of Philosophy of Education also to understand about the Ancient Indian Schools of thought. • Able to critically examine the Concepts of Education in India and Western Philosophical Thoughts, Also to understand Platonic Philosophy of Education and its Implication. 	UNIT I- Philosophy of Educational Philosophy	Remember, Understand
	UNIT II- Indian Schools of Thought- Vedic period	Understand, Apply
	UNIT III- Indian School of Thought- Post Vedic and Medieval Period	Understand, Apply
	UNIT IV- Western Schools of Thought	Understand, Apply, Analyze
	UNIT V- Platonic Philosophy of Education	Understand, Apply, Analyze

PAPER NAME: METHODOLOGY OF EDUCATIONAL RESEARCH

COURSE CODE : 4026

COURSE OUTCOME	UNIT/TOPIC	Bloom's taxonomy
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		Level
<p>After the completion of this course the students will be able to understand-</p> <ul style="list-style-type: none"> • The concept, types and methods of Educational Research. • Concepts, steps, significance of Review of Related Literature in Educational Research. • Acquaint the students with data collection procedure and various tools of Educational Research. • Students will acquire knowledge regarding qualitative and quantitative data analysis and preparing the Research Report. 	Unit-1 Educational Research – concept and its different types- Fundamental, Applied and Action Research Methods of Educational Research - Historical, Descriptive, Experimental	Remember, Understand,
	Unit-2 Review of Related Literature	Remember, Understand
	Unit-3 Design of the study- Population, Sample, Tools of Educational Research	Remember, Understand, Apply
	Unit-4 Qualitative and Quantitative Research	Remember, Understand, Apply
	Unit-5 The Research Report	Remember, Understand, Apply

PAPER NAME: CURRICULUM DEVELOPMENT

PAPER CODE: 4036

COURSE OUTCOME	UNIT/TOPIC	BLOOMS TAXONOMY LEVEL
<p>After the completion of this course the students will be able to-</p> <ul style="list-style-type: none"> • understand the concept, needs and scope of curriculum in relating to curriculum development • acquaint the students with the bases of curriculum and importance of technology integration in transacting 	Unit-1 Curriculum Development	Remember, Understand, Apply
	Unit-2 Bases for Curriculum Development	Remember, Understand, Evaluate
	Unit-3 ICT and Curriculum Development	Apply, analyse, Evaluate

curriculum <ul style="list-style-type: none"> identify the problems of existing curriculum and also to enable them with the new trends and innovative practices in curriculum development. 	Unit-4 Defects of Curriculum and Curriculum Evaluation	Understand, Evaluate
	Unit-5 Towards an Effective Curriculum	Apply, Analyse, Create

PAPER NAME: GUIDANCE AND COUNSELLING

PAPER CODE: 4056

COURSE OUTCOME	UNIT/TOPIC	BLOOM'S TAXONOMY LEVEL
<ul style="list-style-type: none"> After the completion of this course the student will be able to know... The concept, need and viewpoint of guidance and counselling. Understand the principles and problems of different types of guidance. Principles of guidance programme. 	UNIT:1 Guidance & Counselling	Remember, Understand
	UNIT:2 Types of Guidance	Remember, Understand
	UNIT:3 Guidance needs of children	Remember, Understand
	UNIT:4 Child Guidance Clinic	Remember, Understand
	UNIT:5 Various Procedures of Guidance	Remember, Understand

Course Outcome	Unit/Topic	Bloom's taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> Examine the theoretical developments in the working of the firm producing a single product and multiple products Analyze the behavior of the consumer Explain and analyze the working of markets operating at differing levels of competition. To differentiate and analyze the various financial statements of a firm. <p>Compare and contrast the managerial theories of the firm with the traditional theories</p>	<p>Unit 1: Theory of Production and Cost Production function and related concepts–Isoquants and Substitution between Factors–Elasticity of Substitution–Returns to Scale and Returns to a Factor–Technical Progress and Production Function– Forms of Production Function; Cobb-Douglas, CES and Fixed coefficient Type–the Ideas of Partial and Total Factor Productivity–Single Decision of a Firm; Choice of Optimal Factor Combination–Expansion Path–Derivation of Cost Function from Production Function–Multi-product Firm: production Efficiency Locus, Production Possibility Frontier and Choice of Optimal Combination of Output of Products</p>	Understanding, remembering
	<p>Unit 2: Analysis of Consumer's Choice A Review of Indifference Curve and Revealed Preference Approach–Violation of the Premises of Indifference curve Approach: Stationary and Lexicographical Ordering–Indirect Utility Function–Dual Properties of Utility and Expenditure Functions, Ray's Identity-ordinary and compensated demand curves and measures of welfare change–Linear Expenditure System.</p>	Understanding, analyzing
	<p>Unit-3: Market Structure and Pricing of Products A Review of Perfect Competition Equilibrium– Monopoly and its Regulation–Monopolistic Competition: Price-Output Equilibrium– Duopoly Models of Cournot, Bertrand and, Stackelberg– Kinked Demand Curve Model of Oligopoly– Collusive Oligopoly: Price Leadership Models, Contestable Markets.</p>	Understanding, remembering
	<p>Unit-4: Business accounts and Managerial Theories of the Firm Profit and loss account, balance sheet and cash flow statements of a firm, break even analysis,; A critique of the Traditional Theories of Firm-Contributions of Baumal, Morris and Williamson to managerial Theories of the Firm.</p>	Understanding, Analyzing

PROGRAMME OUTCOME OF M.A (EDUCATION)

1. To prepare the learner for understanding real life issues and participate in the programs and practices in the social context.
2. To develop multidimensional understanding of various topics pertaining to society, philosophy of life, technology in modern time, environmental issues.
3. To make an attempt to approach for developing competencies among the students on teaching especially institutions like B.Ed., M.Ed., DIET etc.
4. To incorporate self-discovery, academic understanding and future employment in multidimensional area.

Programme Specific Outcome (M.A in Economics) (CBCS)

1st Semester

PAPER NAME- Principles of Microeconomics

PAPER CODE- ECO-1016

Course Outcome	Unit/Topic	Bloom's taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • Elaborate on the basics of National Income accounting and Income-Employment Determination Process • Interpret the complications of macroeconomic policy making in closed and open economy frameworks • Link macroeconomic theory to micro foundation of consumers' choice and firms' investment decisions 	<p>Unit-1: A Review of Aggregate Income and its Determination</p> <p>The Ideas of Income, Domestic Income and National Income; GDP as a Production Total and its sectoral composition, NDP as an Income Total, the Circular Flow and GDP as an Expenditure Total; Introduction to Equilibrium and Dis equilibrium in the Macro-economy; Classical Model of Full Employment; Keynes Criticism of Classical theory, The Simple Keynesian Framework and the Multiplier</p>	<p>Remembering, analyzing</p>
	<p>Unit-2: Income Determination with Money Market</p> <p>Liquidity Preference and the Rate of Interest ;the IS-LM frame work and Policy Analysis ,IS-LM Model with Flexible Prices ;Real Balance Effect and Patinkin's Full Employment Equilibrium</p>	<p>Understanding, analyzing</p>
	<p>Unit-3: Consumption Function</p> <p>The Consumption Function Puzzle; The Relative Income Hypothesis; The Permanent Income Hypothesis; The Life Cycle Hypothesis; Random Walk Hypothesis; Consumption Theories and Policy Implications</p>	<p>Understanding, remembering</p>
	<p>Unit-4: Investment and Business Cycles</p> <p>Firm Business Investment: The Rental Price of Capital, the Cost of Capital and Determination of Investment; Residential and Inventory Investment: nature and determinants; the Accelerator Model; Business Cycles as Multiplier ,Accelerator ,Interaction Process</p>	<p>Understanding</p>

	Unit-5: Open Economy Macroeconomics The Exchange rate and its Determination; Balance of Payment and its Adjustment under Fixed and Flexible Exchange Rate Regimes, Effectiveness of Devaluation; The Open Economy IS-LM Model; Capital Flow and the Mundell - Fleming Model; Foreign Trade Multiplier	Understanding, analyzing

COURSE OUTCOME
MA IN ECONOMICS
1st Semester
PAPER NAME - Quantitative Orientation
PAPER CODE- ECO-1036

Course Outcome	Unit/Topic	Bloom's taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> Elaborate on the use of basic mathematical tools such as matrix, differentiation and integration in economics. Discuss how these tools can be applied in economics. While going through this course, students will have an idea of using the quantitative technique in Micro economics, Macro economics and other fields of economics. Prepare the student to analyze economic theory in an empirical way. 	Unit-1: Classical Optimization Unconstrained maxima and minima with a single explanatory variable– applications to cost minimization ,revenue maximization, tax revenue maximization, profit maximization and equilibrium of firm, Unconstrained maxima and minima with more than one explanatory variables applications to discriminatory monopoly, Multiproduct equilibrium, Multiplant equilibrium, equilibrium of firm with advertisement cost and subsidy	Understanding , analyzing
	Unit– 2: Optimization with Equality Constraint Optimization with quality constraints, Lagrange's multiplier method–application to consumer's equilibrium and producer's equilibrium in factor market	Understanding
	Unit– 3: Integration Applications relating to derivation of total functions from marginal functions, estimation of consumer's surplus, producer's surplus, problems Relating to investment, capital formation and derivation of simple growth process (Domar).	Understanding , analyzing
	Unit-4: Matrix Algebra and its Applications Rank, Norm and Trace of a matrix, Partition matrix, Matrix inversion, Structure of input-Output table,	Analyzing, remembering

	Static Leontief system–Domestic and External sector	
	Unit– 5: Probability: Basic Ideas Axiomatic Definition and derivation of Basic Probability Rules–Conditional Probability, Baye’s Theorem (Concept only)–Random variable – Mathematical Expectation and Moments relating to Discrete random variables	Understanding
	Unit– 6: Theoretical Probability Distributions Binomial, Poisson and Normal Distributions with Properties– Moment Generating Function– The Central Limit Theory (without Proof).	Understanding , analyzing

COURSE OUTCOME
MA IN ECONOMICS
1st Semester
PAPER NAME - Elements of Development Economics

Course Outcome	Unit/Topic	Bloom’s taxonomy
After the completion of the course, the students will be able to: <ul style="list-style-type: none"> Get an insight in to the real meaning of development, and endowments of economics and political economy 	Unit– 1: Development and its Measurement Problems in Defining Economic Development, Per Capita Income as an Index of Development, Alternative Measures of Development Gap: HDI, GDI and related indices.	Understanding , remembering
	Unit– 2: Poverty and Inequality Poverty: Concepts and Measurement, Income Inequality: Axioms, Index and Measures, Redistribution with Growth	Understanding , remembering
	Unit– 3: Classical Development Theories Theories of Evolution of a Capitalist Economy: Classical, Marx and Schumpeter, Theories of Persistence of underdevelopment: The Vicious Circle Theory, The Stages of Growth: Rostow	Understanding , remembering
	Unit– 4: Development Strategies Big Push: Rosenstein-Rodan, Balanced Growth: Nurkse, Unbalanced Growth: Hirschman, Critical Minimum Efforts: Leibenstein.	Understanding , remembering

<p>influence the allocation of resources and can facilitate, or under certain situations, hamper the reduction of poverty, inequality and unemployment in a given society.</p>	<p>Unit-5: Dualistic Pattern of Development Unlimited Supply of Labour and the Dual Economy-Models of Arthur Lewis and Fei- Renis, Rural-Urban Migration: The Harris–Todaro Model, Core-Periphery Models-The Process of Cumulative Causation: Myrdal, Neo-Colonial Dependence Model</p>	<p>Remembering, understanding</p>
<ul style="list-style-type: none"> • Interpret the various development strategies and theories to assess the different development paths followed by different societies of the world. This can assist them in answering certain basic questions as to why some countries grow at a fast rate, while others lag behind; what are the conditions that can 	<p>Unit– 6: Development Planning The Concept and Types of Planning, Rationale for Planning in a Developing Economy, The Planning Process: Projection of MacroVariables, Input-Output Models and Sectoral Projections, Project Evaluation and Social Cost-Benefit Analysis, Plan Failures, Market Versus Planning, Planning in a Market Oriented Economy, Plan Models in India</p>	<p>Remembering, understanding</p>

promote growth, and what are the conditions that can hinder growth, among others.

- Explain the measurement issues relating to development, the development strategies taken place over the years in terms of changes in the definition of development, and the related methodological issues. The students also gain knowledge on the issues relating to the definition and measurement of poverty and inequality—be it inequality in terms of income, or inequality involving gender.

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**COURSE OUTCOME
MA IN ECONOMICS**

1st Semester

**PAPER NAME - Statistical Software for Data Analysis and Presentation
(Value Added)**

PAPER CODE- ECO-1054

Course Outcome	Unit/Topic	Bloom's taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • To describe the use of computer for presenting and summarizing data. Students can learn appropriate use of diagrammatical and tabular presentation of information. • The use of computer and other statistical software in computing basic statistical tools and other relevant statistical techniques also covered in this course. • There will be 	<p>Unit 1: Presentation of data Diagrammatic Presentation-One dimensional–single, subdivided, multiple deviation; Two dimensional-histogram, pie diagram; Three dimensional-rectangular, cube; Pictograms and cartograms, scatter, line and radar diagrams; Tabular Presentation-Single; Double, Multiple</p>	<p>Understanding , analyzing</p>
	<p>Unit 2: Basic statistics Frequency, Summation, maximum, Minimum, Mean, Median, Mode, standard deviation, skewness</p>	<p>Understanding , analyzing</p>
	<p>Unit3: Statistical relations Covariance; correlation- Bivariate, Partial, Rank, Correlation matrix; Simple Linear regression</p>	<p>Understanding , analyzing</p>

hands-on training for each student with individual computer.		
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**COURSE OUTCOME
MA IN ECONOMICS
2nd Semester
PAPER NAME - Advanced Microeconomics**

Course Outcome	Unit/Topic	Bloom's taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> To discuss how an individual could take decision under uncertain situation about current and future conditions which is a more realistic situation in our day to day life. Against the typical assumptions of complete knowledge about market, in this course discusses in complete information 	<p>Unit 1: Inter-temporal Choice and Choice under Uncertainty</p> <p>Discounting and Present Value–Inter-temporal Consumption Decision–Inter-temporal Production Decision–Evaluation of Investment Projects–Determination of the Rate of Interest; Attitude towards Risk–Expected Utility–Measures of Risk Aversion–Certainty Equivalence and the Cost of Risk</p>	Understanding, remembering
	<p>Unit2: Economics of Insurance and Information</p> <p>Economics of Insurance–Asymmetric Information and Adverse Selection–Moral Hazard–Signaling and Screening-the Principal Agent Problem</p>	Understanding, remembering
	<p>Unit 3: Determination of Factor Prices</p> <p>Pricing of Factors under Perfect Competition–Factor Share and Technical Progress–Backward Bending Supply Curve of Labour–Monopsony</p>	Understanding, remembering
	<p>Unit 4: General Equilibrium</p> <p>Partial Versus General Equilibrium Approaches–Walrasian General Equilibrium System: Existence, Stability and Uniqueness of the Equilibrium-Tatonnement and Non-tatonnement Process–Arrow and Debreure-specification of the Walrasian Economy–Idea of Fixed</p>	Understanding, remembering

<p>about the market by the agents (which is of course more real).</p>	<p>Point Theorems and their Application to Existence Proof–Uncertainty and the Contingent Markets–Ideas of Computable General Equilibrium</p>	
<ul style="list-style-type: none"> • While going through this course student could quantify the risk involve in different real life situation and know how decision could be made that will maximize their satisfaction. • How can the welfare of society be enhanced by considering the character of goods and social choice is also discussed in this course 	<p>Unit 5: Welfare Economics Pareto Optimality–The Fundamental Theorems of Welfare Economics–Market Failure: Externality and Public Good–Welfare Effects of Non-price Allocations and Price Control–Problem of Welfare Maximization: Compensation Principle, Social Welfare Function–Social Choice: Contributions of Arrow and Sen.</p>	<p>Remembering, understanding</p>

COURSE OUTCOME MAIN ECONOMICS 2nd Semester PAPER NAME - Macroeconomic Theory and Policy PAPER CODE- ECO-2026

Course Outcome	Unit/Topic	Bloom’s taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • Evaluate the nuance of different schools of thought and the implications thereof for macroeconomic policy formulation 	<p>Unit 1: Money, Inflation and Unemployment Inventory and Portfolio Balance Approaches to Demand for Money; Friedman’s Restatement of the Quantity Theory of Money; Inflation-Unemployment Trade-off: the Philips Curve Analysis; Monetarists “Criticism of the trade-off, Natural Rate of Unemployment and the Long Run ;Adaptive versus Rational Expectations, New Classical School and the Policy Ineffectiveness Hypothesis</p>	<p>Understanding, remembering</p>

<ul style="list-style-type: none"> Extend the ideas of to the working of the wider Financial Economy Enumerate the latest advances in theories of growth and business cycles 	Unit 2: Supply of Money Supply of Money and its Components, Inside and Outside Money, Determinants of Money Supply, High-powered Money, Money Multiplier, Money Supply Determination in an Open Economy	Understanding, remembering
	Unit 3: Advances in Business Cycle Theory Theory of Real Business Cycles, Interpretation of the Labour Market, Importance of Technology Shocks, Neutrality of Money; New Keynesian Economics: Manu Cost Model, Recessions as Coordination Failure	Understanding, remembering
	Unit 4: Growth Theory Determinants Growth ,Harrod- Domor Model: Instability of Equilibrium, Solow’s Neoclassical Model and Steady State Growth, the Alternative Theory: Kaldor’s theory of Distribution and Growth	Understanding, remembering
	Unit 5: Further Issues in Growth Theory The Convergence Debate, Role of Technical Progress ,Learning by Doing, Role of Human Capital, Endogenous Growth Theories ,Accounting for Sources of Economic Growth, Overlapping Generation Models	Remembering, understanding

COURSE OUTCOME
MA IN ECONOMICS
2nd Semester
PAPER NAME – Quantitative Tools
PAPER CODE- ECO-2036

Course Outcome	Unit/Topic	Bloom’s taxonomy
After the completion of the course, the students will be able to: <ul style="list-style-type: none"> To analyze the classical equilibrium analysis with maximization of profit and minimization of cost. 	Unit– 1: Calculus for Dynamic Analysis First and second order differential equation and its solutions– application to dynamic stability of market and simple growth process(Harrod-Domar),First order difference equation and its solution application of difference equation–lagged market model (Cobweb) and Harrod’s model of growth; Optimal Control Theory- Basic Idea–Procedure–A few illustrative examples	Analyzing, understanding

<ul style="list-style-type: none"> To apply the techniques of game theory for solving various economic problems. To assess the techniques of sampling and hypothesis testing for using in research purposes. 	Unit– 2: Optimization with inequality constraint Linear programming, General formulation Transportation problem, diet problem and production problem– Simplex method of solution for well behaved and ill behaved functions (two variables, two constraints only)– Concept of duality, Formulation of dual equations.	Understanding, analyzing
	Unit– 3: Game Theory An overview of game theory, Nash equilibrium-economic application, Prisoner’s dilemma-economic application, Repeated games, Finitely Repeated Prisoner’s Dilemma and Infinitely repeated Prisoner’s Dilemma.	Analyzing, understanding
	Unit– 4: Sampling and Estimation Concept of Sampling Distribution and Standard Error of a Statistic– Methods of Estimation– Principles of Moments, Least Square and Maximum Likelihood(Concept only)	Understanding, analyzing
	Unit– 5: Statistical Inference Testing of Hypothesis: Type I and Type II Errors, One-tailed and Two-tailed Tests– Test based on Standard Normal, t and Chi-Square Distributions.	Understanding, analyzing

COURSE OUTCOME

MA IN ECONOMICS

2nd Semester

PAPER NAME - Development Economics: Theory and Practice

PAPER CODE- ECO-2046

Course Outcome	Unit/Topic	Bloom’s taxonomy
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<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> Identify the various sources of financing of economic development, the associated theoretical models suggesting the objective and the practical outcomes. Analyze the linkages between trade and development and environment and development Analyze the effects of education and health in the development outcomes of a society Illustrate the role of institutions in development 	<p>Unit- 1: Financing of Development Domestic Sources: Private Savings, Taxation, Financing by Money Creation and its Effects, The Dual Gap Analysis: Saving-Investment Gap and the Foreign Exchange Gap, Foreign Borrowing and the Debt Serving Problem, Private Foreign Investment: Portfolio and Direct Investment, Effects on Host and Investing Countries– Direct Investment and Exploitation</p>	<p>Understanding, remembering</p>
	<p>Unit- 2: Trade and Development Trade as an Engine of Growth, Trade and Aid, Gains from Trade, Terms of Trade and LDCs: Prebisch, Singer and Myrdal's Views.</p>	<p>Understanding, remembering</p>
	<p>Unit- 3: Environment and Development Environment and Economy Interdependence, Poverty and Environmental Degradation, The Concept of Sustainable Development, Micro Planning for Environmental and Eco-Preservation, Watersheds and Joint Forest Management, Role of State in Environmental Preservation</p>	<p>Remembering, understanding</p>
	<p>Unit- 4: Economics of Education Education and Economic Development, Cost-Benefit Analysis of Education, Measurement of Costs, Measurement of Benefits, The Rate of Return of Investment in Education, Social Rate of Return to Investment in Education, Public and Private, Financing of Education: Criteria for Adequacy of Education Finance, Traditional as well as Modern Concept of Adequacy, Financing of Education and Equity</p>	<p>Understanding, analyzing</p>
	<p>Unit-5: Health and Economic Development Health Care and Human Resource Development, Cost-Benefit Analysis of Health Care facilities, Cost-effectiveness Analysis of Health care Facilities.</p>	<p>Understanding, remembering</p>
	<p>Unit- 6: Role of Institutions in Development Overview of growth models, Introducing institutions, Institutions as a determinant of growth, Institutional characteristics ,Pit falls o institutional reform</p>	<p>Remembering, understanding</p>

COURSE OUTCOME
MA IN ECONOMICS
2nd Semester
PAPER NAME - Quantitative Aptitude and Test of Reasoning
(Value Added)

PAPER CODE- ECO-2054

Course Outcome	Unit/Topic	Bloom's taxonomy
After the completion of the course, the students will be able to: <ul style="list-style-type: none"> • Practice skills for competitive examinations 	Unit 1: Mathematical Reasoning Number series–Time and Calendar– Clock related– Number related	Analyzing, remembering
	Unit 2: Numerical Ability Arithmetic– Profit and Loss –Ratio and Proportion– Simple and Compound Interest-Discount	Analyzing, understanding
	Unit 3: Data Interpretation Tabulation– Bar graphs– Pie charts–Line graphs	Understanding, analyzing
	Unit 4: Logical Reasoning Alphabet series–Analogies – Classification –Coding and Decoding– Arranging in Order– Letter Digit term	Understanding, remembering

COURSE OUTCOME

MA IN ECONOMICS

3rd Semester

PAPER NAME - Elements of Econometrics

PAPER CODE- ECO - 3016

Course Outcome	Unit/Topic	Bloom's Taxonomy
After the completion of the course, the students will be able to: <ul style="list-style-type: none"> • Provide Econometric literacy to enable students to read technical literature in Economics • Elaborate the 	Unit1: Classical Linear Regression The General Linear Regression Model– Quantitative and Qualitative Explanatory Factors–Least Square Assumptions– OLS Estimators and their Properties–The Coefficient of Determination–Some Results of Two and Three Variable Regression Models-Test of Hypothesis about Regression Coefficients– Prediction with the Linear Regression Equation.	Remember, Understanding.

<p>techniques for undertaking empirical research</p> <ul style="list-style-type: none"> Analyze and interpret the stochastic situation commonly countered in real life economic situations 		
	<p>Unit 2: Further Topics in Linear Regression</p> <p>Consequences of Omission of Relevant Regressors and Inclusion of Irrelevant Regressors; Multicollinearity : Effects, Detection and Remedies, Dummy Variable Trap; Heteroscedasticity: Consequences, Tests and Remedy, Auto-correlated Disturbances: Consequences, Detection and Remedy</p>	Understanding, Analyze.
	<p>Unit 3: Introduction to Time Series Econometrics</p> <p>The Idea of a Stochastic Time Series- Stationary and Non-stationary- Simple Random Walk and Random Walk with a Drift- Unit Root: Dickey Fuller Tests- Spurious Regression- Integrated Series and Simple Co integration.</p>	Understanding, Analyze.
	<p>Unit 4: Introduction to Simultaneous Equation Model</p> <p>Structural and Reduced Forms- Simultaneity Bias- Informal Introduction to Identification Problem, Indirect Least Squares and Two Stage least Squares</p>	Understanding, Analyze.

**COURSE OUTCOME
MA IN ECONOMICS
3rd Semester
PAPER NAME- Public Finance
PAPER CODE- ECO- 3026**

Course Outcome	Unit/Topic	Bloom's Taxonomy
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<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • Discuss the role of the state in Public Finance in terms of the various functions. • Interpret the phenomenon of total and partial market failure and prescribe potential corrections. • Execute various forms of voting rules as a means of more effective public intervention. • Analyze effects of subsidy under various preconditions. • Illustrate the Cost-Benefit Technique which can be applied to various social security issues. • Public Budgeting is analyzed in details and the implications of the various deficits can be interpreted. 	<p>Unit-1 Role of the State in the Economy The role of the government in the economy- allocation, distribution, and stabilization functions. Criteria for policy evaluation–equity, economic efficiency, paternalism and individual freedom and their tradeoff. The welfare cost of inefficient output.</p>	<p>Remember, Understand.</p>
	<p>Unit-2: The Provision of Public Goods The nature of Public goods. Public Goods and market failure. The efficient provision of public goods. The Theory of Clubs, Inter-local competition and Tie bout Hypothesis. Inefficiency from externalities and its correction. Internalizing externalities: The Coase Theorem. Viability of government intervention</p>	<p>Understanding, Analyze.</p>
	<p>Unit-3: The Theory of Public Choice Preferred political outcome of a voter and Downs “Rational Voter Hypothesis.</p>	<p>Understanding, Analyze.</p>
	<p>Unit-4: Public Expenditure Public Expenditures on non-marketed goods, fixed-quantity subsidy for marketed goods and excise subsidy-their impact on allocation and distribution. Program Budgeting and Cost-effectiveness Analysis. Public Project Appraisal: Cost-Benefit Analysis. Public expenditure on Health Care, Education and Retirement Security: Rationale and Emerging Issues.</p>	<p>Understanding, Analyze.</p>

<ul style="list-style-type: none"> Principles of fiscal federalism and a perspective of the relevant issues are examined 		
	<p>Unit-5: Public Revenue Concepts of Tax Ratio, Buoyancy, and Elasticity of taxation, Tax Credit, Exemption and Deduction, and Taxable Capacity. Excess burden-Lump sum Tax versus Price Distorting Tax, Efficiency Loss Ratio of a tax. Partial versus General Equilibrium Analysis: Incidence of Excise Taxes and General Sales Tax. The welfare cost of taxation. Goods and Services Tax (GST) and the Indian experience.</p>	Understanding, Analyze.
	<p>Unit-6: The Public Budget and Deficit Financing Structure of a public budget. Concepts of Budget Deficits Burden of Deficit Finance-Ricardian Equivalence Theorem. Deficit financing and the Capital market: <i>The Crowding Out Effect</i>. The Welfare Cost of Deficit Finance. Rationale and methods of reducing deficits.</p>	Understanding, Analyze.
	<p>Unit-7: Fiscal Federalism Principles of division of financial resources. Instruments of inter-government resource transfer. Horizontal and Vertical fiscal balance. Problems of Centre-State Financial Relations in India.</p>	Understanding, Analyze.

COURSE OUTCOME
MA IN ECONOMICS
3rd Semester
PAPER NAME- International Economics
PAPER CODE- ECO-3036

Course Outcome	Unit/Topic	Bloom's Taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • Analyze the International trade theories, changing pattern of international trade in view of developments in trade environments • Elaborate how different international trade policies undertaken by the trading nations • Illustrate the historical facts and present status of international trade relations among countries 	<p>Unit 1: International Trade Theories</p> <p>Factor Endowments and Trade: Heckscher-Ohlin Theory, Factor-Price Equalization Theorem and Income distribution- Stolper-Samuelson Theorem, The Specific-Factors Model.</p>	Remember, Understand.
	<p>Unit 2: Economic Growth and Changes in Trade</p> <p>Shifts in Demand: Engel Effects and Engel's Law; Factor Growth- Rybczynski Theorem; Technical progress and Trade; Technological Change and Trade; Technology as Factors of Production; New Products and the Product Cycle.</p>	Remember, Understand.
	<p>Unit 3: Economies of Scale, Imperfect Competition, and International Trade</p> <p>Monopolistic Competition and Trade- Economies of Scale and Comparative Advantage, Significance of Intra-industry Trade, Economies of Reciprocal Dumping</p>	Remember, Understand.
	<p>Unit 4: International Trade Policy</p> <p>Tariff Analysis in General Equilibrium; Theory of Customs Unions; Export Barriers; Export Subsidies and Countervailing Duties, Dumping. Retaliation against Dumping; International Cartels.</p>	Understanding, Analyze.

	<p>Unit 5: International Monetary Order</p> <p>International Monetary System—Gold Standard, Inter War Period, Bretton Woods System; Managed Flexibility, Floating Exchange Rate, Monetary Union, Optimum Currency Area,</p>	Remember, Understand.
	<p>Unit-6: International Debt Crisis</p> <p>Dimensions of Debt Crisis, International capital Movement, Capital Transfer Process, Recycling of Petro-Dollars, Causes of Debt Crisis, Secondary Market for Debt of Developing Countries, Alternative Policy Options.</p>	Understanding, Analyze.

**COURSE OUTCOME
MA IN ECONOMICS
3rd Semester**

**PAPER NAME - FINANCIAL SYSTEM
PAPER CODE- ECO- 3046**

Course Outcome	Unit/Topic	Bloom's Taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> Analyze the financial system including its various components like markets, assets and institutions. 	<p>Unit-1: The Financial System</p> <p>The nature of credit, Financial system and its Components: <i>Instruments, Markets, Institutions and Services</i>, The Functional Perspective of the Financial System, Financial System in Economic Growth and Global Integration.</p>	Remember, Understand.
	<p>Unit-2: Inter temporal Value of Money</p> <p>Time Value of Money, Future Value: Single Cash Flow, Multiple Cash Flows, Annuity, Present Value: Single Cash Flow, Multiple Cash Flows, Annuity, Present Value, Net Present Value, Rate of Return , Internal Rate of Return</p>	Understanding, Analyze.
	<p>Unit-3: The Money Market</p> <p>Structure and functions, Instruments in the money market, Call Money Market and its</p>	Understanding, Analyze.

<ul style="list-style-type: none"> Estimate parameters like cash flow, annuity, net present value, rates of return etc. 	<p>participants, Volatility in Call Rates, Money Market Intermediaries: <i>The Discount and Finance House of India and Money Market Mutual Funds</i>, Liquidity Management Instruments in the Money Market</p>	
<ul style="list-style-type: none"> Analyze the operation of the various instruments of the money market. Expose the capital market which enables the students to explain the modalities of resource mobilization through various capital market assets. Illustrate the trading in the stocks market and analyze the complexi 	<p>Unit-4: The Capital Market</p> <p>The Capital market: Its nature and functions, Primary Capital Market: Instruments of resource mobilization- <i>Public Issues: IPO & FPO, Right Issues, and Private Placement</i>, Resource mobilization from International Capital Market, Pricing of new issues: the Book Building process, Reverse Book Building and Green Shoe Option, Secondary Capital Market Secondary Capital Market: Organization, Management and Membership, Trading & Settlement, <i>The Over the Counter Exchange of India</i>, The Depository System and its operation, Stock Market Index-Method of calculating the index, Mutual Fund and its functional classification, Net Asset Value</p>	<p>Understanding, Analyze.</p>

<p>ties of the derivative market.</p> <ul style="list-style-type: none"> • Undertake valuation of both debt and equity instruments. They acquire the ability to analyze profitability of such instruments as investment destination. 		
	<p>Unit5: The Derivative Market Nature of the Derivative Market, Traders and Instruments in a derivative market, Trading Strategies: Hedging with Index futures, Speculation Strategies and Strategies for Arbitrage</p>	<p>Understanding, Analyze.</p>
	<p>Unit-6: Valuation of Financial Assets Concept of Value, The valuation of debt instruments: bonds with maturity-Yield to Maturity, Current yield, Yield to Call, Deep Discount Bonds, Perpetual Bonds, Interest Rates and Bond Values, Valuing stock: Value of a Preference Share, Ordinary Shares: Single Period and Multi-Period Valuation, Linkage between Share Price, Earnings and Dividends, The significance of Price-Earnings Ratio (P/E)</p>	<p>Understanding, Analyze.</p>

	<p>Unit-7: Banking Sector Operations and Management</p> <p>Overview of bank operations: Banks as financial intermediaries, Sources of Funds of banks, Uses of Funds by banks, Off-balance-sheet activities of banks, Regulation of banks: Capital Regulation, Operations Regulation, Bank Monitoring Measures under taken by Regulators, Issues relating to government bailout, Reforms in Banking Sector in India.</p>	Understanding, Analyze.
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**COURSE OUTCOME
MA IN ECONOMICS
3rd Semester**

**PAPER NAME - ENVIRONMENTAL ECONOMICS
PAPER CODE- ECO-3066**

Course Outcome	Unit/Topic	Bloom's Taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • Understand the environmental issues with an interdisciplinary focus. • Analyze the working of the Environment and 	<p>Unit-1: Environmental Economics as a sub discipline in Economics</p> <p>Environmental Economics–Scope and Nature- Environmental Economics, Ecological Economics and Resource Economics.</p> <p>Basic Concepts: Natural Resources-Renewable and Non-Renewable, Market Failure, Externality, Property Rights, Transaction costs, Pigouvian Tax– Environment as Public Goods-Open Access– The Tragedy of Commons.</p> <p>Global Environmental Issues- Climate Change, Loss of Biodiversity, Ozone Depletion, Pollution Havens-</p>	Remember, understand.

<p>the Economy from the neoclassical and ecological perspective.</p> <ul style="list-style-type: none"> • Interpret the issues related to the use of natural resources • Explain the various techniques of valuation of environmental goods and services. • Explore the relationship between environment and development. 	<p>Unit–2: Environment and the Economy- the neoclassical perspective</p> <p>Environment and the Economy: the neo-classical perspective-Role of natural environment on the economy-market as a provider of information on resource scarcity-price as an indicator of absolute, relative and emerging resource scarcity; Factor substitution possibilities, technical change-implications on resource scarcity and resource conservation. Economy and the environment-Neoclassical worldview.</p>	<p>Remember, Understand.</p>
	<p>Unit–3: Environment and the Economy- An ecological perspective</p> <p>Environment and the Economy: An ecological perspective–Eco system structure, Eco system function-materials recycling-energy and the rmodynamics, Ecological Succession, Ecology and its implications for the economy.</p>	<p>Understanding, Analyze.</p>
	<p>Unit– 4: Economics of Natural Resources</p> <p>Economic Issues relating to use of Non-renewable Resources, Optimal Depletion– Issues relating to Renewable resources, Sustainable exploitation, Common Property Resources– Case studies (e.g Sacred groves)</p>	<p>Understanding, Analyze.</p>
	<p>Unit–5: Valuation of Environmental Goods and Services</p> <p>Demand for environmental goods–ordinary goods Vs environmental goods-Willingness to pay and willingness to accept-Use and Nonuse Values; measuring demand-revealed preference and stated preference. Methods for measuring benefits of environmental improvement–the market pricing approach, the replacement cost approach. Hedonic Pricing approach-valuation of health risks; Household Production Function Approach-Aversive expenditure, Travel Cost method; Contingent Valuation Method</p>	<p>Understanding, Analyze.</p>

	<p>Unit–6: Pollution Control</p> <p>Pollution Prevention, Control and Abatement–Command and Control and Market Based Instruments–Taxes Vs Tradable Permits; International Conventions and Protocols; Environmental Policy in India- Environmental Impact Assessment.</p>	Understanding, Analyze.
	<p>Unit–7: Environment and Development</p> <p>Environment Development Tradeoff: Population, development and environmental degradation in the developing world-Poverty and Environment–Affluence and its contribution to environmental degradation Sustainable Development-Hartwick-Solow Approach, ecological economics approach-safe minimum standard approach; Sustainable National Income Accounting.</p>	Understanding, Analyze.

COURSE OUTCOME

MA IN ECONOMICS

4th Semester

PAPER NAME - INDIAN ECONOMICS IN THE GLOBAL CONTEXT

PAPER CODE- ECO – 4016

Course Outcome	Unit/Topic	Bloom’s Taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> Analyze the concept and evolution of the global economy, and the key issues involved in the process. Provide an insight into the economic history of India 	<p>Unit– 1: Global Economy: Concept and Evolution</p> <p>Global Economy-Nature of Global Economy; Emergence and evolution of the Global Economy-Pre-Industrial Revolution to the Present Times.</p>	Remember, Understand.
	<p>Unit– 2: Global Economy: Key Issues</p> <p>International Trade, Transnational Production, Global Financial System, Global Division of Labour, Gender, Economic Development, Global Environmental change, Ideas, Security, Governance.</p>	Remember, Understand.

<p>and place it in the global prospective.</p> <ul style="list-style-type: none"> Examine and analyze the process and outcome of India's economic reforms. It is also intended to help students in their preparation for competitive exams. 		
	<p>Unit– 3: Economic History of India in the Global Context-An Overview Transition to colonialism-Colonial Times-Post Colonial–Post Independence-Post reforms.</p>	Remember, Understand.
	<p>Unit– 4: India's Economic Reforms Rationale for Economic Reforms–India's Economic Reforms in the Global Context– Foreign Trade Policy–Convertibility of Rupee–Impact of WTO on Indian Economy– Foreign Investment and Multinational Corporations.- Privatization and Competition– Financial Sector Reforms</p>	Understanding, Analyze.
	<p>Unit– 5: India: the Emerging Giant Macroeconomic Indicators - GDP-Real Economy-Prices- Saving- Investment- Government Finance, Money and Finance, External Sector, Infrastructural Indicators; Human Development Indicators; Institutional Development in the Financial Sector; Competitiveness Indicators-India and the Global Financial Crisis</p>	Remember, Understand.

**COURSE OUTCOME
MA IN ECONOMICS
4th Semester
PAPER NAME - Demography
[Elective]
PAPER CODE- ECO- 4026**

Course Outcome	Unit/Topic	Bloom's Taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> Describe the size, composition and distribution of 	<p>Unit-1: Theories of population The Malthusian Theory of population. Theory of Optimum Population, Theory of Demographic Transition, Theory of Becker and Easterlin, Henry Leibenstein's Theory of Fertility.</p>	Remember, understand.

<p>human populations over time and across space, and the processes through which populations change, namely the processes of birth, death and migration.</p> <ul style="list-style-type: none"> • Compare and critique the different theories of population, gain awareness on the roles played by factors such as age, sex, education, occupation, income, and others in influencing the size and distribution of populations, thus enhancing their understanding on population dynamics. • Provide the students with relevant tools to study contemporary and burning issues faced by every country of the world like migration, whether its domestic or internal and international, 	<p>Concept of Stable Population and Stationary Population. The Stable Population model, its vital rates and other characteristics.</p>	
	<p>Unit-2: Vital Rates and the Life Table Measures of Reproductively-Total Fertility Rate, Gross Reproduction Rate, and Net Reproduction Rate, Standardized Fertility and Mortality Rates, Different Approaches to Measuring Infant Mortality Rate. Concept of a Life Table. Relationship among the different life table functions.</p>	Remember, Understand.
	<p>Unit-3: Nuptiality Basic measures of nuptiality, Estimation of the singulate mean age at marriage</p>	Understanding, Analyze.
	<p>Unit-4: Population Projection Component method of projection of population at the national level. Projection of the economically active population</p>	Understanding, Analyze.
	<p>Unit-5: Migration Internal migration–concepts, determinants and consequences. Measures of internal migration. International migration– types, determinant sand consequences. Migration models -Ravenstein’s laws of migration, EverettLee’s theory of migration, Todaro’s model of rural-urban migration, L-F-R model of migration</p>	Understanding, Analyze.

<p>migration from rural areas to urban areas, and the types, determinants and consequences of migration.</p>	<p>Unit-6: Economically Active Population Basic concepts and definitions. Female participation in the workforce.</p>	<p>Understanding, Analyze.</p>
<ul style="list-style-type: none"> Examine the various population policies affecting fertility in the developed and less developed countries, and which contribute in helping the government and society to deal with the issues relating to population growth, aging and migration in a holistic manner. 	<p>Unit-7: Population Policy Population policies affecting fertility in developed and less developed countries. Population policies and programmes in India.</p>	<p>Understanding, Analyze.</p>

Course Outcome	Unit/Topic	Bloom's Taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • Help the students to better develop their understanding of the financial system and its functioning. • Describe the process of investing in securities and assets in terms of investment policy, security analysis, portfolio construction, portfolio revision and portfolio evaluation • Interpret the principles of market valuation of debt instruments as well as valuation of stocks • Measure risk and return of financial assets, in particular risk of a stock, volatility of a stock and stock portfolio, capital asset pricing model and its implications, arbitrage pricing theory and determinants of beta • Analyze the technicalities regarding the mechanics of futures market in 	<p>Unit-1: The Investment Setting Securities, Risk & Return, Markets, and Financial Intermediaries. Process of Investing: <i>investment policy, security analysis, portfolio construction, portfolio revision and portfolio evaluation</i>. Financial Goals: <i>Profit Maximization versus Wealth Maximization. Trading in Securities : types of orders, margin purchases, and short sales</i></p>	Remember, understand.
	<p>Unit-2: Principles of Market Valuation The law of One Price and Arbitrage. The valuation of debt instruments: Pure Discount Bonds. Coupon Bonds, Current Yield and Yield to Maturity. Interest Rates and Bond Values. Bond duration and Interest Rate Sensitivity. Valuing stock: Value of a Common Stock and the Dividend Discount Model: Zero Growth, Constant Growth and Multiple Growth Models. Linkage between Share Price, Earnings and Dividends. The significance of Price-Earnings Ratio</p>	Remember, Understand.
	<p>Unit-3: Measuring Risk and Return Risk of a stock. Measures of risk: Volatility of a stock and a stock portfolio. Beta of a stock and a stock portfolio. Portfolio Risk-Return Analysis: Two Asset Case. Efficient Portfolio and Mean-Variance Criterion. The Capital Asset Pricing Model and its implications. The Arbitrage Pricing Theory. Determinants of Beta.</p>	Understanding, Analyze.
	<p>Unit-4: Principles of Risk Management The Risk Management Process. Dimensions of risk transfer: Hedging, Insurance and its basic features. <i>Financial Guarantees, Caps & Floor on Interest Rates, Options as</i></p>	Understanding, Analyze.

<p>terms of convergence of futures price and spot price, margin operation, hedging strategies and arbitrage with stock index futures, along with various measures relating to bank management and performance evaluation.</p>	<p><i>Insurance.</i> The Diversification Principle. The Derivative Market. Traders in a Derivative Market; Hedgers, Speculators and Arbitrageurs. Instruments in the derivative market.</p>	
	<p>Unit-5: Mechanics of Futures Market Forward and Futures Contracts. Convergence of Futures Price and Spot Price. Margin Operation. Traders and their Orders. Short and Long Hedges. Basis Risk. Cross Hedging Hedging Strategies with Interest Rate Futures and Stock Index Futures. Speculating with Interest Rate Futures and Stock Index futures. Arbitrage with Stock Index Futures. Risk of Trading Futures Contracts.</p>	<p>Understanding, Analyze.</p>
	<p>Unit-6: Options and swaps Call Option and Put Option. Combining Put, Call and Share: Straddle, Strangle and Spread. Spread combining Long and Short Options. Factors determining option prices. The Binomial option prices. The Binomial Option Pricing Model and the Black-Scholes Model for Call Options. Nature of Swaps: Currency Swaps and Interest Rate Swaps.</p>	<p>Understanding, Analyze.</p>
	<p>Unit-7: Bank Management and Performance Evaluation. Interest Rate Risk and its Assessment. Methods to reduce Interest Rate Risk. Credit Risk and its management through diversification. Measuring Market Risk and its management. Valuation of Commercial Bank. Evaluating Bank Performance: Return on Assets and Return on Equity. Bank Failures.</p>	<p>Understanding, Analyze.</p>

**COURSE OUTCOME
MA IN ECONOMICS
4th Semester
PAPER NAME - Financial Operations & Management*
[Elective]
PAPER CODE- Paper- 4076**

**COURSE OUTCOME
MA IN ECONOMICS
4th Semester
PAPER NAME - ECONOMICS OF HEALTH
PAPER CODE- ECO- 4106**

Course Outcome	Unit/Topic	Bloom's Taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • Give the facts that resources for meeting health requirements are scarce, and the future is uncertain, this course intends to enable students to look at health related aspects from an economic perspective. • Cover core topics such as information asymmetry, health insurance, disparity in access to health care, and tries to explain, among others, why educated people experienced better health and aging experience declining health. • Helps the students to draw connections between the theoretical models and health policy debates around the world. 	<p>Unit– 1: Introduction to Health Economics Rationale for Economics of Health. Nature of Health Economics: <i>Information Asymmetry, Health Insurance, Process Utility and Disparity in Access.</i></p> <p>Health and Development. Health and Income: <i>The two way linkage.</i> Health Care as an economic commodity.</p>	Remember, understand.
	<p>Unit– 2: Demand for HealthCare Determining the demand for health care. Elasticity of the demand curve for health. The Grossman Model: <i>production possibility on tier, health production schedule, the labor–leisure–health improvement trade off, the marginal efficiency of capital.</i> Unifying the Grossman Model.</p>	Remember, Understand.
	<p>Unit– 3: Supply of HealthCare Creating the Physician: <i>Medical School and Residency.</i></p> <p>Physician work hours and wages. Returns to medical training and specialization. Market Distortions: <i>barriers to entry, physician induced demand, defensive medicine and discrimination.</i></p>	Understanding, Analyze.

	Organization of a modern hospital. The market for hospitals.	
	<p>Unit– 4: Innovations in the Health Industry and their Outcomes</p> <p>Pharmaceutical innovations and its costs. Patents as an incentive. Technology and the Price of HealthCare. Technology Overuse: <i>The Dartmouth Atlas</i>.</p> <p>Health Technology Assessment: <i>Cost Effectiveness Analysis and Cost-Benefit Analysis</i></p>	Understanding, Analyze.
	<p>Unit– 5: Health Policy</p> <p>The Health Policy Trilemma: <i>Health, Wealth and Equity</i>.</p> <p>Strategies for an optimal Health Insurance system relating health care provision, controlling costs through price controls.</p>	Understanding, Analyze.

COURSE OUTCOME
MA IN ECONOMICS
4th Semester
PAPER NAME - ENVIRONMENTANDENERGY ECONOMICS
[Elective]
PAPER CODE- ECO0-4116

Course Outcome	Unit/Topic	Bloom’s Taxonomy
<p>After the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • Assess the value of environmental resources • Analyze the ill effects of excessive use of energy • Deliberate on the 	<p>Unit– 1: Environment and Economy</p> <p>Linkage:</p> <p>Environment as a source of resources and energy-Earth, life and biosphere, Ecosystem, components of Ecosystem: Biotic Environment, Abiotic Environment, Inorganic Substances, Organic Substances; Climate Condition and Limiting Factors; Soil, Energy, Biodiversity. Concept of Energy and its Role in the Biosphere; Energy Flow along Food Chain</p>	Remember, understand.

<p>more efficient use of energy and the environmental resources</p> <ul style="list-style-type: none"> • Identify/quantify demand and supply factors of energy • Develop models /policies for more efficient energy use by institutions 	<p>Unit– 2: Environmental problems Local and Global Environmental Problems: Air Pollution, Water Pollution, Noise Pollution, Light Pollution; Climate change, Global warming, Loss of biodiversity.</p>	Remember, Understand.
	<p>Unit– 3: Environmental Management Management Systems for Environment: Command and Control, Market Based Instruments, Community Management; Environmental Impact Management. International Conventions and Protocols</p>	Understanding, Analyze.
	<p>Unit– 4: Energy Demand Management Definition, Evolution, Justification-Load Management-Energy Efficiency Improvements and Energy Conservation-Cost-effectiveness-Energy efficiency debate</p>	Understanding, Analyze.
	<p>Unit– 5: Economics of Energy Supply Economic analysis of energy instruments- Economics of fossil fuel supply, electricity supply, renewable energy supply, non-renewable resource supply etc.</p>	Understanding, Analyze.
	<p>Unit– 6: Student Presentations (based on case studies, empirical findings).</p>	Understand, Analyze.

COURSE OUTCOME

B.A./B.Sc. in economics (Honours) Syllabus (CBCS)

I Semester

Paper Name: Microeconomics

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> This course is designed to expose the students to the basic principles of microeconomic theory. The course will illustrate how microeconomic concepts can be applied to analyze real-life situations. 	<p>Unit 1: Exploring the subject matter of Economics Why study economics? Scope and method of economics; the economic problem; scarcity and choice; the question of what to produce, how to produce and how to distribute output; science of economics; the basic competitive model; prices, property rights and profits; incentives and information; rationing; opportunity sets; economic systems; reading and working with graphs.</p>	Remembering, Understanding
	<p>Unit 2: Supply and Demand: How Markets Work, Markets and Welfare Markets and competition; determinants of individual demand/supply; demand/supply schedule and demand/supply curve, demand and supply together; how prices allocate resources; elasticity and its application; controls on prices; taxes and the costs of taxation; consumer surplus; producer surplus and the efficiency of the markets.</p>	Understanding, Analyzing
	<p>Unit 3: The Households The consumption decision- budget constraint, consumption and income/price changes, demand for all other goods and price changes; description of preferences (representing preferences with indifference curves); properties of indifference curves; consumers' optimum choice; income and substitution effects; labour supply and savings decision-</p>	Understanding, Analyzing

	choice between leisure and consumption.	
	Unit 4: The Firm and Perfect Market Structure Behaviour of profit maximizing firms and the production process; short run costs and output decisions; costs and output in the long run.	Understanding, Remembering
	Unit 5: Imperfect Market Structure Monopoly and anti-trust policy; government policies towards competition; imperfect competition.	Understanding, Remembering
	Unit 6: Input Markets Labour and land markets-basic concepts (derived demand, productivity of an input, marginal productivity of labour, marginal revenue product); demand for labour; input demand curves; shifts in input demand curves; competitive labour markets; and labour markets and public policy.	Understanding, Remembering

Paper Name: Mathematical Methods in Economics-I

Paper Code: ECO-HC-1026

Course Outcome	Unit/ Topic	Blooms' Taxonomy
<ul style="list-style-type: none"> 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. This course, means for illustrating the method of applying 	Unit 1: Preliminaries Sets and set operations, relations and function, number system	Understanding, Analyzing
	Unit 2: Functions of one real variable Elementary types of functions: quadratic, polynomial, power, exponential, logarithmic, convex, quasi convex and concave functions, limit and continuity of functions	Understanding, Analyzing

<p>mathematical techniques to economic theory in general.</p>	<p>Unit 3: Differential calculus Differentiation of a function, Basic rules of differentiation, partial and total differentiation, second and higher order derivatives for single variable, economic applications of differentiation.</p>	<p>Understanding, Analyzing</p>
	<p>Unit 4: Single variable optimization Local and global optima: geometric characterization using calculus: tests for maximization and minimization, applications: profit maximization, cost minimization, revenue maximization.</p>	<p>Understanding, Analyzing</p>
	<p>Unit 5 : Integration of functions Meaning and significance of integration, basic rules of integration, significance of a constant after integration, application: derivations of total functions (total cost, total revenue, consumption and saving functions) from marginal functions, consumers' surplus and producer's surplus, problems relating to investment and capital formation.</p>	<p>Understanding, Analyzing</p>

2nd Semester (Honours)

Paper Name: Introductory Macroeconomics

Paper Code: ECO-HC-2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> This course aims to introduce the students to the basic concepts of Macroeconomics. This course discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variable like savings, investment, GDP, money, inflation, and the balance of payments. 	<p>Unit 1: Introduction to Macroeconomics and National Income Accounting Basic issues studied in macroeconomics: measurement of gross domestic product; income, expenditure and the circular flow: real versus nominal GDP; price indices; national income accounting for an open economy; balance of payments: current and capital accounts.</p>	Understanding, Remembering, Analyzing
	<p>Unit 2: Money Functions of money; quantity theory of money; determination of money supply and demand; credit creation; tools of monetary policy.</p>	Remembering and Understanding
	<p>Unit 3: Inflation Inflation and its social costs; hyperinflation</p>	Understanding
	<p>Unit 4: The Closed Economy in the Short Run Classical and Keynesian systems; simple Keynesian model of income determination; IS-LM model; fiscal and monetary multipliers.</p>	Understanding and Remembering

Paper Name: Mathematical Methods for Economics-II

Paper Code: ECO-HC-2026

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> 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 level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook. 	<p>Unit 1: Linear algebra Preference; utility; budget constraint; choice; demand; slusky equation; buying and selling; choice under risk and inter-temporal choice; revealed preference</p>	Understanding, Remerging, Analyzing
	<p>Unit 2: Functions of several real variable Homogeneous and homothetic functions: concepts, Differentiable functions: concepts, Implicit Function Theorem and applications</p>	Understanding, Remerging, Analyzing
	<p>Unit 3 : Multi-variable optimization Unconstrained optimization: geometric characterization, characterization using calculus and applications: price discrimination and multi-plant firm; constrained optimization</p>	Understanding, Remerging, Analyzing

	with equality constraints, Lagrange multiplier, applications: consumer's equilibrium and producer's equilibrium	
	Unit 4: Differential equation Meaning, first order differential equation, application to market model	Understanding, Remerging, Analyzing
	Unit 5: Difference equation First order difference equation, Cob-Web market model	Understanding, Remerging, Analyzing

3rd Semester (Honours)

Paper Name: Intermediate Microeconomics- I

Paper Code: ECO-HC-3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> The course is designed to provide a sound training in microeconomic theory to formally analyze the behaviour of individual agents. Here, mathematical tools are used to facilitate understanding of the basic concepts. This course looks at the behaviour of the consumer and the producer and also covers the behaviour of a competitive firm. 	Unit 1: Consumer Theory Preference; utility; budget constraint; choice; demand; Slutsky Equation; buying and selling; choice under risk and inter-temporal choice; revealed preference.	Remembering and Understanding
	Unit 2: Production, Costs and Perfect Competition Technology; isoquants; production with one and more variable inputs; returns to scale; short run and long run costs; cost curves in the short run and long run; review of perfect competition.	Remembering and Understanding

3rd Semester (Honours)

Paper Name: Intermediate Macroeconomics- I

Paper Code: ECO-HC-3026

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> 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. 	<p>Unit 1: Aggregate Demand and Aggregate Supply Curves Deviation of aggregate demand and aggregate supply curve and supply curves; interaction of aggregate demand and supply.</p>	<p>Understanding and Analyzing</p>
	<p>Unit 2: Inflation, Unemployment and Expectations Philips curve; adaptive and rational expectations; policy ineffectiveness debate.</p>	<p>Understanding and Analyzing</p>
	<p>Unit 3: Open Economy Models Short-run open economy models; Mundell-Fleming model; exchange rate determination: purchasing power parity; asset market approach; Dornbusch's overshooting model; monetary approach to balance of payments; international financial markets.</p>	<p>Understanding and Analyzing</p>

Paper Name: Statistical Methods for Economics

Paper Code: ECO-HC-3026

Course Outcome	Unit/ Topic	Blooms' Economy
<ul style="list-style-type: none">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.	Unit 1: Introduction and Overview The distinction between populations and samples and between population parameters and sample statistics; the use of measures of location and variation to describe and summarize data; moments-basic concepts and types.	Understanding, Analyzing
	Unit 2: Elementary Probability Theory Sample spaces and events; probability axioms and properties; addition and multiplication theorem of probability and Bayes' rule; independence of events.	Understanding, Analyzing
	Unit 3: Random Variable and Probability Distributions Defining random variables; probability distributions; expected values of random variables	Understanding, Analyzing

	and of functions of random variables; properties of commonly used discrete and continuous distributions (uniform, binomial, poisson and normal random variables)	
	Unit 4: Random Sampling and Jointly Distributed Random Variables Density and distribution functions for jointly distributed random variables-basic concepts; covariance and correlation coefficients.	Understanding, Analyzing
	Unit 5: Sampling Principal steps in a sample survey; methods of sampling; Sampling techniques-random, stratified random, mult-staged random and systematic random sampling; the role of sampling theory; properties of random samples.	Understanding, Analyzing

4th Semester (Honours)

Paper Name: Intermediate Microeconomics- II

Paper Code: ECO-HC-4016

Course Outcome	Unit/ Topic	Blooms' taxonomy
<ul style="list-style-type: none"> This course is a sequel to Intermediate Microeconomics I. 	Unit 1: General Equilibrium, Efficiency and Welfare	Understanding, Analyzing

<p>The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools and reasoning. It covers general equilibrium and welfare, imperfect markets and topics under information economics.</p>	<p>(a) Exchange Economy, Consumption Allocation and Pareto Optimality; Edgeworth Box and Contract Curve: Equilibrium and Efficiency and Pure Exchange</p> <p>(b) Pareto Efficiency with Production: Concepts of PPF, Social Indifference Curves and Resource allocation.</p> <p>(c) Perfect Competition, Pareto Efficiency and Market Failure (Externalities and Public Goods, Property Right and Coase Theorem.)</p>	
	<p>Unit 2: Market Structure and Game Theory</p> <p>(a) Monopoly, pricing with Market Power; Degree of Monopoly, Price-Discrimination- Different Degrees; Multi-plant Monopoly, Peak-load Pricing</p> <p>(b) Monopolistic competition; Product Differentiation; Perceived and Proportionate Demand Curves; Price-Output Determination.</p> <p>(c) Oligopoly and Game Theory (Two Person Zero Sum Game, Basic Ideas and examples of non zero sum games, Prisoner's</p>	<p>Understanding, Analyzing</p>

	Dilemma), Applications of Game Theory in Oligopolistic Market (Cournot Equilibrium, Bertrand Equilibrium, Stackelberg Equilibrium)	
	Unit 3 : Market with Asymmetric Information Information Asymmetry, Adverse Selection, Moral Hazard, Signaling and Screening.	Understanding, Analyzing

Paper Name: Intermediate Macroeconomics- II

Paper Code: ECO-HC-4026

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> 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. 	Unit 1: Economic Growth Harrod-Domar model; Solow model: golden rule; technological progress and elements of endogenous growth.	Remembering and Analyzing
	Unit 2: Microeconomic Foundations a. Consumption: Keynesian consumption functions; Fishers' theory of optimal intertemporal choice; life-cycle and permanent income hypotheses; rational expectations and random-walk of consumption expenditure b. Investment: determinants of business fixed investment; residential investment and inventory investment. c. Demand for money.	Understanding and Analyzing

	<p>Unit 3: Fiscal and Monetary Policy Active or passive; monetary policy objectives and targets; rules versus discretion: time consistency; the government budget constraint; government debt and Ricardian equivalence.</p>	Remembering and Analyzing.
	<p>Unit 4: Schools Macroeconomics Thoughts Classicals; Keynesians; New-Classical and New-Keynesians.</p>	

Paper Name: Introductory Econometrics

Paper Code: ECO-HC-4036

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> This course introduces 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. 	<p>Unit 1: Statistical Background Normal distribution; chi-sq,t-and F-distributions; estimation of parameters; properties of estimators; testing of hypotheses: defining statistical hypotheses; distributions of test statistics; testing hypotheses related to population parameters; Type I and Type II errors; power of a test; tests for comparing parameters from two samples.</p>	Remembering, Understanding and Analyzing
	<p>Unit 2: Simple Linear Regression Model: Two Variable Case Estimation of model by method of ordinary least</p>	Analyzing and Understanding.

	squares; properties of estimators; Gauss-Markov theorem; goodness of fit; tests of hypotheses; scaling and units of measurement; confidence intervals; forecasting.	
	Unit 3: Multiple Linear Regression Model Estimation of parameters; properties of OLS estimators; goodness of fit- R^2 and adjusted R^2 ; partial regression coefficients; testing hypotheses-individual and joint; functional forms of regression models; qualitative (dummy) independent variables.	Understanding and Analyzing
	Unit 4: Violations of Classical Assumptions Consequences, Detection and Remedies Multicollinearity; heteroscedasticity; serial correlation	Remembering and Analyzing
	Unit 5 Specification Analysis Omission of a relevant variable; inclusion of irrelevant variable; tests of specification errors.	

5th Semester (Honours)

Paper Name: Indian Economy-I

Paper Code: ECO-HC-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post- 	Unit 1: Economic Development since Independence Major features of the economy at independence; growth and development under	Remembering and Understanding

<p>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.</p>	<p>different policy regimes- goals, constraints, institutions and policy frameworks; an assessment of performance- sustainability and regional contrasts; structural change, savings and investment.</p>	
	<p>Unit 2: Population and Human Development Demographic trends and issues; education; health and malnutrition</p>	Remembering and Understanding
	<p>Unit 3: Growth and Distribution Trends and policies in poverty; inequality and unemployment</p>	Remembering and Understanding
	<p>Unit 4: International Comparisons With China, Pakistan, Bangladesh, Sri Lanka, Nepal and Vietnam.</p>	Remembering and Understanding

Paper Name: Development Economics I

Paper Code: ECO-HC-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons 	<p>Unit 1: Conceptions of Development Alternative measures of development documenting the international variations in these measures, comparing development trajectories across nations and within them.</p>	Understanding, Analyzing
	<p>Unit 2: Growth Models and Empirics The Harrod-Domar</p>	Understanding, Analyzing

<p>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>Model, the Solow Model and its variants, endogenous growth models and evidence on the determinants of growth.</p>	
	<p>Unit 3: Poverty and Inequalities: Definitions, Measures and Mechanisms Inequality axioms; a comparison of commonly used inequality measures; connections between inequality and development; poverty measurement; characteristics of the poor; mechanisms that generate poverty traps and path dependence of growth processes.</p>	<p>Understanding, Analyzing</p>
	<p>Unit 4: Political institutions and the Functioning of the State The determinants of democracy; alternative institutional trajectories and their relationship with economic performance; within-country differences in the functions of the state institutions; state ownership and regulation; government failures and corruption.</p>	<p>Understanding, Analyzing</p>

Paper Code: ECO-HE-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> 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. 	<p>Unit 1: Money Concept, functions of money; concept of money supply and its measurement; money multiplier theory, RBI's approach to money supply.</p>	Remembering and Understanding
	<p>Unit 2: Financial Institutions, Markets Instruments and Financial Innovations Meaning and types of financial institutions, nature and role of financial institutions; financial markets: definitions and types-money market and capital market, their characteristics and functions, call money market, treasury bill market, commercial bill market including commercial paper and certificates of deposits, government securities market, primary and secondary markets for securities, financial sector reforms in India, financial derivative-meaning, types, distinctive features of financial derivatives and its benefits.</p>	Remembering and Understanding

Paper Name: Public Finance

Paper Code: ECO-HE-5036

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> This course is a non-technical overview of 	<p>Unit 1: Theory 1. Normative theory of Public Finance- Nature and</p>	Remembering and Understanding

<p>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.</p>	<p>Scope: Allocation Function, Distribution Function and Stabilization function. Coordinating the functions.</p> <p>2. Public Goods and their characteristics. Free Rider Problem and Market Failure, Externalities vis-à-vis Public Good.</p> <p>3. Direct and Indirect Tax. Concepts of taxation: tax rate, buoyancy and elasticity of a tax. Proportional, Progressive Taxation. Benefit Principle and Ability to Pay Theory.</p> <p>.</p>	
	<p>Unit 2 : Issues from Indian Public Finance</p> <p>4. Fiscal Policies: Definition and Objectives. Instruments of Fiscal Policy. Adopting Monetary Policy to complement Fiscal Policy: The Indian Experience.</p> <p>5. Indian Tax System. Direct Taxes: Income Tax, Corporate Tax, Customs Duty etc. Reforms in the Indirect Tax Structure: Goods and Service Tax.</p> <p>6. Structure of the Public Budget Types of Deficits and their significance: Revenue Deficit, Fiscal Deficit and Primary Deficit.</p> <p>7. Fiscal Federalism in India: Principles of Fiscal Devolution, Horizontal and Vertical Fiscal Balance. Federal Finance and the Finance Commission.</p> <p>8. State and Local Finances. The State Subjects and its Budget. Fiscal</p>	<p>Understanding and Analyzing</p>

	decentralization: Role of Municipalities and Gaon Panchayats	
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Paper Name: Indian Economy II

Paper Code: ECO-HC-6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> 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. 	Unit 1: Macroeconomic Policies and Their Impact Fiscal Policy; trade and investment policy; financial and monetary policies; labour regulation.	Understanding, Analyzing
	Unit 2: Policies and Performance in Agriculture Growth; productivity; agrarian structure and technology; capital formation; trade; pricing and procurement	Understanding, Analyzing
	Unit 3 Policies and Performance in Industry Growth; productivity; diversification; small scale industries; public sector; competition policy; foreign investment.	Understanding, Analyzing
	Unit 4: Trends and Performance in Services	

	inefficiency.	
	Unit 4: Environment and Sustainable Development Defining sustainability for renewable resource; a brief history of environmental change; common-pool resources; environmental externalities and state regulation of the environment; economic activity and climate change.	Remembering Understanding and Analyzing
	Unit 5: Globalization Globalization in historical perspective; the economics and politics of multilateral agreement; trade, production patterns and world inequality; financial instability in a globalized world.	Understanding and Analyzing

Paper Name: Environmental Economics

Paper Code: ECO-HE-6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> This course focuses on economic causes of environmental problems. In particular, economic principles are applied to environmental questions and their management through various economic institutions, economic incentives and other instruments and policies. Economic implications of environmental policy 	Unit 1: Introduction Basic concepts; Environment, Ecology and the Ecosystem. Definition and scope of environmental economics. Interaction between the environment and the economy, environmental economics and ecological economics, environmental economics and resource economics. Review of microeconomics and	Remembering and Understanding

<p>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.</p>	<p>welfare economics; the utility function, social choice mechanism, the compensation principle and the social welfare function (concepts only).</p>	
	<p>Unit 2: The Theory of Externalities Pareto optimality or Pareto efficiency. Externalities: meaning and types of externality, market failure: meaning, market failure in the presence of externalities; market failure and public goods, is environment a public good? Property rights and the Coase theorem.</p>	
	<p>Unit 3: The Design and Implementation of Environmental Policy Environmental Policies: an overview; Nonmarket and market based instruments of Environmental Policy: command and control (CA) approach, economic instruments like Pigovian taxes and effluent fees, tradable permits and mixed instrument. Monitoring and Enforcement: What is monitoring and enforcement? Penalties cost of abatement. Damages from pollution. Incentives to sources to comply with environmental regulations.</p>	<p>Applying and Analyzing</p>
	<p>Unit 4: International Environmental Problems</p>	<p>Understanding and Applying</p>

	<p>Nature of environmental problems: transboundary pollution-climate change, global warming, ozone depletion and bio-diversity loss;trade and environment: pollution heaven hypothesis.</p>	
	<p>Unit 5: Measuring the Benefits of Environmental Improvements Non-Market values: use and non-use values and optional values, measurement methods: Direct method-contingent valuation and indirect method-hedonic pricing methods, value of statistical life and their applications and limitations.</p>	<p>Applying and Analyzing</p>
	<p>Unit 6: Sustainable Development Conventional development model: a critique, Alternative approach: Sustainable Development and its origin, objectives of Sustainable Development, Approaches to Sustainable Development: weak sustainability, strong sustainability, Safe minimum standard approach, ecological perspective and social perspective, Rules and indicators of Sustainable Development.</p>	<p>Remembering and Analyzing</p>

Paper Name: International Economics

Paper Code: ECO-HE-6026

Course Outcome	Unit/ Topic	Bloom's Taxonomy
<ul style="list-style-type: none"> 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. 	<p>Unit 1: Introduction What is international economics about?, subject matter of International Economics, An overview of world trade-its changing pattern.</p>	Understanding and Analyzing
	<p>Unit 2: Theories of International Trade The Ricardian theory-comparative advantage, Heckscher-Ohlin model, specific factors model, new trade theories-Leontief Paradox, factor-intensity reversal, international trade in the context of 26 economies of scale and imperfect competition, technological gap and product cycle theories; the Locational theory international trade; multinational enterprises and international trade.</p>	Understanding and Analyzing
	<p>Unit 3: Trade Policy Instruments of trade policy- tariff and quota-partial equilibrium analysis; political economy of trade policy-free trade vs. protection; controversies in trade policy.</p>	Understanding and Analyzing
	<p>Unit 4: International Macroeconomic Policy Fixed versus flexible exchange rates; international monetary</p>	Understanding and Analyzing

	systems- Gold Standard, interwar period, Bretton-Woods system, European Monetary system; financial globalization and financial crises	
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BA in Economics (Generic) syllabus (CBCS)
1st Semester (Generic)

Paper Name: Principles of Microeconomics–I

Paper Code: ECO-HG-1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Acquaint with the basic principles of Microeconomic Theory. • Understand how microeconomic concepts can be applied to analyse real-life situations. • Gain knowledge on consumer and producer behavior. • Understand the concept of market forms. 	<p>Unit I: Introduction:</p> <p>a. Problem of scarcity and choice: scarcity, choice and opportunity cost; production possibility frontier; economic systems.</p> <p>b. Demand and supply: law of demand, determinants of demand, shifts of demand versus movements along a demand curve, market demand, law of supply, determinants of supply, shifts of supply versus movements along a supply curve, market supply, market equilibrium.</p> <p>c. Applications of demand and supply: price rationing, price floors, consumer surplus, producer surplus.</p> <p>d. Elasticity: price elasticity of demand, calculating elasticity, determinants of price elasticity, other elasticities.</p>	Remember, Understand
	<p>Unit II: Consumer Theory:</p> <p>Budget constraint, concept of utility, diminishing marginal utility, Diamond-water paradox, income and substitution effects;</p>	Remembering, Understand

	consumer choice: indifference curves, derivation of demand curve from indifference curve and budget constraint.	
	<p>Unit III: Production and Costs:</p> <p>a. Production: behavior of profit maximizing firms, production process, production functions, law of variable proportions, choice of technology, isoquant and isocost lines, cost minimizing equilibrium condition.</p> <p>b. Costs: costs in the short run, costs in the long run, revenue and profit maximizations, minimizing losses, short run industry supply curve, economies and diseconomies of scale, long run adjustments.</p>	Remembering, Understand
	<p>Unit IV: Perfect Competition:</p> <p>a. Assumptions: theory of a firm under perfect competition, demand and revenue; equilibrium of the firm in the short run and long run; long run industry supply curve: increasing, decreasing and constant cost industries.</p> <p>b. Welfare: allocative efficiency under perfect competition.</p>	Remembering, Understand

2nd Semester (Generic)

Paper Name: Principles of Microeconomics–II

Paper Code: ECO-HG-2016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Gain knowledge on different market forms. Understand the concept on pricing of factors. 	<p>Unit I: Market Structures:</p> <p>a. Theory of a Monopoly Firm Concept of imperfect competition; short run and long run price and output decisions of a monopoly firm; concept of a supply curve under monopoly; comparison of perfect competition and monopoly, social cost of</p>	Remembering, Understand

<ul style="list-style-type: none"> Develop understanding on the concept of market failure. 	monopoly, price discrimination; remedies for monopoly: Antitrust laws, natural monopoly. b. Imperfect Competition Monopolistic competition: Assumptions, short run and long run price and output determinations under monopolistic competition, Oligopoly: assumptions, overview of different oligopoly models, contestable markets.	
	Unit II: Factor pricing: Demand for a factor input in a competitive factor market, supply of inputs to a firm, market supply of inputs, equilibrium in a competitive factor market. Factor markets with monopsony power.	Remembering, Understand
	Unit III: Market Failure Efficiency of perfect competition, Sources of market failure. Externalities and market failure, public goods and market failure, markets with asymmetric information (Ideas only).	Remembering, Understand

3rd Semester (Generic)

Paper Name: Principles of Macroeconomics–I

Paper Code: ECO-HG-3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to:	Unit I: Introduction: What is macroeconomics? Macroeconomic issues in an economy	Remembering, Understand
	Unit II: National Income	Remembering,

<ul style="list-style-type: none"> • Acquaint with the basic concepts of Macroeconomics. • Understand how Macroeconomics deals with the aggregate economy. • Gain knowledge on the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variable like savings, investment, GDP and money. • Get insights on monetary and fiscal policy 	Accounting: Concepts of Income, Domestic Income and National Income; GDP and NDP at Market Price and Factor Cost, measurement of national income and related aggregates; nominal and real income	Understand
	Unit III: Determination of GDP: Actual and potential GDP; aggregate expenditure; consumption function; investment function; equilibrium GDP; concepts of MPS, APS, MPC, APC; autonomous expenditure; Concept of multiplier.	Remembering, Understand, Analyse
	Unit IV: National Income Determination with Government Intervention and Foreign Trade: Fiscal Policy: impact of changes in government expenditure and taxes; net exports function; net exports and equilibrium national income.	Remembering, Understand, Analyse
	Unit V: Money in a Modern Economy: Concept of money in a modern economy; monetary aggregates; demand for money; quantity theory of money; liquidity preference and rate of interest; money supply and credit creation; monetary policy.	Remembering, Understand

4th Semester (Generic)

Paper Name: Principles of Macroeconomics–II

Paper Code: ECO-HG-4016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able	Unit I: IS-LM Analysis: Derivations of the IS and LM functions; IS-LM and	Remembering, Understand

<p>to:</p> <ul style="list-style-type: none"> • Acquaint with the basic concepts of Macroeconomics. • Understand how Macroeconomics deals with the aggregate economy. • Gain knowledge on the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variable like savings, investment, GDP and money. • Get insights on monetary and fiscal policy 	<p>aggregate demand; shifts in the AD curve</p>	
	<p>Unit II: GDP and Price Level in Short Run and Long Run: Aggregate demand and aggregate supply; multiplier Analysis with AD curve and changes in price levels; aggregate supply in the SR and LR.</p>	<p>Remembering, Understand</p>
	<p>Unit III: Inflation and Unemployment: Concept of inflation; determinants of inflation; relationship between inflation and unemployment: Phillips Curve in short run and long run.</p>	<p>Remembering, Understand, Analyse</p>
	<p>Unit IV: Balance of Payments and Exchange Rate: Balance of payments: current account and capital account; market for foreign exchange; determination of exchange rate.</p>	<p>Remembering, Understand</p>

Department of English

Programme Specific Outcome (B.A in English) (CBCS)

After successful completion of the Programme, BA in English, students are expected to achieve:

- Knowledge on Indian Classical and European Classical traditions through their reading of a selection of translated texts about world literatures across genres such as poetry and drama..
- Knowledge on the historical development of Indian Writing in English and the challenges faced by the early authors.
- Knowledge about the partition of India and thus will be able to visualize the past through a revisit to the partition literature.
- Knowledge on Modern and Post-Modern English Literature and issues and ideas prevailing in the contemporary society.
- Knowledge on diverse societies and cultures, political and literary movements.

- Knowledge about the interrelation of life with literature through their study of a wide variety of texts and genres of literature□
- Knowledge of a broader outlook on literatures of India, America and Africa, and some European nations.
- Knowledge about the ideas and themes dealt by the authors to explore more and more new ideas and motivate them to undertake a comparative study.
- Knowledge and understanding to go for higher studies.

COURSE OUTCOME

B.A. in English (Honours) Syllabus (CBCS)

I Semester

Paper Name : Indian Classical Literature

Paper Code: ENG-HC-1016

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Knowledge and understanding of Classical Literatures of India in English translation across genres like drama, poetry, the epic narrative as well as short fictional fables. • Understand literatures of the world, and the possibility of cultural exchange. • Evaluation of Human Values 	<p>Kalidasa: <i>Abhijnana Shakuntalam</i></p>	<p>Remember, understand, evaluate</p>
	<p>Vyasa: 'The Dicing' and 'The Sequel to Dicing', 'The Book of the Assembly Hall', 'The Temptation of Karna'</p>	<p>Remember, understand, metacognitive</p>
	<p style="text-align: center;">Sudraka: <i>Mrcchakatika</i></p>	<p>Remember, understand</p>
	<p>Ilango Adigal: 'The Book of Banci', in <i>Cilappatikaram</i></p>	<p>Remember, understand, metacognitive</p>

Paper Name : European

Classical Literature Paper Code:

ENG-HC-1026

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students will achieve:</p> <ul style="list-style-type: none"> • Knowledge and understanding on European Classical Literatures through representative texts across 	<p>Homer: <i>The Odyssey</i></p>	<p>Remember, understand, evaluate</p>
	<p>Sophocles: <i>Oedipus the King</i></p>	<p>Remember, understand, metacognitive</p>
	<p>Plautus: <i>Pot of Gold</i></p>	<p>Remember, understand</p>

<p>genres like drama, poetry, and the epic narrative as well.</p> <ul style="list-style-type: none"> An analytic mind about literatures of the world and on the possibility of cultural exchange. Students will An enrichment of their metacognitive knowledge with their understanding of the Classical Theatre Evaluation on human values and culture 	Ovid: <i>Metamorphoses</i>	Remember, understand, metacognitive
	Horace: <i>Satires and Epistles and Persius: Satires I: 4</i>	

2nd Semester (Honours)

Paper Name: Indian Writing in English Paper
Code: ENG-HC-2016

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> Knowledge and understanding of gender, politics of language, nationalism and modernity Learning place of English Writing in India in the larger field of English Literature. Enabling students to discuss critically the use of literary forms of the novel, poetry and drama by Indian English writers Evaluation on human values. 	H.L.V. Derozio: 'Freedom to the Slave'; 'The Orphan Girl'	Remember, understand, evaluate
	Kamala Das: 'Introduction'; 'My Grandmother's House'	Remember, understand, evaluate
	Nissim Ezekiel: 'Enterprise'; 'Night of the Scorpion', 'Very Indian Poem in English'	Remember, understand
	Robin S. Ngangom: 'The Strange Affair of Robin S. Ngangom'; 'A Poem for Mother'	Remember, understand, metacognitive
	Mulk Raj Anand: 'Two Lady Rams'	Remember, evaluate
	Anita Desai: In Custody	Remember, understand, evaluate
	Shashi Deshpande: 'The Intrusion'	Understand
	Manjula Padmanabhan: Lights Out	Remember, understand, evaluate
	Mahesh Dattani: Tara	Remember, understand

Paper Name: British Poetry and Drama: 14th to 17th Centuries
Paper Code: ENG-HC-2026

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students will achieve:</p> <ul style="list-style-type: none"> • Knowledge and understanding on two major forms in British literature from the 14th to the 17th centuries – poetry and drama. • Knowledge on the larger contexts of the Renaissance, the nature of the Elizabethan Age and its predilections 	Geoffrey Chaucer: The Wife of Bath's Prologue	Remember, understand, evaluate
	Edmund Spenser: Selections from <i>Amoretti</i>	Remember, understand, evaluate
	John Donne: 'The Sunne Rising'; 'Batter My Heart'; 'Valediction: Forbidding Mourning'	Remember, understand
	Christopher Marlowe: <i>Doctor Faustus</i>	Remember, understand, metacognitive
<ul style="list-style-type: none"> • Knowledge and understanding on seminal issues and preoccupations of the writers with their 	William Shakespeare: <i>Macbeth</i>	Remember, evaluate, metacognitive
	William Shakespeare: <i>Twelfth Night</i>	Remember, understand, evaluate

3rd Semester

(Honours) Paper Name: History of English Literature and Forms

Paper Code: ENG-HC-3016

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Knowledge of the development of English Literature and 	Poetry from Chaucer to the Present	Remember, understand, evaluate
	Drama from <i>Everyman</i> to the Present	Remember, understand, evaluate

<p>understanding on the different forms of English Literature.</p> <ul style="list-style-type: none"> • Understanding on the contexts in which literary forms and individual texts emerge. • Learning to analyze texts as representative of broad generic explorations. 	Fiction from 17 th Century to Present	Remember, understand
	Non Fictional Prose (Life Writing, Essays, Philosophical and Historical Prose, Satire)	Remember, understand

Paper Name: American Literature
Paper Code: ENG-HC-3026

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Knowledge and understanding on the main currents of American literature in its social and cultural contexts. • understanding the historical reflection of the growth of American society 	Tennessee Williams: <i>The Glass Menagerie</i>	Remember, understand, evaluate
	Mark Twain: <i>The Adventures of Huckleberry Finn</i>	Remember, understand, evaluate
	Edgar Allan Poe: <i>The Purloined Letter</i>	Remember, understand
	F. Scott Fitzgerald: 'The Crack-up'	Remember, understand, metacognitive
	Anne Bradstreet: 'The Prologue'	Remember, evaluate
	Emily Dickinson: 'A Bird Came Down the Walk';	Remember, understand, evaluate
<ul style="list-style-type: none"> • Evaluation on human values • Knowledge on the American society from the beginnings of modernism to the present as well as with exciting generic innovations and developments. 	'Because I Could not Stop for Death'	
	Walt Whitman: Selections from <i>Leaves of Grass</i> : 'O Captain, My Captain'; 'Passage to India' (lines 1–68)	Remember, understand, evaluate
	Langston Hughes: 'I too'	Remember, understand
	Robert Frost: 'Mending Wall'	Remember, understand
	Sherman Alexie: 'Crow Testament'; 'Evolution'	Remember, evaluate, metacognitive

Paper Name: British Poetry & Drama: 17th & 18th Centuries
Paper Code: ENG-HC-3036

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Knowledge and understanding of the diverse kinds of writings that developed in the 17th & 18th Century. • Knowledge on economic, political and social changes in (primarily) Britain during this period. • Understanding larger contexts that generated such literatures as well as the possible impacts. 	John Milton: <i>Paradise Lost: Book I</i>	Remember, understand, metacognitive
	• John Webster: <i>The Duchess of Malfi</i>	Remember, understand, evaluate
	• Aphra Behn: <i>The Rover</i>	Remember, understand
	• John Dryden: <i>Mac Flecknoe</i>	Remember, understand
	• Alexander Pope: <i>The Rape of the Lock</i>	Remember, understand, evaluate

4th Semester

(Honours) Paper Name: British Literature: The 18th Century

Paper Code: ENG-HC-4016

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Knowledge and understanding on how reason and rationality dominated the socio political life in the 18th C England 	• Jonathan Swift: <i>Gulliver's Travels</i> (Books III and IV)	Remember, understand, evaluate
	• Samuel Johnson: 'London'	Remember, understand, evaluate
<ul style="list-style-type: none"> • Knowledge on the emergence of the English Novel and development of satire as dominant form of poetry. • Knowledge of different kinds of drama namely sentimental comedy. 	• Thomas Gray: 'Elegy Written in a Country Churchyard'	Remember, understand, evaluate
	• Daniel Defoe: <i>Moll Flanders</i>	Remember, understand, evaluate
	• Joseph Addison: "Pleasures of the Imagination", <i>The Spectator</i> , 411	Remember, evaluate

	• Oliver Goldsmith: <i>She Stoops to Conquer</i>	Remember, understand, evaluate
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Paper Name: British Romantic Literature Paper
Code: ENG-HC-4026

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Knowledge on the Romantic movement in English through a reading of the poetry of Blake, Burns, Wordsworth, Coleridge, Shelley, and Keats. • Understanding the role of imagination in the poetry of the age and the role of the poet in society. • Understanding the relationship between man and nature. 	William Blake: 'The Lamb', 'The Chimney Sweeper', 'The Tyger', 'Introduction' to The Songs of Innocence	Remember, understand, evaluate
	• Robert Burns: 'A Bard's Epitaph'; 'Scots Wha Hae'	Remember, understand, evaluate
	• William Wordsworth: 'Tintern Abbey'; 'Upon Westminster Bridge'	Remember, understand
	• Samuel Taylor Coleridge: 'Kubla Khan'; 'Dejection: An Ode'	Remember, understand
	• Percy Bysshe Shelley: 'Ode to the West Wind'; 'Hymn to Intellectual Beauty'; 'The Cenci'	Remember, understand, evaluate
	• John Keats: 'Ode to a Nightingale'; 'To Autumn'; 'On First Looking into Chapman's Homer'	Remember, understand
	• Mary Shelley: <i>Frankenstein</i>	Remember, understand, analyse

Paper Name: British Literature: The 19th Century Paper
Code: ENG-HC-4036

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Knowledge and understanding 	• Jane Austen: <i>Pride and Prejudice</i>	Remember, understand, evaluate
	• Charlotte Bronte: <i>Jane Eyre</i>	Remember, understand, evaluate

on how the novel comes into its own through a	• Charles Dickens: <i>The PickwickPapers</i> (Chapters: 1, 2, 23, 56, 57)	Remember, understand
reading of the representative texts of Jane Austen and Charles Dickens. • Knowledge on the ground-breaking efforts of the poets as well as the fiction writers who manage to consolidate and refine upon the achievements of the novelists of the previous era. • Evaluation on human values.	• Thomas Hardy: <i>The Three Strangers</i>	Remember, understand, metacognitive
	• Alfred Tennyson: ‘The Defence of Lucknow’	Remember, understand, evaluate
	• Robert Browning: ‘Love among the Ruins’	Remember, understand
	• Christina Rossetti: ‘GoblinMarket’	Remember, understand, evaluate

5th Semester

(Honours)Paper Name: British Literature: The 20th Century

Paper Code: ENG-HC-5016

Course Outcome	Unit/ Topics	Bloom’s Taxonomy Level
On successful completion of this course students are expected to achieve: • Knowledge and understanding on modernism and modernity in English Literature. • Knowledge and familiarity with modern novelists and poets. • Knowledge on the ethos of postmodernism through a reading of recent poetic and fictional works. • Evaluation on human values and culture.	• Joseph Conrad: <i>Heart of Darkness</i>	Remember, understand, evaluate
	• Virginia Woolf: <i>Mrs Dalloway</i>	Remember, understand, evaluate
	• W.B. Yeats: ‘The Second Coming’; ‘Sailing to Byzantium’	Remember, understand
	• T.S. Eliot: ‘The Love Song of J. Alfred Prufrock’; ‘Journey of the Magi’	Remember, understand, metacognitive
	• W.H. Auden: ‘In Memory of W.B. Yeats’	Remember, understand, evaluate
	• Hanif Kureshi: <i>My Beautiful Launderette</i>	Remember, understand
	• Phillip Larkin: ‘Church Going’	Remember, understand, analyse
	• Ted Hughes: ‘Hawk Roosting’	Remember, understand, evaluate

	• Seamus Heaney: ‘Casualty	Remember, understand
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Paper Name:
Women’s Writing
Paper Code: ENG-
HC-5026

Course Outcome	Unit/ Topics	Bloom’s Taxonomy Level
On successful completion of this course students are expected to achieve:	• Mary Wollstonecraft: <i>A Vindication of the Rights of Woman</i>	Remember, understand, evaluate
<ul style="list-style-type: none"> • Knowledge and ability to analyse nineteenth and twentieth century writings by women living in different geographical and socio cultural settings. • Acquaintance with the distinct and varied experiences of women articulated in a variety of genres-poetry, novels, short stories, and autobiography. • Understanding on the contexts from which the texts emerged. • Ability to analyse the women writers’ handling of the different genres to articulate their women-centric experiences. 	• Rassundari Debi: Excerpts from Amar Jiban in Susie Tharu and K. Lalita, eds., <i>Women’s Writing in India</i> , vol. 1	Remember, understand, evaluate
	• Katherine Mansfield: ‘Bliss’	Remember, understand
	• Sylvia Plath: ‘Daddy’; ‘Lady Lazarus’	Remember, understand, metacognitive
	• Alice Walker: <i>The Color Purple</i>	Remember, understand, evaluate
	• Mahashweta Devi: <i>Draupadi</i> , tr. Gayatri Chakravorty Spivak	Remember, understand
	• Nirupama Bargohain: ‘Celebration’	Remember, understand, analyse
	• Adrienne Rich: ‘Orion’	Remember, understand, evaluate
	• Eunice De Souza: ‘Advice to Women’; ‘Bequest’	Remember, understand

Paper Name: Literature of the Indian Diaspora
Paper Code: ENG-
HE-5036

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Knowledge and understanding on the concepts such as transnationalism, exile, migration and displacement through a reading of texts representing diasporic experience with particular reference to Indian diasporic writers. • Evaluation on human values and culture. 	• M. G. Vassanji: <i>The Book of Secrets</i> (Penguin, India)	Remember, understand, evaluate
	• Rohinton Mistry: <i>A Fine Balance</i> (Alfred A Knopf)	Remember, understand, evaluate
	• Meera Syal: <i>Anita and Me</i> (Harper Collins)	Remember, understand
	• Jhumpa Lahiri: <i>The Namesake</i> (Houghton Mifflin Harcourt)	Understand, evaluate

Paper Name: Literary Criticism and Literary Theory
Paper Code: ENG-HE-5056

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Development on theoretical/practical knowledge for analysing literary texts through a reading of texts beginning from William Wordsworth's Preface to such Modern and Post-Modern texts as Derrida's "Structure, Sign and Play in the Discourse of the Human Science" and Fanon's <i>Black Skin, White Masks</i> • Knowledge on different Literary theories such as Marxism and Feminism. 	William Wordsworth: Preface to the <i>Lyrical Ballads</i> (1802)	Remember, understand, evaluate
	S.T. Coleridge: <i>Biographia Literaria</i> . Chapters IV, XIII, XIV	Remember, understand, evaluate
	Virginia Woolf: <i>Modern Fiction</i>	Remember, understand
	T.S. Eliot: "Tradition and the Individual Talent" (1919)	Remember, understand,
	I.A. Richards: <i>Principles of Literary Criticism</i> Chapters 1, 2 and 34.	Remember, understand, evaluate
	Cleanth Brooks: "The Language of Paradox" in <i>The Well-Wrought Urn: Studies in the Structure of Poetry</i> (1947)	Remember, understand
	Terry Eagleton: Introduction to <i>Marxism and Literary Criticism</i>	Remember, understand, analyse

Elaine Showalter: 'Twenty Years on: A Literature of Their Own Revisited'	Remember, understand, evaluate
Toril Moi: "Introduction" in Sexual/Textual Politics	Remember, understand
Jacques Derrida: "Structure, Sign and Play in the Discourse of the Human Science"	Remember, understand, metacognitive
Michel Foucault: 'Truth and Power'	Remember, understand,
Mahatma Gandhi: 'Passive Resistance' and 'Education', in Hind Swaraj and Other Writings	Remember, understand, evaluate
Edward Said: 'The Scope of Orientalism' in Orientalism	Remember, understand
Frantz Fanon: Black Skin, White Masks (Chapter 4 "The So-Called Dependency Complex of Colonized Peoples")	Remember, understand, analyse

6th Semester

Paper Name: Modern European Drama Paper
Code: ENG-HC-6016

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Knowledge on the innovative dramatic works of playwrights from different locations in Europe –knowledge about European realistic drama and the Theatre of the Absurd. • Understanding contemporary social condition and the innovative experiments carried out in the stage. • Understanding trends and dramatic devices and techniques. • Evaluation on human values. 	• Henrik Ibsen: <i>Ghosts</i>	Remember, understand, evaluate
	• Anton Chekhov: <i>The Cherry Orchard</i>	Remember, understand, evaluate
	• Bertolt Brecht: <i>The Caucasian Chalk Circle</i>	Remember, understand
	• Samuel Beckett: <i>Waiting for Godot</i>	Remember, understand, analyse

Paper Name:
Postcolonial Studies
Paper Code: ENG-
HC-6026

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Understanding colonization and decolonization and identity politics through a reading of select novels, short stories and poems. • Knowledge on the effects of colonization on society and culture. • Understanding how the postcolonial writers treat race and gender in their texts. 	• Chinua Achebe: <i>Things Fall Apart</i>	Remember, understand, evaluate
	• Gabriel Garcia Marquez: <i>Chronicle of a Death Foretold</i>	Remember, understand, evaluate
	• Bessie Head: 'The Collector of Treasures' Ama Ata Aidoo: 'The Girl who can'	Remember, understand
	• Grace Ogot: 'The Green Leaves'	Remember, understand,
	• Shyam Selvadurai: <i>Funny Boy</i>	Remember, understand, evaluate
	• Pablo Neruda: 'Tonight I can Write'; 'The Way Spain Was'	Remember, understand
	• Derek Walcott: 'A Far Cry from Africa'; 'Names'	Remember, understand, analyse
	• David Malouf: 'Revolving Days'; 'Wild Lemons'	Remember, understand, evaluate
	• Easterine Kire: <i>When the River Sleeps</i>	Remember, understand

Paper Name: Partition
Literature Paper Code:
ENG-HE-6036

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
On successful completion of this course students are expected to	• Intizar Husain: <i>Basti</i> , tr. Frances W. Pritchett	Remember, understand, evaluate

achieve: <ul style="list-style-type: none"> Understanding people's traumas and sufferings resulting from the partition of the Indian Subcontinent. Evaluation on how the writers treated the theme of partition across literary genres. Understanding and evaluating human values of universal significance. 	<ul style="list-style-type: none"> Amitav Ghosh: <i>The Shadow Lines</i>. 	Remember, understand, evaluate
	<ul style="list-style-type: none"> Dibyendu Palit: 'Alam's Own House', tr. Sarika Chaudhuri, Bengal Partition Stories: <i>An Unclosed Chapter</i> 	Remember, understand
	<ul style="list-style-type: none"> Manik Bandhopadhyay: 'The Final Solution', tr. Rani Ray, <i>Mapmaking: Partition Stories from Two Bengals</i> 	Remember, understand,
	<ul style="list-style-type: none"> Sa'adat Hasan Manto: 'Toba Tek Singh', <i>Black Margins: Manto</i>, tr. M. Asaduddin 	Remember, understand, evaluate
	<ul style="list-style-type: none"> Lalithambika Antharajanam: 'A Leaf in the Storm', tr. K. Narayana Chandran, in <i>Stories about the Partition of India</i> 	Remember, understand
	<ul style="list-style-type: none"> Faiz Ahmad Faiz: 'For Your Lanes, My Country', in <i>In English: Faiz Ahmad Faiz, A Renowned Urdu Poet</i>, tr. and ed. Riz Rahim 	Remember, understand, analyse
	<ul style="list-style-type: none"> Jibananda Das: 'I Shall Return to This Bengal', tr. Sukanta Chaudhuri, in <i>Modern Indian Literature</i> 	Remember, understand, evaluate
	<ul style="list-style-type: none"> Gulzar: 'Toba Tek Singh', tr. Anisur Rahman, in <i>Translating Partition</i>, ed. Ravikant and Tarun K. Saint 	

Paper Name: Life Writing Paper
Code: ENG-HE-6056

Course Outcome	Unit/ Topics	Bloom's Taxonomy Level
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<p>On successful completion of this course students are expected to achieve:</p> <ul style="list-style-type: none"> • Ability to analyse autobiography as a literary genre and the role of memory in writing autobiography. • Understanding how autobiography writers use it as a form of resistance and as a form of rewriting history. • Remembering and understanding the relation between self and society and how society influences life. 	<p>•Jean-Jacques Rousseau: Confessions, Part One, Book One, pp. 5-43</p>	Remember, understand, evaluate
	<p>• Maya Angelou: I Know Why the Caged Bird Sings, Chapter 6</p>	Remember, understand, evaluate
	<p>• M. K. Gandhi: <i>Autobiography</i> or the Story of <i>My Experiments with Truth</i>, Part I Chapters II-IX, pp.5-26</p>	Remember, understand
	<p>• Ismat Chughtai, <i>A Life in Words: Memoirs</i>, Chapter 1</p>	Remember, understand,
	<p>• Binodini Dasi: <i>My Story and Life as an Actress</i>, pp. 61-83</p>	Remember, understand, evaluate
	<p>• Revathi: Truth About Me: A Hijra Life Story, Chapters One to Four</p>	Remember, understand
	<p>• Richard Wright: Black Boy, Chapter 1, pp. 9-44</p>	Remember, understand, analyse
	<p>• Sharankumar Limbale: <i>The Outcaste</i>, Translated by Santosh Bhoomkar, pp. 1-39</p>	Remember, understand, evaluate

Department of Geography

Programme Specific Outcome (B.A/B.Sc in Geography) (CBCS)

The programme specific outcome of the syllabus prescribed for the major students of Geography is mentioned below:

- PSO1: The programme will enrich and enlighten the students with fundamental geographical understanding to chase higher education in the discipline.
- PSO2: The programme will prepare the students with adequate knowledge applicability and problem solving capacities.
- PSO3: The programme will provide encouragement among students to pursue a career in Geoinformatics in future.
- PSO4: The programme deals with project work and preparation of dissertation which will promote research work and research profession among the students.
- PSO5: The programme will build a sound geographical base in the students which will immensely help them while preparing for any competitive exams.
- PSO6: The programme deals extensively on environment and man-nature relationship. This will create a sense of awareness and social responsibility among the students towards the environment.

Most importantly, the programme will help students to become better and responsible citizens of the nation.

COURSE OUTCOME

BA in Geography (Honours) syllabus (CBCS)

1st Semester

Paper Name: Geomorphology

Paper Code: GGY - HC – 1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none">• The paper will introduce the students about the physical aspect of the subject Geography.	Theory Unit I: Geomorphology: Nature, Scope and Significance	Remember and Understood
	Unit II: Structure and characteristics of the earth's crust and interior	Remember and Understood

<ul style="list-style-type: none"> The students will learn about the different branches of geomorphology. The concepts learned will help students to observe and understand the different landforms critically. The paper will help the students in exams like NET/SLET/ UPSC and other competitive exams. 	Unit III: Forces of landform development: Endogenetic forces (folding, faulting earthquakes and volcanoes) and exogenetic forces (weathering, erosion and masswasting).	Remember, Understand and Analysis
	Unit IV: Earth Movements: Continental Drift Theory, Isostasy, Mountain building: views of Holmes and Kober, Plate tectonics.	Analysis and Apply
	Unit V: Concept of Cycle of Erosion: Davis and Penck, Landform development under Fluvial, Aeolian and Glacial conditions	Understand, Analysis and Apply
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will learn various cartographic techniques for representing different relief profiles. The students will be able to identify different geomorphological features from toposheets and their representation and interpretation from geographical perspectives. The paper will help the students to identify common rocks and their characteristics. 	Practical Unit I: Study of Topographical Maps: Topographical map content and numbering system, the general interpretation of topographic sheets in respect of physical characteristics.	Analysis and Apply
	Unit II: Profile Drawing (serial, superimposed, projected and composite)	Analysis and Apply
	Unit III: Preparation of Slope Map / Relative Relief Map: Wentworth's method and Smith's method.	Analysis and Apply
	Unit IV: Delineation of drainage basin and drainage network, construction of cross and long profiles, stream ordering by Horton and Strahler's method	Analysis and Apply
	Unit V: Interpretation of	Analysis

	Geological map and Construction of cross – section (Two geological maps including one with interruptions) showing different sedimentary beds.	and Apply
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Paper Name: Cartographic Techniques

Paper Code: GGY-HC-1026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will acquire fundamental knowledge about cartography, map characteristics, map design and map layout. The paper will be useful for the students in terms of surveying an area and learning the basic principles and techniques associated with surveying. The students will understand the need of quantification in Geography and learn important quantitative methods involved in geographic data analysis. 	<p>Theory Unit:1 Cartography – Meaning, Development (Traditional and Modern Cartography) and Importance of Cartography in Geography.</p>	Remember and Understand
	Unit:2 II Shape and size of the earth, coordinate system (latitude and longitude)	Remember and Understand
	Unit III: Maps: Types, scale and content, representation of point, line and area in maps	Remember, Understand and Analysis
	Unit IV: Map Projections: Concept of Map Projection, Classification of Map Projections; Choice of map projection.	Remember, Understand and Analysis
	Unit V: Thematic mapping: Concept and types	Remember, Understand and Analysis
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> This paper will provide the students to undertake survey exercises in a 	<p>Practical Unit I: Construction of graphical scale (linear, diagonal and comparative); conversion of map scale</p>	Analysis and Apply
	Unit II: Construction of	Analysis

<p>geographical area and apply different cartographic techniques to map the same.</p> <ul style="list-style-type: none"> Learning map projections is an integral part of map making and this paper will enable the students to gain insight about various map projection techniques. The paper deals with representing socio-economic data in the form of maps which will be useful for the students in their project work. 	<p>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.</p>	and Apply
	<p>Unit III: Preparation of thematic maps (choropleth, isopleth and pie diagram) for representing various physical geographic data.</p>	Analysis and Apply

IIth Semester

Course Name: Human Geography

Paper Code: GGY-HC-2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will acquire fundamental knowledge about cartography, map characteristics, map design and map layout. The paper will be useful for the students in terms of surveying an area and learning the basic principles and techniques associated with surveying. The students will understand the need of quantification in Geography and learn important quantitative methods involved in geographic data analysis. 	<p>Theory Unit:1 Cartography – Meaning, Development (Traditional and Modern Cartography) and Importance of Cartography in Geography.</p>	Remember and Understand
	<p>Unit:2 II Shape and sizeoftheearth,coordinatesystem(latitudeandlongitude)</p>	Remember and Understand
	<p>Unit III: Maps: Types, scale and content, representation of point, line and area in maps</p>	Remember, Understand and Analysis
	<p>Unit IV: Map Projections: Concept of Map Projection, Classification of Map Projections; Choice ofmapprojection.</p>	Remember, Understand and Analysis

<ul style="list-style-type: none"> • 	Unit V: Thematic mapping: Conceptandtypes	Remember ,Understan d and Analysis
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • This paper will provide the students to undertake survey exercises in a geographical area and apply different cartographic techniques to map the same. • Learning map projections is an integral part of map making and this paper will enable the students to gain insight about various map projection techniques. • The paper deals with representing socio-economic data in the form of maps which will be useful for the students in their project work. 	Practical Unit I: Construction of graphical scale (linear, diagonal and comparative); conversion of map scale .	Analysis and Apply
	Unit II: 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.	Analysis and Apply
	Unit III: Preparation of thematic maps (choropleth, isopleth and pie diagram) for representing various physical geographic data.	Analysis and Apply
	Unit IV: Delineation of drainage basin and drainage network, construction of cross and long profiles, stream ordering by Horton andStrahler’smethod	Analysis and Apply
	Unit V: Interpretation of Geological map and Construction of cross – section (Two geological maps including one with interruptions) showing different sedimentarybeds.	Analysis and Apply

Course Name: Climatology and Biogeography

Paper Code: GGY-HC–2026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The paper will be beneficial for the students in developing ideas on climate related aspects of geographical analyses. The students will be benefitted in preparing for NET/SLET/UPSC and other competitive exams. The paper will be useful for the students in gaining information on representing and interpreting various climatic phenomena. The students will gain knowledge about the physical and chemical properties of soil, the processes and factors of their formation and subsequently about their different types. The paper will enhance the knowledge of the students about their environment, the associated environmental concepts and relevance. Understanding about the biogeographic regions, their distribution and also about the man-environment relationship will create awareness and sense of responsibility among students towards the environment. 	<p>Theory Climatology Unit I : Meaning of climatology and its significance in geographical studies.</p>	Remember and Understand
	Unit II: Atmospheric Composition and Structure; and their variation with altitude, latitude and season.	Remember and Understand
	Unit III: Insolation and Temperature; Factors and Distribution and Heat Budget.	Remember ,Understand and Analysis
	Unit IV: Atmospheric Pressure and Wind system; Planetary Winds, Forces affecting Winds, General Circulation, Jet Streams	Remember ,Understand and Analysis
	Unit V: Atmospheric Moisture – Evaporation, Humidity, Condensation, Fog, Precipitation Types, Stability and Instability.	Remember and Understand
	Unit VI: Climatic classification of Koppen and Trewartha; Monsoon - Origin and Mechanism.	Remember and Understand
	Unit VII: Cyclones and anticyclones; Tropical Cyclones, Extra-Tropical Cyclone.	Remember and Understand
	Biogeography Unit I: Meaning, Scope and Significance of biogeography	Remember ,Understand and Analysis
	Unit II: Ecology and Ecosystem, Structure and	Remember ,Understand

	functioning of ecosystem	and Analysis
	Unit III: Global distribution of major plants and animals.	Remember ,Understand and Analysis
	Unit IV: Biomes and Biodiversity hotspots of the world.	Remember ,Understand and Analysis
	Unit V: Soil as a component of environment, soil formation process and factors, soil composition and horizon, Soil types and their distribution in India	Remember ,Understand and Analysis
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Study Weather map of different places of India • Study about rainfall variability of different places • Annual rainfall graph of different places • The students will become skilled at preparing, reading and analysing different weather map. <p>Biogeography</p> <ul style="list-style-type: none"> • The students will gain a comprehensive understanding about the composition and distribution of soil and vegetation at regional and national context. • The paper will develop the skill of the students in cartographically representing different data. 	<p>Practical Climatology Unit I: Interpretation of Indian Weather map for Monsoon and non-monsoon seasons/months based on various weather symbols depicted on maps.</p>	Analysis and Apply
	Unit II: Preparation of weather reports of Indian subcontinent by analyzing the weather satellite images of at least three consecutive days (e.g. INSAT 3D, NOAA satellite).	Analysis and Apply
	Unit III: Preparation of rainfall-temperature graphs; hythergraph, climograph and ergograph taking data from India/N.E.India/Assam	Analysis and Apply
	Unit IV: Calculation of average annual rainfall and variability of annual rainfall and preparation of rainfall distribution and v	Analysis and Apply

	isobars(isotherms)	
	Biogeography Unit V: Mapping of protected areas (National park, biosphere reserve and wildlife sanctuary) of Assam/ N.E.India/India. Unit VI: Mapping of phyto-geographic and zoogeographic regions of the world	Remember and Understand
	Unit VII: Mapping of Biodiversity hotspots of the world.	Remember and Understand
	Unit VIII: Mapping of Soil types of Assam/N.E. India and Soil horizons	Remember and Understand

Course Name: Human Geography

Paper Code: GGY-HC-2036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to:	Theory Human Geography Unit I :Field of human geography: meaning, scope and importance.	Remember, Understand and Analysis
	Unit II: Concepts of man-environment relationship: Determinism and Possibilism.	Remember and Understand
	Unit III: Impact of environment on man; impact of man on environment; population growth and environmental changes; house types in different environmental conditions.	Remember, Understand and Analysis
	Unit	Remember

	IV: Global patterns of racial, religious and linguistic composition of population.	, Understand and Analysis
	Unit V: Origin, growth and characteristics of rural and urban settlements; Patterns of rural settlements; Patterns of urbanization in India and N.E. India.	Remember, Understand and Analysis
	Practical Unit I: Traditional house types of selected ethnic groups of North-East India.	Analysis and Apply
	Unit II: Trend of population growth in the world in relation to five most populous countries of the world using line graph..	Analysis and Apply
	Unit III: Religious composition of population in the world and three most populous countries of the world using pie-graph.	Analysis and Apply
	Unit IV: Spatial patterns of urban population in Assam and N.E. India at state level through choropleth map.	Analysis and Apply
	Unit V: Drawing of major rural settlement types/patterns; Morphological diagram of a village and a town (preferably based on student's own village and town)	Analysis and Apply

IIIth Semester

Course Name: Economic Geography
Paper Code: GGY-HC-3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The paper will help the students to understand how geographic aspect is associated with economic space. The students will gain knowledge about the classification, distribution and importance of different resources and economic activities from geographical perspective. The paper deals with the economic and resource base development which will assist the students to understand the subject matter at global context. 	<p>Theory Economic Geography Unit:I Meaning, scope and approaches ofEconomicGeography.</p>	Remember ,Understand and Analysis
	<p>Unit: II Economic activity: meaning and classification; Production system: Role of land, labour andcapital.</p>	Remember and Understand
	<p>Unit III: Agriculture: Factors influencing agriculture; types of agriculture; Von Thunen's model of agricultural location; Factors influencing cultivation of wheat, rice, coffee and tea, and theirdistributionandproducti onindifferentpartsoftheworl d.</p>	Remember and Understand
	<p>Unit IV: Manufacturing: Factors influencing industrial location; Classification of industry; Weber's theory of industrial location; Factors, distribution and production of iron and steel, cotton textileandITindustriesinthe world;Specialeconomiczone sandtechnologyparks.</p>	Remember and Understand
	<p>Unit V: Transport system: Modes of transport, factors influencing transport development and role of transport in resource mobilization and economicdevelopment.</p>	Remember ,Understand and Analysis
	<p>Unit VI: Trade: Factors influencing trade in</p>	Remember ,Understand

	different countries of the world; Trade relations of India with the countries like USA, Russia and Japan.	d and Analysis
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will learn about population data representation and interpretation using different cartographic techniques. The paper will be useful for the students in identifying different settlement patterns across different geographical settings. The paper will test the sincerity and discipline of the students in terms of geographical exercises conducted in the class through preparation of practical note-book. 	<p>Practical</p> <p>Unit I: Trend of rice, wheat and iron & steel production in the world/USA/India since 1960 using moving average and least squares methods.</p>	Analysis and Apply
	Unit II: Trend of production of wheat, rice, maize and barley in the world/USA since 1960 using Band-graph.	Analysis and Apply
	Unit III: Trend of balance of trade relations (export and import value) of India with USA, China and Japan in respect of major commodities since 1990 using Bar-graph.	Analysis and Apply
	Unit IV: Regional variation in fertilizer consumption and agricultural productivity in rice, wheat and barley in selected countries of the world using Bar-graph.	Analysis and Apply

Course Name: Economic Geography

Paper Code: GGY-HC-3026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The paper will help the students to gather an in-depth and detail knowledge of North-East India which is very pertinent at regional 	<p>Theory</p> <p>Unit I: India's location and its significance; administrative divisions</p>	Remember and Understand
	Unit: II : Physical setting: Physiographic divisions and their characteristics; Climate and its seasonal and	Remember and Understand

<p>context.</p> <ul style="list-style-type: none"> The students will get the opportunity to learn about the geographical aspects of Assam and its significance in terms of location, economy and biodiversity. The paper will be useful for the students to prepare for different national competitive exams in general and regional and local exams in particular. 	<p>regional characteristics; vegetation; soil types and its distribution.</p>	
	<p>Unit III: Population: Trend of growth, spatial variation in growth and distribution; Age and sex composition; Linguistic and religious composition.</p>	<p>Remember and Understand</p>
	<p>Unit IV: Agriculture: Regional distribution and production patterns of rice, wheat and millet.</p>	<p>Remember, Understand and Analysis</p>
	<p>Unit V: Industry: Distribution and production patterns of iron and steel, cotton textile and fertilizers; Role of transport system in industrial development.</p>	<p>Remember, Understand and Analysis</p>
	<p>Unit VI: North-East India: Land of seven sisters and its locational significance; physiographic framework; forest cover; agricultural practices including shifting cultivation; industrial development scenario; population growth, distribution and ethnic composition.</p>	<p>Remember, Understand and Analysis</p>
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will become skilled at preparing, reading and analysing different physical and cultural maps. The paper will provide an opportunity to the students to undertake a field study which will bring a comprehensive research development 	<p>Practical Unit I: Trend of population growth and growth rates in India and N.E. India since 1901 using Census data (Source: censusindia.gov.in).</p>	<p>Analysis and Apply</p>
	<p>Unit II: Choropleth mapping to show spatial variation in decennial population growth rate in India</p>	<p>Analysis and Apply</p>
	<p>Unit III: Spatial variation in the patterns of religious composition of population</p>	<p>Analysis and Apply</p>

<p>among the students.</p> <ul style="list-style-type: none"> The task of preparing a practical notebook will develop the qualitative skill of the students. 	<p>in India and Social composition of population (SC, ST and General) in N.E. India using pie-graph.</p>	
	<p>Unit IV: Trend of foodgrains production (rice, wheat, maize, barley, jowar and bajra) in India since 1950-51 using band-graph.</p>	<p>Analysis and Apply</p>
	<p>Unit V: Map showing distribution of major tribal groups in North-East India.</p>	<p>Analysis and Apply</p>

Course Name: Quantitative Methods in Geography

Paper Code: GGY-HC-3036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p><i>Course outcomes:</i></p> <ul style="list-style-type: none"> The students will acquire fundamental knowledge about cartography, map characteristics, map design and map layout. The paper will be useful for the students in terms of surveying an area and learning the basic principles and techniques associated with surveying. The students will understand the need of quantification in Geography and learn important quantitative methods involved in geographic data analysis. 	<p>Theory Unit I: Quantification and its significance in geographical study; advantages and limitations of quantitative methods in geography.</p>	<p>Remember and Understand</p>
	<p>Unit: II :Geographical Data: Nature, types and sources; scale of measurement (nominal, ordinal, interval and ratio).</p>	<p>Remember and Understand</p>
	<p>Unit III. Measures of central tendency (mean, median and mode) and dispersion (range, quartile deviation, mean deviation, standard deviation)</p>	<p>Remember and Understand</p>
	<p>Unit IV: Sampling techniques: meaning of sampling and its need; types of sampling (simple random and stratified random).</p>	<p>Remember, Understand and Analysis</p>

	Unit V: Time series analysis and its applications in geographical studies; Basic techniques of timeseriesdataanalysis(semi - average,movingaverageandl eastsquares).	Remember ,Understand and Analysis
	Unit VI:Correlation and Regression Analysis: Meaning of correlation; Bi-variate coefficient of correlation (Spearman's rank correlation and Pearson's product-moment correlation); linear regression analysis; and their applications in geographical dataanalysis	Remember ,Understand and Analysis
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • This paper will provide the students to undertake survey exercises in a geographical area and apply different cartographic techniques to map the same. • Learning map projections is an integral part of map making and this paper will enable the students to gain insight about various map projection techniques. • The paper deals with representing socio-economic data in the form of maps which will be useful for the students in their project work. 	<p>Practical</p> <p>Unit I:Tabulation/Grouping of geographical data for making frequency distribution table; Preparation of Histogram, Frequency PolygonandFrequencyCurve</p>	Analysis and Apply
	Unit II: . Computation of mean, median and mode for ungrouped and grouped geographical data; Determination of median and mode using graphical methods; Determination of the locationofspatialmeancentre ofsettlements(usingcentrographicmeasure).	Analysis and Apply
	Unit IIIComputation of the values of standard deviation and coefficient of variation of ungrouped and grouped data relating to some geographical phenomena (rainfall, landholding,	Analysis and Apply

	income, production, etc) for comparison of distribution patterns.	
	Unit IV Analysis of time series data of some geographical phenomena (rainfall, production, export value, import value, etc) using moving average and least squares methods.	Analysis and Apply
	Unit V: Computation of coefficient of correlation between two logically associated geographical phenomena using Spearman's rank correlation and Pearson's product-moment correlation formulae; Preparation of scatter diagram and fitting the line of linear regression of Y on X for any set of bi-variate data relating to meaningful geographical phenomena.	Analysis and Apply

IVth Semester

Name: Environmental Geography and Disaster Management

Paper Code: GGY-HC-4016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> The paper will introduce the students to diverse aspects of environment and its issues and its close relationship to development. The students will obtain 	Theory Unit I: Environmental Geography: Nature, Scope and Significance	Remember and Understand
	Unit: II : Human-Environment Relationships – Historical progression, Adaptation in different Biomes.	Remember and Understand
	Unit III: Major Global	Remember

<p>the opportunity to discuss and understand the geographic dimensions of environmental problems.</p> <ul style="list-style-type: none"> The paper will provide the students a broad and detail idea of sustainable management and development from geographical perspective which is one of the relevant topic in present day context. 	<p>Environmental Problems: Pollution, Deforestation, Desertification, Global Warming, and Bio-Depletion.</p>	<p>and Understand</p>
	<p>Unit IV: Meaning of Hazard, Disaster, Risk and Vulnerability; Types of hazard/disaster (Natural and Manmade).</p>	<p>Remember, Understand and Analysis</p>
	<p>Unit V: Disaster Management Cycle and Phases: Prevention, Preparedness, Response, Rehabilitation, Reconstruction and Mitigation,</p>	<p>Remember, Understand and Analysis</p>
	<p>Unit VI: Major Hazards and Disasters, and their Management: Flood, Earthquake, Wildfire, and Chemical and Nuclear explosions.</p>	<p>Remember, Understand and Analysis</p>
	<p>Unit VII: National Environmental Policy and National Disaster Management Plan: Environmental Protection Act 1986 and Disaster Management Act 2005.</p>	<p>Remember, Understand and Analysis</p>
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> This paper will offer the students to learn different cartographic methods to represent population data at local, regional and global context. Preparation of thematic maps and reading and analysis of these maps including toposheets will 	<p>Practical Unit I: 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 therefrom.</p>	<p>Analysis and Apply</p>
	<p>Unit II: Mapping of major wetlands in a district and computation of shape and size(area) based</p>	<p>Analysis and Apply</p>

<p>enhance the understanding capacity of the students and help them to relate different features with one another.</p>	<p>distribution.</p>	
	<p>Unit III: 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 (field-based).</p>	<p>Analysis and Apply</p>
	<p>Unit IV: Preparation of a long-term precipitation time series curve for any selected station of N.E. India using moving average method by downloading the annual rainfall data for any district/station of Assam for at least 30 years from the portal</p>	<p>Analysis and Apply</p>
	<p>Unit V: Drawing of a diagram of disaster management cycle with reference to some disasters (flood and earthquake) in North-East India and to indicate the activities associated with each step.</p>	<p>Analysis and Apply</p>
	<p>Unit VI: Drawing of a map of Assam showing the major fault lines thereon. Also to plot at least 50 epicentres in last few years and to explain the areas of their concentration by taking the help of Bhookamp app.</p>	<p>Analysis and Apply</p>
	<p>Unit VII: Preparation of a disaster vulnerability map of Assam/ N.E. India based on data of natural disasters (Flood/earthquake/landslide /bank erosion) with respect</p>	<p>Analysis and Apply</p>

	to their occurrence and frequency in different areas.	
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Course Name: Population and Settlement Geography

Paper Code: GGY-HC-4026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Student will understand about population characteristics. • Student will understand about settlement pattern, rural urban differences etc. 	<p>Theory Population Geography Unit I: Defining the field of population geography: nature and scope; Its relation with demography.</p>	Remember and Understand
	<p>Unit: II : Sources, characteristics and problems of population data; Perspectives on Census of India publications – Primary Census Abstract, District Census Hand-Book, Sample Registration System, etc.</p>	Remember and Understand
	<p>Unit III: Distribution and density of population: Factors influencing population distribution and density; global pattern of population distribution; population density regions in the world.</p>	Remember and Understand
	<p>Unit IV: Population Growth: Trend of global population growth; components of population growth– fertility, mortality and migration; factors influencing fertility and</p>	Remember ,Understand and Analysis

	mortality; push and pull factors of migration; spatial variations in population growth in the world.	
	Unit V: Theories of population growth: Malthusian Theory and Demographic Transition Theory.	Remember , Understand and Analysis
	Unit VI: Population composition and associated characteristic patterns in global contexts: Age-Sex Composition; Rural-Urban Composition; Contemporary population issues – population ageing, declining sex ratio, pandemics.	Remember , Understand and Analysis
	Settlement Geography Unit I: Defining the field of settlement of geography: Nature and scope.	Remember , Understand and Analysis
	Unit II : Rural and urban settlements: Factors influencing distribution pattern of settlements; Types of rural settlements; Characteristics of rural and urban settlements.	Remember , Understand and Analysis
	Unit III: Morphology of rural and urban settlements; Burgess theory of internal structure of a town.	Remember , Understand and Analysis
	Unit IV: Concept of settlement hierarchy, primate city and urban fringe; Christaller's	Remember , Understand and Analysis

	Central Place Theory.	
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will learn about population data representation and interpretation using different cartographic techniques. The paper will be useful for the students in identifying different settlement patterns across different geographical settings. The paper will test the sincerity and discipline of the students in terms of geographical exercises conducted in the class through preparation of practical note-book. 	<p>Practical Unit I: 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.</p>	Analysis and Apply
	Unit II: Choropleth map to show spatial pattern of decadal variation in population growth in Assam/N.E. India/India.	Analysis and Apply
	Unit III: Choropleth map showing spatial pattern of population density in Assam/India.	Analysis and Apply
	Unit IV: Calculation of distribution pattern of settlements in an area using Nearest Neighbour Analysis.	Analysis and Apply
	Unit V: Map showing spatial variation in social/religious/rural-urban composition of population in Assam/N.E. India using pie-graph.	Analysis and Apply
	Unit VI: . Choropleth map showing spatial pattern of level of urbanization in Assam/N.E. India.	Analysis and Apply
	UnitVII: Map showing distribution of towns and their varied population size with spheres in Assam/N.E. India.	Analysis and Apply
	Unit VIII: Flow	Analysis and

	cartogram showing direction and volume of migration into Assam/N.E. India from different parts of India.	Apply
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Course Name: Remote Sensing, GIS and GPS

Paper Code: GGY-HC-4036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • The paper will provide the students about the latest and recent development in geographical studies which include RS, GIS & GPS. • The students will be introduced to a very new approach in geography and will give them a basic understanding about RS, GIS & GPS. • The paper will encourage the students to seek a new path of study in geographical domain. 	Unit I: Remote Sensing: Definition and History of Development.	Remember and Understand
	Unit: II :Principles of Remote Sensing System: Energy sources, EMR and its interaction with Atmosphere and Earth Features; Platform, Sensor and Resolutions;Aerial and Satellite Remote Sensing;Fundamentals of Photogrammetry.	Remember and Understand
	Unit III:Remote Sensing data products, sources and characteristics; Elements of Image Interpretation (Visual & Digital); Digital Image Processing: Image Enhancement and Classification (Supervised and Un-supervised).	Remember and Understand
	Unit IV:Application of Remote Sensing: Land, Vegetation and Water	Analysis and Apply
	GIS Unit 1: Geographical Information System (GIS): Definition, Development, Components, and Functions; Open source GIS.	Analysis and Apply

	Unit ii:GIS Data Types &Structures: Spatial and Non-Spatial Data; Raster and Vector Data Structure, Database Management System (DBMS).	Analysis and Apply
	Unit III: Data Layer Extraction and Spatial Analysis: Buffer, proximity and overlay analysis.	Analysis and Apply
	Unit IV :Application of GIS in geographical studies (Land Suitability analysis, Network analysis, Flood damage estimation)	Analysis and Apply
	GPS Unit I: Global Positioning System (GPS): Types, basicprinciples and functions; Different Navigational Systems.	Analysis and Apply
	UnitII: Application of GPS in surveying and mapping.	Analysis and Apply
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • The students will get a first hand on knowledge about a GIS lab and will learn about the different technical aspects of geoinformatics. • The paper will give the opportunity to develop the technical skills of students in the field of RS, GIS & GPS. • The paper will encourage the students to take geoinformatics as a career option and venture out for diverse opportunities in the same field. 	Practical Unit IV Visual Interpretation of Aerial photograph and Satellite Imagery and preparation of thematic maps based on appropriate classification scheme.	Analysis and Apply
	Unit II: Analysis of aerial photographs and satellite image: Determination of photo scale and object height from aerial photo (Using Sterescope); Digital classification of satellite image: supervised and unsupervised.	Analysis and Apply
	Unit III: Geo-referencing and Data layer creation: Map scanning, geometric	Analysis and Apply

•	correction, digitization of different layers using point, line and polygon, attribute data input and their thematic representation, Buffer creation, Overlay analysis.	
	Unit IV: GPS data collection, plotting and mapping of various features within college campus.	Analysis and Apply

Vth Semester

Name Course: Social and Political Geography

Paper Code: GGY-HC-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • The paper will be useful for the students in recognizing the intrinsic relationship between geography, society and environment. • The students will be introduced to the fundamental concepts in political geography and the paper will help them to understand the political issues from geographical point of view. • The paper will be useful for the students in preparing for NET/SLET/UPSC and other competitive exams. 	<p>Theory Social Geography Unit I: Social Geography: Meaning and scope; its approaches of study; and contemporary trend of its development.</p>	Remember and Understand
	Unit: II : Concept and types of social space and social groups.	Remember and Understand
	Unit III: Social Well-being: Concept and Component: Housing, Health and Education; Concept of Human development and its measurements.	Remember and Understand
	Unit IV: Contribution of race, religion, language and ethnicity in promoting diversity in India.	Remember, Understand and Analysis

	Unit V: Social Geographies of inclusion and exclusion: Caste system, slums, gated communities, communal conflicts and crime; Gender identity.	Remember ,Understand and Analysis
	Political Geography Unit I: Political Geography: Nature, scope and recent trends; Approaches to its study	Remember ,Understand and Analysis
	Unit II : Concept of state, nation, and nation-state; Attributes of State.	Analysis and Apply
	Unit III: Concept of frontiers and boundaries; boundary problems with reference to India and NorthEast India; Concept of buffer zones.	Analysis and Apply
	UnitIV: Concept of Geopolitics, Heartland and Rimland; Mackinder'sHeartland Theory.	Analysis and Apply
	Unit V: Concept of colonialism, neo colonialism and lebensraum.	Analysis and Apply
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • The students will learn about population data representation and interpretation using different cartographic techniques. • The paper will be useful for the students in identifying different settlement patterns across different geographical 	<p>Practical Unit I: Mapping the spatial patterns of human development in India and Assam using HDI.</p>	Analysis and Apply
	Unit II: Construction of Ternary Diagram representing social composition of population in India/North East India.	Analysis and Apply
	Unit III: Level of Social well-being with the help of composite Z-score in India /North-East India.	Analysis and Apply

<p>settings.</p> <ul style="list-style-type: none"> The paper will test the sincerity and discipline of the students in terms of geographical exercises conducted in the class through preparation of practical note-book. 	Unit IV: Sex disparity in literacy in India/North-East India using Sopher's Disparity Index	Analysis and Apply
	Unit V: Computation of Shape Index for selected states of India and countries.	Analysis and Apply
	Unit VI: Construction of a map of India/North-East India highlighting the major inter-state boundary conflict zones.	Analysis and Apply
	Unit VII: Reorganization of the states of North-East India during Pre and Post Independence periods	Analysis and Apply

Course Name: Field Techniques in Geography

Paper Code: GGY-HC-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will learn about population data representation and interpretation using different cartographic techniques. The paper will be useful for the students in identifying different settlement patterns across different geographical settings. 	<p>Theory</p> <p>Unit I: Geography and Field Studies: Geography as a field science; Need of field work in geography; Nature of field studies in physical geography and human geography.</p>	Remember and Understand
	<p>Unit: II :Concept of Case Study and Its identification in the varying geographical contexts (Physical/Human/Rural/Urban/Environmental).</p>	Remember and Understand
	<p>Unit III:Tools and Techniques in Field Studies:Nature of data and their collection</p>	Remember and Understand

	<p>techniques relating to various geographical phenomena (Physical and Human); Structure of field survey questionnaire; Collection of Physical geographic data: Observations and photography, field interview, questionnaire survey, Equipment/Measurement-based survey, etc; Collection of Human geographic data: Questionnaire survey, Participant observation, PRA, Focus group interview/discussion, etc.</p>	
	<p>Unit IV: Surveying: Concept of ground surveying and mapping; Conduct of traverse surveying with Prismatic Compass; Profile levelling and contouring with Dumpy Level; Point distribution survey with GPS; Field mapping of Village, River bank, Wetland, Landslides, Market, etc through Transect, Quadrant and sketch map.</p>	<p>Remember and Understand</p>
	<p>Unit V: Preparation of Field Study Report and its broad design: Basis of selection of the theme of field study; Objectives, Methods of data collection, Location/Situation of</p>	<p>Remember, Understand and Analysis</p>

	the study area, Data Analysis and mapping, Interpretation/Findings.	
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • The students will learn about population data representation and interpretation using different cartographic techniques. • The paper will be useful for the students in identifying different settlement patterns across different geographical settings. 	<p>Practical</p> <p>Unit I: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.</p>	Analysis and Apply
	<p>Unit II: Preparation of two field survey questionnaire/schedule (within 2 pages each) for collection of data relating to two different broad phenomena/problems (one on physical phenomenon and another on human phenomenon), and processing, tabulation and graphical representation of the same.</p>	Analysis and Apply
	<p>Unit III: Closed traverse surveying within College campus with Prismatic Compass and plotting of some details within the polygon, and preparation of a plan with appropriate scale and error correction, if any.</p>	Analysis and Apply
	<p>Unit IV: Longitudinal profile levelling and contouring in College campus and any nearby area with Dumpy Level,</p>	Analysis and Apply

	and plotting of collected data in the forms of longitudinal profile and contour map.	
	Unit V:Collection of point data from an area with handheld GPS and preparation of a GPS data table and distribution map with down-loaded data.	Analysis and Apply
	Unit VI:Preparation of field map of a village, urban locality/market, river bank/wetland and its adjoining area or their any section through Transect, Quadrant and sketch map along with a spot photograph of the same.	Analysis and Apply

VIth Semester

Course Name: Geographical Thought

Paper Code: GGY-HC-6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> develops a comprehensive understanding of the discipline; apply the historic and contemporary perspective to explain and approach the real world geographic problems. 	<p>Theory Unit I: Early development of Geography: Ancient,dark age, medieval, and age of exploration and discoveries.</p>	Remember and Understand
	<p>Unit: II :Foundation of modern geography: Contribution of the German, French, British and American geographers.</p>	Remember and Understand
	<p>Unit III:Evolution of</p>	Remember

	geographical thought: Determinism, possibilism, neo-determinism, human ecology, cultural landscape and areal differentiation.	and Understand
	Unit IV:Recent trends in geography: Quantitative revolution and its impact, logical positivism, locational school of thought, behaviouralism, humanistic geographyand post-modernism.	Remember ,Understand and Analysis
	Unit V: Geographical debates: Regional and systematic; ideographic and nomothetic	Remember ,Understand and Analysis
	Unit VI: Models in geography:Meaning, types and significance; basic concepts of Gravity Model, Spatial Diffusion Model and Distance Decay Model.	Remember ,Understand and Analysis
	Practical Unit I:Mapping of routes of exploration and discoveries (Marco Polo, Christopher Columbus, Vasco-da gama, and James Cook)	Analysis and Apply
	Unit II: Intensity of spatial interactionof Guwahati city with neighbouring urban centres.	Analysis and Apply
	Unit III: Mapping of population potential surfaces in Assam using the gravitymodel.	Analysis and Apply
	Unit IV: Demarcation of urban influence zone by using Reily's breaking point formula.	Analysis and Apply

	Unit V: Population Density gradient analysis of Guwahati or any other city.	Analysis and Apply
	Unit VI: Trend of development of paradigms in geography (from Environmental Determinism to Post Modernism) through time-scale graph indicating advocates, tentative time of emergence and overriding theme.	Analysis and Apply
	Unit VII: Preparation of a world map highlighting the major developments of geography (Greek, Arab, France, Germany, Russia, UK and USA) indicating the contribution, name of the contributor and year of contribution.	Analysis and Apply
	Unit VIII: Greek and Arabian contributions to the development of Geography in different ages (Name of contributor and name of contribution at different points of time) through time-scale graph.	Analysis and Apply

Course Name: Research Methods in Geography and Project Work
Paper Code: GGY-HC-6026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to:	Theory Unit I: Meaning and significance of research; types of research; Basics	Remember and Understand

<ul style="list-style-type: none"> proceed with a research problem and the steps she/he should adopt and the tools and craft to be employed while doing quality research. 	of research methodology; Review of literature and its need; Ethics of research.	
	Unit: II :Geographic Research: Meaning and Characteristics; Formulation of research problem.	Remember and Understand
	Unit III:Research Design: Statement of the problem, Review of research works, Objectives, Research questions, Hypotheses, Database and methodology, Significance, Organization of the Work and Referencing.	Remember and Understand
	Unit IV:Data Collection: Types and Sources of Data; Methods of primary data collection (both qualitative and quantitative, and physical and human geographic data); Concept of sample survey; Pilot survey; Data processing	Remember and Understand
	Unit V: Statistical Analysis of Data: Qualitative data analysis; Quantitative data analysis; Data representation	Remember ,Understand and Analysis
	Unit VI: Structure of a Research Report: Preliminaries; Text; Tables, Figures and Appendices; Citations, References and Bibliography; Research/Project Report Writing; Executive Summary.	Remember ,Understand and Analysis
	Project Report: Each	Remember

	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 and Analysis
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Course Name: Geography of Health

Paper Code: GGY-HE-6036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Understand the concept of human health and healthcare from the perspective of Geography • Acquire knowledge about factors influencing human health and occurrence of diseases in varying ecological settings. • useful information about the impact of global climate change on human health and occurrence of various diseases in different ecological settings in India. 	<p>Theory Unit I: Geography of Health: Definition and significance; approaches of study: ecological, social and spatial; dualism between medical geography and geography of health.</p>	Remember and Understand
	<p>Unit: II : Disease ecology: ecology and human health; geographical factors affecting human health; factors influencing disease transmission (pathological, physical, environmental, social, cultural and economic); Diffusion of diseases and their causes in varied biotic, physical and cultural environments.</p>	Remember and Understand
	<p>Unit III: Classification of diseases: genetic, zoonotic, communicable, non-communicable, occupational, deficiency</p>	Remember and Understand

	diseases and malnutrition.	
	Unit IV:Disease occurrence: emergence, re-emergence and persistence; modes of transmission of major diseases (Malaria, Japanese encephalitis, tuberculosis, hepatitis, AIDS and COVID-19) and their broad global distribution.	Remember ,Understand and Analysis
	Unit V: Heathcare systems: Meaning and components; Universal government-funded health system; Role of WHO and UNICEF in global health care; SDG3 for good health and Well-being; Healthcare services in India: family welfare, immunization, National Health Mission and itsprogrammes, health for all programmes, challenges to health care system during pandemic situation like COVID-19.	Remember ,Understand and Analysis
	Unit VI: Environment, human habit and health: Basic concept and ideas realting to food habit and health, occupation and health, environmental degradaton and health, lifestyle and human health.	Remember ,Understand and Analysis
	Practical Unit I:Mapping of health status indicators (hospital beds, primary health centres, doctors, para-	Analysis and Apply

	medics, etc.) in Assam/N.E. India using Z-score method.	
	Unit II: Trend of infant mortality and maternal mortality rates in India in relation to selected developed and developing countries using line graph	Analysis and Apply
	Unit III: Choropleth mapping of infant mortality in India at state level	Analysis and Apply
	Unit IV: Correlation analysis between any physical determinants (monthly rainfall/monthly average temperature) and epidemiological incidence of a disease (monthly malaria cases) in any district of Assam.	Analysis and Apply
	Unit V: Map showing spatial variation of disease incidence rate in India/N.E. India at state level.	Analysis and Apply
	Unit VI: Mapping of seasonal variation in the occurrence of Covid-19 cases in Assam at district level using pie graph.	Analysis and Apply
	Unit VII: Preparation of questionnaire for healthcare and health status survey	Analysis and Apply
	Unit VIII: Computation of distribution pattern of hospitals, health centres, etc. using nearest neighbour analysis.	Analysis and Apply

Course Name: Geography of Tourism

Paper Code: GGY-HE-6056

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • develop ideas on how geographical factors tangent on tourism activities and how geographers seek to address issues of development and carrying capacities of varied environments. • enroll in a research programme and/or provide openings for them to work with tourism/eco-tourism planning agencies. 	<p>Theory Unit I: Geography of Tourism: Nature and scope; Concepts and Issues of tourism; Recreation and leisure inter-relations; Robinson's geographical parameters of tourism.</p>	<p>Remember and Understand</p>
	<p>Unit: II : Factors and types of tourism: Nature tourism, Cultural tourism, Medical tourism, Agritourism, Adventure tourism, Pilgrimage, etc.</p>	<p>Remember and Understand</p>
	<p>Unit III:Recent trends in tourism: International and Domestic (India); Eco-Tourism; Sustainable tourism; Meetings, Incentives, Conventions and Exhibitions (MICE)</p>	<p>Remember and Understand</p>
	<p>Unit IV:Impact of tourism oneconomy,environmentand society.</p>	
	<p>Unit V: Tourism development in India: Tourism infrastructures; Case studies of tourism development inHimalaya,Desert,Coastal Areas and North-East India with special reference to Assam; NationalTourismPoliciesand prospects.</p>	<p>Remember ,Understand and Analysis</p>
	<p>Practical Unit I:Trend of growth of tourist arrivals in the World/India/Assam since 1960 using Movingaverage method and least squares method.</p>	<p>Analysis and Apply</p>

	Unit II: 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.	Analysis and Apply
	Unit III: Line Graph showing pattern of tourist arrival (Domestic and International) in relation to rainfall and temperature in a year for selected tourist spots of North-East India / Assam.	Analysis and Apply
	Unit IV: 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.	Analysis and Apply
	Unit V: Preparation of a transport connectivity (road, railway and air) map of Assam/North-East India for major tourist destinations.	Analysis and Apply
	Unit VI: Preparation of a tourist map of North-East India showing locations of important national parks and wildlife sanctuaries from tourism potential perspectives (indicating the major highlights of the respective destinations including distance from Guwahati city within box)	Analysis and Apply
	Unit VII: Preparation of a tourist guide map of North-East India showing location of major tourist destinations and road connectivity routes from Guwahati city.	Analysis and Apply
	Unit VIII: Mapping of trekking route in a hilly area suitable for adventure tourism using GPS	Analysis and Apply

Department of Geography

Programme Specific Outcome (MA/M.Sc. in Geography)

The programme specific outcome of the syllabus prescribed for the major students of Geography is mentioned below:

- PSO1: The programme assert the significance of Geography as an academic discipline and emphasize its role in reinforcing and confirming the connection between humans and their surroundings.
- PSO2: The programme will enhance the students comprehension of the socio-economic and cultural aspects of populations, with particular emphasis on marginalized segments of society.
- PSO3: The programme will provide engaging in physical field surveys empower students to develop a comprehensive understanding of landforms, geomorphic processes, and the related risks and dangers.
- PSO4: The programme deals with project work and preparation of dissertation which will promote research work and research profession among the students.
- PSO5: The programme will offer instruction to students on the utilization of contemporary tools and techniques, such as aerial photographs, satellite imagery, total stations, and meteorological instruments, to enhance their proficiency in handling these advanced instruments and methods.
- PSO6: The programme deals extensively on environment and man-nature relationship. This will create a sense of awareness and social responsibility among the students towards the environment.

Most importantly, the programme will help students to become better and responsible citizens of the nation.

COURSE OUTCOME

MA in Geography (Honours) syllabus (CBCS)

1st Semester

Paper Name: Nature of Geography

Paper Code: GGY 1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none">• Through understanding of the basics of the subject:• Understanding of	Unit I: Defining the field of Geography; Planet earth as the home of man.	Remember and Understand
	Unit II: Place of Geography in the classification of knowledge; relation of geography with natural and social sciences; multi-	Remember and Understand

<p>sophisticated models and techniques;</p> <ul style="list-style-type: none"> • Interdisciplinary field – a field that crosses traditional boundaries between academic disciplines or schools of thought. 	disciplinary nature of Geography.	
	Unit III: Geography as a spatial science; Spatial Concepts in Geography: Concept of space and place; Geographic space (Absolute Space and Relative Space); Spatial Process and Pattern; Spatial Organization; Spatial Relationship; Spatial Interaction; Spatial Integration; Spatial Diffusion; Spatial Modelling; Space-Time Dimension in Geography	Remember, Understand and Applied.
	Unit IV: Basic Branches and Approaches in Geography: Physical and Human; Systematic and Regional; Ideographic and Nomothetic.	Remember and Understand
	Unit V: Place/Region/Territory and scale factor (macro, meso, micro and space content)	Remember and Understand
	Unit VI: Geography: Pure and Applied; Society-Environment Interface and Applied Geography	Remember, Understand and Apply
	Unit VII: Scientific Methods in Geography: Routes to scientific Explanation: Induction and Deduction; Key elements in scientific practice.	Remember, Understand and Apply
	Unit VIII: Modes of explanations in Geography: Cognitive explanation, Morphometric explanation, Cause and effect explanation, temporal	Remember, Understand, Apply and Analysis.

	modes of explanation, Functional explanation, System analysis.	
	Unit IX: Hagget's Integrated Approaches in Geography: Spatial Analysis, Ecological Analysis and Regional Complex Analysis.	Remember, Understand , Apply and Analysis.
	Unit X: Pattern-Process Model for geographic enquiry.	Understand , Analysis and Apply.

Paper Name: Principles and Concepts in Geomorphology

Paper Code: GGY 1026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Understanding of Principles and Concepts in Geomorphology; • Application of geomorphic concepts and techniques in the field; • Knowledge enrichment of glacial, fluvial and Aeolian processes. 	<p>Unit I: Principles and Concepts in Geomorphology</p> <p>1. History of development of geomorphic ideas; recent trends in Geomorphology</p>	Remember and Understand
	<p>2. Theoretical bases of Geomorphology: Fundamental concepts in geomorphology: uniformitarianism and catastrophism; system concepts in geomorphology; steady state; and dynamic equilibrium.</p>	Remember and Understand
	<p>3. Concepts and techniques in applied geomorphology: Fluvial geomorphology, Palaeo-geomorphology, Environmental geomorphology.</p>	Understand, Analysis and Apply
	<p>4. Threshold concepts and applications in geomorphology.</p>	Understand, Analysis and Apply

	5. Quantitative methods and techniques in geomorphology	Understand, Analysis and Apply
	Unit II: Processes in Geomorphology 1. Geomorphic processes: endogenetic and exogenetic; Glacial, Fluvial and Aeolian processes.	Remember and Understand
	2. Relationship of climate, vegetation and soil with geomorphic processes.	Understand, Analysis and Apply
	3. Morphogenetic regions: concept and genesis, differential intensity and rate of operation of geomorphic processes in various morphometric regions.	Understand, Analysis and Apply
	4. Development of slopes: slope forming processes and slope forms.	Understand, and Analysis
	5. Methods and techniques of geomorphic process study	Understand, Analysis and Apply

Paper Name: Climatology and Biogeography

Paper Code: GGY 1036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Knowledge about different phenomena of weather and climate specially vagaries of Indian monsoon and techniques of weather forecasting; 	Unit I: Climatology 1. Defining the field of Climatology; Importance of Climatology in geographical studies.	Remember and Understand
	2. Climate and Weather; Elements of Weather; factors influencing climate.	Remember and Understand
	3. Insolation; atmospheric temperature; horizontal and vertical distribution of temperature.	Understand, Analysis and Apply

<ul style="list-style-type: none"> • 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. 	4. Atmospheric Pressure and Global Wind System: Vertical pressure gradient and horizontal pressure system; Surface winds, stratospheric winds, seasonal and local winds.	Understand, Analysis and Apply
	5. Air masses and Fronts: Characteristics, Origin and modification of air masses, stability and instability and their influence on weather and climate.	Understand, Analysis and Apply
	6. Climatic disturbances: cyclones, anticyclones, cloud bursts, drought.	Understand, Analysis and Apply
	7. Classification of World Climate: Schemes of Koppen and Thornthwaite.	Understand and Analysis
	8. Monsoons: Mechanism of development, Distribution of monsoons, Trajectories and Irregularities, Effects of El-Nino, Walker oscillation, etc.	Understand, Analysis and Apply
	9. Techniques of weather forecasting: conventional and modern.	Understand, Analysis and Apply
	10. Global warming and climate change and associated impacts and challenges.	Understand, Analysis and Apply
	Unit II: Unit-II Biogeography 1. Defining the field of Biogeography; Its significance, development and approaches.	Remember and Understand
	2. Bio-energy cycles and food-chain.	Understand and Analysis
	3. Soil characteristics and their significance.	Understand and Analysis
4. Habitat, Environment and	Understand,	

	Ecosystem;	Analysis and Apply
	Plant-Animal Association in varying habitats and environments.	Understand, Analysis and Apply
	5. Concept of Bio-diversity; Conservation of forest and wild life.	Understand, Analysis and Apply
	6. National forest and environment policies.	Understand and Apply

Paper Name: Economic Geography

Paper Code: GGY 1046

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> • 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. 	Unit I: Field of Economic Geography: Meaning, significance and theoretical development	Remember and understand
	Unit II: Approaches to Economic Geography: Theoretical, Institutional and Problem solving	Remember and understand
	Unit III: Concepts and Models in Economic Geography: Von Thunen's theory of geographic rent, Spatial Demand Cone, Weberian industrial location model, Suicclair's model, Raw Strong's model, Growth Pole model	Understand, Analysis and Apply
	Unit IV: Technology and Economic Development: Relation between technology and development, regional disparities in technology applications, levels of economic development-global perspective.	Understand, Analysis and Apply

	Unit V: Economic Geography of Primary activity: Geography of pastoral farming, Geography of agriculture, place of agriculture in global economy, critical study of large-scale & small-scale agriculture, Regional pattern of agriculture in the world with special reference to USA, Israel and China	Understand, Analysis and Apply
	Unit VI: Modernization of Agriculture: Intensification, Crop diversification, Mixed farming.	Understand, Analysis and Apply
	Unit VII: Economic geography of power resources: Global pattern of energy production; Conventional sources of energy - water, coal and petroleum; and non-conventional sources of energy - solar, wind and nuclear	Understand, Analysis and Apply
	Unit VIII: Economic Geography of manufacturing: Patterns and problems of manufacturing (mainly iron and steel and textiles) in the world with special reference to USA, UK and Japan.	Understand and Analysis
	Unit IX: Economic geography of International trade in selected commodities: Food grain (Rice and Wheat), Tea, Iron and Steel, Petroleum.	Understand and Analysis

Paper Name: Practical on Geomorphology, Climatology and Economic Geography
Paper Code: GGY 1054

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Practical utility in the field while carrying out research on geomorphology, climatology and economic geography. 	<p>Unit I: Geomorphology 1. Morphometric Analysis: (i) Profile drawing (ii) Relative relief maps based on Smith's method (iii) Slope maps using Wentworth's method</p>	<p>Analysis and Apply</p>
	<p>2. Slope maps using Wentworth's method (i) Drainage ordering, calculation of bifurcation ratio, length ratio, basin circularity ratio, Analysis of laws of stream number, stream length and drainage basin area (ii) Preparation of drainage density, drainage frequency and drainage texture maps</p>	<p>Analysis and Apply</p>
	<p>3. Area-Height Relationship: (i) Hypsometric curve and hypsometric integral (ii) Altimetric frequency curve and histogram</p>	<p>Analysis and Apply</p>
	<p>Unit II: Climatology 1. Climograph, Hythergraph and Ergograph 2. Rainfall dispersion graph, rainfall variability and equipluve maps 3. Water deficiency and surplus graphs</p>	<p>Analysis and Apply</p>
	<p>Unit III: Economic Geography 1. Spatial variation in landuse and cropping pattern of North-East India using pie graph</p>	<p>Analysis and Apply</p>

	2. Trend analysis of production of different commodities with the help of band graph and using moving average and least squares methods.	Analysis and Apply
	3. Analysis of landholding and income pattern	Analysis and Apply
	4. Choropleth mapping of cropping intensity of N.E. India	Analysis and Apply
	5. Determination of the levels of economic development using simple composite index	Analysis and Apply
	6. Spatial analysis of crop concentration in N.E. India and Assam.	Analysis and Apply

IInd Semester

Paper Name: Geographic Thought

Paper Code: GGY 2066

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Develop a comprehensive understanding of the discipline. Apply the historic and contemporary perspective to explain and approach the real world geographic problems. 	Unit I: Geography through the ages; general character of geographic knowledge during the ancient and mediaeval period; impact of explorations and discoveries and European renaissance on the emergence of modern geography.	Remember and Understand
	Unit II: Foundations of modern geography: contribution of German (Humboldt, Ritter, Ratzel), French (Paul Vidal de la Blache), British and American geographers.	Remember and Understand

	Unit III: Evolution of geographic thought (Determinism, Possibilism, Human Ecology, Morphology of Landscape, Areal differentiation) and their impact in the development of the field.	Remember and Understand
	Unit IV: Emergence of New Geography: quantitative revolution, school of locational analysis, reactions to nomothetic geography; behavioural, radical and humanistic approaches, existentialism and phenomenology, welfare approach, modernism.	Remember and Understand
	Unit V: Postmodern geography: socio-spatial dialectic and gender perspective, new environmentalism, applied geography.	Remember and Understand
	Unit VI: Models in Geography and their applications	Understand, Analysis and Apply
	Unit VII: Present trend in Indian Geography	Remember and Understand
	Unit VIII: Postmodern perspective in Indian Society.	Remember and Understand

Paper Name: Geography of Environment and Development

Paper Code: GGY 2076

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to:	Unit I: Meaning of environment; Components of environment and their interrelationship and	Remember and Understand

<ul style="list-style-type: none"> • 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. 	functioning; Natural and Human environment.	
	Unit II: Defining Environmental Geography: emergence of environmental geography as a branch of geography; scope and significance of environmental geography.	Remember and Understand
	Unit III: Man-Environment Relationship: historical perspectives on man's interaction with environment; population growth and environment; approaches to the study of man environment relationship.	Remember and Understand
	Unit IV: Ecosystem: concept and types of ecosystem; functioning of ecosystem; Energy flow in ecosystem; bio-geochemical cycles; biosphere as an ecosystem.	Understand, Analysis and Apply
	Unit V: Man and Atmosphere: man as a factor of climate change; industrialization-urbanization and climate; greenhouse effect and global warming.	Understand, Analysis and Apply
	Unit VI: Development processes: Nature and trend of development-global and national perspective	Understand
	Unit VII: Environment and Development: concept of environment and development; sustainable development.	Understand and Apply
	Unit VIII: Global Environmental Problems: types and extent of environmental problems, areaspecific major	Understand and Apply

	environmental issues and problems	
	Unit IX: Environmental Pollution: factors of environmental pollution; types of pollution; major areas of environmental pollution; effects of environmental pollution	Understand and Apply
	Unit X: Environmental Hazards and Disaster: meaning and types; tectonic disasters; climatic hazards; flood hazards with special reference to floods of Brahmaputra and Barak valleys, Assam.	Understand and Apply
	Unit XI: Environmental Management: concept of environmental management; environmental Impact assessment; approaches of environmental management; global and regional Environmental programs and policies.	Understand and Apply

Paper Name: Population and Settlement Geography

Paper Code: GGY 2086

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The course enables the students to understand population issue in spatial dimension to 	<p>Unit I: Population Geography</p> <p>1. Defining the field of Population Geography; its emergence, trend of development and Significance.</p>	Remember and Understand
	<p>2. Population theories: Malthus theory of population growth; Demographic</p>	Understand, Analysis and Apply

<p>diagnose the problem issue arise out of population growth.</p> <ul style="list-style-type: none"> Understanding the settlement, both in urban and rural context equip students to prepare need based sustainable settlement plans and policies. 	transition theory.	
	3 Population Data: Nature, Sources and associated problems.	Remember and Understand
	4. Components of population growth: fertility, mortality and migration; trend of population growth in the world and its different parts; patterns, processes and consequences of migration.	Understand, Analysis and Apply
	5. Demographic and socio-economic characteristics of population and associated issues: Global perspective and comparison between developed and developing countries	Understand and Analysis
	6. Population- resource relationship, conceptual bases of under population, optimum population, over population and population explosion, population-resource regions.	Understand, Analysis and Apply
	Unit II: Settlement Geography	
	1. Defining the field of settlement of geography; its development trend, significance and approaches	Remember and Understand
	2. Origin and growth of rural and urban settlements; Characteristics of rural and urban settlements; Spatial patterns of settlements.	Understand and Analysis
	3. Morphology of rural and urban settlements; theories related to internal structure of urban settlements; distance-decay rule in urban context	Understand, Analysis and Apply

	<p>4. Rural-urban relationship: dichotomy and continuum; settlement hierarchy with reference to central place theory; concept of centrality; primate city concept; rank-size rule; concept of urban fringe.</p>	<p>Understand, Analysis and Apply</p>
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Paper Name: Geography of Regional Development of India with Special Reference to North-East India

Paper Code: GGY 2096

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> 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. 	<p>Unit I: Geography of Regional Development of India 1. India as a geographical entity; unity in diversity; locational significance.</p>	<p>Remember and Understand</p>
	<p>2. Physical background of regional development: relief, drainage, climate, soil and vegetation.</p>	<p>Understand and Analysis</p>
	<p>3. Mineral and power resources and development: iron ore, coal, petroleum and water power potential, and development scenario.</p>	<p>Understand and Analysis</p>
	<p>4. Population and development issues: population growth and its socio-economic implications, literacy, urbanization, occupation and social structure and development inequalities.</p>	<p>Understand, Analysis and Apply</p>
	<p>5. Regional disparities in economic development: agriculture, industry and transport and Communication.</p>	<p>Understand, Analysis and Apply</p>

	6. India's geo-economic position in Asia and the world; Resource potentials; its economic development policies and international relations.	Understand, Analysis and Apply
	Unit II: Geography of Regional Development of North-East India	Understand
	1. North-East India: location and strategic significance; the land of seven sisters.	
	2. Physical characteristics and their relation to development: relief, drainage, climate, soil and vegetation.	Understand and Analysis
	3. Natural resources, their utilization and development: forests, coal, petroleum, natural gas and water, and development scenario.	Understand, Analysis and Apply
	4. Population and development: population growth and distribution, Migration, population characteristics and their socio-economic implications.	Understand, Analysis and Apply
	5. Agriculture and development: problems of agriculture; agricultural modernization (problems and prospects) and economic development.	Understand, Analysis and Apply
	6. Spatial pattern of socio-economic development (state level) and strategies for future development.	Understand, Analysis and Apply

Paper Name: Practical on Population and Settlement Geography and Regional Development of India and N.E. India

Paper Code: GGY 2104

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> 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. 	<p>Unit I : Population and Settlement Geography 1. Population concentration and density pattern in North East India and Assam.</p>	Analysis and Apply
	<p>2. Trend of population growth (Exponential and Non-Linear methods) and population projection of India, N.E. India/Assam/India.</p>	Analysis and Apply
	<p>3. Determination of spatial mean center of population, spatial mean center of urban population and settlements of selected areas.</p>	Analysis and Apply
	<p>4. Distribution pattern of services/economic activities/settlements using Nearest Neighbour Analysis Statistic.</p>	Analysis and Apply
	<p>5. Determination of settlement hierarchy using centrality index.</p>	Analysis and Apply
	<p>6. Population Density Gradient Analysis.</p>	Analysis and Apply
	<p>7. Mapping volume and direction of</p>	Analysis and Apply
	<p>population migration in North East India.</p>	
	<p>Unit II: Regional Development of India and North East India 1. Analysis of trend of population growth and food production in India.</p>	Analysis and Apply
	<p>2. Spatial pattern of population density in Assam (district level) and dispersion of population density in India.</p>	Analysis and Apply

	3. Mapping of population distribution of North-East India and analysis of its relationship with relief.	Analysis and Apply
	4. Analysis of connectivity and centrality of transport networks in North East India.	Analysis and Apply

IIIrd Semester

Paper Name: Quantitative and Cartographic Methods in Geography

Paper Code: GGY 3116

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Understand what methods to use for geographical data analysis. • Understand the principles of surveying and mapping. 	<p>Unit I: Quantitative Methods in Geography</p> <p>1. Methodological developments in geography: quantitative and qualitative; significance of quantification in geographical analysis; limitations of quantitative techniques</p>	Understand, Analysis and Apply
	2. Geographic data matrix; nature and types of geographic data, levels of measurement, data source and acquisition techniques.	Understand, Analysis and Apply
	3. Sampling and its need in geographical data collection; Sampling techniques (Probability and Non-Probability sampling); application of probability in sample selection and sample data analysis.	Understand, Analysis and Apply
	4. Application of inferential statistics in hypothesis testing; parametric and nonparametric tests, selection of significance level.	Understand, Analysis and Apply

	5. Conceptual basis of quantitative techniques in spatial distribution and concentration, spatial relationship, spatial interaction, spatial diffusion and regional patterns analysis.	Understand, Analysis and Apply
	Unit II: Cartographic Methods in Geography	Understand, Analysis and Apply
	1. Significance of cartography in geography; traditional and digital cartography.	Understand, Analysis and Apply
	2. Principles of surveying; field survey techniques (triangulation, traversing and leveling) and mapping.	Understand, Analysis and Apply
	3. Principles of mapping; base map preparation; concept of point, line and area; concept of generalization; scale factor; choice of map projection (Zenithal, Conical, Cylindrical and Conventional); map design and layout.	Understand, Analysis and Apply
	4. Thematic mapping: meaning and type; principles of thematic mapping; basic ideas of isopleth, choropleth and choro-chromatic mapping; concept of three-dimensional representation of geographical data.	Understand, Analysis and Apply
	5. Techniques of physical and socio-economic data representation and mapping.	Understand, Analysis and Apply

Paper Name: Fundamentals of Remote Sensing, GIS and GPS

Paper Code: GGY 3123

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> 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. 	<p>Unit I: Remote Sensing 1. Basic Concepts and Principles of Remote Sensing.</p>	Understand, Analysis and Apply
	2. Significance of remote sensing in geography as spatial data acquisition tool.	Understand, Analysis and Apply
	3. Airborne and Satellite Remote Sensing: Data products and characteristics.	Understand, Analysis and Apply
	4. Remote Sensing Data Interpretation: Visual and digital techniques; digital image processing.	Understand, Analysis and Apply
	5. Application of Remote Sensing in geomorphology, land use/ land cover, forestry, rural and urban landscape study.	Understand, Analysis and Apply
	<p>Unit II: GIS 1. Field of GIS: Basic concepts, principles, components and functions.</p>	Understand, Analysis and Apply
	2. Data type and structure of GIS; Raster and Vector data structure.	Understand, Analysis and Apply
	3. Spatial analysis techniques and thematic representation of data in GIS.	Understand, Analysis and Apply
	4. GIS Softwares; Licensed and Open Source.	Understand, Analysis and Apply
	5. Application areas of GIS in geographical study.	Understand, Analysis and Apply
	<p>Unit III: GPS 1. Introduction to GPS technology and its working principles.</p>	Understand, Analysis and Apply
	2. GPS elements and types of signals and receivers and data acquisition techniques;	Understand, Analysis and Apply

	Accuracy of GPS data; Concept and principle of DGPS.	
	3. Application areas of GPS in geographical study.	Understand, Analysis and Apply

Paper Name: Research Methodology in Geography

Paper Code: GGY 3133

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> 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. 	Unit I: Meaning of research and geographic research; types of research; Introduction to research methodology in geography.	Remember and Understand
	Unit II: Formulation of a research problem.	Understand and Apply
	Unit III: Research design: statement of the problem, objectives, and hypothesis/ research questions, methodology, significance, review of research works and referencing.	Understand and Apply
	Unit IV: Inductive and deductive approaches in geographic research, concept development, model building and hypothesis testing.	Understand, Analysis and Apply
	Unit V: Questionnaire design, data collection, data processing and analysis.	Understand, Analysis and Apply
	Unit VI: Research write-up.	Understand, Analysis and Apply

Paper Name: Social, Cultural and Political Geography

Paper Code: GGY 3146

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> To appreciate socio-cultural and political dimensions of geographic phenomena. To understand how language, religion, ethnicity tangent with lebensraum, frontiers and boundaries and influence the geography of a region. 	<p>Unit I: Social and Cultural Geography 1. Defining the field of social geography; development of social geography in Anglo American countries and India.</p>	Remember and Understand
	2. Concept of social space, social group, social structure, social differentiation, social diversity, plurality, socio-spatial inequalities, social well-being.	Remember and Understand
	3. Defining the field of cultural geography; its trend of development and significance.	Remember and Understand
	4. Sauer's Morphology of Landscape School.	Remember and Understand
	5. Themes and concepts in cultural geography: cultural hearth, cultural area, cultural region, cultural landscape, cultural history, cultural ecology, cultural diffusion and cultural integration.	Remember and Understand
	6. Patterns of world cultural regions with reference to (a) language,(b) religion and (c) ethnicity.	Understand, Analysis and Apply
	<p>Unit II: Political Geography 1. Defining the field of political geography and its significance.</p>	Remember and Understand
	2. Historical development of political geography; schools of thought: landscape school, ecology school and organismic school.	Remember and Understand

	3. Approaches to the study of political geography: historical, morphological and functional.	Remember and Understand
	4. Concepts in political geography: lebensraum, state and nation, core- periphery and capital, frontier and boundary, buffer zone, rim-land geopolitics, heartland and its theory and political economy.	Understand, Analysis and Apply
	5. International relations; India's relations with neighbours; Act East Policy. 6. Geopolitical problems in global and Indian context.	Understand, Analysis and Apply

Paper Name: Geoinformatics

Paper Code: GGY 3156(5)

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Derive a comprehensive understanding of the use of RS/GIS/GPS techniques and their integration. 	<p>Unit I: Remote Sensing</p> <p>1. Remote Sensing System/technology: Definition, principles and field of study; Types of Remote Sensing (Aerial and Satellite Remote Sensing).</p>	Understand, Analysis and Apply
	2. Electromagnetic spectrum, energy radiation principles, energy interactions in atmosphere and with earth surface features.	Understand, Analysis and Apply
	3. Fundamentals of aerial photography: aerial cameras, spectral and radiometric characteristics.	Understand, Analysis and Apply
	4. Geometric characteristics of aerial photographs; scale and ground coverage; classification of aerial	Understand, Analysis and Apply

	photographs; tilt and relief displacement.	
	5. Remote Sensing Systems - Sensors, Platforms, CCDs and resolution.	Understand, Analysis and Apply
	6. Earth models, datum, coordinate systems, UTM zones.	Understand, Analysis and Apply
	7. Satellite data products from USA, ESA and India.	Understand, Analysis and Apply
	Unit II: Geographic Information System 1. Defining the field of GIS; development trend; components of GIS.	Understand and Analysis
	2. Data input, storage and maintenance; manipulation, analysis and output.	Understand, Analysis and Apply
	3. GIS data models and spatial data structure.	Understand, Analysis and Apply
	4. Raster and vector data formats and raster to vector and vector to raster conversion.	Understand, Analysis and Apply
	5. GIS databases, RDBMS and queries 6. Integration of remote sensing data and GIS.	Understand, Analysis and Apply
	Unit III: Global Positioning System 1. GPS concepts, navigation principles, GPS receivers, DGPS, errors and accuracy.	Remember and Understand
	2. Real world GPS applications: Spatial data updating, Urban planning, forestry, disaster management and infrastructure planning.	Understand, Analysis and Apply

	3. Drones, UAVs and microsatellites: Applications in smart agriculture, environmental conservation, urban planning and climate studies.	Understand, Analysis and Apply
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Paper Name: Population Geography

Paper Code: GGY 3156 (6)

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • Develop an understanding of the theories and “laws” in population geography. • Interpret the problems and prospects of population growth, distribution, composition and rural-urban differences in diverse areal contexts. 	Unit I: The field of population geography: nature, development and approaches; its relation with demography.	Understand , Analysis and Apply
	Unit II: Sources of population data; problems associated with reliability and comparability of data; problems of mapping population data; and techniques of population projection.	Understand , Analysis and Apply
	Unit III: Population theories: ideas of Malthus, Ricardo and Marx.	Understand , Analysis and Apply
	Unit IV: Models and theories: vital rates, migration and population growth; demographic transition; laws of migration –Raveinstein and Lee; and theories of migration –Reilly, Zipf, Staufer, Hagerstrand and Wolpert.	Understand , Analysis and Apply
	Unit V: Population and resource relationship: concept of under population, optimum population, over population, population explosion and population pressure; Population – Resource regions.	Understand , Analysis and Apply
	Unit VI: Growth and distribution of population in the world and in its different	Understand and Analysis

	parts.	
	Unit VII: International migration –push and pull factors and consequences of migration.	Understand and Analysis
	Unit VIII: Comparative study of population characteristics of the developed and less developed countries: vital rates, infant mortality rates, age and sex composition, life expectancy and 51 demographic transition; literacy and education, rural and urban composition, and occupational structure.	Understand , Analysis and Apply
	Unit IX: Contemporary population problems in the developed and developing countries; population policies and programmes in the pro-natalist countries (France, U.S.A. and Japan) and anti-natalist countries (China, India and Egypt)	Understand , Analysis and Apply

Paper Name: Practical on Quantitative and Cartographic Methods

Paper Code: GGY 3164

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Students will be able to learn the different quantitative, cartographic and 	Unit I: Practical Works on Quantitative Methods 1. Application of elementary matrix algebra in multivariate data analysis.	Understand and Analysis
	2. Application of probability distributions (normal, poisson and binomial) in geographical analysis.	Understand and Analysis

surveying techniques and its applications in geographical studies.	3. Application of relevant hypothesis testing techniques (parametric and nonparametric) in geographical data analysis; use of z, t, f and χ^2 (Chi-square) statistics.	Understand and Analysis
	4. Simple and multiple correlation and regression analysis; non-linear relationship (ranksize relationship and distance decay) analysis.	Understand and Analysis
	5. Spatial interaction, population potential surface, spatial diffusion, shape index and transport network analysis.	Understand and Analysis
	6. Techniques of multivariate analysis in areal classification and regionalisation: (a) Triangular graph and combination analysis (b) Composite scores - composite z score and principal component analysis.	Understand and Analysis
	7. Data Grouping Techniques for Choropleth mapping and Accuracy Assessment: Equal step, parameters of normal distribution, nested means, quartiles and equal-area.	Understand and Analysis
	gases) and natural radioactive forcing (Solar cycles- Milankovich cycle).	
	Unit II: Practical Works on Cartographic Methods	Analysis and Apply
	1. Traversing and topographic surveying with the help of prismatic compass and theodolite.	
	2. Contouring and profile levelling with the help of dumpy level.	Analysis and Apply

	3. Construction of map projections (5 Exercises) (i) Zenithal gnomonic (Equatorial case) (ii) Lambert's conical equal-area projection (iii) Gall's cylindrical stereographic projection (iv) Mercator's projection (v) Mollweide's projection.	Analysis and Apply
	4. Map reading and analysis, preparation of base map.	Analysis and Apply
	5. Representation of physical and socio-economic data using band graph, pie graph, sphere diagram, flow chart, isolines and transect chart.	Analysis and Apply
	6. Representation of land and population by topological space diagram (grid cells) for comparative study.	Analysis and Apply

IVth Semester

Paper Name: Environment and Climate Change

Paper Code: GGY 4176

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> 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 biosphere. Students further learn different 	<p>Unit I: Ecology, Environment and Society</p> <p>1. Introduction to ecology and the scientific methods: using observation, experiments and models to understand ecological patterns and processes.</p>	Understand and Analysis
	<p>2. Ecology and society: livelihood environment and development, environmental valuation and accounting.</p>	Understand, Analysis and Apply
	<p>3. Ideologies of environmentalism, Issues of</p>	Understand, Analysis

organizational setup and policies related to climate change.	environment and equity.	and Apply
	4. Environment of land, water and forest in North east India.	Understand and Analysis
	5. Traditional Ecological Knowledge and belief system.	Understand and Analysis
	Unit II: Environment and Climate Change 1. Anthropogenic (Green house-Kyoto Gas)	Understand , Analysis and Apply
	2. Atmospheric circulation, El Niño Southern Oscillation (ENSO), Walker Circulation, Indian Ocean dipole clouds, aerosols.	Understand , Analysis and Apply
	3. Evaluation of climate models, climate projection and prediction.	Understand , Analysis and Apply
	4. Climate change: Impacts, vulnerabilities, adaptation and mitigations strategies: global, sectorial, regional).	Understand , Analysis and Apply
	5. Organization and policies: IPCC, UN COP, ISA, NAPCC, INCCA.	Understand , Analysis and Apply

Paper Name: Geography of Bhutan, Bangladesh and Myanmar

Paper Code: GGY 4186

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: • Students will learn the scope of south-east Asian countries in regional collaboration,	Unit I: Geography of Bhutan 1. Location and situation of Bhutan; locational significance in relation to India; geo-political history.	Remember and Understand
	2. Physical Framework: Physiography, climate, vegetation, forest policy and biodiversity.	Remember and Understand

cooperation, in sustainable environmental and resource management.	3. Socio-Cultural Background: Population, ethno-religious and linguistic composition, literacy and educational pattern, urbanization level.	Understand , Analysis and Apply
	4. Economic Geography: Resource potential, agriculture, industry, transport system, tourism development, trade relations with India, patterns of economic development.	Understand , Analysis and Apply
	Unit II: Geography of Bangladesh 1. Location and situation of Bangladesh; locational significance in relation to India; geo-political history.	Remember and Understand
	2. Physical Framework: Physiography, climate, soil, vegetation and environmental problems.	Remember and Understand
	3. Socio-Cultural Background: Population, ethno-religious and linguistic composition, literacy and educational pattern, urbanization level.	Understand and Analysis
	4. Economic Geography: Resource potential, agriculture, industry, transport system, nature of tourism development, trade relations with India, problems and prospects of economic development.	Understand and Analysis

	Unit III: Geography of Myanmar 1. Location and situation of Myanmar; locational significance in relation to India; geopolitical history.	Understand and Analysis
	2. Physical Framework: Physiography, climate, vegetation, biodiversity and	Understand and Analysis

	environmental policies	
	3. Socio-Cultural Background: Population, ethno-religious and linguistic composition, literacy and educational pattern, urbanization level	Understand, Analysis and Apply
	4. Economic Geography: Resource potential, agriculture, industry, transport system, nature of tourism development, trade relations with India, problems and prospects of economic development.	Understand, Analysis and Apply

Paper Name: Remote Sensing and GIS (Practical)

Paper Code: GGY 4193

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> 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. 	<p>Unit I: Practical Works</p> <p>1. Fundamentals of Photogrammetry: determination of photo scale, object height, slope between two points and relief displacement.</p>	Analysis and Apply
	2. Interpretation of aerial photographs and preparation of land use map, settlement map and road map.	Analysis and Apply
	3. of satellite imagery and preparation of land use/ land cover and fluvial geomorphic maps.	Analysis and Apply
	4. Digitization of different layers of spatial information (Point, line and polygon) and their thematic representation.	Analysis and Apply
	5. Study of changing land use and river course using remote	Analysis and Apply

	sensing and GIS techniques.	
	6. GPS data collection (Point, Line and Polygon) and plotting.	Analysis and Apply

Paper Name: Geo informatics

Paper Code: GGY 4206 (5)

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will enrich themselves with the techniques and skills of Remote Sensing, GIS and GPS and be able to apply these in quality study and research in geography. 	<p>Unit I: Spatial Analysis in GIS</p> <p>1. Spatial Data and their geometric attributes including topology.</p>	Understand , Analysis and Apply
	2. Attribute Data in GIS and their management principles and techniques.	Understand , Analysis and Apply
	3. Thematic representation of attributes in GIS.	Understand , Analysis and Apply
	4. Integration of spatial and non- spatial data in GIS.	Understand , Analysis and Apply
	5. Geo processing and spatial analysis tools in GIS.	Understand , Analysis and Apply
	6. Vector based and raster based spatial analysis tools.	Understand , Analysis and Apply
	7. Network and spatial analysis tools.	Understand , Analysis and Apply
	8. DEM/ DTM preparation.	Understand , Analysis and Apply
	9. Spatial Decision Support Systems, Environmental Impact Analysis and Spatial Data Infrastructure, Clearinghouse Networks and	Understand , Analysis and Apply

	Geoportals.	
	Unit II: Image Analysis, Interpretation and Processing. 1. Introduction to image interpretation.	Understand and Analysis
	2. Basic Principles of image interpretation.	Understand and Analysis
	3. Elements of image interpretation.	Understand and Analysis
	4. Image rectification and registration.	Understand and Analysis
	5. Image enhancement techniques.	Understand and Analysis
	Unit III: Digital Image Classification	
	1. Principles of Image classification: Image space, feature space, image classification.	Understand , Analysis and Apply
	2. Image classification process, preparation, unsupervised and supervised classification.	Understand , Analysis and Apply
	3. Classification of algorithms.	Understand and Analysis
	4. Post classification analysis, ground truthing and accuracy assessment and validating the result.	Understand , Analysis and Apply
	Unit IV: Application of GIS and Remote Sensing in Modelling the Environment.	Understand , Analysis and Apply
	1. Applications of remote sensing with special reference to land, water, forests, settlements and urban areas and climate change.	Understand , Analysis and Apply

	2. Land governance and GIS.	Understand , Analysis and Apply
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Paper Name: Geo informatics (Practical)

Paper Code: GGY4214 (5)

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will be able to know the methods associated with the analysis of different geoinformatics techniques and its applications. 	<p>Unit I: Practical works</p> <p>1. Design of work-plan /schematic chart / flow-chart (geo informatics components and functions, geo referencing procedure, Geo referencing a part or whole topographical map and satellite Imagery Creation of a relational data model. Spatial data types – comparison of different satellite imageries.</p>	Analysis and Apply
	<p>2. Digitization of maps using standard GIS package – point, line and polygon features from small and large scale maps Revenue Circle / Block / District level map of the state /region or from topographical sheets on 1: 250,000 or 1: 50,000 or 1: 63,360 scales).</p>	Analysis and Apply
	<p>3. Adding attributes by joining and relating data, display of attribute data through cartographic methods.</p>	Analysis and Apply
	<p>4. Decision support mapping for point and line features.</p>	Analysis and Apply
	<p>5. Extraction of polyline and polygon features of specific themes from a georeferenced imagery.</p>	Analysis and Apply

	6. Preparation of thematic maps from various attributes (demographic, climatic, socio-economic) of point, line and polygon features.	Analysis and Apply
	7. Preparation of thematic maps from nominal data – such as soils, geology, vegetation types / administrative units.	Analysis and Apply
	8. Digital Image Processing – Enhancement principles and techniques.	Analysis and Apply
	9. Image Classification techniques – Unsupervised and Supervised.	Analysis and Apply
	10. Integration of remote sensing data in GIS environment – Land Use/Land Cover (LULC).	Analysis and Apply
	11. Integration of GPS data in GIS environment for point features, line features and Polygon features.	Analysis and Apply
	12. Land Governance and GIS.	Analysis and Apply
	13. Usage of established models such as USLE and RUSLE.	Analysis and Apply
	Unit II: Practical Notebook and Viva-voce 1. Practical Notebook Assessment. 2. Viva-voce	

Paper Name: Geo informatics (Dissertation)

Paper Code: GGY 4223 (5)

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
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<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Students will write a dissertation on suitable topic related to special paper applying all required methodology and dissertation writing procedure. 	<p>Unit I: 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.</p>	<p>Understand, Analysis and Apply</p>
	<p>2. The dissertation duly signed by the guide concerned has to be submitted to the department at least one week before the scheduled date of examination.</p>	<p>Understand, Analysis and Apply</p>
	<p>3. The marks distribution of dissertation in the final semester examination is as follows: (i) Total marks: 40 (ii) Evaluation of Content: 25 (average between external and internal examiners) (iii) Viva-voce: 15 (exclusively by the external examiner)</p>	<p>Understand, Analysis and Apply</p>

Paper Name: Population Geography

Paper Code: GGY 4206 (6)

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will show the problems and prospects associated with population and also know how population problem can be managed using the Apply knowledge of geography. 	<p>Unit I: Demographic and socio-economic characteristics of India's population: vital rates, population growth, population projections, age-sex composition, literacy and education, social composition and occupational structure; socio-economic well-being of population and population regions.</p>	<p>Understand, Analysis and Apply</p>
	<p>Unit II: Rural-Urban composition of population, differential characteristics of rural-urban population in</p>	<p>Understand, Analysis and Apply</p>

	India.	
	Unit III: International and internal migration; consequences of migration; migration problems in North East India, changing population composition in the region	Understand, Analysis and Apply
	Unit IV: Population growth and associated problems in demographic, social and economic fronts, population growth and food problems with special reference to North East India.	Understand, Analysis and Apply
	Unit V: Population pressure and growing environmental, housing and unemployment problems.	Understand, Analysis and Apply

Paper Name: Population Geography

Paper Code: GGY 4214(6)

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> The students will be able to know the methods associated with the analysis of different demographic characteristics. The students will also learn the problems and prospects of demographic characteristics in a 	<p>Unit I: Practical Works</p> <p>1. Mapping of population distribution, density and concentration in World and India.</p>	Analysis and Apply
	2. Population growth trend analysis and population projections in World and India.	Analysis and Apply
	3. Mapping of Rural-Urban population and population potential surfaces in India.	Analysis and Apply
	4. Representation of demographic, social and economic characteristics of population.	Analysis and Apply
	5. Population- Resource Regions in the World.	Analysis and Apply

region with some practical exposure trips.	6. Levels of socio-economic well-being and demographic zones in India.	Analysis and Apply
	7. Application of field survey methods in population studies.	Analysis and Apply
	Unit II: Practical Notebook and Viva-voce 1. Practical Notebook Assessment.	
	2. Viva-voce	

Paper Name: Population Geography (Dissertation)

Paper Code: GGY 4223 (6)

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Students will write a dissertation on suitable topic related to special paper applying all required methodology and dissertation writing procedure. 	Unit I: 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, Analysis and Apply
	Unit II: The dissertation duly signed by the guide concerned has to be submitted to the department at least one week before the scheduled date of examination.	Understand, Analysis and Apply
	Unit III: The marks distribution of dissertation in the final semester examination is as follows: (i) Total marks: 40 (ii) Evaluation of Content: 25 (average between external and internal examiners) (iii) Viva-voce: 15 (exclusively by the external examiner)	Understand, Analysis and Apply

Department of Geology

Programme Specific Outcome (M.Sc in Geology) (CBCS)

Upon satisfactory completion of M.Sc. degree in geology, the students will be able to--

- Demonstrate sound knowledge in interpreting petrological processes that operates in the lithosphere.
- Carry out exploration activities for hydrocarbon and other ore and mineral deposits in scarcely known terrains
- Explore and analyze groundwater system to ensure safe and trouble-free withdrawals.
- Understand the earth's surface process and the process-form relationship, the linkage between the interdisciplinary components of earth systems science and the Quaternary geological history and associated issues of concern like climate change, active tectonics.
- Understand the key environmental issues of regional concern viz., flood, erosion, earthquake etc.
- Carry out technical analysis of earth material and geological structures for site selection of large civil engineering structures like tunnel, dam, road etc.
- Demonstrate sound knowledge in identifying and interpreting fossil assemblage of sedimentary rocks in constructing and dating the stratigraphic column in a scarcely known geological terrain.
- Carry out geological mapping in an unknown/project specific terrain
- Apply the techniques of Geoinformatics in solving problems not only in the field of earth sciences but also in other fields that require analysis of spatial data, such as environmental science, social science, public administration, economics etc
- Develop skills in creative and critical thinking, analytical methods and integration of knowledge in multiple branches and will be able to formulate a scientific problem and strategies to solve it.

COURSE OUTCOME

M.Sc. in Geology (Honours) Syllabus (CBCS)

I Semester

GLG -1016: Structural Geology and Seismology (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, the students will have knowledge and skills on— <input type="checkbox"/> Lithological and structural mapping of a terrain and correlate with available deformation sequence obtained from physical and microstructural analyses. <input type="checkbox"/> Identify basic structural elements and able to	Unit 1: Stress and Strain	Remember, Understand
	Unit 2: Ductile deformation	Remember, Understand
	Unit 3: Brittle deformation	Remember, Understand, Analysis
	Unit 4: Foliation	Remember, Understand,

<p>interpret the complex geometry in a repeatedly activated crustal terrain.</p> <p><input type="checkbox"/> Investigate the deformation structures within rocks from mesoscopic to microscopic scale.</p> <p><input type="checkbox"/> Interpret importance of structures and their developments which are directly related with the formation of ore and hydrocarbon deposits within the earth crust.</p> <p><input type="checkbox"/> Interpret importance of structures and their developments which are directly related with the formation of ore and hydrocarbon deposits within the earth crust.</p> <p><input type="checkbox"/> Correlate spatial distribution of earthquakes in the light of plate tectonics</p> <p><input type="checkbox"/> Interpret seismic waves and crustal velocity structures.</p>	and lineation in deformed rocks	Analysis
	Unit 5: Shear zone	Remember, Understand
	Unit 6: Rheology	Remember, Understand
	Unit 7: Graphical interpretation of structures	Remember, Understand, Analysis
	Unit 8: Seismology	Remember, Understand, Analysis

GLG -1026: Mineralogy & Crystal Chemistry, and Thermodynamics in Geology (Theory)
Course Outcomes

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—</p> <p><input type="checkbox"/> Study solid solution chemistry, exsolution and structural inversion of important rock forming minerals.</p> <p><input type="checkbox"/> Identify mineral species using X-Ray</p>	Group-A : Mineralogy & Crystal Chemistry	Remember, Understand, Analysis

<p>crystallographic methods.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Analyse importance of ionic radii, coordination number and Pauling rule and bonding in crystals. <input type="checkbox"/> Study transformation processes in minerals, viz. exolution, transient phase in exolution and structural transformations (polymorphism). <input type="checkbox"/> Learn role of fundamental thermodynamic equation, laws of thermodynamics in geological processes. <input type="checkbox"/> Study P-T-X dependence of Gibbs free energy and Clausius-Clapeyron equation in determining slope of a mineral reaction. 	<p>Group-B : Thermodynamics in Geology</p>	<p>Remember, Understand, Analysis</p>
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GLG -1036: Geoinformatics; Geomorphology & Quaternary Geology (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—</p> <ul style="list-style-type: none"> <input type="checkbox"/> Study solid solution chemistry, exsolution and structural inversion of important rock forming minerals. <input type="checkbox"/> Identify mineral species using X-Ray crystallographic methods. <input type="checkbox"/> Analyse importance of ionic radii, coordination number and Pauling rule and bonding in crystals. <input type="checkbox"/> Study transformation processes in minerals, viz. exsolution, transient phase in exsolution and structural transformations (polymorphism). <input type="checkbox"/> Learn role of fundamental thermodynamic 	<p>Group-A: Geoinformatics</p>	<p>Remember, Understand</p>
	<p>Group-B : Geomorphology & Quaternary Geology</p>	<p>Remember, Understand</p>
	<p>Group-B : Thermodynamics in Geology</p>	<p>Remember, Understand, Analysis</p>

<p>equation, laws of thermodynamics in geological processes.</p> <p><input type="checkbox"/> Study P-T-X dependence of Gibbs free energy and Clausius-Clapeyron equation in determining slope of a mineral reaction.</p>		
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GLG -1044: Structural Geology and Seismology (Practical)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—</p> <p><input type="checkbox"/> Prepare geological map after extensive field work and interpret structures from an available geological map.</p> <p><input type="checkbox"/> Plot planar and linear fabric elements within stereo net and used to solve complex structural problems in a reactivated geological terrain.</p> <p><input type="checkbox"/> Identify seismic waves in seismograms during pre-, syn- and post-seismic activities.</p> <p><input type="checkbox"/> Determine earthquake epicentres.</p> <p><input type="checkbox"/> Carry out fault plane solution.</p> <p><input type="checkbox"/> Interpret paleoseismological data.</p>	Group-A : Structural Geology	Remember, Understand, Analysis
	Group-B : Seismology	Remember, Understand

GLG -1052: Mineralogy (Practical)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—</p> <p><input type="checkbox"/> Prepare geological map after extensive field work and interpret structures from an available</p>	Group: Mineralogy	Remember, Understand, Analysis

<p>geological map.</p> <ul style="list-style-type: none"> • Plot planar and linear fabric elements within stereo net and used to solve complex structural problems in a reactivated geological terrain. • Identify seismic waves in seismograms during pre-, syn- and post-seismic activities. • Determine earthquake epicentres. • Carry out fault plane solution. • Interpret paleoseismological data. GROUP-A : Structural Geology Remember, Understand <p>GROUP-B : Seismology Remember, Understand</p>		
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GLG -1064: Geoinformatics, and Geomorphology & Quaternary Geology (Practical)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—</p> <ul style="list-style-type: none"> <input type="checkbox"/> Classify satellite images using various techniques. <input type="checkbox"/> Digitize vector data from various sources in GIS <input type="checkbox"/> Perform spatial analysis in GIS <input type="checkbox"/> Identify landforms, geological and geomorphic features. <input type="checkbox"/> Understand topographic analysis the relation between landform and their controlling factors, 	Group-A: Geoinformatics	Remember, Understand
	Group-B: Geomorphology & Quaternary Geology	Remember, Understand

drainage behaviour, discharge hydrograph, morphometric parameters, Quaternary chronology and tectonics		
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GLG -2016: Hydrogeology, Climatology & Oceanography (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—</p> <ul style="list-style-type: none"> <input type="checkbox"/> Interpret hydrological cycles and occurrence of groundwater in aquifers. <input type="checkbox"/> Analyze movement of groundwater through various rocks. <input type="checkbox"/> Interpret Darcy's law and its validity and limitations. <input type="checkbox"/> Analyze different types and factors of groundwater fluctuation. <input type="checkbox"/> Carry out geological work for choosing a site for a groundwater well and a suitable method for drilling the well. <input type="checkbox"/> Understand the energy budget, the latitudinal and altitudinal thermal gradients, the pressure belts and wind system, monsoon phenomena, storms, cloud and precipitation. <input type="checkbox"/> Understand the mechanism of formation of the surface ocean currents , thermohaline circulation, subtropic gyres, El-Nino phenomena. 	Group-A: Hydrogeology	Remember, Understand, Analysis
	Group-B: Climatology & Oceanography	Remember, Understand, Analysis

GLG -2026: Igneous and Metamorphic Petrology (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—</p> <ul style="list-style-type: none"> <input type="checkbox"/> Understand the process of generation of magma in the crust and mantle and correlate it with the global tectonic processes. <input type="checkbox"/> Apply the principles of phase equilibria in studying igneous systems. <input type="checkbox"/> Classify igneous rocks. <input type="checkbox"/> Describe metamorphic processes and role of structures and textures in the identification of poly-deformational and polymetamorphic rocks. <input type="checkbox"/> Identify spatial mineral reactions in reconstructing PTt path of metamorphism. <input type="checkbox"/> Study types of mineral reaction and their application in geothermobarometry and petrogenetic grid. 	Group-A: Igneous Petrology	Remember, Understand, Analysis
	Group-B: Metamorphic Petrology	Remember, Understand, Analysis

GLG -2035: Geochemistry & Isotope Geology, and Application of Statistics in Geology (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—</p> <ul style="list-style-type: none"> <input type="checkbox"/> Interpret abundance of elements in the interior of the earth. <input type="checkbox"/> Use appropriate techniques for determining abundance of major, trace and rare earth elements in rocks. <p><i>M.Sc. Syllabus and Curriculum in Geology, Gauhati University, Assam, 2016 :: Page 12 of 28</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Describe the application of radiogenic isotopes in geochronology. 	Group-A: Geochemistry and Isotope Geology	Remember, Understand, Analysis
	Group-B: Application of Statistics in Geology	Remember, Understand, Analysis

<input type="checkbox"/> Interpret the processes of fractionation of stable isotopes and their application. <input type="checkbox"/> Apply statistical methods in solving geological problems.		
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GLG -2042: Engineering Geology (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—<input type="checkbox"/> Determine engineering properties of soil and rocks.</p> <p><input type="checkbox"/> Interpret geological structures and their role in stability of large engineering structures.</p> <p><input type="checkbox"/> Assess groundwater condition and its effect in stability rock masses.</p> <p><input type="checkbox"/> Apply your knowledge in geology to suggest suitable techniques of blasting and improvement of rock mass properties.</p> <p><input type="checkbox"/> Carry out geotechnical investigation in selecting sites of large engineering structures like tunnel, dam etc..</p>	Engineering Geology	Remember, Understand, analysis

GLG -3016: Economic Geology – Genesis and Indian deposits, Exploration and mining (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—<input type="checkbox"/> Interpret structural and textural features of ores.</p> <p><input type="checkbox"/> Analyze critically genesis of hydrothermal, magmatic, volcanogenic, submarine exhalative, metasomatic and pegmatitic ore deposits.</p>	Group-A: Economic Geology – Genesis	Remember, Understand, analysis

<input type="checkbox"/> Describe the techniques of geothermometry and geobarometry and their application in ore geology. <input type="checkbox"/> Interpret the roles of plate tectonics in localization of ore deposits. <input type="checkbox"/> Analyze the metallogeny of Archean Greenstone Belts and Proterozoic mobile belts. <input type="checkbox"/> Describe distribution and genesis of ore deposits in India. <input type="checkbox"/> Describe distribution and genesis of major ore and none metallic deposits of Northeast India. <input type="checkbox"/> Assess the applicability of different geophysical, geochemical and radioactive techniques in exploration of mineral deposits. <input type="checkbox"/> Describe the methods of mining and assess the applicability of different methods in different geological conditions.	Group-B: Economic Geology – Indian deposits	Remember, Understand, Analysis
	Group-C: Exploration and mining	Remember, Understand, Analysis

GLG -3024: Sedimentology, and Surveying & Mapping (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—</p> <input type="checkbox"/> Interpret textures and structures of sedimentary rocks. <input type="checkbox"/> Critically analyse the physical and chemical parameters of sedimentary environments and classify them. <input type="checkbox"/> Analyze diagenetic environments and classify the sedimentary rocks genetically. <input type="checkbox"/> Correlate sedimentation with tectonics and classify sedimentary basins. <input type="checkbox"/> Describe various methods of surveying and their advantages and disadvantages.	Group-A: Sedimentology	Remember, Understand, analysis
	Group-B: Surveying and Mapping	Remember, Understand, Analysis

<input type="checkbox"/> Formulate a method of geological mapping in an unknown terrain.		
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GLG -3036: Stratigraphy (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, the students will have knowledge and skills on— <ul style="list-style-type: none"> • Interpret textures and structures of sedimentary rocks. 	Group-A: Principles of Stratigraphy	Remember, Understand, analysis
<ul style="list-style-type: none"> • Critically analyse the physical and chemical parameters of sedimentary environments and classify them. • Analyze diagenetic environments and classify the sedimentary rocks genetically. • Correlate sedimentation with tectonics and classify sedimentary basins. • Describe various methods of surveying and their advantages and disadvantages. • Formulate a method of geological mapping in an unknown terrain. 	Group-B: Indian Stratigraphy	Remember, Understand, analysis

GLG -4014: Palaeontology (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level

<p>Upon successful completion, the students will have knowledge and skills on—</p> <ul style="list-style-type: none"> □ Carry out taxonomic identification of foraminifers in sedimentary rocks and interpret their significance in geological studies and hydrocarbon explorations. □ Study evolution of some of vertebrates based on fossil records in the context of changing pattern of paleoclimate and paleoecology. □ Learn and understand separation techniques and taxonomic identification of palynomorphs from sedimentary rocks and significance of palynological studies. □ Analyze application of Gondwana flora in deciphering paleoclimate of the Permian Period. 	<p>Palaeontology</p>	<p>Remember, Understand, analysis</p>
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GLG -4026: Fuel Geology (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, the students will have knowledge and skills on—</p> <ul style="list-style-type: none"> □ Analyze coal samples for proximate and ultimate analysis and classify them. □ Carry out petrological study of coal samples under microscope and write about origin of macerals and their applications in hydrocarbon exploration. □ Analyze the properties and assess utilization prospects of Indian coal deposits. □ Assess reservoir properties of sedimentary rocks for petroleum deposits. □ Explore petroleum systems in a sedimentary 	<p>Group-A: Coal</p>	<p>Remember, Understand, analysis</p>
	<p>Group-B: Petroleum</p>	<p>Remember, Understand, analysis</p>

basin and identify source, reservoir, trap and seal components in it. <input type="checkbox"/> Describe the techniques of exploration and geophysical logging and assess their application.		
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GLG -4083: Open Course-3:: Fluvial System (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, the students will have knowledge and skills on— <input type="checkbox"/> Source to sink overview of the fluvial system, fluvial landforms and their significance, fluvial sedimentary sequence <input type="checkbox"/> Understand the fluvial landform features in Northeast India.	Group-A: Fluvial processes:	Remember, Understand, analysis
	Group-B: Fluvial landforms	Remember, Understand, analysis

GLG -4093: Open Course-4: Environmental Geology (Theory)

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, the students will have knowledge and skills on— <input type="checkbox"/> Write about causal factors of pollution and hazards related to mining. <input type="checkbox"/> Analyze impact of landslides on environment. <input type="checkbox"/> Write about the causal factors of flood in fluvial systems and their management. <input type="checkbox"/> Identify the sources of water pollution and suggest remedial measures.	Environmental Geology	Remember, Understand, analysis

Department of Geology

Programme Specific Outcome (B.Sc in Geology) (CBCS)

- The Bachelor of Science in Geology programme of Pragjyotish College under Gauhati University includes graded semester system which combines detailed theoretical knowledge, practical knowledge and extensive field survey/field work. The primary goal of this undergraduate programme is to provide students' academic competencies, ethical values and professional skills that facilitate their transition from undergraduate to post graduate work or professional positions.
- This programme inspires geology graduates to be life-long learners in a diverse global community and prepare them to pursue a geology career through innovative and hands-on engagement in the classroom, laboratory, and field. .
- Students will acquire a solid base of knowledge in the science of geology as a whole as well as earth materials, earth history, mineralogy, petrology and stratigraphy, deformational processes and structural features, and geomorphic processes and landforms.
- Students will understand how geologic resources form, how they can be exploit and use and about their economic value and resource areas.
- Students will develop proficiency in conveying complex geologic concepts in clear, technically correct writing; apply theoretical, conceptual, and observational knowledge to the analysis and solution of geologic data and problems.
- Students will develop proficiency in complex geologic concepts and communicate clearly and articulately their geologic knowledge, findings and interpretations in oral presentation.
- Students will develop the aptitudes and dispositions necessary to help democratize society by obtaining and maintaining employment as a professional geologist.
- Students will be able to Interpret, analyze, discuss, and critique topics about geological problems.
- They will be able to produce high quality written analyses of data, results, interpretations, and conclusions in a scientific format.
- As geology is mainly a field work based subject so students are to be trained to carry out extensive field work and to do advanced geological and scientific analysis, there by imparting practical knowledge/ hands- on training in the geological field work for augmenting practical/ professional knowledge which has implication in near future. Students will greatly strengthen their observational accuracy in the field, and this skill will translate into other aspects of data description and interpretation and they will gain new field experience, perspective, competence, and confidence as a field geologist.
- Students will develop the capability to produce geologic maps and cross sections of unknown terrains working individually and/or in groups. Production of geologic maps will allow students to demonstrate the capacity for synthesizing and interpreting field data and compiling that information into a working understanding of the assigned field area.

COURSE OUTCOME

B.Sc. in Geology (Honours) Syllabus (CBCS)

I Semester

Paper Code: GLG-HC-1016

Paper Name: EARTH SYSTEM SCIENCE

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, students the students will have knowledge and skills on— 1. Earth and its relation to Universe, major internal processes of the Earth and tectonic processes. 2. Processes operating in our climate and mechanism of formation and movement of the ocean currents which affects the climate system in the Earth. 3. Geological time scale and evolution of through the geologic time 4. Distribution of elements, Chemical differentiation and composition of the Earth 5. Soil formation processes	Unit 1: Earth as a planet	Remember, Understand
	Unit 2: Earth's magnetic field	Remember, Understand
	Unit 3: Plate Tectonics	Remember, Understand, Analysis
	Unit 4: Hydrosphere and Atmosphere	Remember, Understand, Analysis
	Unit 5: Soil	Remember, Understand
	Unit 6: Understanding the past from stratigraphic records	Remember, Understand
	Unit 7: Cosmic abundance of elements	Remember, Understand, Analysis

Paper Code: GLG-HC-1026
 Paper Name: MINERAL SCIENCE

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, students the students will have knowledge and skills on— 1. Elementary ideas about crystal morphology in relation to internal structures 2. Elements of crystal chemistry and aspects of crystal structures 3. Basics of Physical mineralogy and Optical Mineralogy. 4. Identification of different minerals based on physical and optical properties	Unit 1: Crystallography	Remember, Understand, Analysis
	Unit 2: Crystal symmetry and projections	Remember, Understand, Analysis
	Unit 3: Rock forming minerals	Remember, Understand, Analysis
	Unit 4: Properties of light and optical microscopy	Remember, Understand, Analysis

Paper Code: GLG-HC-2016
 Paper Name: ELEMENTS OF GEOCHEMISTRY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, students the students will have knowledge and skills on— 1. Concepts of geochemistry 2. Composition of different Earth reservoirs and the nuclides and radioactivity 3. concept of radiogenic isotopes in geochronology and isotopic tracers 4. Use appropriate techniques for determining abundance of major, trace and rare earth elements in rocks. 5. Geochemical data analysis and interpretation of common geochemical plots.	Unit- 1: Concepts of geochemistry	Remember, Understand, Analysis
	Unit 2: Layered structure of Earth and geochemistry	Remember, Understand, Analysis
	Unit 3: Element transport	Remember, Understand, Analysis
	Unit 4: Geochemistry of solid Earth	Remember, Understand, Analysis
	Unit 5: Geochemical behavior of selected elements	Remember, Understand, Analysis

Paper Code: GLG-HC-2026

Paper Name: STRUCTURAL GEOLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, students the students will have knowledge and skills on— 1. Accurate geometric description of the structures observed in natural deformed rocks. 2. Accurate geometric description of the structures observed in natural deformed rocks. 3. Classification and basic idea about different structural elements, for e.g. fold, fault, joint, foliation, lineation.. 4. To read geologic maps and solve geological map. 5. To use the stereographic projection to plot planar and linear data.	Unit- 1: Structure and Topography	Remember, Understand, Analysis
	Unit 2: Stress and strain in rocks	Remember, Understand, Analysis
	Unit 3: Folds	Remember, Understand, Analysis
	Unit 4: Foliation and lineation	Remember, Understand, Analysis
	Unit 5: Fractures and faults	Remember, Understand, Analysis

Paper Code: GLG-HC-3056

Paper Name: IGNEOUS PETROLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, students the students will have knowledge and skills on— 1. Origin and nature of magma, Mode of occurrence, texture and structure of igneous rocks and classification of igneous rocks based on mineralogical	Unit- 1: Concepts of Igneous petrology	Remember, Understand, Analysis
	Unit- 2: Forms	Remember, Understand, Analysis
	Unit- 3: Phase diagrams and petrogenesis	Remember, Understand, Analysis

and chemical criteria.	Unit- 4: Magmatism in different tectonic settings	Remember, Understand, Analysis
2. Understand Binary and Ternary Phase diagrams, Magma generation in crust and mantle, their emplacement and evolution		
3. Magmatism in different tectonic settings and Petrogenesis of Igneous rocks	Unit- 5: Petrogenesis of Igneous rocks	Remember, Understand, Analysis
4. Identification of igneous rocks, texture and structure in hand specimen and to interpret the environment and process of formation.		

Paper Code: GLG-HC-3066

Paper Name: SEDIMENTARY PETROLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, students the students will have knowledge and skills on— 1. Process of formation of sedimentary rock, diagenesis. 1. Knowledge on sediment transport, erosion and deposition 2. Detailed knowledge on sedimentary atructure 3. Paleocurrent analysis 4. Composition of different sedimentary rocks.	Unit- 1: Origin of sediments	Remember, Understand,
	Unit 2: Sediment granulometry	Remember, Understand, Analysis
	Unit 3: Sedimentary textures, structures and environment	Remember, Understand, Analysis
	Unit 4: Varieties of sedimentary rocks	Remember, Understand, Analysis
	Unit 5: Diagenesis	Remember, Understand, Analysis

Paper Code: GLG-HC-3076

Paper Name: PALEONTOLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, students the students will have knowledge and skills on—	Unit-1: Fossilization and fossil record	Remember, Understand,

<ol style="list-style-type: none"> 1. Basic idea about palaeontology which includes mode of preservation of fossil and importance of fossil in various aspects of geological studies. 2. Morphological characteristics and geological distribution and functional adaptation of various classes 3. Evolutionary trend of Man, Proboscidea from the study of vertebrate fossils. 4. Importance of fossil 	Unit- 2: Taxonomy and Species concept	Remember, Understand,
	Unit- 3: Invertebrates	Remember, Understand, Analysis
	Unit- 4: Vertebrates	Remember, Understand,
	Unit- 5: Application of fossils in Stratigraphy	Remember, Understand, Analysis

Paper Code: GLG-HC-4016

Paper Name: METAMORPHIC PETROLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, students the students will have knowledge and skills on—</p> <ol style="list-style-type: none"> 1. Metamorphic petrology, types of metamorphism, depth zone of metamorphism. 2. Facies and facies series of metamorphism, textures and structures of metamorphic rock. 3. Characteristic mineral assemblage and mineral reactions of mafic, basic and calcareous rock. 4. Megascopic and microscopic study (textural and mineralogical) of various metamorphic rocks 	Unit- 1: Metamorphism: controls and types.	Remember, Understand,
	Unit- 2: Metamorphic facies and grades	Remember, Understand,
	Unit- 3: Metamorphism and Tectonism	Remember, Understand, Analysis
	Unit- 4: Migmatites and their origin	Remember, Understand, Analysis
	Unit- 5: Metamorphic rock associations	Remember, Understand, Analysis

Paper Code: GLG-HC-4026

Paper Name: STRATIGRAPHIC PRINCIPLES AND INDIAN STRATIGRAPHY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, students the students will have knowledge and skills on—</p> <ol style="list-style-type: none"> 1. Familiarize the student with stratigraphic principles and nomenclature, major stratigraphic units, methods of stratigraphic correlation. 2. Understand basic principles of stratigraphy, different types of stratigraphic units. 3. Preliminary concepts of sequence stratigraphy, magneto stratigraphy and seismic stratigraphy. <ol style="list-style-type: none"> 1. Detailed stratigraphy of Precambrian in peninsular India, Phanerozoic Stratigraphy of India, Volcanic provinces of India and Stratigraphic boundaries. 	Unit- 1: Principles of stratigraphy	Remember, Understand,
	Unit- 2: Code of stratigraphic nomenclature	Remember, Understand,
	Unit 3: Physiographic and tectonic subdivisions of India	Remember, Understand,
	Unit 4: Phanerozoic Stratigraphy of India	Remember, Understand,
	Unit 5: Volcanic provinces of India	Remember, Understand,
	Unit 6: Stratigraphic boundaries	Remember, Understand

Paper Code: GLG-HC-4036

Paper Name: HYDROGEOLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, students the students will have knowledge and skills on—</p>	Unit 1: Introduction and basic concepts	Remember, Understand,
	Unit 2: Groundwater	Remember, Understand,

<ol style="list-style-type: none"> 1. Acquire knowledge about the physical and chemical attributes, occurrence, movement and exploration of the groundwater resources. 2. Occurrence of groundwater, water bearing properties of formations, aquifer types and aquifer parameters. 3. Preparation and interpretation of water table maps and analysis of rainfall data. 4. To learn Graphical representation of chemical quality data and water classification (C-S and Trilinear diagrams) Simple numerical problems related to: determination of permeability in field and laboratory, Groundwater flow, Well hydraulics etc 	flow	
	Unit 3: Well hydraulics and Groundwater exploration	Remember, Understand, Analysis
	Unit 4: Groundwater management	Remember, Understand, Analysis
		Remember, Understand, , Analysis
		Remember, Understand, Analysis

Paper Code: GLG-HC-5016

Paper Name: ECONOMIC GEOLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, students the students will learn--</p> <ol style="list-style-type: none"> 1. Concept about the process of formation of economic mineral deposit, mode of formation of ore deposit and classification of economic mineral deposit. 2. Exploitation techniques, Remote Sensing, Geophysical and Geochemical Explorations 3. Megascopic identification of ore minerals: Iron, copper, Manganese, Lead and Zinc, Aluminum, Chromium 4. Study of microscopic properties of ore forming minerals (Oxides and sulphides)and assessment of grade of ore and reserve estimation 	Unit 1 Ores and gangues	Remember, Understand,
	Unit 2: Mineral deposits and Classical concepts of Ore formation	Remember, Understand,
	Unit 3: Mineral exploration	Remember, Understand,
	Unit 4: Structure and texture of ore deposits	Remember, Understand,
	Unit 5: Metallic and Nonmetallic ores	Remember, Understand, ,

		Remember, Understand,
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Paper Code: GLG-HC-5026
 Paper Name: GEOMORPHOLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, students the students will learn-- 1. Concept about topics related to geomorphology which includes the role of climate and tectonics on landscape development, weathering processes, mass wasting and hill slope evolution 2. Endogenic- Exogenic interactions, Rates of uplift and denudation, Tectonics and drainage development, Sea-level change, Long-term landscape development. 3. Finally to get an overview of Indian Geomorphology, Extraterrestrial landforms. 4. Student will learn reading of topographic maps, Concept of scale Preparation of a topographic profile, Preparation of longitudinal profile of a river, Calculating Stream length gradient index, Morphometry of a drainage basin 5. To learn preparation of geomorphic map and Interpretation of geomorphic processes from the geomorphology of the area	Unit 1	Remember, Understand,
	Unit 2	Remember, Understand,
	Unit 3:	Remember, Understand, Analysis
	Unit 4	Remember, Understand,
	Unit 5	Remember, Understand, Analysis

Paper Code: GLG-HE-5016
 Paper Name: EXPLORATION GEOLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, students the students will learn-- <ol style="list-style-type: none"> 1. To learn Resource reserve definitions, Mineral resources in industries 2. Learning Prospecting and Exploration techniques, , Sampling, sub, trenching and drilling, Geochemical exploration. 3. Learning Drilling and Logging techniques, Planning of bore holes and location of boreholes on ground 4. To study Principles of reserve estimation, density and bulk 5. To identify anomaly, to prepare Geological cross-section and Models of reserve estimation 	Unit 1: Mineral Resources	Remember, Understand,
	Unit 2: Prospecting and Exploration,	Remember, Understand,
	Unit 3: Evaluation of data	Remember, Understand,
	Unit 4: Drilling and Logging	Remember, Understand, Analysis
	Unit 5: Reserve estimations and Errors	Remember, Understand, , Remember, Understand,

Paper Code: GLG-HC-6016
 Paper Name: ENGINEERING GEOLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
Upon successful completion, students the students will learn-- <ol style="list-style-type: none"> 1. To familiarize students about role of 	Unit 1	Remember, Understand,
	Unit 2	Remember, Understand, Analysis
	Unit 3	Remember, Understand, Analysis

<p>geologist in various engineering construction sites.</p> <p>2. To learn Foundation treatment: Grouting, Rock Bolting and other support mechanisms,</p> <p>3. To understand Concept, Mechanism and Significance of, Rock Quality Designation (RQD), Rock Structure Rating (RSR), Rock Mass Rating (RMR), Tunneling Quality Index (Q)'</p> <p>4. To understand Causes, Factors and corrective/Preventive measures of Landslides and Earthquakes</p> <p>5. Learning Computation of reservoir area, catchment area, reservoir capacity and reservoir life, Index properties of rocks, Computation of RQD, RSR, RMR and 'Q'.</p>	Unit 4	Remember, Understand, Analysis
	Unit 5	Remember, Understand, ,

Paper Code: GLG-HC-6026

Paper Name: REMOTE SENSING AND GIS

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, students the students will learn--</p> <p>1. The students will get an idea about basics of remote sensing,</p> <p>2. They will learn about the application of remote sensing in geomorphological, structural and lithological mapping and</p>	Unit 1: Photogeology	Remember, Understand,
	Unit 2: Remote Sensing	Remember, Understand, Analysis
	Unit 3: Digital Image Processing	Remember, Understand, Analysis
	Unit 4: GIS	Remember, Understand, Analysis

<p>natural hazard mitigation and basics of GIS and data analysis.</p> <p>3. Concepts of GPS, Integrating GPS data with GIS and Applications in earth system sciences</p> <p>4. Understanding Digital Image Processing, Image Errors.</p> <p>5. GIS integration and Case studies-Indian Examples.</p> <p>6. Aerial Photo interpretation, identification of sedimentary, igneous and metamorphic rocks and various Aeolian, Glacial, Fluvial and Marine landforms</p> <p>7. Introduction to DIP and GIS softwares. Digital Image Processing exercises including analysis of satellite data in different bands and interpretation of various objects on the basis of their spectral signatures.</p>	Unit 5: GPS	Remember, Understand, ,
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Paper Code: GLG-HC-6036

Paper Name: FUEL GEOLOGY

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, students the students will learn--</p> <p>1. Mechanism of hydrocarbon generation from organic material</p> <p>2. To study oil fields of NE India.</p> <p>3. To comprehend fundamentals of coal, definition and coal forming sedimentary environments, definition and</p> <p>4. Analytical techniques in coal and its importance in coal classification and</p>	Unit 1: Coal	Remember, Understand,
	Unit 2: Coal as a fuel	Remember, Understand, Analysis
	Unit 3: Petroleum	Remember, Understand, Analysis
	Unit 4: Petroleum Reservoirs and Traps	Remember, Understand, Analysis

<p>utilization for various industries,</p> <p>5. Concept of macerals, its gross diagnostic properties under microscope and implications in climate and paleogeography.</p> <p>6. Getting an idea about Coal Bed Methane (CBM): global and Indian scenario, Underground coal gasification and Coal liquefaction.</p>	<p>Unit 5: Other fuels</p>	<p>Remember, Understand, ,</p>
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Paper Code: GLG-HC-6046

Paper Name: INTRODUCTION TO GEOPHYSICS

Course Outcome	Unit no. and Name	Bloom's Taxonomy Level
<p>Upon successful completion, students the students will learn--</p>	<p>Unit 1: Geology and Geophysics</p>	<p>Remember, Understand,</p>
<p>1. Interrelationship between geology and geophysics, Role of geological and geophysical data in explaining geodynamical features of the earth.</p>	<p>Unit 2: General and Exploration geophysics</p>	<p>Remember, Understand, Analysis</p>
<p>2. To understand Different types of geophysical methods - gravity, magnetic, electrical and seismic; their principles and applications ,Concepts and Usage of corrections in geophysical data</p>	<p>Unit 3: Geophysical field operations</p>	<p>Remember, Understand, Analysis</p>
<p>3. To study Different types of surveys, grid and route surveys, profiling and sounding techniques Scales of survey,</p>	<p>Unit 4: Application of Geophysical methods</p>	<p>Remember, Understand, Analysis</p>

<p>Presentation of geophysical data</p> <p>4. To learn Application of Geophysical method in Regional geophysics, oil and gas geophysics, ore geophysics, groundwater geophysics, engineering geophysics etc.</p>	<p>Unit 5: Geophysical anomalies</p>	<p>Remember, Understand, ,Analysis</p>
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Department of Hindi

Programme Specific Outcome (B.A in Hindi) (CBCS)

The Programme specific outcome of the syllabus prescribed for the students of Hindi Honours Classes is given below:

- The learners are acquainted with the information of various periods of Hindi literature and language like Aadikal, Bhaktikal, Ritikal, Aadhunik kal as well as the development of Khariboli.
- Through the compositions of the various writers like novels, essays and poems etc, the learners get life skill & realities of life.
- The knowledge of philosophy gives the opportunity to the learners to know the linguistic pattern as well as socio-cultural affairs of various community of our country.
- Through the compositions of Aadikalin, Bhaktikalin, Ritikalin poet the learners become familiar with the Maithili, Braj, Abhadhi languages and its characteristics. Above all the spiritual essence contained in the writing also gives the lessons of the traditional value system of our country.
- Kavyasastra, Bhasavigyan etc have been incorporated in the syllabus to give a solid foundation of Hindi and its culture.

COURSE OUTCOME

B.A. in Hindi (Honours) Syllabus (CBCS)

I Semester

Paper Name: Hindi Sahitya Ka Itihas (Reetikal Tak)

Paper Code: HIN-HC-1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none">• This course aims to get students acquainted with history of Hindi literature• This course provides the information of Adikal and its historical importance• This course also help the students to know about the Bhaktikal & Ritikal also.	Unit I: ADIKAL	Remember, Understand, Apply
	Unit II: BHAKTIKAL	Remember, Understand, Apply
	Unit III: REETIKAL	Remember, Understand, Apply

Paper Name: Hindi Sahitya Ka Itihas (Adhunik Kal)

Paper Code: HIN-HC-1026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none">This paper will help the students to get information about the modern period of Hindi literature and its importance.It will also help them to know about Bharatendu era, Dwivediera, Chhayavad, Pragativad, Prayogvad, Nayi Kavita and Contemporary poetry as well as its poets and trends.Students will also learn about the development of Khariboli.	UnitI: BHARATENDU KAL	Remember, Understand, Apply
	Unit II: DWIVEDI KAL	Remember, Understand, Apply
	UnitIII:CHHAYAVAD, PRAGATIVAD,PRAYOGVAD, NAYI KAVITA	Remember, Understand, Apply
	UnitIV: DEVELOPMENT OF KHARIBOLI	Remember, Understand, Apply

2nd Semester (Honours)

Paper Name: Adikaleen Evam Madhyakaleen Hindi Kavita

Paper Code: HIN-HC-2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none">Students will be able to get information about the biography and literary work of great personalities like poet Vidyapati, Kabir, Jayasi, Surdas, Tulsidas, Bihari, Ghananand etcThis course aims to know the students about the old	Unit I: VIDYAPATI, KABIR, JAYSI	Remember, Understand, Apply,
	Unit II: SURDAS, TULSIDAS	Remember, Understand, Apply,
	UnitIII:BIHARI, GHANANAND	Remember, Understand, Apply

poetry and Medieval poetry.		
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Paper Name: Adhunik Hindi Kavita (Chhayavad Tak)

Paper Code: HIN-HC-2026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Students will get the knowledge of Bharatendu era, Dwivedi era, Chhayavad era poems written in Khariboli Hindi. The objective of the course is to study about the Poet Bhartendu, Maithilicharan Gupt, Nirala, Pant & Mahadevi Verma and jayshankar Prasad. Student also benefitted and know about the Bhasa development & emotion of these poets. 	Unit I: BHARATENDU, MAITHILICHARAN GUPT	Remember, Understand, Apply, Create
	Unit II: MAITHILICHARAN GUPT, NIRALA, PANT	Remember, Understand, Apply, Create
	Unit III: MAHADEVI VERMA, PRASAD	Remember, Understand, Apply, Create

3rd Semester (Honours)

Paper Name: Chhayavadottar Hindi Kavita

Paper Code: HIN-HC-3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to:	Unit I: KEDARNATH AGRAWAL, NAGARJUN	Remember, Understand, Apply,

<ul style="list-style-type: none"> This course aim to acquainted students with some Chhayavadottar Hindi Kavita. Students know about the poets & his view to the Chhayavadottar Hindi Kavita. They will be able to know about the sense of the poetries written by Kedarnath, Agyeya, Raghuveer etc. 	Unit II: DINKAR, MAKHANLAL CHATURVEDI, BHAVANIPRASAD MISHRA, AGYEYA	Remember, Understand, Apply, Create
	Unit III: RAGHUVVEER SAHAY, SARVESHVARDAYAL SAKSENA, GIRIJA KUMAR MATHUR	Remember, Understand, Apply, Create

Paper Name: Bharatiya Kavyashastra

Paper Code: HIN-HC-3026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Students will get proper knowledge of the main principles of Indian Poetics for classical review of poetry. Through the study students will be able to gain knowledge about the poetic character, the purpose of poetry and various theories, such as Dhvani, Alankar, Riti, Vakrokti, Auchitya etc. 	Unit I: KAVYA LAKSHAN, KAVYA-HETU, KAVYAPRAYOJAN, RAS SIDDHANT	Remember, Understand, Apply
	Unit II: DHWANI SIDDHANT, ALANKAR SIDDHANT	Remember, Understand, Apply
	Unit III: RITI SIDDHANT, VAKROKTI SIDDHANT, AUCHITYA SIDDHANT	Remember, Understand, Apply

Paper Name: Pashchatya Kavyashastra

Paper Code: HIN-HC-3036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none">• Students know the view of Western Poetics as like as Plato, Arastu, Longinus, Wordsworth, Coleridge, Croce, T.S Eliot, I. A. Richards.• They also know about the importance of Romanticism, Realism, Shailivigyan.	Unit I: PLATO, ARASTU, LONGINUS	Remember, Understand, Apply
	Unit II: WORDSWORTH, COLERIDGE, CROCE	Remember, Understand, Apply
	Unit III: T.S. ILIOT, I.A. RICHARDS, SWACHCHHANDATAVAD, YATHARTHVAD, SHAILIVIGYAN	Remember, Understand, Apply

3rd Semester Hindi (SEC)

Paper Name: Karyalayeen Anuvad

Paper Code: HIN-SE-3014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none">• The study of Karyalayeen Anuvad paper Students will be able to know the concept of Translation (Official) and various forms of Hindi language.• Students will be know about the usage information of mechanical devices in official	Unit I: HINDI BHASHA KE VIVIDH ROOP, SHIKSHAN MADHYAM, RAJBHASA KA SWARUP	Remember, Understand, Apply
	Unit II: TIPPAN, ALEKHAN, PALLAVAN, SANKSHEPAN, PATRACHAR, PRASHASANIK PATRAVALI	Remember, Understand, Apply

purpose.	Unit III: PARIBHASHIK SHABDAVALI, KARYALAYEEN PRAYOJANON MEIN VIBHINNA YANTRIK UPKARANON KA ANUPRAYOG	Remember, Understand, Apply
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4th Semester (Honours)

Paper Name: Bhashavigyan, Hindi Bhasha Aur Devnagri Lipi

Paper Code: HIN-HC-4016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> This course aim about the students benefit with the language and dialect This paper also help students to know about the Sound and its classification, Causes of change in sound & Phenomenon. This course is also help the students in the field of the origin & development of Hindi language and detailed information about Awadhi, Braj, Khariboli and Devanagari script. 	Unit I: BHASHA, BHASHAVIGYAN	Remember, Understand, Apply
	Unit II: DHWANI VIGYAN, ROOP VIGYAN, VAKYA VIGYAN	Remember, Understand, Apply
	Unit III: ARTHVIGYAN, DEVELOPMENT OF HINDI BHASHA, DEVNAGRI LIPI	Remember, Understand, Apply

Paper Name: Hindi Katha Sahitya

Paper Code: HIN-HC-4026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Students will get information about the nature, origin and development of Hindi fiction, especially novel and story. • The students read the selected Novels and stories and learn the characteristic features of the Characters. • Students able to apply collected experiences in their life if necessary. 	Unit I: UPANYAS EVAM KAHANI	Remember, Understand, Apply, Create
	Unit II: TYAGPATRA, AAPKA BANTI	Remember, Understand, Apply, Create
	Unit III: CHAYANIT KAHANIYAN	Remember, Understand, Apply, Create

Paper Name: Hindi Natak Evam Ekanki

Paper Code: HIN-HC-4036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Students will get information about the nature, origin and development of Hindi drama and one-act literature • Through this paper, students will be introduced to the emerging modern life-sense through selected plays and monologues. 	Unit I: NATAK EVAM EKANKI	Remember, Understand, Apply,
	Unit II: ANDHER NAGRI, AASHADH KA EK DIN	Remember, Understand, Apply,
	Unit III: AKANKI-VISHKANYA, BHOR KA TARA, YE SWATANTRATA KA YUG	Remember, Understand, Apply, Create

<ul style="list-style-type: none"> Students provide the historical information about the plays and monologues. 		
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4th Semester Hindi (SEC)

Paper Name: Anuvad vigyan

Paper Code: HIN-SE-4014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Students will be able to know the theoretical and practical knowledge of Translation. Students will be know about the translation of prescribed documents by complying official language rules regarding official translation. 	Unit I: ANUVAD, ANUVAD KE PRAKAR	Remember, Understand, Apply
	Unit II: ANUVAD PRAKRIYA KE CHARAN, ANUVAD KI BHUMIKA	Remember, Understand, Apply
	Unit III: KARYALAYEEN ANUVAD, VYAVAHARIK ANUVAD	Remember, Understand, Apply

5th Semester (Honours)

Paper Name: Hindi Nibandh Evam Anya Gadya Vidhayen

Paper Code: HIN-HC-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> This paper also help the 	Unit I: NIBANDH, SANSMARAN, REKHACHITRA	Remember, Understand, Apply, Create
	Unit II: CHAYANIT	Remember, Understand,

student to know about the elements of Nibandh, Sansmaran and Rekhachitra • Students are also inspired the view of Essayist as like as Sardar Purna Singh, Ramchandra Shukla, Hazari Prasad Dwivedi, Mahadevi Verma etc.	NIBANDH	Apply, Create
	Unit III: CHAYANIT SANSMA-RAN AUR REKHA-CHITRA	Remember, Understand, Apply, Create

Paper Name: Prayojanmulak Hindi Paper

Paper Code: HIN-HC-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: • Students get the knowledge about the Hindi Language, Rajbhasha & Constitutional status of official language. • Students will get information about the Functional Hindi, its main features; Media of Communication. • This paper also helps the students to know about the Official letter, Noting, Drafting, Terminology, Translation etc	Unit I: HINDI BHASHA KE VIVIDH ROOP AUR SAMVIDHAN ME HINDI	Remember, Understand, Apply
	Unit II: PRAYOJANMULAK HINDI KE PRAMUKH PRAKAR	Remember, Understand, Apply
	Unit III: BHASHA-VYAVAHAR	Remember, Understand, Apply

5th Semester (Honours DSE)

Paper Name: Lok-Sahitya-Chintan

Paper Code: HIN-HE-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Students will get knowledge of folk, folk-talk, folk culture and folk-literature. Students get information about folk-song, folk-drama, folk-tale etc. Students will be able to deal with it in public life. 	Unit I: LOK AUR LOK-VARTA, LOK-SANSKRITI, LOKSAHITYA	Remember, Understand, Apply, Create
	Unit II: BHARAT ME LOK-SAHITYA KA ADHYAYAN KA ITIHAS, LOK-SAHITYA KE PRAMUKH ROOP, LOK-GEET	Remember, Understand, Apply, Create
	Unit III: LOK-NATYA, HINDI LOKNATYA KI PARAMPARA EVAM PRAVIDHI, LOKKATHA	Remember, Understand, Apply, Create

Paper Name: Hindi Ki Rashtriya-Sanskritik Kavyadhara

Paper Code: HIN-HE-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Students will get the history of the rich national cultural poetry stream of Hindi and the compositions of the selected poets of this stream. This will develop the feeling of nationalism and cultural consciousness among the students. 	Unit I: HINDI KI RASHTRIY SANSKRITIK KAVYADHARA KA UDBHAVVIKAS, MAITHILICHARAN GUPT	Remember, Understand, Apply, Create
	Unit II: MAKHANLAL CHATURVEDI KI KAVITAEN	Remember, Understand, Apply, Create
	Unit III: RAMDHARI SINGH DINKAR KI	Remember, Understand, Apply, Create

	KAVITAEN	
	Unit- 4 SUBHADRA KUMARI CHAUHAN KI KAVITAEN	Remember, Understand, Apply, Create

6th Semester (Honours)

Paper Name: Hindi Ki Sahityik Patrakarita

Paper Code: HIN-HC-6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Students will be able to know the history and nature of literary journalism and the literary journalism of Hindi . 	UnitI:SAHITYIK PATRAKARITA, BHARATENDUYUGIN SAHITYIK PATRAKARITA	Remember, Understand, Apply
	UnitII:DWIVEDIYUGIN AUR PREMCHANDYUGIN SAHITYIK PATRAKARITA	Remember, Understand, Apply
	UnitIII: SWATANTRYOTTAR EVAM SAMKALEEN SAHITYIK PATRAKARITA, MAHATTVAPOORN PATRAPATRIKAEN.	Remember, Understand, Apply

PAPER NAME: HINDI PARIYOJNA KARYA

PAPER CODE: HIN-HC-6026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
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<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> By this paper Research interest will be awakened in the students. 	<p>Unit I: HINDI SAHITYIK VIBHOOTI</p>	<p>Understand, Apply, Analyze, Create</p>
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6th Semester (Honours-DSE)

Paper Name: Chhayavadi Kavyadhara

Paper Code: HIN-HE-6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> Students will get information about the history of Chhayavadi Kavyadhara and selected poems of Hindi literature. 	<p>Unit I: CHHAYAVADI KAVYADHARA KA UDBHAVVIKAS, JAYSHANKAR PRASAD KI KAVITAEN</p>	<p>Remember, Understand, Apply, Create</p>
	<p>Unit II: SURYAKANT TRIPATHI NIRALA KI KAVITAEN</p>	<p>Remember, Understand, Apply, Create</p>
	<p>Unit III: SUMITRANANDAN PANT KI KAVITAEN</p>	<p>Remember, Understand, Apply, Create</p>
	<p>Unit IV: MAHADEVI VERMA KI KAVITAEN</p>	<p>Remember, Understand, Apply, Create</p>

Paper Name: Premchand Ka Sahitya

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none">• Students will get information about literature written by Munshi Premchand.• They will be able to know about Karbala drama, Sevasadan novel and many stories of Premchand.	Unit I: PREMCHAND KA SAHITYA, SAHITYA KA UDDESHYA (NIBANDH)	Remember, Understand, Apply, Analyze, Create
	Unit II: KARBALA (NATAK)	Remember, Understand, Apply, Analyze, Create
	Unit III: SEVASADAN (UPANYAS)	Remember, Understand, Apply, Analyze, Create
	Unit IV KAHANIYAN-POOS KI RAAT, SHATRANJ KE KHILADI, PANCH PARMESHVAR, IDGAH, DO BAILON KI KATHA.	Remember, Understand, Apply, Analyze, Create

Department of History

Programme Specific Outcome (B.A in History) (CBCS)

- The knowledge with facts and figures with different subjects of humanities like History, Geography, Economics, Languages etc.
- Understand the basic concepts, principles and various theories in UG course in humanities
- Realise the importance of literature in terms of aesthetics, mental, moral, intellectual development of an individual and accordingly of the society
- Understand how different issues in social science get influenced by the literature and how the literature can provide solutions to the social issues
- Can gain analytical ability to analyse the literature and social issues to appreciate the strength and to suggest the improvements for better results
- Can interpret the social issues and understand that these are no longer permanent and largely depend on the political and economic changes.
- It will give confidence to the students and make them good citizens responsible in the society participating in various social and cultural activities.
- Through literary activity students can spread the message of equality, nationality, social harmony, gender sensitive and other human values.
- Student will acquire multifaceted personality, to be self dependent, earning his own bread and butter and also creating opportunities to others.
- Students can compete for different competitive examinations to get government services as well as in other private companies with the knowledge they gain in UG level
- Student can pursue higher studies and research with untiring efforts and positive attitude
- Student can develop various communicative skills, which will be helpful in expressing positive ideas and views clearly and effectively.

COURSE OUTCOME

B.A./B.Sc. in History (Honours) Syllabus (CBCS)

I Semester

Specific outcome of studying History (Honours) prescribed for the students of Gauhati University may be cited as below

PSO-1 Demonstrate the knowledge of chronology, narrative, major events and turning points of the history of India from the early age to modern times

PSO-2 to understand the multi casual explanations of major historical developments based on contextualized analysis of modern world history.

PSO-3 to provide different explanations of major developments of Assam and deep interest in studying the sources of Assam as well as of India.

PSO-4 to inculcate interest for doing research in history

PSO-5 Students will be able to formulate historical arguments indifferent social and political issues including ethnic troubles

PSO-6 to initiate interest in preserving oral culture and to establish an analytical interrelationship of other historical source materials with the knowledge of oral history

PSO-7 Students can get an idea about tourism in North-East India with special reference to the historical monuments, cultural and ecological elements in place of North-Eastern region of India as tourist and heritage sites of the nation

PSO-8 Career options for students to engage as educators, archivists and researchers in historic sites and in the field of history

PSO-9 History helps the students knowing the past impartially, their culture, their religion and social system and transforms them into responsible citizen

1st Semester (Honours)**Paper Name: History of India-I****Paper Code- HIS-HC-1016**

Course Outcome	Unit with Name	Bloom Taxonomy Level
After going through this paper <ul style="list-style-type: none"> students will gather knowledge regarding the people of ancient India and of different sources and tools of historical reconstruction. This paper tries to highlight different stages of human evolution and eventual establishment of the Harappan civilization 	Unit-I Reconstructing Ancient Indian History	Remember, Understand, Apply, Analyse
	Unit-II Pre-historic hunter-gatherers	Remember, Understand, Apply, Analyse
	Unit-III The Advent of Food Production	Remember, Understand, Apply, Analyse
	Unit-IV The Harappan Civilization	Remember, Understand, Apply, Analyse
	Unit-V Cultures in Transition	

Paper Name: Social Formations and Cultural Patterns of the Ancient World**Paper Code- HIS-HC-1026**

Course Outcome	Unit with Name	Bloom Taxonomy Level
After going through this paper <ul style="list-style-type: none"> students will be able to explain the processes and stages of the evolution of variety of cultural pattern throughout antique period in history. They will be able to relate the connections between various ages of civilization, from Paleolithic age to slave and polis societies of ancient Greece 	Unit-I Evolution of Humankind	Remember, Understand, Apply, Analyse
	Unit-II Bronze Age Civilizations: Economy, Social Stratification, State Structure	Remember, Understand, Apply, Analyse
	Unit-III Nomadic Groups	Remember, Understand, Apply, Analyse
	in Central and West Asia	Remember, Understand, Apply, Analyse
	Unit-IV Slave Society in Ancient Greece	Remember, Understand, Apply, Analyse
Unit-V Polis in Ancient	Remember, Understand,	

	Greece	Apply, Analyze
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2nd Semester (Honours)

Paper Name: History of India-II

Paper Code- HIS-HC-2016

Course Outcome	Unit with Name	Bloom Taxonomy Level
After going through this paper <ul style="list-style-type: none"> students will be able to explain the economic and socio-cultural connections during the ruling houses, empires and politico-administrative nuances of early Indian History from 300 BCE to 300 CE 	Unit-I Economy and Society	Remember, Understand, Apply, Analyze
	Unit-II Changing Political Formations	Remember, Understand, Apply, Analyze
	Unit-III Towards Early Medieval India	Remember, Understand, Apply, Analyze
	Unit-IV Religion, Philosophy and Society	Remember, Understand, Apply, Analyze
	Unit-V Cultural Developments	Remember, Understand, Apply, Analyze

Paper Name: Social Formations and Cultural Patterns of the Medieval World

Paper Code- HIS-HC-2026

Course Outcome	Unit with Name	Bloom Taxonomy Level
After going through this paper <ul style="list-style-type: none"> students will be able to analyse 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, Apply, Analyze
	Unit-II Roman Republic: II	Remember, Understand, Apply, Analyze
	Unit-III Economic Developments in Europe from the 7 th to the 14 th centuries	Remember, Understand, Apply, Analyze
	Unit-IV Religion and Culture in Medieval Europe	Remember, Understand, Apply, Analyze
	Unit-V Societies in Central Islamic Lands	Remember, Understand, Apply, Analyze

3rd Semester (Honours)

Paper Name: History of India

Paper Code- HIS-HC-3016

Course Outcome	Unit with Name	Bloom Taxonomy Level
<p>The completion of this paper</p> <ul style="list-style-type: none">students will enable the students to relate and explain the developments in India in its political and economic fieldsand 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 foreign influenceand the changes brought in its wake in the period.	Unit-I Studying Early Medieval India	Remember, Understand, Apply, Analyze
	Unit-II Political Structures	Remember, Understand, Apply, Analyze
	Unit-III Agrarian Structure and Social Change	Remember, Understand, Apply, Analyze
	Unit-IV Trade and Commerce	Remember, Understand, Apply, Analyze
	Unit-V Religious and Cultural Developments	Remember, Understand, Apply, Analyze

Paper Name: Rise of the Modern West I

Paper Code- HIS-HC-3026

Course Outcome	Unit with Name	Bloom Taxonomy Level
<p>After studying this paper students will be</p> <ul style="list-style-type: none">able to explain major trends and developments in the Western World between the 14th to the 16th century CE.They will be able to explore and analyse the significant historical shifts	Unit-I Transition from Feudalism to Capitalism	Remember, Understand, Apply, Analyze
	Unit-II Geographical Explorations and Early Colonial Expansion	Remember, Understand, Apply, Analyze
	Unit-III Renaissance	Remember, Understand, Apply, Analyze
	Unit-IV Reformation in the	Remember, Understand,

<ul style="list-style-type: none"> and events and the resultant effects on the civilizations of Europe in the period. 	16 th Century: Origin and Impact	Apply, Analyze
	Unit-V Economic Developments in the sixteenth Century	Remember, Understand, Apply, Analyze

Paper Name: History of India-IV (c. 1206—1550)

Paper Code- HIS-HC-3036

Course Outcome	Unit with Name	Bloom Taxonomy Level
After going through this paper <ul style="list-style-type: none"> students will be able to explain the political and administrative history of medieval period of India from 1206 to 1550 CE. 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, Apply, Analyze
	Unit-II Polity	Remember, Understand, Apply, Analyze
	Unit-III Society and Economy	Remember, Understand, Apply, Analyze
	Unit-IV Regional Polities	Remember, Understand, Apply, Analyze
	Unit-V Religion and Culture	Remember, Understand, Apply, Analyze

4th Semester (Honours)

Paper Name: Rise of the Modern West-II

Paper Code- HIS-HC-4016

Course Outcome	Unit with Name	Bloom Taxonomy Level
After going through this paper <ul style="list-style-type: none"> students will be able to 	Unit-I Europe in the 17 th Century	Remember, Understand, Apply, Analyze
	Unit-II The English	Remember, Understand,

<ul style="list-style-type: none"> explain political and intellectual currents in Europe in the Modern Age. They will also be able to relate the circumstances and causal factors of the intellectual and revolutionary currents of both Europe and America at the beginning of the Modern Age. 	Revolution	Apply, Analyze
	Unit-III European Economy	Remember, Understand, Apply, Analyze
	Unit-IV Politics in the 18 th Century	Remember, Understand, Apply, Analyze
	Unit-V Prelude to the Industrial Revolution	Remember, Understand, Apply, Analyze

Paper Name: History of India-V 9c.1550-1605)

Paper Code- HIS-HC-4026

Course Outcome	Unit with Name	Bloom Taxonomy Level
<p>After going through this paper</p> <ul style="list-style-type: none"> students will be able to analyse the circumstances and historical shifts and foundations of a variety of administrative and political set up in India between c. 1550-1605. They will also be able to describe the interrelationships between the economy, culture and religious practices of the period 	Unit-I Sources and Historiography	Remember, Understand, Apply, Analyze
	Unit-II Establishment of Mughal Rule	Remember, Understand, Apply, Analyze
	Unit-III Consolidation of Mughal Rule Under Akbar	Remember, Understand, Apply, Analyze
	Unit-IV Expansion and integration	Remember, Understand, Apply, Analyze
	Unit-V Rural Society and Economy	Remember, Understand, Apply, Analyze

Paper Name: History of India-VI (c.1605-1750)

Paper Code- HIS-HC-4036

Course Outcome	Unit with Name	Bloom Taxonomy Level
<p>After going through this paper</p> <ul style="list-style-type: none"> students will be able to explain and reconstruct the linkage 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, Apply, Analyze
	Unit-II Mughal Empire under Aurangzeb	Remember, Understand, Apply, Analyze
	Unit-III Patterns of Regional Politics	Remember, Understand, Apply, Analyze
	Unit-IV Trade and Commerce	Remember, Understand, Apply, Analyze
	Unit-V 18 th Century India	Remember, Understand, Apply, Analyze

5th Semester (Honours)

Paper Name: History of Modern Europe-I (c. 1780—1939)

Paper Code- HIS-HC-5016

Course Outcome	Unit with Name	Bloom Taxonomy Level
<p>After going through this paper students will be</p> <ul style="list-style-type: none"> able to evaluate the historical evolution and political developments that occurred in Europe between 1780 to 1939. They will also be able to critically analyse the evolution of social classes, nation states, evolution of capitalism and nationalist sentiments in Europe. They will be able to relate to the variety of causes that dragged the world into devastating wars in the intervening period. 	Unit-I The French Revolution and its European Repercussions	Remember, Understand, Apply, Analyze
	Unit-II Restoration and Revolution: c. 1815--1848s	Remember, Understand, Apply, Analyze
	Unit-III Capitalist Industrialisation	Remember, Understand, Apply, Analyze
	Unit-IV Social and Economic transformation (Late 18 th century to c. 1914)	Remember, Understand, Apply, Analyze
	Unit-V Varieties of Nationalism and the Remaking of Stats in the 19 th and 20 th Centuries	Remember, Understand, Apply, Analyze

Paper Name: History of India VII (c. 1780-1857)

Paper Code- HIS-HC-5026

Course Outcome	Unit with Name	Bloom Taxonomy Level
<p>After going through this paper</p> <ul style="list-style-type: none">students will be able to relate 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.This paper 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, Apply, Analyze
	Unit-II Colonial State and Ideology	Remember, Understand, Apply, Analyze
	Unit-III Rural Economy and Society	Remember, Understand, Apply, Analyze
	Unit-IV Trade and Industry	Remember, Understand, Apply, Analyze
	Unit-V Popular Resistance	Remember, Understand, Apply, Analyze

Paper Name: History of Assam up to c. 1228

Paper Code- HIS-HE-5016

Course Outcome	Unit with Name	Bloom Taxonomy Level
<p>This paper will give</p> <ul style="list-style-type: none">a general outline of the history of Assam from the earliest times to the advent of the Ahoms in the 13th century.After completion of this paper students will be acquainted with the	Unit-I a) A brief survey of the sources b) Land and the people: migration routes c) Cultural linkages with South East Asia: the Stone Jars of Dima Hasao	Remember, Understand, Apply, Analyze

major stages of developments in the political, social and cultural history of Assam during the early times		
	Unit-II a) Origin and Antiquity of Pragjyotisha or Kamrupa Society	Remember, Understand, Apply, Analyze
	Unit-III Political Dynasties a) Varmana b) Salastambha c) Pala	Remember, Understand, Apply, Analyze
	Unit-IV a) Political Condition of Assam in the Post-Pala period b) Turko-Afghan Invasions c) Disintegration of the Kingdom of Kamrupa	Remember, Understand, Apply, Analyze
	Unit-V a) Central and Provincial administration b) Judicial administration c) Revenue Administration d) Cultural Life: Literature, Art and Architecture	Remember, Understand, Apply, Analyze

Paper Name: History of Assam (c. 1228-1826)

Paper Code- HIS-HE-5026

Course Outcome	Unit with Name	Bloom Taxonomy Level
After studying this	Unit-I	Remember, Understand,

<p>paper,</p> <ul style="list-style-type: none"> 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 enable the students to explain the history of Assam from the thirteenth century to the occupation of Assam by the English East India Company in the first quarter of the nineteenth century. 	<p>a) Sources: Archaeological, epigraphic, literary, numismatic and accounts of the foreign travelers: <i>Buranjis</i></p> <p>b) Political condition of the Brahmaputra Valley at the time of the foundation of the Ahom Kingdom in the 16th century</p> <p>c) Siu-ka Pha: an assessment</p>	<p>Apply, Analyze</p>
	<p>Unit-II</p> <p>a) Expansion of the Ahom Kingdom in the 16th century</p> <p>b) Political developments in the 17th century: rule of Pratap Simha; Ahom –Mughal Wars; the treaty of 1639</p>	<p>Remember, Understand, Apply, Analyze</p>
	<p>Unit-III</p> <p>a) Assam in the second half of the 17th century- the Ahom-Mughal wars- Mirjumlal's invasion of Assam-causes and consequences</p>	<p>Remember, Understand, Apply, Analyze</p>
	<p>Unit-IV</p> <p>a) Ahom rule at the zenith: Rudra Simha (1696-1714) to Rajeswar Simha (1751-1769)</p> <p>b) Decline and fall of the Ahom kingdom; the Moamariya rebellion and</p> <p>c) Burmese Invasions- The English East India Company in Assam politics</p> <p>d) Treaty of Yandaboo and Assam</p>	<p>Remember, Understand, Apply, Analyze</p>

	<p>Unit –V a) Ahom system of administration: the Paik system: Ahom policy towards the neighbouring hill tribes</p> <p>b) Religious life-Sankardeva and Neo-Vaisnavite Movement-background and implications</p> <p>c) Cultural developments: art, architecture and literature</p>	Remember, Understand, Apply, Analyze
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6th Semester (Honours)

Paper Name: History of India VIII (c. 1857-1950)

Paper Code- HIS-HC-6016

Course Outcome	Unit with Name	Bloom Taxonomy Level
<p>After going through this paper</p> <ul style="list-style-type: none"> students will be able to analyse the course of British colonial exploitation, the social 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 the decolonization and also the initial period of nation building in India 	Unit-I Cultural Changes and Socio-Religious Reform Movements	Remember, Understand, Apply, Analyze
	Unit-II Nationalism: trends up to 1919	Remember, Understand, Apply, Analyze
	Unit-III Gandhian Nationalism after 1919: Ideas and Movements	Remember, Understand, Apply, Analyze
	Unit-IV Nationalism and Social Groups	Remember, Understand, Apply, Analyze
	Unit-V Communalism and Partition	Remember, Understand, Apply, Analyze

Paper Name: History of Modern Europe II (c. 1780-1939)

Paper Code- HIS-HC-6026

Course Outcome	Unit with Name	Bloom Taxonomy Level
<p>After going through this paper</p> <ul style="list-style-type: none"> 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 of modern Europe, the students will be able to situate the historical development of working class movements, socialist upsurge and the economic forces of the two wars and the other ideological shifts of Europe in this period of study. 	Unit-I Liberal Democracy, Working Class Movements and Socialism in the 19 th and 20 th Centuries	Remember, Understand, Apply, Analyze
	Unit-II The Crisis of Feudalism in Russia and Experiments in Socialism	Remember, Understand, Apply, Analyze
	Unit-III Imperialism, War and Crisis: c. 1880--1919	Remember, Understand, Apply, Analyze
	Unit-IV The Post 1919 World Oder	Remember, Understand, Apply, Analyze
	Unit-V Cultural and Intellectual Developments since circa 1850	Remember, Understand, Apply, Analyze

Paper Name: History of Assam (c. 1826-1947)**Paper Code- HIS-HE-6016**

Course Outcome	Unit with Name	Bloom Taxonomy Level

<p>After going through this paper</p> <ul style="list-style-type: none"> • students will be able to understand the political and socio-economic developments in Assam during the colonial period. • It will acquaint the students of British rule in Assam after its annexation by the imperialist forces. • This paper will also situate the development of nationalism in Assam and its role in India's freedom struggle. 	<p>Unit-I</p> <p>a) Political condition of Assam on the eve of the British rule</p> <p>b) establishment and consolidation of the British rule: reforms and reorganisations- David Scott-annexation of lower Assam, administrative measures</p> <p>c) Reorganisations and revenue measures of David Scott; Robertson-administrative and revenue measures; Jenkins' administrative measures</p>	<p>Remember, Understand, Apply, Analyze</p>
	<p>Unit-II a) Ahom monarchy in Upper Assam (1833-38)</p> <p>b)Annexation of Cachar</p> <p>c)Early phase of revolts and resistance to British rule- Gomdhar Konwar, Piyali Phukan, Tirot Singh</p> <p>d) The Khampti and Singpho rebellion</p> <p>e) The 1857 revolt in Assam and its aftermath</p>	<p>Remember, Understand, Apply, Analyze</p>

	<p>Unit-III</p> <p>a) Establishment of Chief Commissionership in Assam</p> <p>b) Land revenue measures and peasant uprisings in 19th century Assam</p> <p>c) Growth of national consciousness- Assam Association, Sarvajanik Sabhas, Rayat Sabhas</p> <p>d) Govt. of India Act, 1919- Dyarchy on trial in Assam</p>	<p>Remember, Understand, Apply, Analyze</p>
	<p>Unit-IV</p> <p>a) Non-cooperation Movement and Swarajist politics in Assam</p> <p>b) The Civil Disobedience Movement</p> <p>c) Trade Union and Allied Movements</p> <p>d) Tribal League and politics in Assam</p>	<p>Remember, Understand, Apply, Analyze</p>
	<p>Unit-V</p> <p>a) Quit India Movement in Assam</p> <p>b) Cabinet Mission Plan and the Grouping Controversy</p> <p>c) the Sylhet referendum</p> <p>d) Migration, Line system and its impact on politics in Assam</p>	<p>Remember, Understand, Apply, Analyze</p>

Paper Name: Assam since Independence

Paper Code- HIS-HE-6016

Course Outcome	Unit with Name	Bloom Taxonomy Level
<p>After going through this paper</p> <ul style="list-style-type: none">students will be able to understand the main currents of the political and socio-economic developments in Assam after India's independence.It will acquaint the students of the aftermath of Partition and the socio-economic developments in post-independent Assam.It will also make the students to understand and analyze various movements and struggles in contemporary Assam.	<p>Unit-I – Political Developments</p> <ul style="list-style-type: none">a) Political changes and impact of partitionb) Administrative re-organizationc) Indo-China War (1962)d) Electoral politics in Assame) Independence of Bangladesh and its impact on Assam	Remember, Understand, Apply, Analyze
	<p>Unit-II Economic Developments</p> <ul style="list-style-type: none">a) Economic impact of the partitionb) Revenue policiesc) Five Years' Pland) Industrialization and urban developmente) Demographic changesf) Transport and communication	Remember, Understand, Apply, Analyze
	<p>Unit-III- Movements and Ethnic resurgence</p> <ul style="list-style-type: none">a) Growth of middle classb) Language movementc) Refinery Movementd) Assam Movemente) Ethnic resurgence and movement for autonomy;	Remember, Understand, Apply, Analyze

	insurgency	
	<p>Unit-IV: Environmental Issues</p> <p>a) Natural Disasters: earthquake of 1950, flood, erosion</p> <p>b) Land policies and land hunger</p> <p>c) Development and environment</p> <p>d) Big dam issue</p> <p>e) Development displacement and natural resources</p>	Remember, Understand, Apply, Analyze
	<p>Unit-V Cultural Development</p> <p>a) Activities of the Assam Sahitya Sabha</p> <p>b) Development of media (print and electronic), the All India Radio</p> <p>c) Development of education; elementary, secondary and higher</p> <p>d) Women's Movements: Mahila Samiti, Assam Lekhika Samaroh</p>	Remember, Understand, Apply, Analyze

Department of Mathematics

Programme Specific Outcome (B.Sc in Mathematics) (CBCS)

On completion of the B.Sc-Mathematics, (CBCS) programme, the student will be able to:

- Communicate mathematics effectively by oral, written, computational and graphic means.
- Create mathematical ideas from basic axioms.
- Utilize mathematics to solve theoretical and applied problems.
- Identify applications of requirement of Mathematics in other disciplines and in real world.
- Appreciate the requirement of lifelong learning through continued education.
- Ability to learn and apply the computer programming in C.
- Ability to undertake project work.

COURSE OUTCOME

B.A./B.Sc. in Mathematics (Honours) Syllabus (CBCS)

1st Semester

Paper Name: Calculus

Paper Code: MAT-HC-1016

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Learn first and second order derivative tests for relative extrema and apply the knowledge in problems in business, economics and lifesciences. ii) Sketch curves in a plane using its mathematical properties in the different coordinate systems of reference. iii) Compute area of surfaces of revolution and the volume of solids by integrating over cross-sectional areas. iv) Understand the calculus of vector functions and its use to develop the basic principles of planetary motion.	UNIT 1: Higher order derivatives and its application, geometrical interpretation.	Remember, Understand, apply, evaluate
	UNIT 2: Reduction formulas for integration and application of integration in geometry	Remember, Understand, apply, evaluate
	UNIT 3: Vector functions and its applications	Remember, Understand, apply, evaluate

Paper Name: Algebra

Paper Code: MAT-HC-1026

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Employ De-Moivre's theorem in a number of applications to solve numerical problems. ii) Learn about equivalent classes and cardinality of a set. iii) Use modular arithmetic and basic, properties of congruence. iv) Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix. v) Learn about the solution sets of linear systems using matrix method and Cramer's rule	Unit1: Generalization of complex numbers	Remember, Understand, evaluate
	Unit 2: Statements and Logic, Functions	Remember, Understand, evaluate
	Unit 3: Relations Induction Principle and number system	Remember, Understand, evaluate
	Unit 4: System of linear equations and matrix operations	Remember, Understand, evaluate

2nd Semester (Honours)

Paper Name: Real Analysis

Paper Code: MAT-HC-2016

Course Outcome	Unit No. And Name	Bloom's Taxonomy Level
This course will enable the students to: i) Understand many properties of the real line R , including completeness and Archimedean properties. ii) Learn to define sequences in terms of functions from N to a subset of R . iii) Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior,	UNIT 1: Algebraic and order properties of R ,	Remember, Understand, evaluate
	UNIT-2: Real sequences	Remember, Understand, evaluate

limit inferior, and the limit of a bounded sequence. Apply the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.	UNIT 3: Infinite series	Remember, Understand, evaluate
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Paper Name: Differential Equation

Paper Code: MAT-HC-2026

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Learn basics of differential equations and mathematical modelling. ii) Formulate differential equations for various mathematical models. iii) Solve first order non-linear differential equations and linear differential equations of higher order using various techniques. iv) Apply these techniques to solve and analyse various mathematical models.	UNIT 1: Differential equations and mathematical models	Remember, Understand, apply, evaluate
	UNIT 2: Application of differential equations in Modelling	Remember, Understand, apply, evaluate
	UNIT 3: Solutions and properties of Differential equations.	Remember, Understand, apply, evaluate

3rd Semester (Honours)

PAPER NAME: Theory of Real Functions

PAPER CODE: MAT-HC-3016

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Have a rigorous understanding of the concept of limit of a function. ii) Learn about continuity and uniform continuity of functions defined on intervals.	Unit1: Limits of a Function.	Remember, Understand, evaluate

iii) Understand geometrical properties of continuous functions on closed and bounded intervals.	UNIT 2: Continuous functions	Remember, Understand, evaluate
iv) Learn extensively about the concept of differentiability using limits, leading to a better understanding for applications.	UNIT 3: Differentiability of a function and related properties.	Remember, Understand, evaluate
v) Know about applications of mean value theorems and Taylor's theorem		

Paper Name: Group Theory

Paper Code: MAT-HC-3026

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc.	Unit1: Introduction to symmetry and different forms of groups and its different properties.	Remember, Understand, evaluate
ii) Link the fundamental concepts of groups and symmetrical figures. iii) Analyze the subgroups of cyclic groups and classify subgroups of cyclic groups.	Unit2: Quotient groups and related properties	Remember, Understand, evaluate
iv) Explain the significance of the notion of cosets, normal subgroups and factor groups. v) Learn about Lagrange's theorem and Fermat's Little theorem. vi) Know about group homomorphisms and group isomorphisms.	Unit3: Group Homomorphisms, its properties and related theorems.	Remember, Understand, evaluate

Paper Name: Analytic Geometry

Paper Code: MAT-HC-3036

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Learn conic sections and transform co-ordinate systems	UNIT 1: Transformation of coordinates, Conic sections.	Remember, Understand, evaluate
ii) Learn polar equation of a conic, tangent, normal and properties iii) Have a rigorous understanding of the concept of three-dimensional coordinates systems	Unit2: Study of Planes	Remember, Understand, evaluate

4th Semester (Honours)

Paper Name: Multivariate Calculus

Paper Code: MAT-HC-4016

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Learn the conceptual variations when advancing in calculus from one variable to multivariable discussion. ii) Understand the maximization and minimization of multivariable functions subject to the given constraints on variables. iii) Learn about inter-relationship amongst the line integral, double and triple integral formulations. iv) Familiarize with Green's, Stokes' and Gauss divergence theorems	UNIT 1: Functions of several variables,	Remember, Understand, evaluate
	UNIT 2: Extrema of functions of two variables, Method of Lagrange multipliers	Remember, Understand, apply, evaluate
	UNIT 3: Double integration over rectangular and nonrectangular regions,	Remember, Understand, evaluate
	UNIT 4: Line integrals and its applications	Remember, Understand, apply, evaluate

Paper Name: Numerical Method

Paper Code: MAT-HC-4026

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: 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. ii) Know about methods to solve system of linear equations, such as False position method, Fixed point iteration method, Newton's method, Secant method, LU decomposition.	Unit1: Algorithms, Convergence, Bisection method, False position method, Fixed point iteration method, Newton's method, Secant method, LU decomposition	Remember, Understand, apply, evaluate
	UNIT 2: Lagrange and Newton interpolation: linear and higher order, finite difference operators.	Remember, Understand, evaluate

iii) Interpolation techniques to compute the values for a tabulated function at points not in the table.	UNIT 3: Numerical differentiation: forward difference, backward difference and central difference. Integration: trapezoidal rule, Simpson's rule, Euler's method.	Remember, Understand, evaluate
iv) Applications of numerical differentiation and integration to convert differential equations into difference equations for numerical solutions.		

Paper Name: Ring Theory

Paper Code: MAT-HC-4036

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Appreciate the significance of unique factorization in rings and integral domains. ii) Learn about the fundamental concept of rings, integral domains and fields. iii) Know about ring homomorphisms and isomorphisms theorems of rings. iv) Learn about the polynomial rings over commutative rings, integral domains, Euclidean domains, and UFD.	Unit1: Rings, field, Ideals and their properties.	Remember, Understand
	Unit 2: Polynomial Rings, PID, homomorphism isomorphism and related theorems	Remember, Understand, evaluate

5th Semester (Honours)

Paper Name: Complex Analysis

Paper Code: MAT-HC-5016

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
The completion of the Course will enable the students to: i) Learn the significance of differentiability of complex functions leading to the understanding of Cauchy-Riemann equations.	UNIT 1: Properties of Complex Numbers	Remember, Understand
	UNIT 2: Analytic Functions	Remember, Understand, Evaluate

(ii) Learn some elementary functions and evaluate the contour integrals. (iii) Expand some simple functions as Taylor and Laurent series, classify the nature of singularities, find residues and apply Cauchy residue theorem to evaluate integrals.	UNIT 3: Contours, Contour Integrals and Its Examples	Remember, Understand, Evaluate
	UNIT 4: Anti-derivatives, Proof of Anti-derivative Theorem and Other Related Theorems	Remember, Understand, Apply, Evaluate

Paper Name: Linear Algebra

Paper Code: MAT-HC-5026

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Learn about the concept of linear independence of vectors over a field, and the dimension of a vector space. ii) Basic concepts of linear transformations, dimension theorem, matrix representation of a linear transformation, and the change of coordinate matrix. iii) Compute the characteristic polynomial, eigenvalues, eigenvectors, and eigenspaces, as well as the geometric and the algebraic multiplicities of an eigenvalue and apply the basic diagonalization result. iv) Compute inner products and determine orthogonality on vector spaces, including Gram-Schmidt orthogonalization to obtain orthonormal basis. v) Find the adjoint, normal, unitary and orthogonal operators.	Unit 1: Vector spaces and subspaces	Remember, Understand
	Unit 2: Eigenvectors and eigenvalues of a matrix, the characteristic equation, diagonalization, eigen-vectors of a linear transformation, complex eigenvalues,	Remember, Understand, evaluate
	Unit 3: Inner product, length, and orthogonality, orthogonal sets, orthogonal projections, the Gram-Schmidt process, inner product spaces; Diagonalization of symmetric matrices, the Spectral Theorem	Remember, Understand, apply, evaluate

Paper Name: Number Theory

Paper Code: MAT-HE-5016

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
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<p>This course will enable the students to:</p> <p>i) Learn about some fascinating discoveries related to the properties of prime numbers, and 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 and related theorems</p>	<p>Remember, Understand, evaluate</p>
	<p>Unit 2: Number theoretic functions, sum and number of divisors, totally multiplicative functions and other functions</p>	<p>Remember, Understand, evaluate</p>

PAPER NAME: Programming in C (Including Practical)

PAPER CODE: MAT-HE-5066

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
<p>This 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 applications in factorization of an integer and understanding Cartesian geometry and Pythagorean triples.</p> <p>iii) Use of containers and templates in various applications in algebra.</p> <p>iv) Use mathematical libraries for computational objectives.</p> <p>v) Represent the outputs of programs visually in terms of well formatted text and plots.</p> <p>vi) In practical students learn about the roots of a quadratic equation, solution of an equation using N-R algorithm, $\sin(x)$, $\cos(x)$ with the help of functions</p>	<p>Unit 1: Variables, constants, reserved words, library functions, structure of a C program, input/output functions and statements</p>	<p>Remember, Understand, evaluate</p>
	<p>Unit 2: Control Statements</p>	<p>Remember, Understand, apply, evaluate</p>
	<p>Unit 3: Arrays and subscripted variables, Functions</p>	<p>Remember, Understand, apply, evaluate</p>

6th Semester (Honours)

PAPER NAME: Riemann Integration and Metric Space

PAPER CODE: MAT-HC-5016

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Learn about some of the classes and properties of Riemann integrable functions, and the applications of the Fundamental theorems of integration. ii) Know about improper integrals including, beta and gamma functions. 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. iv) Analyse how a theory advances from a particular frame to a general frame. v) Appreciate the mathematical understanding of various geometrical concepts, viz. Balls or connected sets etc. in an abstract setting. vi) Know about Banach fixed point theorem, whose far-reaching consequences have resulted into an independent branch of study in analysis, known as fixed point theory. vii) Learn about the two important topological properties, namely connectedness and compactness of metric spaces.	Unit 1: Riemann integration	Remember, Understand, evaluate
	Unit 2: Metric spaces and their properties	Remember, Understand, evaluate
	Unit 3: Continuous mappings in metric spaces and other mappings related to metric spaces	Remember, Understand, evaluate

Paper Name: Partial Differential Equations

Paper Code: MAT-HC-6026

Course Outcome	Unit No. and Name	Bloom's Taxonomy Level
This course will enable the students to: i) Formulate, classify and transform first order PDEs into canonical form. ii) Learn about method of characteristics and separation of variables to solve first order PDE's. iii) Classify and solve second order linear PDEs. iv) Learn about Cauchy problem for second order PDE and homogeneous and non-homogeneous wave equations. i) Apply the method of separation of variables for solving many well-known second order PDEs.	Unit 1: Introduction, Construction of first order partial differential equations (PDE). Cauchy's problem for first order equations and related methods	Remember, Understand, evaluate
	Unit 2: Canonical form of first order PDE, Method of separation of variables for first order PDE.	Remember, Understand, evaluate
	Unit 3: Reduction to canonical forms, Equations with constant coefficients, General solution.	Remember, Understand, evaluate

Paper Name: Mathematical Modelling

Paper Code: MAT-HE-6036

Course Outcome	Unit No. And Name	Bloom's Taxonomy Level
This course will enable the students to: i) Know about power series solution of a differential equation and learn about Legendre's and Bessel's equations. ii) Use of Laplace transform and inverse transform for solving initial value problems. ii) iii) Learn about various models such as Monte Carlo simulation models, queuing models, and	Unit 1: Power series solution of a differential equation about an ordinary point, solution about a regular singular point, The method of Frobenius; Legendre's and Bessel's equation.	Remember, Understand, evaluate
	Unit2: Laplace transform and inverse transform, application to initial value problem up to second order.	Remember, Understand, evaluate

linear programming models.	Unit 3: Monte Carlo Simulation Modelling, Generating Random Numbers	Remember, Understand, apply, evaluate
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Department of Physics

Programme Specific Outcome (B.Sc in Physics) (CBCS)

The programme specific outcome of the syllabus prescribed for the major students of physics is mentioned below:

- Understand the core theoretical concept of physics: Understand the core theoretical principles of physics.
- Acquire analytical and logical skill for higher Education: Acquire the ability to analyse critical problems logically.
- Excel in experimental physics and learn good laboratory practices and safety: Learn to handle experiments perfectly and safely.
- Trained to take up jobs in allied fields: Use the knowledge of physics to seek opportunities in other allied fields.

COURSE OUTCOME

B.Sc. in Physics(Honours) Syllabus (CBCS)

I Semester

Paper Name: Mathematical Physics I

Paper Code: PHY-HC-1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none">• explain vector and its applications in various fields, [understand]• interpret differential equations and its applications, [apply]• use different coordinate systems [apply]• use concept of probability and error [apply]	Unit I: Vector Calculus	Understand, Apply
	Unit II: First and Second order Differential Equations	
	Unit III: Orthogonal Curvilinear Coordinates	
	Unit IV: Dirac Delta function and its Properties	
	Unit V: Introduction to Probability	
	Unit VI: Theory of Errors	

Paper Name: Mechanics

Paper Code: PHY-HC-1026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • explain Inertial and non-inertial reference frames, Newtonian motion, Galilean transformations, projectile motion, [understand] • interpret work and energy, Elastic and inelastic collisions, [apply] • explain motion under central force, simple harmonic oscillations, [understand] • use special theory of relativity. [apply] 	Unit I: Fundamentals of Dynamics	Understand, Apply
	Unit II: Work and Energy	
	Unit III: Collisions	
	Unit IV: Rotational Dynamics	
	Unit V: Elasticity	
	Unit VI: Fluid Motion	
	Unit VII: Gravitation and Central Force Motion	
	Unit VIII: Oscillations	
	Unit IX: Non-Inertial Systems	
	Unit X: Special Theory of Relativity	

Paper Name: Mechanics

Paper Code: PHY-HG-1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • explain the role of vectors and coordinate systems in Physics, [understand] • solve Ordinary Differential Equations, [apply] • apply laws of motion to various dynamical situations, [apply] • explain Inertial reference frames their transformations, [understand] • apply the concept of conservation of energy, momentum, angular momentum to basic problems, [apply] • explain phenomenon of 	Unit I: Vectors	Understand, Apply
	Unit II: Laws of Motion	
	Unit III: Momentum and Energy	
	Unit IV : Rotational Motion	
	Unit V : Gravitation	
	Unit VI : Oscillations	
	Unit VII : Elasticity	
	Unit VII : Special Theory of Relativity	

<p>simple harmonic motion, motion under central force [understand]</p> <ul style="list-style-type: none"> • conceptualise time dilation, Length contraction using special theory of relativity. [understand] • use measuring instruments (like screw gauge, Vernier calipers, travelling microscope) [apply] • learn various principles and associated measurable parameters of measuring instruments. [understand] 		
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Paper Name: Electricity & Magnetism

Paper Code: PHY-HC-2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • explain electric and magnetic fields in matter, dielectric properties of matter magnetic properties of matter, electromagnetic induction. [understand] • apply Kirchoff's law in different circuits. [apply] • apply network theorem in circuits. [apply] 	Unit I: Electric Field and Electric Potential	Understand, Apply
	Unit II: Dielectric Properties of Matter	
	Unit III: Magnetic Field	
	Unit IV: Magnetic Properties of Matter	
	Unit V: Electromagnetic Induction	
	Unit VI: Electrical Circuits	
	Unit VII: Network Theorems	
	Unit VIII: Ballistic Galvanometer	

Paper Name: Waves & Optics

Paper Code: PHY-HC-2026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of	Unit I: Superposition	Understand,

<p>this course, the students will be able to:</p> <ul style="list-style-type: none"> explain superposition of harmonic oscillations, different types of wave motions, superposition of harmonic waves, [understand] use interference and interferometer, diffraction, holography. [apply] 	of Collinear Harmonic Oscillations	Apply
	Unit II: Superposition of Two Perpendicular Harmonic Oscillations	
	Unit III: Wave Motion	
	Unit IV: Velocity of Waves	
	Unit V: Superposition of Two Harmonic Waves	
	Unit VI: Wave Optics	
	Unit VII: Interference	
	Unit VIII: Interferometer	
	Unit IX: Diffraction	
	Unit X: Fraunhofer Diffraction	
	Unit XI: Holography	

Paper Name: Electricity & Magnetism

Paper Code: PHY-HG-2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> apply Gauss's law of electrostatics to solve a variety of problems [apply] calculate the magnetic forces that act on moving charges and the magnetic fields due to currents, [apply] explain about magnetic materials, [understand] apply the concepts of induction to solve variety of problems. [apply] measure resistance (high 	Unit I: Vector Analysis	Understand, Apply
	Unit II: Electrostatics	
	Unit III: Magnetism	
	Unit IV : Electromagnetic Induction	
	Unit V : Maxwell's Equations and EM Wave	

<p>and low), voltage, current, self and mutual inductance, capacitor, strength of magnetic field and its variation, [apply]</p> <ul style="list-style-type: none"> understand different circuits RC, LCR etc. [understand] 		
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Paper Name: Mathematical Physics II

Paper Code: PHY-HC-3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> solve differential equation using power series solution method [apply] solve differential equation using separation of variables method, [apply] use special integrals, matrix, Fourier series. [apply] 	Unit I: Frobenius Method and Special Functions	Apply
	Unit II: Partial Differential Equations	
	Unit III: Some Special Integrals	
	Unit IV: Matrix	
	Unit V: Fourier Series	

Paper Name: Thermal Physics

Paper Code: PHY-HC-3026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> describe laws in thermodynamics, in particular: entropy, temperature, thermodynamic potentials, Free energies, [understand] explain Maxwell's 	Unit I: Zeroth and First Law of Thermodynamics	Understand
	Unit II: Second Law of Thermodynamics	
	Unit III: Entropy	
	Unit IV: Thermodynamic Potentials	
	Unit V: Maxwell's Thermodynamic	

relations in thermodynamics, behaviour of real gases. [understand]	Relations	
	Unit VI: Distribution of Velocities	
	Unit VII: Molecular Collisions	
	Unit VIII: Real Gases	

Paper Name: Digital Systems & Applications

Paper Code: PHY-HC-3036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • explain the working principle of CRO [understand] • apply digital logic to solve real life problems [apply] • analyze combinational logic circuits [analyse] • Classify different semiconductor memories [understand] • organise sequential logic circuits [analyse] • analyze digital system design using PLD [analyse] • implement combinational and sequential circuits [apply] 	Unit I: Introduction to CRO	Understand, Apply, Analyse
	Unit II: Integrated Circuits (qualitative treatment only)	
	Unit III: Digital Circuits	
	Unit IV: Boolean Algebra	
	Unit V: Data Processing Circuits	
	Unit VI: Arithmetic Circuits	
	Unit VII: Sequential Circuits	
	Unit VIII: Timers: IC 555	
	Unit IX: Shift Registers	
	Unit X: Counters	
	Unit XI: Computer Organization	
	Unit XII: Intel 8085 Microprocessor Architecture	
	Unit XIII: Introduction to Assembly Language	

Paper Name: Thermal Physics & Statistical Mechanics

Paper Code: PHY-HG-3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy
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		Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> explain the basic concepts of thermodynamics, the first and the second law of thermodynamics, the concept of entropy and the associated theorems, the thermodynamic potentials and their physical interpretations, Maxwell's thermodynamic relations, fundamentals of the kinetic theory of gases, Maxwell-Boltzmann distribution law, equipartition of energies, mean free path of molecular collisions, viscosity, thermal conductivity, diffusion and Brownian motion, black body radiations, Stefan-Boltzmann's law, Rayleigh-Jean's law and Planck's law and their significances, quantum statistical distributions, viz., the Bose-Einstein statistics and the Fermi-Dirac statistics. [understand] measure of Planck's constant using black body radiation, [apply] determine Stefan's Constant, coefficient of thermal conductivity of a bad conductor and a good conductor [apply] determine the temperature coefficient of resistance [apply] examine variation of thermos emf across two junctions of a 	Unit I: Laws of Thermodynamics	Understand, Apply, Analyse
	Unit II: Thermodynamic Potentials	
	Unit III: Kinetic Theory of Gases	
	Unit IV : Theory of Radiation	
	Unit V : Statistical Mechanics	

thermocouple with temperature etc. [analyse]		
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Paper Name: Applied Optics

Paper Code: PHY-SE-3074

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> determine of the grating radial spacing of the Compact Disc (CD) by reflection using He-Ne or solid state laser. [apply] find the width of the wire or width of the slit using diffraction pattern obtained by a He-Ne or solid state laser. [apply] find the polarization angle of laser light using polarizer and analyzer [apply] execute experiments with semiconductors [apply] record and reconstruct holograms [apply] describe a Michelson interferometer or a Fabry Perot interferometer [understand] measure the refractive index of air [apply] 	Unit I: Sources and detectors	Understand, Apply
	Unit II: Holography	
	Unit III: Photonics: Fibre Optics	

Paper Name: Mathematical Physics III

Paper Code: PHY-HC-4016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> solve complex integrals using residue theorem [apply] 	Unit I: Complex Analysis	Understand, Apply
	Unit II: Complex Integration	
	Unit III: Fourier Transforms	
	Unit IV: Laplace	

<ul style="list-style-type: none"> • apply Fourier and Laplace transforms in solving differential equations [apply] • explain properties of tensor like transformation of coordinates, contravariant and covariant tensors, indices rules for combining tensors [understand] 	Transforms	
	Unit V: Tensor Algebra	

Paper Name: Elements of Modern Physics

Paper Code: PHY-HC-4026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • describe modern development in physics, starting from Planck's law, development of the idea of probability interpretation and the formulation of Schrodinger equation. [understand] • explain the structure of nucleus, radioactivity, fission and fusion [understand] • conceptualize the principle of Laser [understand] 	Unit I: Quantum Theory and Blackbody Radiation	Understand
	Unit II: Uncertainty and Wave-Particle Duality	
	Unit III: Schrödinger Equation	
	Unit IV: One-dimensional Box and Step Barrier	
	Unit V: Structure of the Atomic Nucleus	
	Unit VI: Radioactivity	
	Unit VII : Detection of nuclear radiation	
	Unit VIII: Fission and Fusion	
	Unit IX: Lasers	

Paper Name: Analog Systems & Applications

Paper Code: PHY-HC-4036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students	Unit I: Semiconductor Diodes	Understand

<p>will be able to:</p> <ul style="list-style-type: none"> describe about the physics of semiconductor p-n junction and devices such as rectifier diodes, zener diode, photodiode etc. and bipolar junction transistors, transistor biasing and stabilization circuits [understand] explain feedback in amplifiers and the oscillator circuits [understand] classify operational amplifiers and their applications. [understand] 	Unit II: Two-terminal Devices and their Applications	
	Unit III: Bipolar Junction Transistors	
	Unit IV: Amplifiers	
	Unit V: Coupled Amplifier	
	Unit VI: Feedback in Amplifiers	
	Unit VII: Sinusoidal Oscillators	
	Unit VIII: Operational Amplifiers	
	Unit IX: Applications of Op-Amps	
	Unit X: Convversion	

Paper Name: Waves & Optics

Paper Code: PHY-HG-4016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> describe simple harmonic oscillation and superposition principle, importance of classical wave equation in transverse and longitudinal waves [understand] describe a range of physical systems based on wave equation [understand] explain of normal modes in transverse and longitudinal waves: their frequencies and configurations, interference as superposition of waves from coherent sources derived from same parent source, [understand] 	Unit I: Superposition of Two Collinear Harmonic Oscillations	Understand, Apply
	Unit II: Superposition of Two Perpendicular Harmonic Oscillations	
	Unit III: Waves Motion	
	Unit IV: Fluids	
	Unit V : Sound	
	Unit VI : Wave Optics	
	Unit VIII : Michelson Interferometer	
	Unit IX : Diffraction	
	Unit X : Polarization	

<ul style="list-style-type: none"> • Demonstrate understanding of interference and diffraction experiments, Polarization. [apply] • use various optical instruments [apply] • make finer measurements of wavelength of light using Newton Rings experiment, Fresnel Biprism etc. [apply] • find out resolving power of optical equipment, the motion of coupled oscillators [apply] • explain Lissajous figures and behaviour of transverse, longitudinal waves [understand] 		
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Paper Name: Research & Technical Writing

Paper Code: PHY-SE-4024

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • identify and write different parts of technical reports, [understand] • write article, thesis [apply] • make presentation in latex [apply] • use different format of chart based on need [apply] • plot data from different sources using Origin plot.[apply] 	Unit I: Introduction	Understand, Apply
	Unit II: Technical Writing in LaTeX	
	Unit III: Scientific graphing and data analysis	

Paper Name: Quantum Mechanics & Applications

Paper Code: PHY-HC-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
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<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> explain the principles in quantum mechanics, such as the Schrödinger equation, the wave function, the uncertainty principle, stationary and non-stationary states, time evolution of solutions, as well as the relation between quantum mechanics and linear algebra. [understand] solve the Schrödinger equation for hydrogen atom [apply] describe angular momentum and spin, as well as the rules for quantization and addition of these, spin-orbit coupling and Zeeman Effect. [understand] 	Unit I: Time Dependent Schrödinger Equation	Understand, Apply
	Unit II: Time Independent Schrödinger Equation	
	Unit III: Bound States	
	Unit IV: Hydrogen-like Atoms	
	Unit V: Atoms in Electric & Magnetic Fields	
	Unit VI: Many Electron Atoms	

Paper Name: Solid State Physics

Paper Code: PHY-HC-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> explain the main features of crystal lattices and phonons [understand] describe the elementary lattice dynamics and its influence on the properties of materials [understand] describe the main features of the physics of electrons in solids [understand] explain the dielectric ferroelectric and magnetic 	Unit I: Crystal Structure	Understand
	Unit II: Elementary Lattice Dynamics	
	Unit III: Magnetic Properties of Matter	
	Unit IV: Dielectric Properties of Materials	
	Unit V: Ferroelectric Properties of Materials	
	Unit VI: Free Electron Theory of Metals	
	Unit VII: Superconductivity	

properties of solids [understand] <ul style="list-style-type: none"> explain the basic concept in superconductivity. [understand] 		
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Paper Name: PHY-HE-5046

Paper Code: Physics of Devices and Instruments

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> describe advanced electronics devices such as UJT, JFET, MOSFET, CMOS etc., [understand] explain detailed process of IC fabrication, Digital Data serial and parallel Communication Standards [understand] describe communication systems.[understand] 	Unit I: Devices	Understand
	Unit II: Power supply and Filters	
	Unit III: Active and Passive Filters	
	Unit IV: Multivibrators	
	Unit V: Phase Locked Loop(PLL)	
	Unit VI: Processing of Devices	
	Unit VII: Digital Data Communication Standards	
Unit VIII: Introduction to communication systems		

Paper Name: Experimental Techniques

Paper Code: PHY-HE-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> describe the errors in measurement and statistical analysis of data required while performing an experiment [understand] explain the working principle, efficiency and 	Unit I: Measurements	understand
	Unit II: Signals and Systems	
	Unit III: Shielding and Grounding	
	Unit IV: Transducers & industrial instrumentation (working principle, efficiency, applications)	

applications of transducers & industrial instruments like digital multimeter, RTD, Thermistor, Thermocouples and Semiconductor type temperature sensors [understand]	Unit V: Digital Multimeter	
	Unit VI: Impedance Bridges and Q-meter	
	Unit VII: Vacuum Systems	

Paper Name: Nuclear and Particle Physics

Paper Code: PHY-HE-5056

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> describe the sub atomic particles and their properties. [understand] explain different nuclear techniques and their applications in different branches of physics and societal application. [understand] applied the concept of nuclear physics in medical, archeology, geology and other interdisciplinary fields of Physics and Chemistry. [apply] 	Unit I: General Properties of Nuclei	Understand, Apply
	Unit II: Nuclear Models	
	Unit III: Radioactivity decay	
	Unit IV: Nuclear Reactions	
	Unit V: Interaction of Nuclear Radiation with matter	
	Unit VI: Detector for Nuclear Radiations	
	Unit VII: Particle Accelerators	
	Unit VIII: Particle physics	

Paper Name: Electromagnetic Theory

Paper Code: PHY-HC-6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> describe the Maxwell's equations, propagation of electromagnetic (EM) waves in different homogeneous-isotropic as 	Unit I: Maxwell Equations	Understand
	Unit II: EM Wave Propagation in Unbounded Media	
	Unit III: EM Wave in Bounded Media	
	Unit IV: Polarization	

well as anisotropic unbounded and bounded media [understand] • explain production and detection of different types of polarized EM waves [understand] • describe waveguides and fibre optics. [understand]	of Electromagnetic Waves	
	Unit V: Rotatory Polarization	
	Unit VI: Optical Fibres	

Paper Name: Statistical Mechanics

Paper Code: PHY-HC-6026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: • apply Statistical Mechanics to in various fields including Astrophysics, Semiconductors, Plasma Physics, Bio-Physics, Chemistry and in many other directions. [apply]	Unit I: Classical Statistics	Apply
	Unit II: Classical Theory of Radiation	
	Unit III: Quantum Theory of Radiation	
	Unit IV: Bose-Einstein Statistics	
	Unit V: Fermi-Dirac Statistics	

Paper Name: Advanced Mathematical Physics II

Paper Code: PHY-HE-6036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: • apply the concepts of Calculus of Variations, Group Theory and Probability Theory to solve numerical problems in Physics [apply]	Unit I: Calculus of Variations	Apply
	Unit II: Group Theory	
	Unit III: Advanced Probability Theory	

Paper Name: Astronomy and Astrophysics

Paper Code: PHY-HE-6046

Course Outcome	Unit/ Topic	Bloom's
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		Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • explain the origin and evolution of the Universe. [understand] • describe the measurement of basic astronomical parameters such as astronomical scales, luminosity and astronomical quantities. [understand] • describe the developments in observational astrophysics [understand] • explain the instruments implemented for astronomical observation [understand] • describe the formation of planetary system and its evolution with time, [understand] • explain the physical properties of Sun and the components of the solar system [understand] • describe the difference between stellar and interstellar components of our Milky Way galaxy [understand] • describe the origin and evolution of galaxies, presence of dark matter and large scale structures of the Universe. [understand] 	Unit I: Stellar properties	Understand
	Unit II: The Sun and the solar system	
	Unit III: Positional Astronomy	
	Unit IV: Astronomical Techniques	
	Unit V: Galaxies	
	Unit VI: Large Scale Structure and Cosmology	

Paper Name: PHYSICS-DSE: CLASSICAL DYNAMICS
Paper Code: PHY-HE-6056

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students	Unit I: Classical Mechanics of Point	Understand, Apply

<p>will be able to:</p> <ul style="list-style-type: none"> • explain Newton's Laws of Motion [understand] • describe Special Theory of Relativity by 4-vector approach and fluids. [understand] • explain Lagrangian and Hamiltonian of a system [understand] • solve the seen or unseen problems/numericals in classical mechanics.[apply] 	Particles	
	Unit II: Small Amplitude Oscillations	
	Unit III: Special Theory of Relativity	
	Unit IV: Fluid Dynamics	

Paper Name: Communication Electronics

Paper Code: PHY-HE-6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • describe the role of electronics in communication [understand] • describe details of communication techniques based on Analog Modulation, Analog and digital Pulse Modulation including PAM, PWM, PPM, ASK, PSK, FSK, [understand] • explain communication and Navigation systems such as GPS and mobile telephony system. [understand] 	Unit I: Electronic communication	Understand
	Unit II: Analog Modulation	
	Unit III: Analog Pulse Modulation	
	Unit IV: Digital Pulse Modulation	
	Unit V: Satellite Communication	
	Unit VI: Mobile Telephony System	
	Unit VII: GPS navigation system	

Department of Political Science

Programme Specific Outcome (B.Ain Political Science) (CBCS)

The programme specific outcome of the syllabus prescribed for the major students of Political Science is mentioned below:

- This program shall introduce the students to Political Theory and to familiarize them to the concepts and ideas of Political Theory.
- It shall give them a fair idea about the history and approaches about Political Theory and the working of the Indian Constitution.
- It shall familiarise them with the critical and contemporary trends of the discipline.
- It shall help the students to reconcile and relate the ideas of political theory with the working and practice of a democracy.
- The program shall also help the students to understand the basic aspects of the Indian Constitution.
- It shall explain to them about the organs of the government and their working.
- It shall also introduce them to the working of the federalism and decentralization in the Indian state.
- After such inculcation of knowledge, it shall help the students to develop democratic values and a proactive political culture.
- The program shall introduce the students to the comparative study of states and their systems of governments and shall give them a reasonable idea about the history and approaches of subject.
- It will also introduce them to the comparative methodology of studying different forms of government and their political/administrative institutions and help them understand the different political systems of the world in a more comprehensive manner.
- This program covers public administration in its historical context with an highlighting the various classical and contemporary administrative theories of political/administrative institutions.
- The program also explores some of the recent trends, including feminism and ecological conservation and also emphasizes the greater democratization is restructuring public administration.
- The students shall learn about international relations, critical debates and issues in this context. They will be acquainted with current topics like globalisation and contemporary international issues.
- Political philosophy shall again help them to gain in-depth understandings of Western and Indian political thought.

COURSE OUTCOME

B.A. in Political Science (Honours) Syllabus (CBCS)

I Semester

Paper Name: Understanding Political Theory

Paper Code: POL - HC – 1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
,After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • know about the meaning and relevance of Political Theory • the importance of theoretical knowledge about democracy and the importance of participation in it. • understand critical ideologies like Feminism and Postmodernism and how they can alter perspectives and worldviews 	Unit I: What is Political Theory and its relevance, Feminism, Post-modernism	Remember, Understand, Evaluate, Analyse, Apply
	Unit II: Grammar of Democracy: Procedural and Participative democracy	Remember, Understand, evaluate Analyse

Paper Name: Constitutional Government and Democracy in India

Paper Code: POL - HC – 1026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
,After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • know about the institution of the state and constitution • the understand the functioning of the organs of the government 	Unit I: The Constituent Assembly and the Constitution	Remember, Understand, Evaluate, Analyse
	Unit II: Organs of Government	Remember, Understand, Evaluate Analyse
	Unit III: Federalism and Decentralization	Remember, Understand, Analyse. Evaluate

<ul style="list-style-type: none"> understand the meaning of federalism and the significance of decentralization 		
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2ND Semester (Honours)

Paper Name: Political Theory-Concepts and Debates

Paper Code: POL - HC – 2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> Understand the various concepts in political theory and appreciate how they can be helpful to analyse crucial political issues Understand the significance of debates in political theory in exploring multiple perspective to concepts, ideas and issues. Appreciate how these concepts and debates enrich political life and issues surrounding it. 	Section A: Core Concepts Unit I: Importance of Freedom Unit II: Significance of Equality Unit III: Indispensability of Justice	Remember, Understand and evaluate
	Section B: Major Debates Unit I: Why should we obey the state? Issues of political obligation and civil disobedience. Unit II: Are human rights universal? Issue of cultural relativism. Unit III: How do we accommodate diversity in plural society? Issues of multiculturalism and toleration.	Remember, Understand and evaluate

Paper Name: Political Process in India

Paper Code: POL - HC – 2026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> Understand the working of major 	Unit I: Political Parties and the Party System	Remember, Understand and evaluate

<p>political institutions in India</p> <ul style="list-style-type: none"> Understand the major debates in Indian politics along the axes of caste, gender, region and religion Understand the changing nature of the Indian state and the contradictory dynamics of modern state power 	Unit II: Determinants of Voting Behaviour : Caste, Class, Gender and Religion	Remember, Understand, analyse and evaluate
	Unit III: Regional Aspirations: The Politics of Secession and Accommodation	Remember, Understand and evaluate
	Unit IV: Religion and Politics: Debates on Secularism; Minority and Majority Communalism	Remember, Understand and evaluate
	Unit V: Caste and Politics: Caste in Politics and the Politicization of Caste	Remember, Understand and evaluate
	Unit VI: Affirmative Action Policies: Women, Caste and Class	Remember, Understand and evaluate
	Unit VII: The Changing Nature of the Indian State: Developmental, Welfare and Coercive Dimensions	Remember, Understand and evaluate

3rd Semester (Honours)

Paper Name: Introduction to Comparative Government and Politics

Paper Code: POL-HC-3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> understand the entire idea of comparative politics and the concepts related to it. Know about the history about the evolution of the modern form of governments To compare and 	Unit I: Understanding Comparative Politics	Remember, Understand, Evaluate, Analyse, Apply
	Unit II: Historical context of modern government	Remember, Understand, Analyse
	Unit III: Themes for comparative analysis	Remember, Understand, evaluate

understand the different forms of governments in different countries of the world.		
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Paper Name: Perspectives on Public Administration
Paper Code: POL-HC-3026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • understand the basic concepts related to public administration. • understand the different theories of public administration • to understand the meaning and relevance of public policy ; as well it's formulation and implementation. • familiarize themselves with the new and major approaches in public administration. 	Unit I: Public administration as a discipline	Remember, Understand, Evaluate, Analyse, Apply
	Unit II: Theoretical Perspectives: Classical & Neo-classical theories	Remember, Understand, Evaluate, Analyse
	III: Public policy	Remember, Understand, Evaluate
	Unit IV: Major approaches in public administration	Remember, Understand, Evaluate, Analyse

Paper Name: Perspectives on International Relations and World History
Paper Code: POL-Paper Code: HC-3036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • understand the emergence of the international 	Unit I: Studying International Relations	Remember, Understand, Evaluate, Analyse
	Unit II: Theoretical Perspectives	Remember, Understand, Evaluate, Analyse

<p>system and the modern nation state.</p> <ul style="list-style-type: none"> to understand the different theoretical perspectives of studying international relations like realism, liberalism, feminism and Marxism. to know about the World Wars. The collapse of the Second world and development of a post-Cold War World order and the emergence of alternative centres of power. 		
	Unit III: An Overview of Twentieth Century IR History	Remember, Understand, Evaluate. Analyse

4th Semester (Honours)

Paper Name: Political Processes and Institutions in Comparative Perspective
Paper Code: POL - HC – 4016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> To understand, comprehend and analyse the complex nature and functioning of the political systems, political institutions and corresponding issues to these both in a country specific case of India and cross-country perspectives. To demonstrate critical thinking about key issues of political system of different forms, political process and public policy. to use the 	Unit I: Approaches to Studying Comparative Politics a. Political Culture b. New Institutionalism	Remember, understand, analyze and evaluate
	Unit II: Electoral System: Definition and procedures: Types of election system (First Past the Post, Proportional Representation, Mixed Representation)	Remember, understand, analyze and evaluate
	Unit III: Party System: Historical contexts of emergence of the party system and types of parties	Remember, understand, analyze and evaluate

<p>contents and sub-units of the course as yardsticks for comparing these political systems and processes.</p>	<p>Unit IV: Nation-state: What is nation–state? Historical evolution in Western Europe and postcolonial contexts ‘Nation’ and ‘State’: debates</p>	<p>Remember, understand, analyze and evaluate</p>
	<p>Unit V: Democratization Process of democratization in postcolonial, post-authoritarian and post-communist Countries</p>	<p>Remember, understand, analyze and evaluate</p>

Paper Name: Public Policy and Administration In India
Paper Code: POL - HC – 4026

Course Outcome	Unit/ Topic	Bloom’s Taxonomy Level
<ul style="list-style-type: none"> Gain knowledge about the processes of public policy making in India and their significance in administering the state. Develop the ability to assess the functioning of the government in ensuring a citizen centric welfare administration in India. 	<p>Unit I: Public Policy a. Definition, characteristics and models b. Public Policy Process in India</p>	<p>Remember, understand, analyze and evaluate</p>
	<p>Unit II: Decentralization a. Meaning, significance and approaches and types b. Local Self Governance: Rural and Urban</p>	<p>Remember, understand, analyze and evaluate</p>
	<p>Unit III: Budget a. Concept and Significance of Budget b. Budget Cycle in India c. Various Approaches and Types Of Budgeting</p>	<p>Remember, understand, analyze and evaluate</p>

	<p>Unit IV: Citizen and Administration Interface</p> <p>a. Public Service Delivery</p> <p>b. Redressal of Public Grievances: RTI, Lokpal, Citizens' Charter and E-Governance</p>	Remember, understand, analyze and evaluate
	<p>Unit V: Social Welfare Administration</p> <p>a. Concept and Approaches: Social Welfare</p> <p>b. Social Welfare Policies:</p> <ul style="list-style-type: none"> • Education: Right To Education, • Health: National Health Mission, • Food: Right To Food Security • Employment: MNREGA 	Remember, understand, analyze and evaluate

Paper Name: Global Politics
Paper Code: POL - HC – 4036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> • To enable students to understand how to approach important global political and economic policy problems and participate in public policy debates on the crucial issues facing the world today. • To have knowledge of the essential theoretical 	<p>Unit I: Globalization: Conceptions and Perspectives</p> <p>a. Understanding Globalization and its Alternative Perspectives</p> <p>b. Political: Debates on Sovereignty and Territoriality</p> <p>c. Global Economy: Its Significance and Anchors of Global Political Economy: IMF,</p> <p>d. World Bank, WTO, TNCs</p> <p>e. Cultural and Technological</p>	Remember, Understand, Analyze, and Evaluate

<p>assumptions and their relationships to policy interventions.</p> <ul style="list-style-type: none"> To demonstrate elementary knowledge of major issues and subject-matters surrounding globalisation that decides the international relations-<i>political, economic and security relations-</i>among the nations. 	<p>Dimension f. Global Resistances (Global Social Movements and NGOs)</p>	
	<p>Unit II: Contemporary Global Issues</p> <p>a. Ecological Issues: Historical Overview of International Environmental Agreements, Climate Change, Global Commons Debate</p> <p>b. Proliferation of Nuclear Weapons</p> <p>c. International Terrorism: Non-State Actors and State Terrorism; Post 9/11 developments, Migration</p>	<p>Remember, Understand, Analyze and Evaluate</p>
	<p>Unit III: Global Shifts: Power and Governance</p>	<p>Remember, Understand, analyze and evaluate</p>

5th Semester (Honours)

Paper Name: Classical Political Philosophy

Paper Code: POL-HC-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able	Unit I: Text and Interpretation: Marxist Feminist, & Post-	Remember, Understand, Evaluate, Analyse

<p>to:</p> <ul style="list-style-type: none"> understand the basic ideas underlying classical political philosophy to understand the essence of thought of the philosophers belonging from this period. To familiarise and comprehend their philosophies of thought and evaluate them in comparison to the contemporary times. 	modernist.	
	Unit II: Plato and his political philosophy	Remember, Understand, Analyse
	Unit III: Aristotle and his political philosophy	Remember, Understand, Analyse
	Unit IV: Machiavelli and his political philosophy.	Remember, Understand, Analyse
	UNIT 5: Hobbes and his political philosophy	Remember, Understand, Analyse
	UNIT 6: John Locke and his political philosophy	Remember, Understand, Analyse

Paper Name: Indian Political Thought-I
Paper Code: POL-HC-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> understand the basic ideas underlying Indian political philosophy beginning from the pre-colonial times to understand and compare the thoughts of the different Indian philosophers of this time. To acquaint themselves and grasp their philosophies of thought and evaluate them in 	Unit I: Traditions of Precolonial Indian Political Thought	Remember, Understand, Evaluate, Analyse
	Unit II: Ved Vyasa (Shantiparva): Rajadharma	Remember, Understand, Analyse
	Unit III: Manu: Social Laws	Remember, Understand, Analyse
	Unit IV: Kautilya: Theory of State.	Remember, Understand, Analyse
	UNIT 5: Aggannasutta (Digha Nikaya): Theory of kingship	Remember, Understand, Analyse
	UNIT 6: Barani: Ideal Polity	Remember, Understand, Analyse
	Unit 7: Abul Fazal: Monarchy R	Remember, Understand, Evaluate

comparison to the contemporary times.	Unit 8: Kabir: Syncretism	Remember, Understand, Evaluate
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Paper Name: Human Rights
Paper Code: POL-HE-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • understand the basic idea of Human Rights and understand it's importance. • understand the different approaches to study and view/understand human rights. • to familiarize themselves with how organisations like the UNO and other NGOs are working to protect, promote and enhance the enjoyment of these rights by all people, irrespective of differences. 	Unit I: Introduction to Human Rights	Remember, Understand, Evaluate, Analyse, Apply
	Unit II: Approaches and perspectives	Remember, Understand, Evaluate, Analyse
	III: Human Rights and UNO	Remember, Understand, Evaluate
	Unit IV: Human rights and the role of NGO	Remember, Understand, Evaluate, Analyse

Paper Name: Select Constitutions
Paper Code: POL-HE-5046

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • understand the working of the constitutions of the countries of the UK and USA 	Unit I: Unit 1: United Kingdom: The British Political Tradition Parliamentary Government	Remember, Understand, Evaluate, Analyse
	Unit II: United States of America: Making of the American Constitution,	Remember, Understand, Evaluate, Analyse

<ul style="list-style-type: none"> be able to compare and contrast the presidential and prime-ministerial government and evaluate their successes and failures. 	The Federal System National Government	
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6th Semester (Honours)

Paper Name: Modern Political Philosophy

Paper Code: POL - HC –6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> To interpret ideas underlying traditions in modern political philosophy To analyze the debates and arguments of leading political philosophers of different philosophical traditions To appraise the relevance of modern political philosophy in understanding contemporary politics 	<p>Unit I: Modernity and its discourses</p> <p>This section will introduce the idea of modernity and the discourses around modernity.</p>	Remember, Understand, analyze and evaluate
	<p>Unit II: Romantics</p> <p>a. Jean Jacques Rousseau</p> <p>Presentation themes: General Will; local or direct democracy; self-government; origin of inequality.</p> <p>b. Mary Wollstonecraft</p> <p>Presentation themes: Women and paternalism; critique of Rousseau's idea of education; legal rights</p>	Remember, Understand and evaluate
	<p>Unit III: Liberal socialist</p> <p>John Stuart Mill</p> <p>Presentation themes: Liberty, suffrage and</p>	Remember, Understand, analyze and evaluate

	subjection of women, right of minorities; utility principle.	
	<p>Unit IV: Radicals:</p> <p>a. Karl Marx</p> <p>Presentation themes: Alienation; difference with other kinds of materialism; class struggle</p> <p>b. Alexandra Kollontai</p> <p>Presentation themes: Winged and wingless Eros; proletarian woman; socialization of housework; disagreement with Lenin</p>	Remember, Understand and evaluate

Paper Name: Indian Political Thought-II
Paper Code: POL - HC – 6026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> To underline themes and issues in political thought of modern India. To compare and contrast positions of leading political thinkers in India on issues those are constitutive of modern India. To assess the relevance of political thought of 	Unit-I: Introduction to Modern Indian Political Thought	Remember, Understand, analyze and evaluate
	Unit-II: Rammohan Roy: Rights	Remember, Understand and evaluate
	Unit-III: Pandita Ramabai: Gender	Remember, Understand, evaluate
	Unit-IV: Vivekananda: Ideal Society	Remember, Understand, evaluate
	Unit-V: Gandhi: Swaraj	Remember, Understand, evaluate
	Unit-VI: Ambedkar: Social Justice	Remember, Understand, evaluate
	Unit-VII: Tagore: Critique of Nationalism	Remember, Understand, evaluate

modern India in understanding contemporary politics.	Unit-VIII: Iqbal: Community	Remember, Understand, evaluate
	Unit-IX: Savarkar: Hindutva	Remember, Understand, evaluate
	Unit-X: Nehru: Secularism	Remember, Understand, evaluate
	Unit-XI: Lohia: Socialism	Remember, Understand, evaluate

Paper Name: Select Constitutions-II

Paper Code: POL - HE – 6046

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<ul style="list-style-type: none"> To understand the importance of constitution. To introduce various types of constitutions of different parts of the world To know the various forms of governments from different parts of the world 	Unit 1: Peoples Republic of China: Revolutionary Legacy	Remember, Understand, analyze and evaluate
	Unit2: Peoples Republic of China: Rights and Duties of Citizens	Remember, Understand and evaluate
	Unit 3: Switzerland: Political Traditions, Federalism	Remember, Understand, analyze and evaluate
	Unit 4: Switzerland: Direct Democracy	Remember, Understand and evaluate

Paper Name : Human Rights In India

Paper Code : POL HE 6016

Course Outcome	Unit/Topic	Bloom's Taxonomy Level
This course will enable the students to: <ul style="list-style-type: none"> To understand the origin and development of human rights. To know the measure 	Unit 1: Origin and development of human rights in India	Remember, Understand and evaluate
	Unit2: Institutional mechanism for the protection of human rights	Remember, Analyze and Evaluate

adopted for the protection of human rights in India. <ul style="list-style-type: none"> To familiarize emerging issues of human rights 	Unit 3: Emerging Issues of human rights	Remember, Understand, analyze and evaluate
	Unit 4: Human Rights of vulnerable groups	Remember, Understand, analyze and evaluate

Department of Sanskrit

Programme Specific Outcome (B.A in Sanskrit) (CBCS)

- It emphasises the importance of passing down India's rich cultural heritage, which broadens one's perspective on the subject.
- The curriculum gives information about the history of Sanskrit and provides an overview of Sanskrit literature.
- It introduces students to the fundamental ideas of many fields, including Indian philosophy, medical science, Vedic & Classical literature, Vedic & Classical metres along with musical rendering & etc.
- Students learn how to apply pertinent theoretical viewpoints to issues related to ancient Indian literature, religion, and history.
- By the systematic study of poetry, plays, grammar and etc., the Sanskrit honours course as a whole provides learners with plenty of opportunities to interact, translate textual version and also correlate the acquired knowledge with other languages in order to appreciate the beauty of the language and literature.
- It possesses all the potentialities to develop human resources giving opportunity for inculcating the spirit of ethical values, which is considered to be the backbone of Sanskrit culture.
- It makes students capable of handling both academic and practical obstacles simultaneously.

COURSE OUTCOME

B.A. in Sanskrit (Honours) Syllabus (CBCS)

I Semester

Paper Name: Classical Sanskrit Literature (Poetry)

Paper Code: SKT- HC-1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none">understand the development of Sanskrit Literature.negotiate the texts independently	Unit- IRaghuvamsam: Canto- I (Verse No. 1-25)	Remember, understand, analyse
	Unit- II: Kumarasambhavam: Canto- V (Verse No. 1-30)	Remember, understand, analyse
	Unit- III: Kiratarjuniyam: Canto- I (Verse No. 1- 25)	Remember, understand, analyse
	Unit- IV: Nitisatakam (Verse No. 1- 20, Ist Two Paddhatis)	Remember, understand, analyse
	Unit- V: Origin and Development of Mahakavya and Gitikavya	Remember, understand, analyse

PAPER NAME: Critical Survey of Sanskrit Literature

PAPER CODE: SKT- HC- 1026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none">familiar with the journey of Sanskrit literature from	Unit- I: Vedic Literature	Remember, understand, analyse
	Unit- II: Ramayana	Remember, understand, analyse

<p>Vedic literature to Purāṇa.</p> <ul style="list-style-type: none"> Know the different genres of Sanskrit Literature and Śāstras. 	Unit- III: Mahabharata	Remember, understand, analyse
	Unit- IV: Puranas	Remember, understand, analyse
	Unit- V: General Introduction to Vyakarana, Darsana and Sahityasastra	Remember, understand, analyse

2nd Semester (Honours)

Paper Name: Classical Sanskrit Literature (Prose)

Paper Code: SKT- HC- 2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> familiar with Classical Sanskrit Prose literature. understand the origin and development of Sanskrit Prose literature through some important prose romances and fables. 	Unit- I: Sukanasopadesa	Remember, understand, analyse
	Unit- II: Visrutacaritam	Remember, understand, analyse
	Unit- III: Origin and Development of prose, Important prose romances and fables	Remember, understand, analyse

PAPER NAME: Self-Management In The Gita

PAPER CODE: SKT- HC- 2026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> negotiate the text 	Unit- I: Gita: Cognitive and emotive apparatus	Remember, understand, analyse, apply
	Unit- II: Gita: Controlling the mind	Remember, understand,

independently without referring to the traditional commentaries. • experience the richness of the text • apply for the sustainable development of society through the ideals of the Gita.		analyse, apply
	Unit- III: Gita: Self-management through devotion	Remember, understand, analyse, apply

3rd Semester (Honours)

Paper Name: Classical Sanskrit Literature (Drama)

Paper Code: SKT- HC- 3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: • acquaint themselves with the three most famous dramas of Sanskrit literature, which represent three stages in the growth of Sanskrit drama. • understand the contents of the important Sanskrit dramas prescribed as their texts. • analyse and evaluate the core messages of the dramas	Unit- I: Svapnavasavadattam	Remember, understand, analyse
	Unit- II: Abhijnanasakuntalam (Act I- IV)	Remember, understand, analyse
	Unit- III: Mudraraksasam (Act I, II & III)	Remember, understand, analyse
	Unit- IV: Critical Survey of Sanskrit Drama	Remember, understand, analyse

PAPER NAME: Poetics and Literary Criticism

PAPER CODE: SKT-HC-3026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be	Unit- I: Svapnavasavadattam	Remember, understand,

<p>able to:</p> <ul style="list-style-type: none"> understand poetic concepts like <i>alāṅkāra</i>, <i>rasa</i>, <i>rīti</i>, <i>vakrokti</i>, <i>dhvani</i>, <i>aucitya</i> etc. develop their capacity for creative writing and literary appreciation. 		analyse
	Unit- II: Abhijñanasakuntalam (Act I- IV)	Remember, understand, analyse
	Unit- III: Mudraraksasam (Act I, II & III)	Remember, understand, analyse
	Unit- IV: Critical Survey of Sanskrit Drama	Remember, understand, analyse

PAPER NAME: Indian Social Institutions and Polity

PAPER CODE: SKT- HC- 3036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> become 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>, Kautīlya's <i>Arthaśāstra</i> and other works known as <i>Nītiśāstra</i>. analyse the cardinal Theories of Indian Polity. 	Unit- I: Indian Social Institutions: Nature and Concepts	Remember, understand, analyse
	Unit- II: Structure of Society and Value of Life	Remember, understand, analyse
	Unit- III: Indian Polity: Origin and Development	Remember, understand, analyse
	Unit- IV: Cardinal Theories and Thinkers of Indian Polity	Remember, understand, analyse

Paper Name: Acting & Script Writing

Paper Code: SKT- SE- 3014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be	Unit- I: Acting (Abhinaya)	Remember, understand,

able to:		analyse, apply
<ul style="list-style-type: none"> familiarise themselves with the theoretical and practical aspects of Sanskrit play. develop their capacity for creative writing. 	Unit- II: Script Writing	Remember, understand, analyse, apply

4 th Semester (Honours)

PAPER NAME: Indian Epigraphy, Palaeography and Chronology

PAPER CODE: SKT- HC- 4016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> acquaint themselves with the epigraphical journey in Sanskrit, the only source that directly reflects the society, politics, geography, and economy of the time. know the different styles of Sanskrit writing. 	Unit- I: Epigraphy	Remember, understand, analyse
	Unit- II: Paleography	Remember, understand, evaluate
	Unit- III: Study of selected inscriptions	Remember, understand, analyse
	Unit- IV: Chronology	Remember, understand

Paper Name: Modern Sanskrit Literature

Paper Code: SKT- HC- 4026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> expose students to the rich 	Unit- I: Mahakavya and Charitakavya	Remember, understand, analyse
	Unit- II: Gadyakavya and Rupaka	Remember, understand, analyse

and profound tradition of modern creative writing in Sanskrit, enriched by new genres of writing. • know the different styles of Sanskrit writing.	Unit- III: Gitikavya and Other genres	Remember, understand, analyse
	Unit- IV: General Survey of Modern Sanskrit	Remember, understand, analyse

PAPER NAME: Sanskrit and World Literature

PAPER CODE: SKT- HC- 4036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: • acquaint themselves about the spread & influence of Sanskrit literature and culture through the ages in various parts of the world in medieval & modern times. • assess South-East Asian folk culture.	Unit- I: Survey of Sanskrit Literature in the World	Remember, understand, analyse
	Unit- II: Upanisads and Gita in World Literature	Remember, understand, analyse
	Unit- III: Sanskrit Fables in World Literature	Remember, understand, analyse
	Unit- IV: Ramayana and Mahabharata in South East Asian Countries	Remember, understand, analyse
	Unit- V: Kalidasa's Literature in World Literature	Remember, understand, analyse
	Unit- VI: Sanskrit Studies across the World	Remember, understand, analyse

PAPER NAME: Sanskrit Metre and Music

PAPER CODE: SKT- SE- 4014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
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<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • employ Sanskrit metres for analysis and poetic approaches. • With lyrical approaches, students will receive comprehensive instruction on a few selected Vedic and Classical metres. 	Unit- I: Brief introduction to Cchandasasra	Remember, understand, analyse
	Unit- II: Classification and Elements of Sanskrit Metre	Remember, understand, analyse
	Unit- III: Analysis of Selected Vedic Metre and their Lyrical methods	Remember, understand, analyse
	Unit- IV: Analysis of Selected Classical Metres as per Chandomanjari and their Lyrical Methods	Remember, understand, analyse

5th Semester (Honours)

Paper Name: Vedic Literature
Paper Code: SKT-HC- 5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • read one Upaniṣad, namely, Muṇḍaka, where the primary Vedānta-view is propounded. • acquaint themselves with various types of Vedic texts and grammar. 	Unit- I: Samhita and Brahmana	Remember, understand, apply
	Unit- II: Vedic Grammar	Remember, understand, apply
	Unit- III: Mundakopanisad	Remember, understand, analyse

Paper Name: Sanskrit Grammar
Paper Code: SKT-HC- 5026

Course Outcome	Unit/ Topic	Bloom's
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		Taxonomy Level
<p>After the completion of this course, the students will be able to :</p> <ul style="list-style-type: none"> acquaint themselves with general Sanskrit Grammar. develop a better sense of self and a higher level of effective communication, which will improve their proficiency in Sanskrit. 	Unit- I: General Introduction to Vyakarana, Sivasutra, Paribhasa, Sandhi	Remember, understand, and apply
	Unit- II: Natvavidhi & Satvavidhi	Remember, understand, and apply
	Unit- III: Declension Conjugation	Remember, understand, and apply
	Unit-IV: Vibhaktyarthaprakarana, Samasa Prakaranam	Remember, understand, and apply

PAPER NAME: Art of Balanced Living

PAPER CODE: SKT-HE- 5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> acquaint themselves with theories of the art of living inherent in Sanskrit literature and apply them to live a better life. shape their cognitive, affective, and behavioural abilities. Aware about life and self. 	Unit- I: Self-presentation	Remember, understand, and apply
	Unit- II: Concentration	Remember, understand, and apply
	Unit- III: Refinement of Behaviour	Remember, understand, and apply

PAPER NAME: Project

PAPER CODE: SKT HE-5046

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level

<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> engage in the process of making projects that enhance their critical thinking skills. learn the basic knowledge of research methodologies. 	PROJECT	Understand, analyse, apply
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6th Semester (Honours)

PAPER NAME: Ontology and Epistemology

PAPER CODE: SKT-HC- 6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> acquaint themselves with the cardinal principles of the Nyāya-Vaiśeṣika philosophy through the Tarkasamgraha. understand philosophical texts in Sanskrit and comprehend the essential aspects of Indian Philosophy. 	Unit- I: Essentials of Indian Philosophy	Remember, understand, analyse
	Unit- II: Ontology (Based on Tarkasamgraha)	Remember, understand, analyse
	Unit- III: Epistemology (Based on Tarkasamgraha)	Remember, understand, analyse

Paper Name: Sanskrit Composition and Communication

Paper Code: SKT-HC- 6026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
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<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • acquaint themselves with the composition and other related information based on the Samasaprakarana of Laghusiddhantakaumudi. • read and understand any Sanskrit text. • think and write creative articles in Sanskrit. 	Unit- I: Samasa, Voice & Krt	Remember, understand, apply
	Unit- II: Translation and Communication	Remember, understand, apply
	Unit- III: Essay	Remember, understand, apply

PAPER NAME: Fundamentals of Ayurveda

PAPER CODE: SKT-HE- 6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> • understand the basic principles and concepts of preventative medicine and health maintenance, diet and nutrition, usage of commonly used spices and herbs and outline of Ayurvedic therapeutic procedures as prescribed in the Ayurveda. • apply Ayurveda to live a better life. 	Unit- I: Introduction to Ayurveda	Remember, understand, apply
	Unit- II: Carakasamhita	Remember, understand, apply
	Unit- III: Bhaisajyaratnavali	Remember, understand, apply

PAPER NAME: Kamarupa School of Dharmasastra

PAPER CODE: SKT-HE- 6036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be	Unit- I: Introduction to Dharmasastras in Assam.	Remember, understand,

able to:		analyse
<ul style="list-style-type: none"> • understand the historical perspective of the different schools of Dharmasastras in Assam. • acquaint themselves with the Smriti writers of Assam and their Works. • know the religious history of Assam through the work Tirthakaumodi. 	Unit- II: Kamarupa School of Dharmasastra.	Remember, understand, analyse
	Unit- III: Tirthakaumodi of Pitambarasiddhantavagisa.	Remember, understand, analyse

1st Semester (Honours Generic)

PAPER NAME: Basic Sanskrit

PAPER CODE: SKT-HG-1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • learn Sanskrit from the very beginning. • acquaint themselves with the essential Sanskrit Grammar. • Construct simple sentences in Sanskrit. • understand and analyse the philosophy of the Gita, which may be applied to the sustainable development of society. 	Unit- I: Grammar and Composition part I	Remember, understand, apply
	Unit- II: Grammar and Composition Part II	Remember, understand, apply
	Unit- III: Literature	Remember, understand, apply

PAPER NAME: Indian Culture and Social Issues

PAPER CODE: SKT-HG-2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be	Unit- I: Culture in a multi-cultural society	Remember, understand,

able to:		analyse
<ul style="list-style-type: none"> understand Indian culture and how cultural traditions have evolved. Know certain significant socio-cultural issues. 	Unit- II: Cultural roots of India	Remember, understand, analyse

PAPER NAME: **Basic Principles of Indian Medicine System (Ayurveda)**

PAPER CODE: **SKT-HG-3016**

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> understand the basic principles and concepts of preventive medicine and health care, diet and nutrition, usage of commonly used spices and herbs and an outline of Ayurvedic therapeutic procedures. 	Unit- I: Introduction to Indian Medicine System: Ayurveda	Remember, understand, analyse
	Unit- II: Basic Principles of Ayurveda	Remember, understand, apply
	Unit III: Dietetics, Nutrition and Treatment in Ayurveda	Remember, understand, apply
	Unit IV: Important Medicinal Plants and their based-on Ayurveda	Remember, understand, apply

PAPER NAME: **Fundamentals of Indian Philosophy**

PAPER CODE: **SKT-HG-4016**

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> acquaint themselves with 	Unit- I: General Introduction	Remember, understand, analyse
	Unit- II: Schools of Indian Philosophy	Remember, understand, analyse

<p>the basic knowledge of Indian philosophy.</p> <ul style="list-style-type: none">• handle philosophical texts in Sanskrit and understand the essential aspects of Indian Philosophy.	<p>Unit III: Problems in Indian Philosophy</p>	<p>Remember, understand, analyse</p>
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Department of Statistics

Programme Specific Outcome (B.Sc in Statistics) (CBCS)

1st Semester

Paper Name: (Descriptive Statistics)

Paper Code: HC-1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> • Learn design data collection plans and basic tools of descriptive statistics. • Have the critical thinking in the theory of probability and its applications in real life problems. • Get a concept of Regression and correlation. • Have the prior knowledge of Index Numbers and its applications in business related field. 	Unit I: Statistical Methods	Remember, Understand
	Unit II: Measures of Central Tendency.	Remember, Understand, Analyse
	Unit III: Bivariate data.	Remember, Understand
	Unit IV: Index Numbers.	Remember, Understand

Paper Name: Calculus

Paper Code: HC-1026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to Understand mathematical calculus, Integral calculus, Differential equations and partial Differential equations through visualizations	Unit I: Differential Calculus.	Remember, Understand, Apply, Analyze
	Unit II: Integral Calculus.	Remember, Understand, Analyse
	Unit III: Differential Equations.	Remember, Understand, Analyse

	UnitIV:Partial Differential Equations.	Remember, Understand, Apply, Analyse

2nd Semester (Honours)

Paper Name: Probability and Probability Distributions

Code: HC-2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to :</p> <ul style="list-style-type: none"> • Acquire knowledge on random variables, types of r.v and properties of r.v. • Know about the distribution functions and properties of distribution function. • Know about the expectations and generating function like mgf, cumulant generating function, characteristic functions. • Have Knowledge on Binomial, Poisson and Normal distributions and its various properties. 	Unit I: Probability.	Remember, Understand, Apply, Analyze
	Unit II:Random variables.	Remember, Understand
	Unit III:Mathematical Expectation and Generating Functions.	Remember, Understand, Analyse
	Unit IV: Mathematical Expectation and Generating Functions.	Remember, Understand, Apply, Analyse

Paper Name: Algebra**Code: HC-2026**

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course: <ul style="list-style-type: none"> the students will be able to gain knowledge on different types of equation like quadratic, cubic etc. Acquire a prior knowledge on matrix, different types of matrices, adjoint and inverse of a matrix, solution of set of linear equations through matrices, rank of a matrix, characteristic roots and characteristic vectors and their properties, quadratic forms. 	Unit I: Theory of equations.	Remember, Understand, Apply, Analyze
	Unit II: Algebra of matrices.	Remember, Understand
	Unit III: Determinants of Matrices.	Remember, Understand, Apply, Evaluate
	Unit IV: Matrices.	Remember, Understand, Apply, Analyze

3rd Semester (Honours)**Paper Name: Sampling Distribution****Code: HC-3016**

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course the students will be able to: <ul style="list-style-type: none"> Understand the concept of sampling distribution, t distribution, F distribution, chi – square distribution 	Unit I: Order Statistics.	Remember, Understand
	Unit II: Sampling Distributions.	Remember, Understand, Apply
	Unit III: Exact Sampling Distribution.	Remember, Understand,

<p>and their properties and applications in real life.</p> <ul style="list-style-type: none"> • .Acquire knowledge on Population, Sample, Parameter, Statistics, Large and small sample, Types of hypothesis and types of errors etc. 		Apply, Evaluate
	Unit IV: Sampling Distribution.	Remember, Understand, Apply, Analyse, Evaluate

**Paper Name: Survey Sampling and Indian Official Statistics.
Code: HC-3026**

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course the students will be able to:</p> <ul style="list-style-type: none"> • Understand Census, Sampling, Execution of sample surveys and error. • Design a questionnaire. • Know the function of CSO NSSO, MOSPI etc. • Use of simple random sampling with and without replacement, stratified random sampling, systematic sampling, cluster sampling etc 	Unit I: Survey Sampling.	Remember, Understand
	Unit II: Stratified Random Sampling.	Remember, Understand,
	Unit III: Ratio and Regression Method of Sampling.	Remember, Analyse
	Unit IV: Official Statistics.	Remember

**Paper Name: Mathematical Analysis
Code: HC-3036**

Course Outcome	Unit/ Topic	Bloom's
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		Taxonomy Level
<p>After the completion of this course the students will be able to:</p> <ul style="list-style-type: none"> • Understand the basic concepts of linear algebra. • Understand series, sequence, divergence and convergence. • Solve various numerical problems by integration and differentiation. 	Unit I: Real Analysis.	Remember, Understand, Apply, Analyse
	Unit II: Infinite Series.	Remember, Understand, Apply, Analyse,
	Unit III: Limits, Continuity and Differentiability.	Remember, Understand, Apply, Analyse, Evaluate
	Unit IV: Numerical Analysis.	Remember, Understand, Apply

4th Semester (Honours)

Paper Name: Statistical Data Analysis Using Software Packages

Paper Code: SE - 3014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course the students will be able to:</p> <ul style="list-style-type: none"> • Acquire knowledge on entering data by using R programming, performing various graphical representation of collected data and analysis of data by using various R packages.. 	Unit I: Graphical Representation.	Remember, Understand, Apply, Analyse
	Unit II: Report Generation.	Remember, Understand, Apply, Analyse,
	Unit III: Fitting Curves.	Remember, Understand, Apply, Analyse, Evaluate
	Unit IV: Analysis	Remember, Understand, Apply

4th Sem (Honours)

Paper Name: Statistical Inference

Code: STA-HC 4016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course the students will be able to: <ul style="list-style-type: none"> Understand Estimation, various methods of Estimation, Test of Significance and SPRT. 	Unit I: Estimation	Remember, Understand, Apply, Analyse
	Unit II Methods of Estimation.	Remember, Understand, Apply, Analyse,
	Unit III: Principles of test of significance	Remember, Understand, Apply, Analyse, Evaluate
	Unit IV: Principles of test of significance	Remember, Understand, Apply

Paper Name: Linear Models

Paper Code: HC- 4026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course the students will be able to: <ul style="list-style-type: none"> Understand Analysis of Variance in one way and two way classified data and prediction of fitted data. Gain knowledge on linear model, Gauss Markov model and regression analysis. 	Unit I: Gauss-Markov Set-up.	Remember, Understand, Apply, Analyse
	Unit II Regression Analysis.	Remember, Understand, Apply, Analyse,
	Unit III: Analysis of Variance.	Remember, Understand, Apply, Analyse, Evaluate
	Unit IV: Model Checking.	Remember, Understand, Apply

Paper Name: Statistical Quality Control

Paper Code: HC - 4036

Course Outcome	Unit/ Topic	Bloom's
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		Taxonomy Level
<p>After the completion of this course the students will be able to:</p> <ul style="list-style-type: none"> • Understand Principle of acceptance sampling plans and six Sigma method. Single and Double sampling plan their OC, AQL, LTPD, AOQ, AOQL, ASN, ATI functions with graphical interpretation. • Understand Statistical Quality Control, Different types of control Charts like X-bar ,R-chart, np-chart and their uses 	Unit I: Statistical Process Control	Remember, Understand, Apply, Analyse
	Unit II Control Charts for Variables.	Remember, Understand, Apply, Analyse,
	Unit III: Acceptance Sampling Plan.	Remember, Understand, Apply, Analyse, Evaluate
	Unit IV Six-Sigma-up.	Remember, Understand, Apply

5th Semester(Honours)

Paper Name: Stochastic Processes and Queuing Theory
Code: STA-HC 5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course the students will be able to:</p> <ul style="list-style-type: none"> • Get an idea about bivariate distributios, stochastic process and stationary process. • Understand Markov Chain, transition probability, stochastic matrix. Have knowledge 	Unit I: Probability Distributions.	Remember, Understand, Apply, Analyse
	Unit II: Markov Chains.	Remember, Understand, Apply, Analyse,
	Unit III:Poisson Process.	Remember, Understand, Apply, Analyse, Evaluate

on queuing theory		
	Unit IV:Queuing System.	Remember, Understand, Apply

Paper Name: Statistical Computing Using C/C++ Programming
Code: STA-HC 5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course the students will be able to: <ul style="list-style-type: none"> • Have basic knowledge of different operators in C programming, loops and Arrays used in C programming. 	Unit I: C Programming.	Understand, Apply, Analyse, Create
	Unit II: Decision making and Arrays.	Understand, Apply, Analyse, Create

Paper Name: Operations Research
Code: STA-HE-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course the students will be able to: <ul style="list-style-type: none"> • Acquire some basic knowledge of Operation Research and its applications. • Apply various optimization techniques in the field of manufacturing, transportation, job assignment and inventory management. 	Unit I: Operations Research	Remember, Understand, Apply, Analyse
	Unit II:Transportation Problem	Remember, Understand, Apply, Analyse,
	Unit III:Game Theory	Remember, Understand, Apply, Analyse, Evaluate
	Unit IV: Inventory Management	Remember, Understand, Apply

Paper Name: Time Series Analysis
Code: STA-HE-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course the students will be able to: <ul style="list-style-type: none"> • Know the meaning and application of Time series • Have knowledge on various forecasting method.. 	Unit I: Introduction to Time Series	Remember, Understand, Apply, Analyse
	Unit II: Introduction to Time Series	Remember, Understand, Apply, Analyse,
	Unit III: Moving average	Remember, Understand, Apply, Analyse, Evaluate
	Unit IV: Forecasting and Smoothing to Time Series	Remember, Understand, Apply

6th Semester (Honours)

Paper Name: Design of Experiments
Code: STA-HC- 6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course the students will be able to: <ul style="list-style-type: none"> • Understand various experimental designs like CRD, RBD, LSD, Split Plot design and BIBD and their applications in analysis of data. • Understand factorial Experiments and their application in various fields 	Unit I: Design of Experiments.	Remember, Understand, Apply, Analyse
	Unit II: Design of Experiments.	Remember, Understand, Apply, Analyse,
	Unit III: Factorial Experiments.	Remember, Understand, Apply, Analyse, Evaluate

Paper Name: Multivariate Analysis and Non Parametric Methods
Code: STA-HC- 6026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course the students will be able to: <ul style="list-style-type: none"> • Understand different types of non parametric tests and their applications. • Understand bivariate and multivariate normal distributions along with their properties and applications 	Unit I: Bivariate and Multivariate Distributions.	Remember, Understand, Apply, Analyse
	Unit II: Multivariate Normal Distributions.	Remember, Understand, Apply, Analyse,
	Unit III: Non-parametric Tests.	Remember, Understand, Apply, Analyse, Evaluate

Paper Name: Demography and Vital Statistics
Code: STA-HE- 6026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course the students will be able to: <ul style="list-style-type: none"> • Understand various fertility rates and mortality rates. • Know the meaning and usage of life table. • Acquire knowledge on various population theories. 	Unit I: Population Theory	Remember, Understand, Apply, Analyse
	Unit II: Measurement of Mortality	Remember, Understand, Apply, Analyse,
	Unit III: Life Table Unit IV: Measurement of Fertility	Remember, Understand, Apply, Analyse, Evaluate

Paper Name: Project Work
STA-HE-6046

Department of Tourism Management

Programme Specific Outcome MTM (Master of Tourism Management (CBCS)

(About the Programme)

Travel and Tourism, in today's context is considered as one of the largest industry and the biggest contributor in the global economic development. It is one of the biggest foreign exchange earners of a country. Besides earning foreign exchange, it is also being recognized as a great source of employment to both skilled, semi-skilled and unskilled labour. Since it is a service industry, it creates employment opportunities for the local population as well. Now-a-days, Tourism has become very instrumental and beneficial for developing countries, where the level of unemployment and underemployment trends seem to be very high. It also helps in achieving an equitable balance between major industrial areas and the rest of the country. Besides economic benefits to a country by way of earning foreign exchange and employment generation tourism also makes a tremendous contribution to the improvement of social, political and their cultural understanding. Travel between different countries helps to minimize the political, social and cultural misconceptions. International contracts have always been the perfect way of spreading ideas about other cultures, bringing of inter-personal and inter cultural cohesion and fraternity. Tourism makes possible to know different political views of different people and helps in bringing people closer to each other, thereby improving the understanding and goodwill between different nations of the world.

“TOURISM” : ITS RELATION TO OTHER SUBJECTS :

The subject of tourism is related to many other subjects, Its relationship is closer to Anthropology, History, Geography, Economics and Management studies and other subject areas. Hence in terms of dissemination of knowledge and creation of knowledge tourism may prove to be instrumental, besides generating employment avenues in different levels. It will also help in the growth of many ancillary trades and services practices, In today's context no educational programme will be successful without having a direct bearing on employment Market, Since we are fast heading towards a knowledge based society, as envisaged by the national planning commission, and since we are bound to diversity our academic programmes in the context of social realities, we think, tourism in the P.G. level is sure to usher in a change in our institution.

ii

“TOURISM” AS A JOB ORIENTED COURSE:

i) **EMPLOYMENT OPPORTUNITIES:**

The Tourism industry comprised of mainly four distinctive sectors.

1. Transportation
2. Accommodation
3. Travel Agency & Tour Operator
4. Govt. Sector.

1. **Transportation**: In the transportation sectors mainly in the different airlines of the world, a Tourism Graduate or post Graduate can engage themselves/herself in the ticketing department (both domestic and international) in their Main Office or in the Branch Office which are scattered in different parts of India as well as across the Globe.

In the Indian Railways there are lot of job opportunities for the Tourism Graduate or post Graduate since the department is recently giving more priority for the promotion of Tourism by introducing different Tourist Trains.

2. **Accommodation**: In the accommodation sector that is in the hotels and other establishments, such as, Mountain Resorts, Beach Resorts etc. where a Travel Department exists in which a Tourism Graduate and post Graduate can engage himself as Tour Manager and Tour In charge.

3. **Travel Agency and Tour Operators**: In this sector there are lot of employment opportunities for the Tourism Graduate, and post Graduate and Professionals.

A Travel Agency usually have different departments like Marketing and Sales, Finance and Accounting, International Counter, Domestic Travel, Documentation, Planning and Costing etc. where Tourism Graduate, post Graduate and Professionals can be a major workforce for the Travel Agency.

Since many Travel Agencies and Tour Operators require “Tourist Guide”, who can give all the detail information about a place or destination, where a Tourism Graduate, post Graduate can become very effective.

4. **Govt. Sector:** In govt. sector a Graduate or post Graduate and tourism professional can work as tourist information officer and tourist officer in state/central tourism department and development corporation in the state, outside the state and abroad.

ii) **Self-Employment:**

In case of self-employment, there are lots of scope for a Tourism Graduate and post Graduate. They can engage themselves in establishing their own Travel Agency or can work as a local Tour Operator. They can also establish some Hotel or Resort in the important Tourist destination, since during their course curriculum, they will be provided with all the information and requirements for the establishment of Travel Agency and their working activities and also for setting up of a Hotel or Resort and the Marketing parts of it.

Government Assistance for Tourism Post Graduate in case of Self-Employment :

The Department of Tourism (Govt. of India/Assam) gives various kinds of assistance in the form of information and finance to the Tourism Post Graduate and Tourism Professionals if they want to be self-sufficient in the field of Tourism in matters of establishment of Travel Agency, Hotels etc.

COURSE OUTCOME

Baster of Tourism Management

I Semester

Paper Name: Fundamentals of Tourism

Paper Code: 101

Course Outcome	Unit/Topic	Blooms Taxonomy Level
To acquaint the students with the basic terms and terminologies and the fundamentals of tourism.	Unit1: Definition and concept	Remember, Understand
	Unit 2: Motivation	Remember, Understand
	Unit3: Understanding Tourism Resources	Remember, Understand
	Unit 4: Significance of Tourism	Remember, Understand

Paper Name: Tourism Policy Planning and Development**Paper Code: 102**

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The course will give a thorough idea of the steps in planning process involved in tourism and the various forms of tourism along with the plans and policies of the government.	Unit1: Tourism Policy	Remember, Understand
	Unit 2: Tourism and Development Planning	Remember, Understand
	Unit3: Planning Approach of Tourism	Remember, Understand
	Unit 4: Planning of Tourist Resort	Remember, Understand

Paper Name: Physical and Cultural Resources of Tourism of NE India**Paper Code: 103**

Course Outcome	Unit/Topic	Blooms Taxonomy Level
To provide an insight into the various natural, cultural and man-made tourism resources of Assam and North east India.	Unit1: Tourism Resources of Assam	Remember, Understand
	Unit 2: Natural Resources of NE	Remember, Understand
	Unit3: Cultural resources of NE	Remember, Understand
	Unit 4: Role of State Tourism Departments	Remember, Understand

Paper Name: Natural and Wildlife Tourist Resources of India**Paper Code: 104**

Course Outcome	Unit/Topic	Blooms Taxonomy Level
To provide an insight into the various natural and wildlife tourism resources of India along with thorough study of the beaches, deserts, islands	Unit1: Natural Tourist Resources	Remember, Understand
	Unit 2: Adventure Sports and Desserts	Remember, Understand

and adventure related tourism related activities.	Unit3: Beach Tourism	Remember, Understand
	Unit 4: Wild Life Tourism	Remember, Understand

Paper Name: Environmental and Ecological Basis of Tourism

Paper Code: 105

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The students will understand the environment and their relationship with tourism. It also helps the students to get knowledge on the ecological balance and carrying capacity of tourist destination.	Unit1: Environment and Ecology	Remember, Understand
	Unit 2: Tourism and Environment	Remember, Understand
	Unit3: Environment Impact on Tourism	Remember, Understand
	Unit 4: Carrying Capacity	Remember, Understand

Paper Name: Transport and Tourism

Paper Code: 106

Course Outcome	Unit/Topic	Blooms Taxonomy Level
To provide basic knowledge about the transport network i.e. Railways, Waterways, Airways and Roadways in the development of tourism industry.	Unit1: Rail Transport	Remember, Understand
	Unit 2: Air Transport	Remember, Understand
	Unit3: Water Transport	Remember, Understand
	Unit 4: Road Transport	Remember, Understand

Paper Name: Computer Application in Tourism and Project Work

Paper Code: 107

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It imparts knowledge on the basics of computer and finally its application in tourism. Besides the project work gives the students a thorough knowledge on the use of computer in preparing tourist itinerary.	Unit1: Computer Fundamentals	Analyze, Understand
	Unit 2: Binary Arithmetic	Analyze, Understand
	Unit3: Operating System	Analyze, Understand
	Unit 4: Microsoft Word	Analyze, Understand
	Unit 5: Microsoft Excel	Analyze, Understand
	Unit 6: Microsoft Power Point	Analyze, Understand
	Unit 7: Project work	Create, Apply

Paper Name: Study of Map and its application in Tourism

Paper Code: 108

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The students will get a basic understanding of latitudes and longitudes and its implementation in the practical field. Further the study of GIS and GPS and spatial analysis will be an added advantage for the preparation of Map designing.	Unit1: Knowledge and Drawing of Latitude and Longitude	Apply
	Unit 2: Scale of Map	Apply
	Unit3: Plan Table Survey	Apply
	Unit 4: Topographical Map	Apply
	Unit 5: GIS and GPS	Apply

2nd Semester

Paper Name: Tourism Management

Paper Code: 201

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It will give a basic understanding of the fundamentals of management and its functions in tourism. In addition it also provides knowledge on the intergovernmental, national and international tourism organizations.	Unit1: Management Concept	Remember, Understand
	Unit 2: Management Function in Tourism	Remember, Understand
	Unit3: Staffing and Directing	Remember, Understand
	Unit 4: Coordinating and Controlling	Remember, Understand

Paper Name: Functional Language

Paper Code: 202

(A) English

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The course enables the students to learn English in the context of phonetics which allows them to speak the language in a fluent way.	Unit1: Areas Difficulty	Apply, Understand
	Unit 2: Function	Apply, Understand
	Unit3: Situation Conversations	Apply, Understand
	Unit 4: Non Verbal Communication	Apply, Understand

(B) Russian

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The inclusion of Russian also prepares them to communicate and escort the Russian tourist.	Unit1: Introduction to Russian Language	Apply, Understand
	Unit 2: Application in Tourism	Apply, Understand

	Unit3: Simple Grammar	Apply, Understand
	Unit 4: Translation	Apply, Understand

Paper Name: Travel Agency, Tour Operation and Ticketing

Paper Code: 203

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It gives a further insight into the travel related organizations, their significance and their functions. Along with it also enables the students to learn about the various travel formalities and tour package designing.	Unit1: Travel Agency	Remember, Understand
	Unit 2: Tour Package	Remember, Understand
	Unit3: Ticketing	Remember, Understand
	Unit 4: Travel Agency Business	Remember, Understand

Paper Name: Introduction to Marketing

Paper Code: 204

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It provides the concept and the application of marketing in the tourism industry.	Unit1: Introduction	Remember, Understand
	Unit 2: Marketing Mix for Tourism	Remember, Understand
	Unit3: Distribution System	Remember, Understand
	Unit 4: Tourist Destination	Remember, Understand

Paper Name: Tourism Entrepreneurship

Paper Code: 205

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It gives the idea to develop	Unit1: Introduction	Remember, Understand

new venture of their own. It also helps to promote new ideas for motivating entrepreneurs.	Unit 2: Contributing Factors of Entrepreneurship	Remember, Understand
	Unit3: Motivation, Project Formulation	Remember, Understand
	Unit 4: Role of Entrepreneurship	Remember, Understand

Paper Name: Survey and Mapping of National Park, Sanctuary, Project

Paper Code: 206

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It will help to work on the mapping of different National Parks and Wild Life Sanctuaries.	Unit1: Survey and Mapping of National Park	Apply
	Unit 2: Survey and Mapping of Wild Life Sanctuary	Apply
	Unit3: Wild Life Project in India	Apply
	Unit 4: Preparation of Map of India	Apply

Paper Name: Survey and Mapping of Tourist Spots of N.E. India and CRS

Paper Code: 207

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It will help to work on the mapping of different tourist spots of North East India to understand the place in a better way and also to learn CRS.	Unit1: Mapping of Transport Network	Apply
	Unit 2: Survey of Natural Tourist Spots	Apply
	Unit3: Survey of Cultural and Religious Tourist Spots	Apply
	Unit 4: CRS	Apply

Paper Name: Disserttion/Field Study Report and On Job Training

Paper Code: 208

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The students will prepare a report on field trip to understand the area in a better way and will also do an on job training in both government and private sector and prepare a report to gather knowledge of their activities.	Dissertation	Apply
	On Job Training of 1 Month after Semester II	Apply

3rd Semester

Paper Name: Tourism: A Spatial Perspective

Paper Code: 301

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It will give an overview of the world environment and political structure with population density and distribution. Further it also studies about the different countries and their tourist destinations.	Unit1: Biological Regions of the World	Remember, Understand
	Unit 2: Political Structure of the World	Remember, Understand
	Unit3: Population Patterns of the World	Remember, Understand
	Unit 4: Study of important Natural, Cultural and Historical Tourist Spots of the World	Remember, Understand

Paper Name: Tourism and Information Technology

Paper Code: 302

Course Outcome	Unit/Topic	Blooms Taxonomy Level
To provide information on IT and its relation in tourism, global distribution systems, internet, GIS, GPS etc. further it will also study about IT in Hotel, Airline, Travel Agency etc.	Unit1: Information Technology	Remember, Understand
	Unit 2: Application of Information Technology in Tourism	Remember, Understand
	Unit3: Information Technology and Tourist Destination	Remember, Understand
	Unit 4: Role of GIS and GPS	Remember, Understand and Apply

Paper Name: Reverine, Recreation and Tourism

Paper Code: 303

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The paper is a major source of information of The main river streams of Assam along with its tourism perspectives and also the role of Government and Private sector's role in this regard. It will also help in further to study about the water based tourism resources like angling, rafting, boating, surfing etc.	Unit1: Study of Major River System in Assam	Remember, Understand
	Unit 2: Rivers and its Tourism Potentiality	Remember, Understand
	Unit3: Role of Assam Govt./Pvt, Sector	Remember, Understand
	Unit 4: Economic Importance of Tourism	Remember, Understand

Paper Name: Tourism Law and Ethics

Paper Code: 304

Course Outcome	Unit/Topic	Blooms Taxonomy Level
To understand the law related	Unit1: Tourism Business	Remember, Understand

to the preservation of the different tourist spots as well as tourism resources of India.	Unit 2: Tourism Legislation	Remember, Understand
	Unit3: Law relating to Wildlife Preservation	Remember, Understand
	Unit 4: Law relating to Cultural Heritage, Antiquities and Art Treasures Preservation	Remember, Understand

Paper Name: Tourism and Hospitality Management

Paper Code: 305

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It will give a detailed study about the hotel industry along with its emergence and need in tourism sector.	Unit1: Accommodation	Remember, Understand
	Unit 2: Supplementary Tourist Accommodation	Remember, Understand
	Unit3: Marketing Strategies	Remember, Understand
	Unit 4: Role of National/Assam Govt.	Remember, Understand

Paper Name: Foreign Exchange, Meeting and Event Management

Paper Code: 306

Course Outcome	Unit/Topic	Blooms Taxonomy Level
Foreign Exchange being an integral part of tourism, this paper studies about its implementation in this field. Further it also studies about the meeting and event organized in this sector.	Unit1: Meetings	Remember, Understand
	Unit 2: Foreign Exchange	Remember, Understand
	Unit3: Exchange Control	Remember, Understand
	Unit 4: International Financial Institutions	Remember, Understand

Paper Name: Foreign Exchange, Meeting and Event Management**Paper Code: 307**

Course Outcome	Unit/Topic	Blooms Taxonomy Level
As international tourism plays an important role, this paper will give a knowledge about different tourist spots of various countries which are playing an important role in this sector.	Mapping of Tourism Potentiality and Analysis of the Countries USA, UK, Japan, Australia, Thailand, Malaysia, Singapore, Hongkong, Switzerland, France	Apply

Paper Name: Dissertation/Field Study Report**Paper Code: 308**

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It will help students to know a place in a better way by visiting the place. It also makes them understand to find out the problems associated with the place so that further they can put some suggestions to the authorities and the local bodies in this regard.	Mapping of Tourism Potentiality and Analysis of the Countries USA, UK, Japan, Australia, Thailand, Malaysia, Singapore, Hongkong, Switzerland, France	Apply

4th Semester**Paper Name: Foreign Exchange, Meeting and Event Management****Paper Code: 401**

Course Outcome	Unit/Topic	Blooms Taxonomy Level
	Unit1: Financial Management	Remember, Understand

It gives a knowledge on the basics of financial management, cost determination and budgeting and its relation with the tourism industry	Unit 2: Accounting for Management	Remember, Understand
	Unit3: Cost determination system	Remember, Understand
	Unit 4: Budgeting and control	Remember, Understand

Paper Name: Human Resource Management in Tourism

Paper Code: 402

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The course enables the students to understand the concept and nature of Human Resource Management and its role in the tourism industry.	Unit1: Human Resource Management	Remember, Understand
	Unit 2: Human Resurce Planning	Remember, Understand
	Unit3: Selection Process and Devices	Remember, Understand
	Unit 4: Role of Human Resource Management	Remember, Understand

Paper Name: Functional Language

Paper Code: 403

A Hindi

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The course enables the students to learn Hindi which makes them to speak the language in a fluent way.	Unit1: Introduction to Hindi	Remember, Understand
	Unit 2: Application in tourism industry	Remember, Understand
	Unit3: Simple Grammar	Remember, Understand
	Unit 4: Translation	Remember, Understand

B French

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The course enables the students to learn French which makes them to speak the language in a fluent way.	Unit1: Introduction to French	Remember, Understand
	Unit 2: Application in tourism industry	Remember, Understand
	Unit3: Simple Grammar	Remember, Understand
	Unit 4: Translation	Remember, Understand

Paper Name: Cultural and historical monument as tourist attraction

Paper Code : 404

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It gives an elementary knowledge of Indian history, historical tourism resources , archaeological sites and the cultural tourism resources of India.	Unit1: Elementary knowledge of Indian History	Remember, Understand
	Unit 2: Historical tourism resources of India	Remember, Understand
	Unit3: Important archaeological sites	Remember, Understand
	Unit 4: Cultural Tourism Resources	Remember, Understand

Paper Name: Organisational Behaviour in Tourism

Paper Code: 405

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The course teaches organisational behaviour, the various theories of motivation group behaviour, organisatioal culture and organizational change and its significance in tourism.	Unit1: Organisation Behaviour	Remember, Understand
	Unit 2: Motivation	Remember, Understand
	Unit3: Group Behaviour	Remember, Understand
	Unit 4: Organisational Culture	Remember, Understand

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Paper Name: Tourism Organisation

Paper Code: 406

Course Outcome	Unit/Topic	Blooms Taxonomy Level
It will help students to know about the tourist organization of India, Ministry of Civil Aviation, Travel Organisation and International Tourism Organisation and their functions.	Unit1: Tourist Organisation in India	Remember, Understand
	Unit 2: Ministry of Civil Aviation	Remember, Understand
	Unit3: Travel Organisation	Remember, Understand
	Unit 4: International Tourism Organisation	Remember, Understand

Paper Name: Survey and Preparation of Analytical Reports on Fairs and Festivals

Paper Code: 407

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The students will prepare an analytical report on Fairs and Festivals of India with detail survey.	Unit1: Bihu , Durga Puja, Moharam , Kherai , Dol Jatra, Christmas, Id, Lohri, Dewali, Chamangkon	Understand, Apply

Paper Name: Dissertation (Application of Research Methodology in studying the Historical monuments, Cultural Events, Festivals and National Parks and Sanctuary as a means of Tourism Development).

Paper Code: 408

Course Outcome	Unit/Topic	Blooms Taxonomy Level
The students will prepare an analytical report on Fairs and Festivals of India with detail survey.	Unit1: Bihu , Durga Puja, Moharam , Kherai , Dol Jatra, Christmas, Id, Lohri, Dewali, Chamangkon	Understand, Apply

Department of Zoology

Programme Specific Outcome (B.Sc in Zoology) (CBCS)

The Department has clearly stated learning outcomes of the Programs and Courses by the following mechanism and is followed by the department to communicate the learning outcomes to the teachers and students.

- The Department of Zoology, Pragjyotish College maintain a hard copy of syllabi for ready reference to the teachers and students
- The students are also made aware of the same through Meetings.

After completion of the programme students will be able to -

- PSO1: Identify and list out animals in and around our environment. Develop respect for nature , explain the role and impact of different environmental conservation programmes and develop skills to analyze the impact of environment
- PSO2 : Understand various genetic abnormalities, identify animals beneficial to humans and explain various physiological changes in our bodies
- PSO3: Develop scientific attitude and temperament among the students, which will be beneficial for the society
- PSO4: Equip themselves to learn and know about different biological systems, their coordination and control as well as evolution, behavior and biological roles of the animals in the ecosystem.
- PSO5: Acquire skills in diagnostic testing procedures used in clinical and research laboratories will provide them scopes to work in research laboratory.
- PSO6 : Develop cognitive ability to Use tools of information technology for all activities related to higher studies.
- PSO9: Enhance collaborative learning and communication skills through practical sessions, team work, group discussions, assignments and projects.

COURSE OUTCOME

B.Sc. in Zoology (Honours) Syllabus (CBCS)

I Semester

Paper Name: Non-chordates I: Protista to Pseudocoelomates

Paper Code: ZOO-HC-1016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Learn about the importance of systematics, taxonomy and structural organization of animals. ➤ Understand the diversity of non-chordates living in varied habit and habitats. ➤ Understand evolutionary history and relationships of different non-chordates through functional and structural affinities. ➤ Critically analyse the organization, complexity and characteristic features of non-chordates making them familiarize with the morphology and anatomy of representatives of various animal phyla. ➤ Comprehend the economic importance of non-chordates, their interaction with the environment and role in the ecosystem. ➤ Enhance collaborative learning and communication skills through practical sessions, team work, group discussions, assignments 	<p>Unit 1: Protista, Parazoa and Metazoa</p> <ul style="list-style-type: none"> ➤ General characteristics and Classification up to classes ➤ Study of Euglena, Amoeba and Paramecium Life cycle and pathogenicity of Plasmodium vivax and Entamoeba histolytica ➤ Locomotion and Reproduction in Protista ➤ Evolution of symmetry and segmentation of Metazoa <p>Unit 2: Porifera</p> <ul style="list-style-type: none"> ➤ General characteristics ➤ Classification up to classes ➤ Canal system and spicules in sponges <p>Unit 3: Cnidaria</p> <ul style="list-style-type: none"> ➤ General characteristics ➤ Classification up to classes ➤ Metagenesis in Obelia ➤ Polymorphism in Cnidaria ➤ Corals and coral reefs <p>Unit 4: Ctenophora</p> <ul style="list-style-type: none"> ➤ General characteristics and Evolutionary significance <p>Unit 5: Platyhelminthes</p> <ul style="list-style-type: none"> ➤ General characteristics and Classification up to classes ➤ Life cycle and pathogenicity of Fasciola hepatica and Taenia solium 	<p>Remember, Understand, Apply, Analyse, Evaluate , Create</p>

<p>and projects.</p>	<p>Unit 6: Nematelminthes</p> <ul style="list-style-type: none"> ➤ General characteristics and Classification up to classes ➤ Life cycle, and pathogenicity of <i>Ascaris lumbricoides</i> and <i>Wuchereria bancrofti</i> ➤ Parasitic adaptations in helminthes 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Study of whole mount of <i>Euglena</i>, <i>Amoeba</i> and <i>Paramecium</i>, Binary fission and Conjugation in <i>Paramecium</i> ➤ Examination of pond water collected from different places for diversity in protista ➤ Study of <i>Sycon</i> (T.S. and L.S.), <i>Hyalonema</i>, <i>Euplectella</i>, <i>Spongilla</i> ➤ Study of <i>Obelia</i>, <i>Physalia</i>, <i>Millepora</i>, <i>Aurelia</i>, <i>Tubipora</i>, <i>Corallium</i>, <i>Alcyonium</i>, <i>Gorgonia</i>, <i>Metridium</i>, <i>Pennatula</i>, <i>Fungia</i>, <i>Meandrina</i>, <i>Madrepora</i> ➤ One specimen/slide of any ctenophore ➤ Study of adult <i>Fasciola hepatica</i>, <i>Taenia solium</i> and their life cycles (Slides/micro- photographs) ➤ Study of adult <i>Ascaris lumbricoides</i> and its life stages (Slides/micro- photographs) ➤ To submit a Project Report on any related topic on life cycles. 	

Paper Name: Principles of Ecology

Paper Code: ZOO-HC-1026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Understand the community characteristics, ecosystem development and climax theories. ➤ Know about the types of ecosystems, food chains, food webs, energy models, and ecological efficiencies. ➤ Apply the basic principles of ecology in wildlife conservation and management ➤ Demonstrate an understanding of key concepts in ecology with emphasis on historical perspective, role of physical factors and concept of limiting factors. ➤ Comprehend the population characteristics, dynamics, growth models and interactions. ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p>Unit 1: Introduction to Ecology</p> <ul style="list-style-type: none"> ➤ History of ecology, Autecology and synecology ➤ Levels of organization, Laws of limiting factors, ➤ Study of physical factors 	<p>Remember, Understand, Apply, Analyse, Create</p>
	<p>Unit 2: Population</p> <ul style="list-style-type: none"> ➤ Unitary and Modular populations ➤ Unique and group attributes of population: Density, natality, mortality, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion ➤ Exponential and logistic growth, equation and patterns, r and K strategies ➤ Population regulation - density-dependent and independent factors ➤ Population interactions, Gause's Principle with laboratory and field examples, ➤ Lotka-Volterra equation for competition and Predation, functional and numerical responses 	
	<p>Unit 3: Community</p> <ul style="list-style-type: none"> ➤ Community characteristics: species richness, dominance, diversity, abundance, vertical stratification, Ecotone and edge effect; Ecological succession with one example ➤ Theories pertaining to climax community 	
	<p>Unit 4: Ecosystem</p> <ul style="list-style-type: none"> ➤ Types of ecosystems with 	

	<p>one example in detail, Food chain: Detritus and grazing food chains, Linear and Y-shaped food chains, Food web, Energy flow through the ecosystem, Ecological pyramids and Ecological efficiencies</p> <ul style="list-style-type: none"> ➤ Nutrient and biogeochemical cycle with one example of Nitrogen cycle ➤ Human modified ecosystem 	
	<p>Unit 5: Applied Ecology</p> <ul style="list-style-type: none"> ➤ Ecology in Wildlife Conservation and Management 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Study of life tables and plotting of survivorship curves of different types from the hypothetical/real data provided ➤ Determination of population density in a natural/hypothetical community by quadrat method and calculation of Shannon-Weiner diversity index for the same community ➤ Study of an aquatic ecosystem: Phytoplankton and Zooplankton, Measurement of area, temperature, turbidity/penetration of light, determination of pH, and Dissolved Oxygen content (Winkler's method). ➤ Report on a visit to National Park/Biodiversity Park/Wild life sanctuary 	

2nd Semester (Honours)

Paper Name: Non Chordates- II: Coelomate

Paper Code: ZOO-HC-2016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Learn about the importance of systematics, taxonomy and structural organization of animals. ➤ Appreciate the diversity of non-chordates living in diverse habit and habitats. ➤ Understand evolutionary history and relationships of different non-chordates through functional and structural affinities. ➤ Critically think about the organization, complexity and characteristic features of non-chordates. ➤ Getting familiarized with the morphology and anatomy of representatives of various animal phyla. ➤ Comprehend the economic importance of non-chordates, their interaction with the environment and role in the ecosystem. ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p>Unit 1: Introduction to Coelomates</p> <ul style="list-style-type: none"> ➤ Evolution of coelom and metamerism 	<p>Remember, Understand, Apply, Analyse, Create</p>
	<p>Unit 2: Annelida</p> <ul style="list-style-type: none"> ➤ General characteristics and Classification up to classes ➤ Excretion in Annelida 	
	<p>Unit 3: Arthropoda</p> <ul style="list-style-type: none"> ➤ General characteristics and Classification up to classes ➤ Vision and Respiration in Arthropoda ➤ Metamorphosis in Insects ➤ Social life in bees and termites 	
	<p>Unit 4: Onychophora</p> <ul style="list-style-type: none"> ➤ General characteristics and Evolutionary significance 	
	<p>Unit 5: Mollusca</p> <ul style="list-style-type: none"> ➤ General characteristics and Classification up to classes ➤ Respiration in Mollusca ➤ Torsion and detorsion in Gastropoda ➤ Pearl formation in bivalves ➤ Evolutionary significance of trochophore larva 	
	<p>Unit 6: Echinodermata</p> <ul style="list-style-type: none"> ➤ General characteristics and Classification up to classes ➤ Water-vascular system in Asteroidea ➤ Larval forms in Echinodermata 	

	<p>➤ Affinities with Chordates</p> <p>Practical</p> <p>➤ Study of following specimens:</p> <p>➤ Annelids- <i>Aphrodite</i>, <i>Nereis</i>, <i>Heteronereis</i>, <i>Sabella</i>, <i>Serpula</i>, <i>Chaetopterus</i>, <i>Pheretima</i>, <i>Hirudinaria</i></p> <p>➤ Arthropods - <i>Limulus</i>, <i>Palamnaeus</i>, <i>Palaemon</i>, <i>Daphnia</i>, <i>Balanus</i>, <i>Sacculina</i>, <i>Cancer</i>, <i>Eupagurus</i>, <i>Scolopendra</i>, <i>Julus</i>, <i>Bombyx</i>, <i>Periplaneta</i>, termites and honey bees Onychophora - <i>Peripatus</i></p> <p>➤ Molluscs - <i>Chiton</i>, <i>Dentalium</i>, <i>Pila</i>, <i>Doris</i>, <i>Helix</i>, <i>Unio</i>, <i>Ostrea</i>, <i>Pinctada</i>, <i>Sepia</i>, <i>Octopus</i>, <i>Nautilus</i></p> <p>➤ Echinodermates - <i>Pentaceros/Asterias</i>, <i>Ophiura</i>, <i>Clypeaster</i>, <i>Echinus</i>, <i>Cucumaria</i> and <i>Antedon</i></p> <p>➤ Study of digestive system, septal nephridia and pharyngeal nephridia of earthworm</p> <p>➤ T.S. through pharynx, gizzard, and typhlosolar intestine of earthworm</p> <p>➤ Mount of mouth parts and dissection of digestive system and nervous system of</p> <p>➤ <i>Periplaneta</i>*</p> <p>➤ To submit a Project Report on any related topic to larval forms (crustacean, mollusc and echinoderm)</p>	
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Paper Name: Cell Biology

Paper Code: ZOO-HC-2026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Understand fundamental principles of cell biology. ➤ Understand defects in functioning of cell organelles and regulation of cellular processes can develop into diseases. ➤ Explain structure and functions of cell organelles involved in diverse cellular processes. ➤ Appreciate how cells grow, divide, survive, die and regulate these important processes. ➤ Comprehend the process of cell signalling and its role in cellular functions. ➤ Learn the advances made in the field of cell biology and their applications. ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p>Unit 1: Over view of Cells</p> <ul style="list-style-type: none"> ➤ Prokaryotic and Eukaryotic cells, Virus, Viroids, Mycoplasma, Prions 	<p>Remember, Understand, Apply, Analyse, Create</p>
	<p>Unit 2: Plasma Membrane</p> <ul style="list-style-type: none"> ➤ Various models of plasma membrane structure ➤ Transport across membranes: Active and Passive transport, Facilitated transport ➤ Cell junctions: Tight junctions, Desmosomes, Gap junctions 	
	<p>Unit 3: Endomembrane System</p> <ul style="list-style-type: none"> ➤ Structure and Functions: Endoplasmic Reticulum, Golgi Apparatus, Lysosomes 	
	<p>Unit 4: Mitochondria and Peroxisomes</p> <ul style="list-style-type: none"> ➤ Mitochondria: Structure, Semi- autonomous nature ➤ Endosymbiotic hypothesis ➤ Mitochondrial Respiratory Chain ➤ Chemi-osmotic hypothesis ➤ Peroxisomes 	
	<p>Unit 5: Cytoskeleton</p> <ul style="list-style-type: none"> ➤ Structure and Functions: Microtubules ➤ Microfilaments and 	

	<p style="text-align: center;">Intermediate filaments</p> <p>Unit6: Nucleus ➤ Structure of Nucleus: Nuclear envelope, Nuclear pore complex ➤ Nucleolus Chromatin: Euchromatin and Hetrochromatin and packaging(nucleosome)</p> <p>Unit 7: Cell Division ➤ Mitosis, Meiosis, Cell cycle and its regulation</p> <p>Unit 8: Cell Signaling ➤ GPCR and Role of second messenger (cAMP)</p> <p>Practical</p> <ul style="list-style-type: none"> ➤ Preparation of temporary stained squash of onion root tip to study various stages of mitosis ➤ Study of various stages of meiosis. ➤ Preparation of permanent slide to show the presence of Barrbody in human female blood cells/cheek cells. ➤ Preparation of permanent slide to demonstrate: iDNA by Feulgen reaction ➤ Mucopolysaccharides by PAS reaction ➤ Proteins by Mercurio bromophenol blue/FastGreen 	
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3rd Semester (Honours)

Paper Name: Diversity of Chordata

Paper Code: ZOO-HC-3016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Understand different classes of chordates, level of organization and evolutionary relationship between different subphyla and classes, within and outside the phylum. ➤ Know about the habit and habitat of chordates in marine, freshwater and terrestrial ecosystems ➤ Study about diversity in animals making students understand about their distinguishing features. ➤ Contrast the similarities and differences in life functions among various groups of animals in Phylum Chordata. ➤ Comprehend the circulatory, nervous and skeletal system of chordates. ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p style="text-align: center;">Unit 1: Introduction to Chordates</p> <ul style="list-style-type: none"> ➤ General characteristics and outline classification 	<p>Remember, Understand, Apply, Analyse</p>
	<p style="text-align: center;">Unit2: Protochordata</p> <ul style="list-style-type: none"> ➤ General characteristics of Hemichordata, Urochordata and Cephalochordata ➤ Study of larval forms in protochordates; ➤ Retrogressive metamorphosis in Urochordata 	
	<p style="text-align: center;">Unit 3: Origin of Chordata</p> <ul style="list-style-type: none"> ➤ Dipleurula concept and the Echinoderm theory of origin of chordates ➤ Advanced features of vertebrates over Protochordata 	
	<p style="text-align: center;">Unit4: Agnatha</p> <ul style="list-style-type: none"> ➤ General characteristics and classification of cyclostomes up to class 	
	<p style="text-align: center;">Unit5: Pisces</p> <ul style="list-style-type: none"> ➤ General characteristics of Chondrichthyes and Osteichthyes, ➤ Classification up to order ➤ Migration, Osmoregulation and Parental care in fishes 	
	<p style="text-align: center;">Unit6: Amphibia</p> <ul style="list-style-type: none"> ➤ Origin of <i>Tetrapoda</i> (Evolution of terrestrial ectotherms); ➤ General characteristics and classification up to order ➤ Parental care in Amphibians 	
	<p style="text-align: center;">Unit7: Reptilia</p> <ul style="list-style-type: none"> ➤ General characteristics and 	

	<p>classification up to order</p> <ul style="list-style-type: none"> ➤ Affinities of <i>Sphenodon</i> ➤ Poison apparatus and Biting mechanism in snakes 	
	<p>Unit8: Aves</p> <ul style="list-style-type: none"> ➤ General characteristics and classification up to order ➤ <i>Archaeopteryx</i>-- a connecting link; ➤ Principles and aerodynamics of flight, ➤ Flight adaptations and Migration in birds 	
	<p>Unit9: Mammals</p> <ul style="list-style-type: none"> ➤ General characters and classification up to order ➤ Affinities of Prototheria ➤ Adaptive radiation with reference to locomotory appendages 	
	<p>Unit10: Zoogeography</p> <ul style="list-style-type: none"> ➤ Zoo geographical realms, ➤ Theories pertaining to distribution of animals, ➤ Plate tectonic and Continental drift theory, ➤ Distribution of vertebrates in different realms 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Protochordata: <i>Balanoglossus, Herdmania, Branchiostoma</i>, Colonial Urochordata Sections of <i>Balanoglossus</i> through proboscis and branchio genital regions, Sections of <i>Amphioxus</i> through pharyngeal, intestinal and caudal regions. Permanent slide of <i>Herdmania</i> spicules ➤ Agnatha: <i>Petromyzon, Myxine</i> ➤ Fishes: <i>Scoliodon, Sphyrna, Pristis, Torpedo, Chimaera, Mystus, Heteropneustes, Labeo, Exocoetus, Echeneis, Anguilla, Hippocampus, Tetradon/ Diodon, Anabas</i>, Flat fish ➤ Amphibia: <i>Ichthyophis/Ureotyphlus, Necturus, Bufo, Hyla, Alytes, Salamandra</i> ➤ Reptilia: <i>Chelone, Trionyx, Hemidactylus, Varanus, Uromastix, Chamaeleon, Ophiosaurus, Draco, Bungarus, Vipera, Naja, Hydrophis, Zamenis, Crocodylus</i>. Key for 	

	<p>Identification of poisonous and non-poisonous snakes</p> <ul style="list-style-type: none"> ➤ Aves: Study of six common birds from different orders. Types of beaks and claws ➤ Mammalia: <i>Sorex</i>, Bat (Insectivorous and Frugivorous), <i>Funambulus</i>, <i>Loris</i>, <i>Herpestes</i>, <i>Erinaceous</i>. ➤ Mount of weberian ossicles of <i>fish</i> ➤ Power point presentation on study of any two animals from two different classes by students (may be included if dissections not given permission) 	
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Paper Name: Animal Physiology: Controlling And Coordinating Systems

Paper Code: ZOO-HC-3026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Know the basic fundamentals and understand advanced concepts so as to develop a strong foundation that will help them to acquire skills and knowledge to pursue advanced degree courses. ➤ Know the role of regulatory systems viz. endocrine and nervous systems and their amalgamation in maintaining various physiological processes. ➤ Recognize and explain how all physiological systems work in unison to maintain homeostasis in the body and use of feedback loops to control 	<p>Unit 1: Tissues</p> <ul style="list-style-type: none"> ➤ Structure, location, classification and functions of epithelial tissue, connective tissue, muscular tissue and nervous tissue 	<p>Remember , Understand, Apply, Analyse</p>
	<p>Unit 2: Bone and Cartilage</p> <ul style="list-style-type: none"> ➤ Structure and types of bones and cartilages, Ossification, bone growth and resorption 	
	<p>Unit 3: Nervous System</p> <ul style="list-style-type: none"> ➤ Structure of neuron, resting membrane potential, ➤ Origin of action potential and its propagation across the myelinated and 	

<p>the same</p> <ul style="list-style-type: none"> ➤ Learn an integrative approach to understand the interactions of various organ systems resulting in the complex overall functioning of the body. Synthesize ideas to make connection between knowledge of physiology and real world situations, including healthy life style decisions and homeostatic imbalances ➤ Comprehend and analyze problem-based questions ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p>unmyelinated nerve fibers;</p> <ul style="list-style-type: none"> ➤ Types of synapse, Synaptic transmission and, Neuromuscular junction; ➤ Reflex action and its types - reflex arc; ➤ Physiology of hearing and vision. 	
	<p>Unit 4: Muscle</p> <ul style="list-style-type: none"> ➤ Histology of different types of muscle; ➤ Ultra structure of skeletal muscle; ➤ Molecular and chemical basis of muscle contraction ➤ Characteristics of muscle twitch; Motor unit, summation and tetanus 	
	<p>Unit 5: Reproductive System</p> <ul style="list-style-type: none"> ➤ Histology of testis and ovary ➤ Physiology of male and female reproduction; ➤ Puberty, Methods of contraception in male and female 	
	<p>Unit 6: Endocrine System</p> <ul style="list-style-type: none"> ➤ Histology of endocrine glands- pineal, ➤ Hormones secreted by them and their mechanism of action ➤ Classification of hormones; Regulation of their secretion; ➤ Mode of hormone action, ➤ Signal transduction pathways for steroidal and non-steroidal hormones; ➤ Hypothalamus (neuroendocrine gland)- principal nuclei involved in neuro endocrine control of anterior pituitary and 	

	<p>endocrines system; ➤ Placental hormones</p>	
	<p>Practical</p> <p>➤ Demonstration of the unconditioned reflex action (Deep tendon reflex such as kneejerk reflex)</p> <p>➤ Preparation of temporary mounts: Squamous epithelium, Striated muscle fibres and nerve cells</p> <p>➤ Study of permanent slides of Mammalian skin, Cartilage, Bone, Spinal cord, Nerve cell, Pituitary, Pancreas, Testis, Ovary, Adrenal, Thyroid and Parathyroid</p> <p>➤ Microtomy: Preparation of permanent slide of any five mammalian (Goat/rat/mice) tissues</p>	

Paper Name: Fundamentals of Biochemistry

Paper Code: ZOO-HC-3036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>➤ Gain knowledge and skill in the fundamentals of biochemical sciences, interactions and interdependence of</p>	<p>Unit1: Carbohydrates</p> <p>➤ Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides and Glycoconjugates</p>	<p>Remember , Understand, Apply</p>
	<p>Unit2: Lipids</p> <p>➤ Structure and Significance:</p>	

<p>physiological and biochemical processes.</p> <ul style="list-style-type: none"> ➤ Know about classical laboratory techniques, use modern instrumentation, design and conduct scientific experiments, and analyze the resulting data. ➤ Get exposed to various processes used in industries and gain skills in techniques of chromatography and spectroscopy. ➤ Demonstrate foundation knowledge in biochemistry; synthesis of proteins, lipids, nucleic acids, and carbohydrates; and their role in metabolic pathways along with their regulation. ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p>Physiologically important saturated and unsaturated fatty acids, Triacylglycerols, Phospholipids, Glycolipids, Steroids</p>	
	<p>Unit3: Proteins</p> <ul style="list-style-type: none"> ➤ Amino acids: Structure, Classification and General properties of α- amino acids; Physiological importance of essential and non-essential α-amino acids ➤ Proteins: Bonds stabilizing protein structure; Levels of organization in proteins; Denaturation; Introduction to simple and conjugate proteins ➤ Immunoglobulins: Basic Structure, Classes and Function, Antigenic Determinants 	
	<p>Unit 4: Nucleic Acids</p> <ul style="list-style-type: none"> ➤ Structure: Purines and pyrimidines, Nucleosides, Nucleotides, Nucleic acids ➤ Cot Curves ➤ Basepairing ➤ De-naturation and Re-naturation of DNA ➤ Types of DNA and RNA ➤ Complementarity of DNA ➤ Hpyo- Hyper-chromaticity of DNA 	
<p>Unit5: Enzymes</p> <ul style="list-style-type: none"> ➤ Nomenclature and classification; Cofactors; ➤ Specificity of enzyme action; ➤ Isozymes ➤ Mechanism of enzyme action; ➤ Enzyme kinetics; ➤ Factors affecting rate of enzyme-catalyzed reactions; ➤ Derivation of Michaelis- 		

	<p>Menten equation,</p> <ul style="list-style-type: none"> ➤ Concept of Km and V-max, Line weaver-Burk plot ➤ Multi-substrate reactions; ➤ Enzyme inhibition; Allosteric enzymes and their kinetics; Regulation of enzyme action 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Qualitative tests of functional groups in carbohydrates, proteins and lipids. ➤ Paper chromatography of amino acids. ➤ Action of salivary amylase under optimum conditions. ➤ Effect of pH, temperature on the action of salivary amylase. ➤ Demonstration of proteins separation by SDS-PAGE. 	

Paper Name: Ornamental Fish and Fisheries (SEC)

Paper Code: ZOO-SE-3014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Define, comprehend, scope and significance of aquaculture ➤ Acquire knowledge on taxonomy and morphology of fishes. ➤ Understand food, feeding, growth, digestion and respiration in fishes. ➤ Examine the types and 	<p>Unit 1:</p> <ul style="list-style-type: none"> ➤ Ornamental Fish Diversity of North East India. 	<p>Remember, Understand, Apply, Analyze, Create</p>
	<p>Unit 2:</p> <ul style="list-style-type: none"> ➤ Aquarium plant diversity in the wetland of Assam. 	
	<p>Unit 3:</p> <ul style="list-style-type: none"> ➤ Construction and management of Home Aquarium. 	
	<p>Unit 4:</p> <ul style="list-style-type: none"> ➤ Natural feed of Ornamental Fish 	
	<p>Unit 5:</p> <ul style="list-style-type: none"> ➤ Strategies for maintenance of natural colour of Ornamental 	

practices of Aquaculture. ➤ Construct aquariums and plankton cultures ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects	Fish	
	Unit 6: ➤ Natural Breeding of Tricogaster species	
	Unit 7: ➤ Health management of Ornamental Fish	
	Unit 8: ➤ Feed formulation of Ornamental Fish	
	Unit 9: ➤ Development of Biological filtration in Aquarium	
	Unit 10: ➤ Pure culture of planktons	
	Practical ➤ Identification of Ornamental Fish ➤ Culture of Indigenous ornamental fish in Aquarium ➤ Estimation of Physico-chemical characteristics of Aquarium water ➤ Biological filter for removal of Ammonia from Aquarium ➤ Culture of Plankton	

4th Semester (Honours)

Paper Name: Comparative Anatomy of Vertebrates

Paper Code: ZOO-HC-4016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: ➤ Understand the pattern of vertebrate evolution, organization and functions of various systems. ➤ Learn the comparative account of integument, skeletal components,	Unit 1: Integumentary System ➤ Structure, functions and derivatives of integument	Remember, Understand, Analyze,
	Unit 2: Skeletal System ➤ Overview of axial and appendicular skeleton, Jaw suspensorium, Visceral arches	
	Unit 3: Digestive System ➤ Alimentary canal and associated glands, dentition	

<p>their functions and modifications in different vertebrates.</p> <ul style="list-style-type: none"> ➤ Understand the evolution of heart, modification in aortic arches, structure of respiratory organs used in aquatic, terrestrial, aerial vertebrates; and digestive system and its anatomical specializations with respect to different diets and feeding habits. ➤ Learn the evolution of brain, sense organs and excretory organs to a complex, highly evolved form in mammals ➤ Analyze and critically evaluate the structure and functions of vertebrate systems, which helps them to discern the developmental, functional and evolutionary history of vertebrate species. ➤ Understand the importance of comparative vertebrate anatomy to discriminate human biology ➤ Explain comparative account of the different vertebrate systems. ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p>Unit 4:Respiratory System</p> <ul style="list-style-type: none"> ➤ Skin, gills, lungs and air sacs; ➤ Accessory respiratory organs 	
	<p>Unit 5: Circulatory System</p> <ul style="list-style-type: none"> ➤ General plan of circulation ➤ Evolution of heart and aortic arches 	
	<p>Unit 6: Urinogenital System</p> <ul style="list-style-type: none"> ➤ Succession of kidney, ➤ Evolution of urinogenital ducts, ➤ Types of mammalian uteri 	
	<p>Unit 7:Nervous System</p> <ul style="list-style-type: none"> ➤ Comparative account of brain ➤ Autonomic nervous system, ➤ Spinal cord, ➤ Cranial nerves in mammals 	
	<p>Unit 8:Sense Organs</p> <ul style="list-style-type: none"> ➤ Classification of receptors ➤ Brief account of visual and auditory receptors in man 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Study of placoid, cycloid and ➤ Disarticulated skeleton of Frog, Fowl, Rabbit ➤ Carapace and plastron of turtle/tortoise ➤ Mammalian skulls: One herbivorous and one carnivorous animal ➤ Study of structure of any two organs (heart, lung, kidney, eye and ear) from video recording (may be included if dissection not permitted) ➤ Project on skeletal modifications in 	

	vertebrates (may be included if dissection not permitted)	
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Paper Name: Animal Physiology: Life Sustaining Systems

Paper Code: ZOO-HC-4026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: <ul style="list-style-type: none"> ➤ Understand basic fundamentals and understanding of advanced concepts of physiology. ➤ Learn interactions of various organ systems resulting in the complex overall functioning of the body. ➤ Comprehend and analyse problem- 	Unit 1: Physiology of Digestion <ul style="list-style-type: none"> ➤ Structural organization and functions of gastrointestinal tract and associated glands; ➤ Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins; ➤ Hormonal control of secretion of enzymes in Gastrointestinaltract. 	Remember, Understand, Analyze
	Unit 2: Physiology of Respiration <ul style="list-style-type: none"> ➤ Histology of trachea and lung; ➤ Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities; ➤ Transport of oxygen and carbon dioxide in blood; Respiratory pigments, 	

<p>based questions on physiological aspects.</p> <p>➤ Recognize and explain how all physiological systems maintain homeostasis in the body; and use of feedback loops to control the same.</p> <p>➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects</p>	<ul style="list-style-type: none"> ➤ Dissociation curves and the factors influencing it; ➤ Carbon monoxide poisoning; ➤ Control of respiration 	
	<p>Unit 3: Renal Physiology</p> <ul style="list-style-type: none"> ➤ Structure of kidney and its functional unit ➤ Mechanism of urine formation; ➤ Regulation of water balance; ➤ Regulation of acid-base balance 	
	<p>Unit4: Blood</p> <ul style="list-style-type: none"> ➤ Components of blood and their functions ➤ Structure and functions of haemoglobin ➤ Haemostasis: Blood clotting system, Kallikrein-Kininogen system, ➤ Complement system & Fibrinolytic system, Haemopoiesis ➤ Blood groups: Rh factor, ABO and MN 	
	<p>Unit 5: Physiology of Heart</p> <ul style="list-style-type: none"> ➤ Structure of mammalian heart; Coronary circulation; ➤ Structure and working of conducting myocardial fibers. ➤ Origin and conduction of cardiac impulses ➤ Cardiac cycle; Cardiac output and its regulation, ➤ Frank-Starling Law of the heart, nervous and chemical regulation of heart rate. ➤ Electrocardiogram, Blood pressure and its regulation 	
<p>Practical</p> <ul style="list-style-type: none"> ➤ Determination of ABO Blood group ➤ Enumeration of red blood cells and white blood cells using haemocytometer ➤ Estimation of haemoglobin using Sahli's haemoglobinometer 		

	<ul style="list-style-type: none"> ➤ Preparation of haemin crystals ➤ Recording of blood pressure using a sphygmomanometer ➤ Examination of sections of mammalian oesophagus, stomach, duodenum, ileum, rectum liver, trachea, lung, kidney 	
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Paper Name: Biochemistry of Metabolic Processes

Paper Code: ZOO-HC-4036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Gain knowledge and skill in the interactions and interdependence of physiological and bio-molecules ➤ Understand essentials of the metabolic pathways along with their regulation. ➤ Apply knowledge to the scientific understanding of metabolism ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p>Unit 1: Overview of Metabolism</p> <ul style="list-style-type: none"> ➤ Catabolism vs Anabolism ➤ Stages of catabolism ➤ Compartmentalization of metabolic pathways ➤ Shuttle systems and membrane transporters ➤ ATP as "Energy Currency of cell"; coupled reactions ➤ Use of reducing equivalents and cofactors ➤ Intermediary metabolism and regulatory mechanisms <p>Unit 2: Carbohydrate Metabolism</p> <ul style="list-style-type: none"> ➤ Sequence of reactions and regulation of glycolysis ➤ Citric acid cycle ➤ Phosphate pentose pathway ➤ Gluconeogenesis, Glycogenolysis and Glycogenesis 	<p>Remember, Understand, Apply</p>

	<p>Unit 3: Lipid Metabolism</p> <ul style="list-style-type: none"> ➤ β-oxidation and omega-oxidation of saturated fatty acids with even and odd number of carbon atoms ➤ Biosynthesis of palmitic acid ➤ Ketogenesis 	
	<p>Unit 4: Protein Metabolism</p> <ul style="list-style-type: none"> ➤ Catabolism of amino acids: Transamination, Deamination, Urea cycle ➤ Fate of C-skeleton of Glucogenic and Ketogenic amino acids 	
	<p>Unit 5: Oxidative Phosphorylation</p> <ul style="list-style-type: none"> ➤ Redox systems ➤ Review of mitochondrial respiratory chain ➤ Inhibitors and un-couplers of Electron Transport System 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Estimation of total protein in given solutions by Lowry's method. ➤ Detection of SGOT and SGPT in serum/tissue ➤ To study the enzymatic activity of Trypsin and Lipase. ➤ Study of biological oxidation (SDH) [goat liver] ➤ To perform the Acid and Alkaline phosphatase assay from serum/tissue. 	

Paper Name: Non-Mulberry Sericulture (SEC)

Paper Code: ZOO-SE-4014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Understand overall aspects of Sericulture, namely, Mulberry and non-mulberry silkworms and their food plants, ➤ Learn various technologies involved in Sericulture. ➤ Apply knowledge to rearing of the silkworm, Silkworm pathology, Process of silkworm seed production and silk technology. ➤ Apply knowledge learnt for Mulberry nursery management, Silkworm rearing, and Silk reeling. ➤ Evaluate quality of silkworms and their products ➤ Create awareness on economic importance and suitability of Sericulture in Indian conditions. ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, 	<p>Unit 1: Introduction</p> <ul style="list-style-type: none"> ➤ Sericulture: Definition, history and present status of Mulberry and Non-Mulberry Sericulture ➤ Silk route Varieties of Silk ➤ Types and distribution of non-mulberry or wild or vanya sericigenous insects in N-E India <p>Unit 2: Biology of Non-mulberry Silkworm:</p> <ul style="list-style-type: none"> ➤ Life cycle of silkworm- Eri and Muga Structure of silk gland and Nature of Silk <p>Unit 3: Rearing of Silkworms</p> <ul style="list-style-type: none"> ➤ Eri and Muga Silkworm ➤ Food plants of Eri and Muga Silkworm <p>Rearing Operation:</p> <ul style="list-style-type: none"> ➤ Rearing house/Site and rearing appliances ➤ Disinfectants: Formalin, bleaching powder ➤ Rearing technology: Early age and Late age rearing ➤ Environmental conditions in rearing-Temperature, Humidity, Light and Air ➤ Types of mountages ➤ Harvesting and storage of cocoons ➤ Spinning and Reeling of silk <p>Unit 4: Pests and Diseases:</p> <ul style="list-style-type: none"> ➤ Pests of eri and muga silkworm ➤ Pathogenesis of eri and muga silkworm diseases: 	<p>Remember, Understand, Apply, Analyze, Create</p>

assignments and field projects	Protozoan, viral, fungal and bacterial ➤ Prevention and control measures of pests and diseases	
	Unit 5: Entrepreneurship in Non-Mulberry Sericulture: ➤ Varieties of Non-Mulberry Silk products and economics in India ➤ Prospectus of Non-Mulberry Sericulture in India: Non-Mulberry Sericulture industry in different states, employment generation and potential	
	Practical ➤ Visit to various sericulture Govt. /Private Farm/ Centers.	

5th Semester (Honours)

Paper Name: Molecular Biology

Paper Code: ZOO-HC-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>➤ Describe the basic structure and chemistry of nucleic acids, DNA and RNA; molecular machinery and mechanism of information transfer processes, transcription and translation- in prokaryotes and eukaryotes, modification mechanisms for the processing of eukaryotic RNAs;</p> <p>➤ Understand gene expression regulation in eukaryotes</p>	<p>Unit 1: Nucleic Acids</p> <p>➤ Salient features of DNA and RNA Watson and Crick model of DNA</p>	<p>Remember, Understand, Apply, Analyze</p>
	<p>Unit 2: DNA Replication</p> <p>➤ DNA Replication in prokaryotes and eukaryotes ➤ Mechanism of DNA replication ➤ Semi-conservative, bidirectional and semi-discontinuous replication ➤ RNA priming, Replication of circular and linear <i>ds</i>-DNA, replication of telomeres</p>	
	<p>Unit 3: Transcription</p> <p>➤ RNA polymerase and transcription unit ➤ Mechanism of transcription in</p>	

<ul style="list-style-type: none"> ➤ Explain the significance of DNA repair mechanisms in controlling DNA damage, role of RNAs (riboswitches, siRNA and miRNA) in gene expression regulation. ➤ Compare and contrast DNA replication machinery and mechanisms in prokaryotes and eukaryotes. ➤ Estimate concentration of DNA and RNA by colorimetric methods. ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	prokaryotes and eukaryotes ➤ Synthesis of rRNA and mRNA, transcription factors
	Unit4: Translation ➤ Genetic code, Degeneracy of the genetic code Wobble Hypothesis ➤ Process of protein synthesis in prokaryotes: Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, <i>aminoacyl tRNA synthetases</i> and charging of tRNA; ➤ Proteins involved in initiation, elongation and termination of Polypeptide chain; Inhibitors of protein synthesis; ➤ Difference between prokaryotic and eukaryotic translation
	Unit 5: Post Transcriptional Modifications and Processing of Eukaryotic RNA ➤ Structure of globin mRNA ➤ Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing, ➤ Processing of tRNA
	Unit 6: Gene Regulation ➤ Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from <i>lac</i> operon and <i>trpoperon</i> , Transcription. ➤ Regulation in eukaryotes: Activators, Repressor. Gene Silencing and Genetic importing
	Unit 7: DNA Repair Mechanism ➤ Pyrimidine dimerization and mismatch repair
	Unit 8: Regulatory RNAs ➤ Ribo-switches, RNA interference, miRNA, siRNA
	Practical: ➤ Study of Polytene chromosomes from Chironomous/ Drosophila larvae

	<ul style="list-style-type: none"> ➤ Preparation of liquid culture medium (LB) and raise culture of <i>E.coli</i> ➤ Estimation of the growth kinetics of <i>E. coli</i> by turbidity method ➤ Quantitative estimation DNA using colorimeter (Diphenylamine reagent) ➤ Quantitative estimation of RNA using Orcinol reaction ➤ Study and interpretation of electron micrographs/ photograph showing <ul style="list-style-type: none"> (a) DNA replication (b) Transcription (c) Split genes 	
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Paper Name: Principles of Genetics

Paper Code: ZOO-HC-5026

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Have a deeper understanding of the varied branches of the biological sciences like microbiology, evolutionary biology, genomics and metagenomics. ➤ Gain knowledge of the basic principles of inheritance. ➤ Analyse pedigree 	<p>Unit 1: Mendelian Genetics and its Extension</p> <ul style="list-style-type: none"> ➤ Principles of inheritance, Incomplete dominance and co- dominance ➤ Multiple alleles, Lethal alleles, Epistasis, Pleiotropy ➤ Sex-linked, sex- influenced and sex-limited characters inheritance. <p>Unit 2: Linkage, Crossing Over and</p>	<p>Remember, Understand, Apply, Analyze</p>

<p>leading to development of analytical skills and critical thinking enabling the students to present the conclusion of their findings in a scientific manner.</p> <ul style="list-style-type: none"> ➤ Know the mechanisms of mutations, the causative agents and the harmful impact of various chemicals and drugs being used in day to day life. ➤ Find out the effects of indiscriminate use of various chemicals, drugs or insecticides in nature by studying their effect on various bacterial species in soil and water samples from different industrial or polluted areas ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p>Chromosomal Mapping</p> <ul style="list-style-type: none"> ➤ Linkage and crossing over, Cytological basis of crossing over, Molecular mechanisms of crossing over including models of recombination ➤ Recombination frequency as a measure of linkage intensity, Two factor and three factor crosses ➤ Interference and coincidence ➤ Somatic cell hybridization. <hr/> <p>Unit3: Mutations</p> <ul style="list-style-type: none"> ➤ Types of gene mutations (Classification) Types of chromosomal aberrations (Classification, figures and with one suitable example of each) ➤ Molecular basis of mutations in relation to UV light and chemical mutagens ➤ Detection of mutations: CLB methods attached X method. <hr/> <p>Unit 4: Sex Determination</p> <ul style="list-style-type: none"> ➤ Chromosomal mechanisms of sex determination in <i>Drosophila</i> and Man <hr/> <p>Unit 5: Extra-chromosomal Inheritance</p> <ul style="list-style-type: none"> ➤ Criteria for extra-chromosomal inheritance ➤ Antibiotic resistance in <i>Chlamydomonas</i> ➤ Mitochondrial mutations in 	
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	<p><i>Saccharomyces</i></p> <ul style="list-style-type: none"> ➤ Infective heredity in <i>Paramecium</i> and Maternal effects 	
	<p>Unit 6: Polygenic Inheritance</p> <ul style="list-style-type: none"> ➤ Polygenic inheritance with suitable examples; simple numerical based on it. 	
	<p>Unit 7: Recombination in Bacteria and Viruses</p> <ul style="list-style-type: none"> ➤ Conjugation, Transformation, Transduction, Complementation test in Bacteriophage 	
	<p>Unit 8: Transposable Genetic Elements</p> <ul style="list-style-type: none"> ➤ Transposons in bacteria, Ac-Ds elements in maize and P elements in <i>Drosophila</i> ➤ Transposons in humans 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ To study the Mendelian laws and gene interactions. ➤ Chi-square analyses using seeds/ beads/ <i>Drosophila</i>. ➤ Linkage maps based on data from conjugation, transformation and transduction. ➤ Linkage maps based on data from <i>Drosophila</i> crosses. ➤ Study of human karyotype (normal and abnormal). ➤ Pedigree analysis of some human inherited traits. 	

Paper Name: Computational Biology and Biostatistics (DSE)

Paper Code: ZOO-HE-5016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Gain knowledge on history, definition, overview and scopes of Bioinformatics. ➤ Understand different types of Biological Databases: NCBI, EMBL, PIR, SWISS-Prot, PubChem, and phylogenetic trees ➤ Gain concepts on sequence similarity, identity and homology, definitions of homologues, orthologues, paralogues, Scoring matrices: basic concept of a scoring matrix, PAM and BLOSUM series ➤ Apply and Evaluate sequence-based database searches, BLAST and FASTA algorithms, various versions of basic BLAST and FASTA ➤ Create Phylogenetic trees ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p>Unit 1: Introduction to Bioinformatics</p> <ul style="list-style-type: none"> ➤ Importance, Goal, Scope ➤ Genomics, Transcriptomics, Systems Biology ➤ Functional Genomics, Metabolomics, ➤ Molecular Phylogeny ➤ Applications and Limitations of Bioinformatics 	<p>Remember, Understand, Apply, Analyze, Evaluate, Create</p>
	<p>Unit 2: Biological Databases</p> <ul style="list-style-type: none"> ➤ Introduction to biological databases; Primary, secondary and compositedatabases; ➤ Nucleic acid databases (GenBank, DDBJ, EMBL and NDB) ➤ Protein databases (PIR, SWISS-PROT, TrEMBL, PDB) ➤ Metabolic pathway database (KEGG, EcoCyc, and MetaCyc) ➤ Small molecule databases (PubChem, Drug Bank, ZINC, CSD) 	
	<p>Unit 3: Data Generation and Data Retrieval</p> <ul style="list-style-type: none"> ➤ Generation of data (Gene sequencing, Protein sequencing, Mass spectrometry, Microarray) ➤ Sequence submission tools (BankIt, Sequin, Webin) ➤ Sequence file format (flat file, FASTA, GCG, EMBL, Clustal, Philip, Swiss-Prot) ➤ Sequence annotation; Data retrieval systems (SRS, Entrez) 	
	<p>Unit 3: Basic Concepts of Sequence Alignment</p> <ul style="list-style-type: none"> ➤ Scoring Matrices (PAM, BLOSUM) ➤ Methods of Alignment (Dot 	

	<p>matrix, Dynamic Programming, BLAST and FASTA)</p> <ul style="list-style-type: none"> ➤ Local and global alignment, pair wise and multiple sequence alignments; Similarity, identity and homology of sequences. 	
	<p>Unit 4: Applications of Bioinformatics</p> <ul style="list-style-type: none"> ➤ Structural Bioinformatics (3-D protein, PDB) ➤ Functional genomics (genome-wide and high throughput approaches to gene and protein function) ➤ Drug discovery method (Basic concepts) 	
	<p>Unit 5: Biostatistics</p> <ul style="list-style-type: none"> ➤ Introduction ➤ Calculation of standard deviation, standard error, Coefficient of Variance, Chi-square test, Z test, t-Test 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Accessing biological databases ➤ Retrieval of nucleotide and protein sequences from the databases. ➤ To perform pair-wise alignment of sequences (BLAST) and interpret the output ➤ Predict the structure of protein from its amino acid sequence. ➤ To perform a —two-sample t- testll for a given set of data ➤ To learn graphical representations of statistical data with the help of computers (e.g. MS Excel) 	

Paper Name: Endocrinology (DSE)

Paper Code: ZOO-HE-5036

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
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<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Gain knowledge and Understand endocrine systems their functions and endocrine disorders ➤ Understand Regulation of Hormone Action. ➤ Apply knowledge to gain a general understanding of the approaches used to study endocrinology. ➤ Classify and contrast different endocrine glands and their functions ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<p>Unit 1: Introduction to Endocrinology</p> <ul style="list-style-type: none"> ➤ History of endocrinology ➤ Classification, Characteristic and Transport of Hormones, Neuro secretions and Neuro hormones 	<p>Remember, Understand, Apply, Analyze</p>
	<p>Unit 2: Epiphysis, Hypothalamo-hypophysial Axis</p> <ul style="list-style-type: none"> ➤ Structure of pineal gland, Secretions and their functions in biological rhythm sand reproduction. ➤ Structure of hypothalamus, Hypothalamic nuclei and their functions, ➤ Regulation of neuro endocrine glands, Feedback mechanisms ➤ Structure of pituitary gland, Hormones and their functions, ➤ Hypothalamo- hypophysial portal system, ➤ Disorders of pituitarygland. 	
	<p>Unit3:Peripheral Endocrine Glands</p> <ul style="list-style-type: none"> ➤ Structure, Hormones, Functions and Regulation of Thyroid gland, Parathyroid, Adrenal, Pancreas, Ovary and Testis ➤ Hormones in homeostasis, Disorders of endocrine glands 	
	<p>Unit4: Regulation of Hormone Action</p> <ul style="list-style-type: none"> ➤ Hormone action at Cellular level: Hormone receptors, transduction andregulation ➤ Hormone action at Molecular level: Molecular mediators ➤ Genetic control of hormone action 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Dissect and display of Endocrine glands in laboratory bred rat* ➤ Study of the permanent slides of all the endocrine glands ➤ Demonstration of Castration/ovariectomy in 	

	laboratory bred rat* ➤ Designing of primers of any hormone	
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6th Semester (Honours)

Paper Name: Developmental Biology

Paper Code: ZOO-HC-6016

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Understand the events that lead to formation of a multicellular organism from a single cell ➤ Understand the impact of Teratogenic agents and their effects on embryonic development ➤ Understand stem cells, and Amniocentesis and their implications in real life situations ➤ Acquire basic knowledge of developmental process in frog, chick and mammals, the cellular processes of development and the 	<p>Unit1: Introduction</p> <ul style="list-style-type: none"> ➤ Historical perspective and basic concepts: Phases of development, Cell-Cell interaction, Pattern formation, Differentiation and growth, Differential gene expression, Cytoplasmic determinants and asymmetric cell division 	Remember, Understand, Apply, Analyze, Evaluate
	<p>Unit 2: Early Embryonic Development</p> <ul style="list-style-type: none"> ➤ Gametogenesis, Spermatogenesis, Oogenesis ➤ Types of eggs, Egg membranes ➤ Fertilization (External and Internal): Changes in gametes, Blocks to polyspermy; Planes and patterns of cleavage; ➤ Types of Blastula; Fate maps (including Techniques); ➤ Early development of frog and chick up to gastrulation; Embryonic induction and organizers 	
	<p>Unit 3: Late Embryonic Development</p> <ul style="list-style-type: none"> ➤ Fate of Germ Layers; Extra-embryonic membranes in birds ➤ Implantation of embryo in humans, 	

<p>molecular mechanisms underlying these.</p> <ul style="list-style-type: none"> ➤ Describe the general patterns developmental stages during embryogenesis. ➤ Elucidate the process of embryonic development ➤ Contrast and compare between-types of blastula, cleavage, and placenta ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, group discussions, assignments and projects 	<ul style="list-style-type: none"> ➤ Placenta (Structure, types and functions of placenta) 	
	<p>Unit 4: Post Embryonic Development</p> <ul style="list-style-type: none"> ➤ Metamorphosis: Changes, hormonal regulations in amphibians and insects ➤ Regeneration: Modes of regeneration, epimorphosis, morphallaxis and compensatory regeneration (with one example each) ➤ Ageing: Concepts and Theories 	
	<p>Unit 5: Implications of Developmental Biology</p> <ul style="list-style-type: none"> ➤ Teratogenesis: Teratogenic agents and their effects on embryonic development ➤ <i>In vitro</i> fertilization ➤ Stem cell (ESC) ➤ Amniocentesis 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Study of whole mounts and sections of developmental stages of frog through permanent slides: Cleavage stages, blastula, gastrula, neurula, tail-bud stage, tadpole (external and internal gill stages) ➤ Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 21, 24, 28, 33, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburger stages) ➤ Study of the developmental stages and life cycle of <i>Drosophila</i> from stock culture ➤ Study of different sections of placenta (photo micrograph/slides) ➤ Project report on <i>Drosophila</i> culture/chick embryo development 	

Paper Name: Evolutionary Biology

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Remember origin and evolution of life, Historical review of evolutionary concept, Geological time scale, ➤ Gain knowledge evidences of evolution ➤ Understand the variations, genetic drift to ensure that conservation for small threatened populations, origin and evolution of man, products of evolution and extinction ➤ Use various software to generate interest towards the field of bioinformatics and coding used in programming language ➤ Apply knowledge gained, on populations in real time, while studying speciation, behaviour and susceptibility to diseases. ➤ Acquire problem solving and high order analytical skills by attempting numerical problems ➤ Predict the practical implication of various evolutionary forces acting on the human population in the field of human health, agriculture and wildlife conservation. ➤ Create and interpret phylogenetic trees ➤ Enhance collaborative learning, communication and technical skills through 	<p>Unit1:</p> <ul style="list-style-type: none"> ➤ Life's Beginnings: Chemogeny, RNA world, Biogeny, ➤ Origin of photosynthesis ➤ Evolution of eukaryotes <p>Unit2:</p> <ul style="list-style-type: none"> ➤ Historical review of evolutionary concept: Lamarckism, Darwinism, Neo-Darwinism <p>Unit3:</p> <ul style="list-style-type: none"> ➤ Evidences of Evolution: Fossil record (types of fossils) ➤ Transitional forms, ➤ Geological time scale, ➤ Evolution of horse, ➤ Molecular (universality of genetic code and protein synthesising machinery) three domains of life, neutral theory of molecular evolution, molecular clock, example of globin gene family, rRNA/cyt-c <p>Unit4:</p> <ul style="list-style-type: none"> ➤ Sources of variations: Heritable variations and their role in evolution <p>Unit5:</p> <ul style="list-style-type: none"> ➤ Population genetics: Hardy-Weinberg Law (statement and derivation of equation, application of law to human Population) ➤ Evolutionary forces upsetting H-W equilibrium ➤ Natural selection (concept of fitness, selection coefficient, derivation of one unit of selection for a dominant allele, genetic load) ➤ Mechanism of working, types of selection, density-dependent selection, heterozygous superiority, kin selection, adaptive resemblances, sexual selection. ➤ Genetic Drift (mechanism, founder's effect, bottle neck phenomenon ➤ Role of Migration and Mutation in changing allele frequencies 	<p>Remember, Understand, Apply, Analyze, Evaluate, Create</p>

<p>practical sessions, team work, group discussions, assignments and projects</p>	<p>Unit 6:</p> <ul style="list-style-type: none"> ➤ Product of evolution: Micro evolutionary changes (inter-population variations, clines, races) ➤ Species concept, Isolating mechanisms, modes of speciation—allopatric, sympatric, ➤ Adaptive radiation / macroevolution (exemplified by Galapagos finches)
	<p>Unit7:</p> <ul style="list-style-type: none"> ➤ Extinctions, Background and mass extinctions (causes and effects),detailed example of K-T extinction
	<p>Unit 8:</p> <ul style="list-style-type: none"> ➤ Origin and evolution of man ➤ Unique hominin characteristics contrasted with primate characteristics ➤ Primate phylogeny from <i>Dryopithecus</i> leading to <i>Homo sapiens</i> ➤ Molecular analysis of human origin
	<p>Unit 9:</p> <ul style="list-style-type: none"> ➤ Phylogenetic trees, Multiple sequence alignment, construction of phylogenetic trees, interpretation of trees
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Study of fossils from models/pictures ➤ Study of homology and analogy from suitable specimens ➤ Study and verification of Hardy-Weinberg Law by chi square analysis ➤ Graphical representation and interpretation of data of height/weight of a sample of 100 humans in relation to their age and sex. ➤ Construction of phylogenetic trees with the help of bioinformatics tools(Clustal X, Phylip, NJ) and its interpretation.

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> ➤ Gain knowledge on basics of classification of fish ➤ Identify fish based on their morphological feature. ➤ Understand fish breeding and toxicology, fish morphology and physiology, aquaculture, fish diseases and fish preservation and processing of harvested fish ➤ Elaborate the concept of fishery resources and need of their conservation. ➤ Make use of survey and identification tools and techniques for fish identification, conservation, processing and technology. ➤ Gain knowledge on integrated fish farming to support income growth. ➤ Compare and contrast different fishing gears ➤ Apply remote sensing and GIS in fisheries ➤ Analyze and evaluate Fisheries law and regulations ➤ Design fishery management plans and gain knowledge on how to create brood stock management ➤ Enhance collaborative learning, communication and technical skills through practical sessions, team work, 	<p>UNIT 1: Introduction and Classification</p> <ul style="list-style-type: none"> ➤ General description of fish ➤ Account of systematic classification of fishes (up to classes) ➤ Classification based on feeding habit, habitat and manner of reproduction. 	<p>Remember, Understand, Apply, Analyze, Evaluate, Create</p>
	<p>UNIT 2: Morphology and Physiology:</p> <ul style="list-style-type: none"> ➤ Types of fins and their modifications ➤ Locomotion in fishes ➤ Hydrodynamics; Types of Scales, Use of scales in Classification and determination of age of fish ➤ Gills and gas exchange ➤ Swim Bladder: Types and role in Respiration, buoyancy ➤ Osmoregulation in Elasmobranchs ➤ Reproductive strategies (special reference to Indian fishes) ➤ Electric organs ➤ Bioluminescence; Mechanoreceptors; Schooling; Parental care; Migration 	
	<p>UNIT 3: Fisheries</p> <ul style="list-style-type: none"> ➤ Inland Fisheries; Marine Fisheries ➤ Environmental factors influencing the seasonal variations in fish catches in the Arabian Sea and the Bay of Bengal ➤ Fishing crafts and Gears ➤ Depletion of fisheries resources ➤ Application of remote sensing and GIS in fisheries ➤ Fisheries law and regulations 	

<p>group discussions, assignments and projects</p>	<p>Unit 4: Aquaculture</p> <ul style="list-style-type: none"> ➤ Sustainable Aquaculture ➤ Extensive, semi-intensive and intensive culture of fish ➤ Pen and cage culture, Poly culture, Composite fish culture ➤ Brood stock management ➤ Induced breeding of fish ➤ Management of finfish hatcheries ➤ Preparation and maintenance of fish aquarium; Preparation of compound diets for fish ➤ Role of water quality in aquaculture ➤ Fish diseases: Bacterial, viral and parasitic ➤ Preservation and processing of harvested fish, Fishery by-products 	
	<p>UNIT 5: Fish in research</p> <ul style="list-style-type: none"> ➤ Transgenic fish ➤ Zebra fish as a model organism in research 	
	<p>Practical</p> <ul style="list-style-type: none"> ➤ Morphometric and meristic characters of fishes ➤ Study of <i>Petromyzon</i>, <i>Myxine</i>, <i>Pristis</i>, <i>Chimaera</i>, <i>Exocoetus</i>, <i>Hippocampus</i>, <i>Gambusia</i>, <i>Labeo</i>, <i>Heteropneustes</i>, <i>Anabas</i> ➤ Study of different types of scales (through permanent slides/photographs). ➤ Study of crafts and gears used in Fisheries ➤ Water quality criteria for Aquaculture: Assessment of pH, conductivity, Total solids, Total dissolved solids ➤ Study of air breathing organs in <i>Channa</i>, <i>Heteropneustes</i>, <i>Anabas</i> and <i>Clarias</i> ➤ Demonstration of induced breeding in Fishes(video) ➤ Demonstration of parental care in fishes (video) ➤ Project Report on a visit to any fish farm /pisciculture unit/ Zebra fish rearing Lab. 	

Paper Name: Dissertation

Paper Code: ZOO-HE-6056

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <ul style="list-style-type: none">➤ Gather, form and critique knowledge from research studies➤ Identify and investigate a research problem➤ Apply an appropriate research design and associated methods rigorously➤ Conduct the research project in an ethical fashion➤ Draw appropriate conclusions and indicate the significance of the findings for educational practice and research➤ Report the research in a scholarly fashion appropriate to the disciplinary area	<p>Dissertation</p>	<p>Remember, Understand, Apply, Analyze, Evaluate, Create</p>

Department of Zoology

Programme Specific Outcome (M.Sc in Zoology) (CBCS)

The programme specific outcome of the syllabus prescribed for the post graduate students of 'Zoology' is mentioned below:

At the end of the program the student will be able to –

PSO1: Gain knowledge on key concepts of life sciences including biodiversity, biochemistry, molecular cell biology, physiology, reproductive biology, immunology, biostatistics, computational biology, evolutionary biology, ecology and environmental biology, animal behavior, integrative biology, fisheries, entomology, parasitology, microbiology and analytical techniques

PSO2: Identify and describe of animal-plant-microbe interactions

PSO3: Understand phenotypic expression of genomes, their regulatory pathways, phenotypes, genotypes and relationship with environment

PSO4: Describe different metabolic and regulatory pathways from organismic level to individual level

PSO5: Compare and contrast different ecological, physiological, morphological, and anatomical systems in animal

PSO6: Develop an understanding of zoological science for its application in parasitology, pathology, medical entomology, fisheries, drug design, environmental policies, ecosystem conservation and management plans

PSO7: Develop theoretical and practical knowledge in animal handling and using them as model organism to formulate, modify, design, review, validate different hypothesis and test those hypothesis using statistical tools

PSO8: Prepare research plan to discover, design, develop and contribute towards the enrichment of science

COURSE OUTCOME

M.Sc. in Zoology Syllabus (CBCS)

I Semester

Paper Name: Biosystematics and Biostatistics

Paper Code: ZOO-1014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Define species</p> <p>CO2: Understand the basic concepts of speciation, types of species concept</p> <p>CO3: Elaborate and explain different types of species</p> <p>CO4: Understand and explain taxonomic characters, concepts of measurement of variations and statistical tests</p> <p>CO5: Remember and apply important rule of Zoological Nomenclature</p> <p>CO6: Develop concept on intra-population variations</p> <p>CO7: Apply sampling methods and statistical knowledge in the field of biology</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Concept of species: Species, Polytypic species, Importance of recognition of Polytypic species taxa. 2. Intraspecific categories, subspecies, temporal subspecies, race and cline 3. Population taxonomy, the new systematics and superspecies. 4. Speciation: Sympatric, Parapatric and allopatric speciation, Speciation in time, sibling species. 5. Taxonomic characters: Molecular, Behavioural, Ecological and geographical characters, weighing of characters, characters with low and high taxonomic weight. 6. Intrapopulation variations: Non-genetic and Genetic variations. 7. Interpretation and application of important rules. 	<p>Knowledge, Understand, Apply, Create</p>
	<p>Unit II:</p> <ol style="list-style-type: none"> 1. Applications of Biostatistics, Sampling methods: Random sampling, Stratified sampling and Sub-sampling 2. Measurement of variations: Standard error, standard deviation and co-efficient 	<p>Knowledge, Understand, Apply, Create</p>

	<p>of variation, Quartile and percentiles, probability and distribution, Binomial, poisson and normal distributions.</p> <p>3. Correlation and regression: Linear regression equation and line of best fit, Coefficient of correlation, Coefficient of regression</p> <p>4. Chi-square test value of statistics, Confidence limit, t-test, Introduction to one way and two ways Anova and F-test.</p> <p>5. Kruskal-Wallis test, Man-Whitney U test</p>	
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Paper Name: Bioinformatics and Instrumentation

Paper Code: ZOO-1024

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember, theoretical knowledge of sequence analysis, molecular phylogeny and evolution</p> <p>CO2: Identify different types of microscopes, remember the principles of microscopy</p> <p>CO3: Understand and explain theoretical knowledge of sequence analysis, molecular phylogeny and evolution</p>	<p>Unit I:</p> <p>1. Theoretical aspects of sequence analysis. Needleman-Wunsch and Smith-Waterman methods of global and local alignments for a pair of sequences.</p> <p>2. Molecular phylogeny and evolution: Properties and types of phylogenetic trees; Tree building methods- Distance based: UPGMA (Unweighted pair group method using arithmetic mean), Neighbor-joining, minimum evolution and least square methods; Character-based: Maximum parsimony, maximum likelihood.</p> <p>3. Levels of protein structures and visualization: Protein secondary and tertiary structures prediction methods (Description of machine learning methods for secondary structures, homology/comparative modeling, fold recognition or threading and abinitio methods for tertiary structure prediction)</p>	<p>Knowledge, Understand, Apply</p>

<p>CO4: Understand the concept, principles and applications of microscopy, autoradiography, immunological techniques, centrifugation, molecular separation techniques, cryopreservation, Chromosome banding, FISH-chromosome painting techniques.</p>	<p>4. Overview of protein-protein and protein-ligand interactions (use of Cluspro and Autodock)</p>	
<p>CO5: Explain theoretical knowledge of sequence analysis, molecular phylogeny and evolution</p>	<p>Unit II:</p> <ol style="list-style-type: none"> 1. Microscopy: Principles and applications of phase contrast, Fluorescence and confocal Microscopy. 2. Principles and application of tracer techniques- autoradiography and radio immunoassay. 3. Immunological techniques: Immunodiffusion, Immunoelectrophoresis, Enzyme linked Immuno-absorbant assay (ELISA) 4. Centrifugation: Density gradient and unit gravity centrifugation, tissue processing and separation of various sub-cellular organelles by centrifugation 5. Molecular separation Techniques: Ion-Exchange, Absorption, partition, gel filtration, and affinity chromatography, and HPLC. Electrophoresis- Principle and applications, Agarose, SDS, SDS-PAGE, Pulsed gel and Disc electrophoresis, determination of molecular weight by SDS-gel electrophoresis 6. Cryopreservation: Methods and applications 7. Southern, Northern and Western Blotting 8. Principle and application of Nick-translation, in situ-hybridization 9. Chromosome banding, FISH-chromosome painting technique 	<p>Knowledge, Understand, Apply</p>
<p>CO6: Compare different levels of protein structures, of protein-protein and protein-ligand interactions</p>		

Paper Name: Evolution and Chronobiology

Paper Code: ZOO-1034

Course Outcome	Unit/ Topic	Bloom's
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		Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember theories of organic evolution, prokaryotes, eukaryotes, modern theories for origin of life, Darwinism, Neo-darwinism and molecular evolution</p> <p>CO2: Define and understand biological clock, biological rhythms, molecular bases of circadian rhythms, methods of measurement of circadian rhythm</p> <p>CO3: Understand and criticize the different concepts, forces and factors evolution</p> <p>CO4: Use the theories of evolution and chronobiology</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Theories of organic evolution, Prebiotic molecules (Amino acid and Nucleic acid bases). 2. Evolution of Prokaryotes and Eukaryotes. 3. Origin of life: Modern theories, Changes in hereditary instructions in relation to evolution. 4. Notion of selectively neutral mutations, evolutionary gene duplication, the founder principle, bottleneck effect of genetic drift. 5. Evolutionary history of natural integration, evolution of man. 6. Factors and forces of evolution: Mutation, Genetic variation, Isolation mechanisms and their role in speciation. 7. Emergence of the theory of Neo-Darwinism. 8. Molecular evolution : Concept of neutral evolution (Kimura), molecular divergence and molecular clock, molecular tools in phylogeny, classification and identification, Origin of new genes and proteins, gene duplication and divergence 	<p>Knowledge, Understand, Apply, Evaluate</p>
	<p>Unit II:</p> <ol style="list-style-type: none"> 1. Biological clocks 2. Significance of Biological time keeping 3. Biological rhythms: Types of rhythms- Circadian, Circatidal, Circalunar, Circannual; Centres of biological rhythms- Suprachiasmatic nuclei, Pineal gland, Optic lobes; Factors influencing biological rhythms- Environmental, Photoperiod, Temperature, Other Zeitgebers. 4. Methods of measurement: Entrainment, 	<p>Knowledge, Understand, Apply, Evaluate</p>

	<p>Re-entrainment, Phase angle difference, Freerun, Phase shift, Phase response curve, Arrhythmia.</p> <p>5. Molecular bases of circadian rhythms: Clock genes: <i>Drosophila</i> and Mouse.</p> <p>6. Applied Chronobiology: Human circadian rhythms, Application of circadian rhythms and principles; Jet-lag</p>	
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Paper Name: Genetics and Cytogenetics

Paper Code: ZOO-1044

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Describe and explain the structure of Eukaryotic chromatin , types of DNA, chromosomal proteins, giant chromosome, bacteriophage, and methods of sex determination</p> <p>CO2:Remember function and organization of mitochondrial DNA</p> <p>CO3: Understand and contrast Chromosomal anomalies, genetic diseases</p> <p>CO4: Explain gene interaction,</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Eukaryotic chromatin structure and chromosome organization: Classes of DNA Chromosomal proteins: histones and their modifications, non-histone proteins, scaffold/ matrix proteins, levels of chromatin condensation at interphase and metaphase stage. 2. Organization and functions of mitochondrial DNA 3. Microbial genetics: bacterial chromosomes, transformation, transduction, conjugation 4. Bacteriophage: Type, structure and morphology 5. Chromosome anomalies and diseases: chromosomal anomalies in malignancy(chronic myeloid leukemia, Burkitt's lymphoma, retinoblastoma and Wilm's tumor) 6. Genetics and cancer: oncogenes- 	<p>Knowledge, Understand, Apply, Analyze</p>

<p>nature of gene and its function</p> <p>CO5: Apply and illustrate concepts of genetics for gene mapping</p>	<p>tumour inducing retroviruses and viral oncogenes, chromosome rearrangements and cancer, tumour suppressor genes, cellular roles of tumour suppressor genes, PRB, P53, P APC, genetic pathways to cancer.</p> <p>7. History of organization, goals and values of human genome project, organization and distribution of human genes.</p> <p>8. Gene action: from genotype to phenotypes- penetrance and expressivity, gene interaction, epistasis, pleiotropy.</p> <p>9. Nature of gene and its function, fine structure of gene (r11 locus)</p> <p>10. Methods of gene mapping: 3 point test cross in Drosophila, gene mapping in human by Linkage analyses in pedigrees.</p> <p>11. Basic concept of molecular disorders and gene therapy.</p>	
	<p>Unit II:</p> <p>1. Giant chromosome: models for studies on chromosome organization and gene expression.</p> <p>2. Sex determination: Role of Y chromosome, sex mosaics, sex chromosome anomalies, sex influenced alleles, sex limited genes and hormonal influence. 3. Sex determination and dosage compensation gap of X-linked genes, hyperactivation of X linked genes in Drosophila, Inactivation of X-linked gene in female mammals, Hypoactivation of X-linked genes in Caenorhabditiselegans.</p> <p>4. Human genetics: Karyotype and nomenclature of metaphase chromosome bands.</p>	<p>Knowledge, Understand, Apply, Analyze</p>

Paper Name: Ecology and Environmental biology

Paper Code: ZOO-1054

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Define population ecosystem, homeostasis, community, tropic structure and biogeochemical cycles</p> <p>CO2: Remember and understand the impact of human on environment, major drivers of environmental change and environmental regulations</p> <p>CO3: Explain features of aquatic and terrestrial ecosystem, community development, niche concept, energy flow models, and life history strategies</p> <p>CO4: Understand, analyze and create environmental assessment and monitoring plans</p> <p>CO5: Conceptualize productivity and measure of primary productivity.</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Structure of ecosystem-variations in physical environment and adaptations, Homeostasis, stability concept 2. Biodiversity of ecosystem – Salient features of aquatic and terrestrial ecosystem and their biotic communities 3. Biotic community concept and community analysis – organization, population density, relative abundance, frequency, dominance, carrying capacity, species richness and species diversity 4. Community development: Types of community changes, causes and examples of ecological succession, Climax community and stability 5. The Niche concept, ecological niche, niche overlap and separation 6. Population ecology- growth pattern, life tables & survivorship curve and density dependent & independent factors. 7. Life history strategies: K- or r-selection, Age and sex ratio. 8. Trophic structure, food chain and food webs, energy flow and Lindeman's trophic dynamics concept, Food web pattern and measurement in ecosystem energy flow model, concept of productivity and measurement of primary productivity. 	<p>Knowledge, Understand, Apply, Analyze, Create</p>
<p>CO6: Solve problems related to life table, survivorship curve,</p>	<p>Unit II:</p> <ol style="list-style-type: none"> 1. Environmental issues, environmental regulations and biodiversity management 	<p>Knowledge, Understand, Apply, Analyze, Create</p>

<p>environmental issues and concerns</p>	<p>approaches.</p> <p>2. Environmental concerns—green house effect, global warming and environmental pollution.</p> <p>3. Biogeochemical cycles- carbon, nitrogen and sulphur cycles; impact of human activity on nutrient cycles.</p> <p>4. Human and Environment: Anthropogenic Impact on Environment, Environmental Impact assessment.</p> <p>5. Environmental monitoring and documentation.</p> <p>6. Major drivers of biodiversity changes in environment and principles of biodiversity Conservation.</p>	
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Paper Name:Biochemistry

Paper Code: ZOO-1064

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Define energy rich compound</p> <p>CO2: Understand and explain role of ATP/ADP cycle respiratory complex, protein structures, enzyme kinetics, structure of amino acids and nucleic acids</p>	<p>Unit I:</p> <p>1. Energy rich compound, role of ATP/ADP cycle in transfer of high energy phosphate</p> <p>2. Important respiratory complex of ATP synthesis and oxidative phosphorylation, chemiosmotic hypothesis</p> <p>3. Secondary structure: α-helix, β-pleated sheet & bends, Prediction of secondary structure, Ramachandran plot</p> <p>4. Tertiary structure: Forces stabilizing tertiary structure, Domains and motifs, Quaternary Structure of proteins.</p> <p>5. Enzyme kinetics, lowering of activation energy, Derivation of Michaelis-Menten</p>	<p>Knowledge, Understand, Apply, Analyze, Create</p>

<p>CO3: Understand the mechanism of DNA replication and transcription</p>	<p>equation and determination of K_m and V_{max} using MM & LB plots, Concepts of regulation of enzyme activity.</p> <p>6. Concept of metabolic pathways, Glycolysis and Gluconeogenesis, Glycogenesis and Glycogenolysis; Kreb cycle.</p>	
<p>CO4: Conceptualize and explain regulation of enzyme activity, metabolic pathways, intermediary metabolism</p> <p>CO5: Analyze and predict protein structure using ramachandran plot</p> <p>CO6: Derive of Michaelis-Menten equation and determine of K_m and V_{max}</p>	<p>Unit II:</p> <ol style="list-style-type: none"> 1. Hexose monophosphate shunt pathway and its significance; β-oxidation of fats and synthesis of fatty acids. 2. Intermediary metabolism: inter-conversion between lipids, carbohydrate and proteins. 3. Amino acid: Structure and chemistry of amino acid, Amino acid catabolism 4. Transamination, Transdeamination and oxidative deamination, Urea cycle 5. Nucleic acids : Structure, folding motifs, conformational flexibility and supercoiling, 6. DNA replication, DNA polymerases, Origin of replication and formation of primosome, 7. Replication fork and replisome, Termination of replication, Transcription unit, split genes 8. Mechanism of transcription: RNA polymerases , Formation of pre-initiation complex 9. RNA pol II promoter, Capping , Poly (A) tailing ,Splicing Mechanism of translation: Role of ribosomes and tRNA, Formation of initiation complex. 10. Elongation and termination. 	<p>Knowledge, Understand, Apply, Analyze, Create</p>

Paper Name:Biosystematics, Biostatistics and Bioinformatics**Paper Code:** ZOO-1072

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Identify and contrast different larval forms of animals</p> <p>CO2: Test hypothesis using bio-statistical test</p> <p>CO3: Estimate presence of biomolecules using biochemical tests</p> <p>CO4: Determine molecular mass of protein, and effect of enzyme activity</p> <p>CO5: Solve numerical on biodiversity</p> <p>CO6: Create graphical representation of data</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Identification of invertebrates, larval forms of invertebrates, protista, and vertebrates. 2. Determination of biodiversity indices: Shannon-Weiner Index, Similarity and Dissimilarity index and association index. 3. Graphical representation of data. 4. Calculation of Standard error, standard deviation, analysis of variation, Coefficient of variation, t-test, chi-square test and two way ANOVA. 5. Extraction of biomolecules (carbohydrates, proteins, lipids) from fish liver. 6. Estimation of protein extracted from fish liver by Biuret/Lowry/Bradford method. 7. Estimation of glycogen extracted from fish liver by Anthrone reagent method. 8. Estimation of blood glucose by Folin-Wu method. 9. Effect of substrate concentration on enzyme activity and determination of Km and Vmax by plotting Michaelis-Menten and LB plot. 10. Estimation of DNA 11. Estimation of RNA 	<p>Knowledge, Understand, Apply, Analyze, Evaluate Create</p>

	<p>12. Determination of Pka& PI value of glycine using Titration method.</p> <p>13. Determination of molecular mass of proteins by SDS-PAGE.</p>	
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Paper Name:Genetics, Cytogenetics, Evolution and Chronobiology

Paper Code: ZOO-1082

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Identify and contrast mutant phenotypes of <i>Drosophila</i></p> <p>CO2: Understand and use protein sequence database, search engines</p> <p>CO3: Prepare smears to study metaphase chromosome, sex chromatin, chromosomal banding, chromosomal aberrations</p> <p>CO4: Contrast between normal, tumor and irradiated cells</p> <p>CO5: Construct phylogenetic trees using softwares</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Study of mutant phenotypes of <i>Drosophila</i>. 2. Study of sex chromatin in buccal smear and hair bud cells (Human). 3. Preparation and study of metaphase chromosomes from mouse bone marrow. 4. Chromosome banding (C- and G-banding). 5. Study the difference in number, shape and size of chromosomes in normal vs. tumor cells and normal vs. irradiated cells. 6. Preparation of human karyotype and study of chromosomal aberrations with respect to number, translocation, deletion, etc. from the pictures provided. 7. Study of Hardy-Weinberg equilibrium in human population by taking the example of blood 	<p>Knowledge, Understand, Apply, Analyze, Evaluate, Create</p>

<p>CO6: Prediction of protein structure and use homology modelling, data mining and Autodock</p> <p>CO7: Solve numericals on Hardy Weinberg Equilibrium</p>	<p>group system (ABO).</p> <p>8. Use of search engines like Scopus, Science Direct for reference material collection management.</p> <p>9. Nucleic acid and protein sequence databases</p> <p>10. Data mining for sequence analysis</p> <p>11. Web based tools for sequence searches and homology screening</p> <p>12. Construction for phylogenetic trees for proteins using UPGMA or Neighbor joining method(no software to be used)</p> <p>13. Reproduction of the same phylogeny using MEGA software for the given set of sequences</p> <p>14. Finding possible genes in a given nucleotide sequence(ORF finder)</p> <p>15. Prediction and validation of protein structure using homology modeling (use of Swiss model)</p> <p>16. Determination of binding modes of a given ligand in the active site of a protein(use of Autodock)</p>	
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M.Sc. 2nd Semester

Paper Name:Biodiversity

Paper Code: ZOO-2014

Course Outcome	Unit/ Topic	Bloom's Taxonomy
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		Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember elements of biodiversity, distribution, evolution values of biodiversity</p> <p>CO2: Define carrying capacity</p> <p>CO3: Understand and analyze the magnitude and patterns of biodiversity, impact of climate change, conservation of biological diversity and the role of men and women in biodiversity conservation</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Major elements of global diversity, Evolution and distribution 2. Biodiversity in different levels (Country, Global, Regional) 3. Components of Biodiversity (Genetic, Organismal and Ecological) 4. Magnitude and pattern of Biodiversity 5. Carrying capacity, land use and population pressure on Biodiversity 6. Impact of climate Change, Global health and diseases on Biodiversity 	<p>Knowledge, Understand, Apply, Analyze, Create</p>
<p>CO4: Apply tools for biodiversity conservation</p> <p>CO5: Analyze the legal instruments related to environmental sustainability, benefit sharing, and biodiversity conservation</p> <p>CO6: Create environment awareness from the concepts learnt</p>	<p>Unit II:</p> <ol style="list-style-type: none"> 7. Value of Biodiversity (Species and Ecosystems), Utilization of Biodiversity 8. Methods and tools for biodiversity conservation (ex-situ, in-situ, Restoration and Rehabilitation, land use) 9. Priority setting: Criteria for conservation 10. Women, gender and biodiversity conservation 11. Legal instruments for Biological diversity conservation 12. Sustainability, Harnessing and benefit sharing 	<p>Knowledge, Understand, Apply, Analyze, Create</p>

Paper Name:Endocrinology

Paper Code: ZOO-2024

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember different types of hormones and their target organ, their characteristics and functions</p> <p>CO2: Understand feedback mechanisms</p> <p>CO3: Understand neuroendocrine system of insects</p> <p>CO4: Apply the concepts of role of insect hormone in pest control</p> <p>CO5: Compare endocrine glands in vertebrates</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Hormone and target organs: hormone receptors and their characteristics. neurocrine endocrine and paracrine secretion of hormones, Hormonal signal transduction , 2. Hypothalamus: Hypothalamic neurosecretory centres, Hypothalamic hormones, hormonal feedback. 3. Pituitary: Pituitary hormones and their functions. 4. Thyroid: Thyroid hormones biosynthesis and their functions 5. Comparative anatomy of adrenal glands in vertebrates, Biosynthesis of adrenal hormones and their functions, Adrenal Medulla: Catecholamine biosynthesis, release and its physiological functions. 6. Parathyroid: Calcitonin and vitamin D in calcium Homeostasis 7. Endocrine Pancreas: Glucose homeostasis and physiological functions of Insulin and Glucagon 	<p>Knowledge, Understand, Apply, Analyze</p>
<p>CO6: Elaborate and explain the structure of different types of endocrine glands and their functions in vertebrates and</p>	<p>Unit II:</p> <ol style="list-style-type: none"> 8. Neurosecretory hormones in insets and crustaceans and their 	<p>Knowledge, Understand, Apply, Analyze</p>

insects	<p>functions</p> <p>9. Neuroendocrine system of Insect : Neurosecretory cells of brain and ventral nerve cord, synthesis and assemblage of neurohormones, neurohemal organs, release and transport of neurohormones to targets, long distance axonal transport, Hormones produced by Neurosecretory cells and their function</p> <p>10. Prothoracicotropic hormone, Allatotropin, Allatostanin, Diapause hormone, Bursicon, Eclosion hormone, Proctolin, Diuretic hormone and Heart beat accelerating factor</p> <p>11. Corpus cardiacum : Structure , Hormones produced by Corpus Cardiacum and their functions, Corpus allatum : structure and functions of JH, JH as a gonadotropin</p> <p>12. Prothoracic gland and ring gland, ecdysone and its functions; Ovarian ecdysoesstructure and function, synthesis of ecdysone. Role of Juvenile hormone analogues and ecdysteroids in pest control</p>	
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Paper Name:Developmental Biology

Paper Code: ZOO-2034

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember the Principles of experimental</p>	<p>Unit I:</p> <p>1. Principles of experimental embryology: the developmental dynamics of cell specification stem cells and developmental commitment,</p>	<p>Knowledge, Understand, Apply, Analyze</p>

<p>embryology</p> <p>CO2: Understand cell specification, morphogenesis, cell adhesion thermodynamics, fertilization events, nucleo-cytoplasmic interactions, cell-cell communication, organogenesis, regeneration and the role of maternal genes in development</p> <p>CO3: Differentiate between stem cells and their roles</p> <p>CO4: Apply the concepts learnt in experimental embryology</p> <p>CO5: Analyze the role of environment in animal development</p>	<p>totipotency and pluripotency.</p> <p>2. Morphogenesis and cell adhesion-the thermodynamic model of cell interactions, concept of morphogen gradients and morphogenetic fields, cell adhesion molecules</p> <p>3. Fertilization-pre and post fertilization events, activation of eggs, Gamete fusion and prevention of phylogeny</p> <p>4. Nucleo cytoplasmic interaction in development of unicellular organisms and in early development and differentiations of multi cellular organisms, Importance and role of cytoplasm, hybridization experiments, nature of changes in nuclei, cell hybridization and nuclear transplantation experiments.</p> <p>5. Cell to cell communications in development: Induction and competence, Reciprocal and sequential inductive events, Instructive and permissive interactions, Epithelial and mesenchymal interactions, Genetic specificity of induction, Paracrine Factors; the inducer molecules.</p>	
	<p>Unit III:</p> <p>6. Role of maternal contribution in early embryogenic development in <i>Drosophila</i>: Maternal effect genes, gap genes, pair rule genes, segment polarity genes, homeotic genes and hox genes in development.</p> <p>7. Organogenesis: vulva formation in <i>Caenorhaptitiselegans</i>.</p> <p>8. Regeneration: Epimorphic regeneration of Salamander limbs, Morphallactic regeneration in hydra, Compensatory regeneration in</p>	<p>Knowledge, Understand, Apply, Analyze</p>

	<p>Mammalian liver.</p> <p>9. Different types of stem cells and their applications „Regeneration therapy.</p> <p>10. Role of environment in animal Development: Gravity and pressure, Developmental symbiosis , Larval settlement. Diapause: suspended development.</p>	
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Paper Name:Animal cell Culture and Genetic Engineering

Paper Code: ZOO-2044

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember the basic techniques of cell culture, Cell culture media, concept of DNA polymorphism</p> <p>CO2: Understand cell culture media preparation, cloning vectors, RNA interference, gene and somatic cloning techniques, and transgenic technology</p> <p>CO3: Make use of Cell culture Bioassays</p> <p>CO4: Analyzeviability and parameters of growth of cells in cell culture</p>	<p>Unit I:</p> <p>1. Cell culture: Basic techniques of cell culture. Development of primary cell cultures; cell separation, harvesting and maintenance of cell lines; Transformation and differentiation of cell cultures, types of cell culture: monolayer, suspension, clonal and stem cell culture, cryopreservation cell lines.</p> <p>2. Cell culture Media: Primary and established cell line cultures; Media supplements- their metabolic functions; Serum and protein-free defined media and their applications.</p> <p>3. Measurement of viability and parameters of growth. Cell cycle analysis and synchronization of cultures; Assessment of cell culture contaminants, safety parameters.</p>	<p>Knowledge, Understand, Apply, Analyze, Create</p>

CO5: Compare between different sequencing methods	4. Cell culture Bioassays: Cell proliferation assays	
CO6: Create cell lines and cloning vectors from the concepts learnt	<p>Unit II:</p> <p>5. Automated sequencing methods; Sanger's dideoxynucleotide method; Shotgun DNA DNA sequencing method; Polymerase chain reaction and its advantages.</p> <p>6. DNA polymorphism: Basis of DNA typing/fingerprinting; Expressed sequence tags and their use for developing STSs, SSRs and SNPs</p> <p>7. Basic biology of cloning vectors: plasmids, phages, single stranded DNA vectors, high capacity vectors, retroviral vectors, expression vectors, and other advanced vectors in use; genomic library and cDNA library</p> <p>8. RNA interference: History, molecular mechanisms and applications of antisense RNA, microRNA, siRNA, and ribozymes.</p> <p>9. Gene and somatic cloning techniques</p> <p>10. Transgenic technology- animals as bioreactors</p>	Knowledge, Understand, Apply, Analyze, Create

Paper Name:Animal behavior

Paper Code: ZOO-2054

Course Outcome	Unit/ Topic	Bloom's Taxonomy
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		Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Identify patterns of animal behavior, objectives, reflexes, orientation and kinesis</p> <p>CO2: Define learning, communication, motivation, sociobiology</p> <p>CO3: Understand development of behaviour, neural basis of behaviour, reproductive strategies, parental behaviour, altruism and kin selection</p> <p>CO4: Relate the role of genes, environment, brain and hormone with behaviour</p> <p>CO5: Analyze physiological basis of motivation</p> <p>CO6: Compare between types of learning, communication, reproductive strategies and parental care</p> <p>CO7: Measure motivation</p>	<p>Unit I:</p> <p>1. Patterns of animal behavior a. Objectives and mechanism of behaviours. b. Types of reflexes, characteristics of reflexes and complex behaviour. c. Orientation: Primary and Secondary Orientation, Sum-Compass Orientation. d. Kinesis: Orthokinesis and Klinokinesis. e. Taxis: Different kind of taxis.</p> <p>2. Development of behaviour: Genetic basis of behaviour, Hormone brain relationship</p> <p>3. Neural basis of behaviour: Key stimuli, Stimulus filtering, Supernormal stimuli, Open and closed IRM, Biological rhythms.</p> <p>4. Learning Definition, Types of learning, Neural mechanism of learning</p> <p>5. Communication : Types of communications-Auditory communication ; Infrasound communication among Elephants and Whales; Sonar, Navigation, and communications; Vocalization in nonhuman primates; Ecolocation in Bats; Visual communication; Chemical signals; Functions of scent in vertebrates; Tactile communications.</p> <p>Unit II:</p> <p>6. Motivational system: Physiological basis of motivation, control of hunger drive and thirst drive in animals. Motivational conflict and decision making, displacement activity, models of motivation, measuring</p>	<p>Knowledge, Understand, Apply, Analyze, Evaluate</p> <p>Knowledge, Understand, Apply, Analyze, Evaluate</p>

	<p>motivation, hormones and pheromones influencing behaviour of animals.</p> <p>7. Sociobiology:Units of Sociobiology; major social behaviours; Altruism: Reciprocal altruism, group selection, kin selection and concept of inclusive fitness, cooperation , /reciprocation; Selfishness; Eusociality.</p> <p>8. Reproductive strategies: Sexual selection, intrasexual selection (male rivalry), intersexual selection (female choice), infanticide, mate guarding.</p> <p>9. Parental Behaviour:Care before birth;Care after birth; Early parental care;Types of parental care ;Factors affecting parental care; Care and attachment; Parent offspring conflict.</p>	
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Paper Name:Animal Physiology

Paper Code: ZOO-2064

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember different types of body fluids, cardiac cycle, parts of respiratory system, nervous system and sensory system</p> <p>CO2: Understandgeneration, regulation and conduction of cardiac impulse, counter current mechanism of urine formation, hormonal regulation of urine formation and</p>	<p>Unit I:</p> <p>1. Body Fluid: Blood, Lymph, Hydrolymph, Hemolymph: Chemical compositions and Functions</p> <p>2. Cardiac Cycle, Specialized conducting system of heart, generation and conduction of cardiac impulse, neurohormonal regulation of cardiac amplitude and frequency.</p> <p>3. Respiratory system in vertebrate: Pulmonary ventilation, alveolar ventilation, diffusion and transport of gases, Basal metabolic rate. Respiratory centers:</p>	<p>Knowledge, Understand, Apply, Analyze</p>

<p>homeostasis, nerve impulse transmission, generation and processing of visual and auditory impulse and muscle contraction</p> <p>CO3: Compare different types of body fluids, impulse generation in different types of nerves</p>	<p>organization and function</p> <p>4. Counter current mechanism of urine formation, RAS and hormonal regulation of urine formation. Acid-base balance and homeostasis</p> <p>5. Nutrition: Gastro intestinal hormones and digestive enzymes: chemical nature and functions.</p>	
<p>CO4: Explain different types of physiological process from the concepts learnt</p>	<p>Unit II:</p> <p>6. Nervous system: Neurons and types of neurons, Types of synapses and synaptic knobs, Axonal transmission.</p> <p>7. Membrane potential and generation of action potential. Sodium-potassium pump, Synaptic transmission, neuromuscular junction Excitatory and inhibitory post-synaptic potential, Chemical transmission, neurotransmitters (acetylcholine, catecholamines, serotonin and GABA), Autonomic nervous system (Sympathetic and parasympathetic)</p> <p>8. Special sensory system: Eye: Anatomical Organisation of retina, Photoreceptors: Processing of visual impulses Ear: Cochlea, basilar membrane, and organ of Corti. Generation of endocochlear potential. Processing of auditory impulses.</p> <p>9. Muscle: Contractile proteins, Ultrastructure of skeletal muscles, Properties of muscle: muscle twist, summation,</p>	<p>Knowledge, Understand, Apply, Analyze</p>

	tetanus and fatigue, Sliding filament theory of muscle contraction and regulation.	
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Paper Name:Biodiversity, Animal behavior, Developmental Biology

Paper Code: ZOO-2072

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Identify different types of eggs, <i>Drosophila</i> imaginal disc, developmental stages of fish</p> <p>CO2: Remember life cycle of <i>Drosophila melanogaster</i></p> <p>CO3: Prepare smears and study sperm cells</p> <p>CO4: Experiment with fish to study the effects of toxicants</p> <p>CO5: Detect SH proteins stages in the early development of amphibian embryo.</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Collection and identification of egg (at least six different types) 2. Study of life cycle of <i>Drosophila melanogaster</i>. 3. Dissection and study of larval pre pupal wing, leg, eye, and antennal imaginal disc in <i>D. melanogaster</i>. 4. Preparation and study of frog/mice sperm smear. 5. Detection of SH proteins during various stages in the early development of amphibian embryo. 6. Study of developmental stages of fish from egg to hatchling. 7. In vitro culture of chick embryo. 8. Study of chick embryo using vital staining. 9. Study of cell death during development. 10. Activity budgeting of 	<p>Knowledge, Understand, Apply, Analyze, Create</p>

CO6: Create and Evaluate activity budgeting of animals	bird/mammal 11. Effect of toxicant on opercular movement and surfacing in fish. 12. Effect of toxicant on movement of fish.	
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Paper Name:Endocrinology, Animal Physiology, Animal cell Culture And Genetic Engineering
Paper Code: ZOO-2082

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Identify endocrine glands of vertebrates from histological slides</p> <p>CO2: Dissect, mount and explain Neuroendocrine system, Prothoracic gland of cockroach</p> <p>CO3: Prepare slides of Thyroid and parathyroid gland of mouse/chicken, and Pituitary gland of mouse /fish</p> <p>CO4: Detect uric acid in malpighian tubules</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Neuroendocrine system of cockroach – Dissection and display 2. Prothoracic gland of cockroach – Dissection, display and mounting 3. Mounting of prothoracic gland 4. Thyroid and parathyroid gland of mouse/chicken – dissection and display and slide preparation 5. Pituitary gland of mouse /fish – Dissection, display and permanent slide preparation using metachromatic stains. 6. Steroid and thyroid hormone assay by ELISA 7. Histological study of endocrine glands of vertebrates 8. Detection of uric acid in malpighian tubules 9. Hemocyte count and estimation 	<p>Knowledge, Understand, Apply, Analyze, Create</p>

<p>CO5: Analyze and estimate blood cells from a given sample, MTT cell proliferation assay, cell viability assay</p> <p>CO5:Isolate of genomic DNA and perform agarose gel electrophoresis</p> <p>CO6:Compare Restriction-digestion of DNA samples</p>	<p>of protein in hemolymph.</p> <p>10. Total RBC and WBC count in human blood.</p> <p>11. Isolation of genomic DNA from mammalian tissue.</p> <p>12. Restriction-digestion of DNA sample and separation of fragments by performing agarose gel electrophoresis. Interpretation of the results by comparing with the standard digests.</p> <p>13. MTT cell proliferation assay, cell viability assay.</p>	
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M.Sc.3rd Semester

Paper Name:Cell Biology

Paper Code: ZOO- 3014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember structural and molecular features of prokaryotic and eukaryotic cells, models of plasma membrane, structure and dynamics of cytoskeleton,</p>	<p>Unit I:</p> <p>1. Chemical complexity and organization : distinctive structural and molecular features of prokaryotic and eukaryotic cells</p> <p>2. Models of plasma membrane structure , membrane lipids, proteins and carbohydrates, organizational and functional features of plasma membrane</p>	<p>Knowledge, Understand, Analyze</p>

<p>functions and assembly of peroxisomes, and apoptosis</p> <p>CO2: Understand how cells adhere to each other, biogenesis of cell organelles, regulation of gene expression, protein import and mitochondrial assembly, and mechanism and significance of apoptosis</p> <p>CO3: Analyze transcriptional modifications and trafficking mechanism.</p>	<p>3. Cytoskeleton, microfilament, microtubules and intermediate filaments – structure and dynamics</p> <p>4. Cell movement, intracellular transport, role of kinesin and dyenin, cilia and flagella structure and function</p> <p>5. Cell to cell adhesion :Ca⁺⁺ dependent and CA⁺⁺ independent homophilic cell-cell adhesion, Gap junctions and connexins, cell matrix adhesion – intrigrins, collagen</p> <p>6. Cell cycle :cyclins and cyclin dependent kinases; regulation of cdk-cyclin activity, cell cycle checkpoints.</p>	
	<p>Unit II:</p> <p>1. Biogenesis of membrane bound organelle: Mitochondria and nucleus.</p> <p>2. Protein import and mitochondrial assembly.</p> <p>3. Peroxisomes, functions of peroxisomes. Peroxisome assembly.</p> <p>4. Regulation of gene expression in prokaryotes and Eukaryotes, and RNA editing</p> <p>5. Intracellular protein traffic: Protein synthesis on bound and free polysomes, membrane proteins, golgi sorting uptake into ER; Post-transcriptional modifications and trafficking mechanism.</p> <p>6. Apoptosis: definition, mechanism and significance</p>	<p>Knowledge, Understand, Analyze</p>

Paper Name: Immunology, Microbiology and Parasitology

Paper Code: ZOO-3024

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember components and characteristic features of innate and acquired immunity, cells of the immune system, different types of microbial products, and hosts and their common parasites.</p> <p>CO2: Differentiate between cells of immune system, microbial diversity</p> <p>CO3: Understand concept of B and T cell antigen receptors and CD markers, structure and function of immunoglobulin</p>	<p>Unit I:</p> <p>Innate and acquired immunity – components and characteristic features, primary and secondary responses</p> <p>Cells of the immune system : Types of cells and their subsets responsible for immune response- WBC, macrophages, dendritic cells, B,T and NK cells; Basic concept of B and T cell antigen receptors and CD markers, Cell cooperation in immune response Lymphoid organs – primary and secondary lymphoid organs and their functions, their micro and macro structures, vascular and lymphatic connections.</p> <p>Immunoglobulins: Structure and domain of Ig molecule, Ig classes, subclasses and types; Myeloma protein, monoclonal antibody, Ig superfamily Antigen-antibody reaction: antibody affinity and avidity cross reactivity, agglutination reaction, precipitation reaction.</p>	<p>Knowledge, Understand, Apply , Analyze</p>
<p>CO4: Apply concepts of microbiology to study pathogenesis, microbial products, wastewater treatment</p>	<p>Unit II:</p> <p>Microbial diversity: Prokaryotic microbes- Bacterial and archaea;</p> <p>Eukaryotic microbes Anaerobic and aerobic Protozoa. Microbial pathogenesis: Invasiveness and Toxigenicity; pure culture techniques of microbes.</p> <p>Applied microbiology: Microbial products; Food microbiology; Biocontrol;</p>	<p>Knowledge, Understand, Apply , Analyze</p>

CO4: Analyze life cycle of economically important helminth parasites of man	<p>Biological weapons; Wastewater treatment.</p> <p>Parasitism: General consideration, Types of parasites, Types of Hosts, symbiosis and Commensalism Distribution, habit and habitat, structure and life cycle of economically important helminth parasites of man and domesticated animals: <i>Echinococcus granulosus</i>, <i>Hymenolepis nana</i>, <i>Scistosoma haematobium</i>, <i>Trichinella spiralis</i> and <i>Wuchereria bancrofti</i></p>	
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Paper Name: Reproductive Biology

Paper Code: ZOO-3034

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember the hormones that play role in puberty and adolescence, reproductive cycles fertilization, pregnancy, lactation, placental hormones</p> <p>CO2: Understand sexual differentiation, follicular development in mammals, spermatogenesis, implantation</p> <p>CO3: Understand environmental endocrine issues</p> <p>CO4: Analyze assisted reproductive techniques</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Development of gonads and Disorder of gonadal development 2. Sexual differentiation within the gonads Anatomical organization of male and female reproductive system 3. Reproductive life cycle 4. Puberty and adolescence, role of hormones 5. Reproductive cycles in animals and human: Estrous and menstrual cycle 6. Ovarian Follicular development: Folliculogenesis, mechanism of ovulation In mammals 7. Testicular organization, seminiferous epithelium cycle, Spermatogenesis 	<p>Knowledge, Understand, Analyze</p>
	Unit II:	Knowledge, Understand,

	8. Role of hormones in fertilization, 9. Placenta and Placental hormones 10. Implantation and role of hormones 11. Pregnancy and hormones of pregnancy. 12. Development of breast, Lactation and hormonal regulation 13. Parturition in mammals 14. Assisted reproductive Techniques: IVF-ET Environmental endocrine issue: environmental estrogens, endocrine disruptors	Analyze
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Paper Name:Entomology and Aquatic Biology

Paper Code: ZOO-3044

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
After the completion of this course, the students will be able to: CO1: Identify and Remember different types of insects with examples CO2: Define limnology and aquatic resources CO3: Understand the importance of insects, their	Unit I: 1. Classification of class of Insect up to Orders with salient features and common example. 2. Useful insects: Insects and Insect products, Pollinating insects, insect used as food and medicine. 3. Harmful insects: Insect pests, vectors of diseases. 4. Insect's role in ecosystem and nutrient cycle.	Knowledge, Understand, Apply, Analyze, Create

<p>role in the ecosystem, characteristic features of aquatic resources, and major threats to freshwater ecosystem</p>	<p>5. Insects as environmental indicator.</p> <p>6. Concept of Pest management</p>	
<p>CO4: Differentiate between lotic and lentic aquatic systems</p> <p>CO5: Apply the concepts learnt for pest management, breeding techniques of ornamental fishes</p> <p>CO6: Analyze and make use of fish germplasm diversity of North East India</p> <p>CO7: Formulate pest management techniques, and conservation strategies for conserving fish diversity</p>	<p>Unit II:</p> <p>7. Limnology: Introduction, Definition of limnology, Essential nature of limnology.</p> <p>8. Aquatic Resources: Characteristic features of fresh water, brackish water and marine water environment.</p> <p>9. Freshwater Environment: Extent and distribution of freshwater. Lotic environments, ideological classification of fresh water biota. Freshwater communities.</p> <p>10. Rivers: Origin and characteristics of Rivers, Function and Biological productivity</p> <p>11. Major threats to freshwater ecosystem including pollution and sand mining, impact of large dams.</p> <p>12. Fish germplasm diversity of North East India — their prospects, problems & conservation strategy.</p> <p>13. Ornamental fishes of North-East India and exotic ornamental fishes: their culture & breeding techniques.</p>	<p>Knowledge, Understand, Apply, Analyze, Create</p>

Paper Name: Integrative Biology

Paper Code: ZOO-3056 (Open I)

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Gain knowledge on molecules and their interactions, enzyme kinetics, Conformation of Nucleic acids, Microbial Physiology, Cell signalling, Cellular communication</p> <p>CO2: Understand Homologous and non-homologous recombination, Polygenic inheritance</p> <p>CO3: Apply concepts of Population genetics to understand the rate of change in gene frequency through natural selection.</p> <p>CO4: Analyze Gene mapping methods, Pedigree, QTL mapping, lod score for linkage testing</p>	<p>Unit I:</p> <p>Molecules and their interactions: Structures of atoms, molecules and chemical bonds, Stabilizing interactions (van der waal's, Electrostatic, Hydrogen bonding, Hydrophobic interactions, etc)</p> <p>Growth, yield and Principles of catalysis, enzymes and enzyme kinetics, enzyme regulation, mechanism of enzyme catalysis, isozymes.</p> <p>Conformation of Nucleic acids (A-, B-, Z- DNA), t-RNA and micro RNA.</p> <p>Microbial Physiology: Growth, yield and characteristic, strategies of cell division, Stress response.</p> <p>Cell signaling: Hormones and their receptors, signaling through G protein coupled receptors, signal transduction pathways, second messengers, and regulation of signaling pathways, bacterial chemotaxis and quorum sensing.</p> <p>Cellular communication: Regulation of haematopoiesis, Neurotransmission and its</p>	<p>Knowledge, Understand, Apply, Analyze</p>

	<p>regulation</p> <p>Gene mapping methods: Linkage maps, tetrad analysis, Mapping by using somatic somatic cell hybrids</p> <p>Human genetics: Pedigree analysis, lod score for linkage testing, karyotypes, genetic disorders.</p> <p>Quantitative genetics: Polygenic inheritance, heritability and its measurements.QTL mapping.</p> <p>Recombination: Homologous and non-homologous recombination including transposition, site specific recombination.</p> <p>Population genetics: population, gene pool, gene frequency; concepts and rate of change in gene frequency through natural selection.</p>	
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Paper Name:Cell Biology, Histology, Histochemistry, Immunology and Reproductive Biology

Paper Code: ZOO- 3063

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Observe and identify different stages of estrous cycle</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Isolation of mitochondria from mouse liver by differential centrifugation and staining. 2. Microtubules in vesicle transport in fish chromatophore. 	<p>Knowledge, Understand, Apply, Analyze, Evaluate</p>

<p>CO2: Prepare histological sections testis, ovary and lymphoid organs</p> <p>CO3: Apply differential centrifugation and staining for Isolation of mitochondria from mouse liver, cytochemical technique for detection of DNA, glycogen and protein,</p> <p>CO4: Analyze viability of cells from bone marrow and spleenocytes.</p> <p>CO5: Analyze and Estimate WBC in mammalian blood.</p>	<ol style="list-style-type: none"> 3. Observation of DNA fragmentation in apoptotic cell 4. Dissection and histology of lymphoid organs in rat/mouse. 5. Differential WBC count in mammalian blood. 6. Isolation of B lymphocytes. 7. Cell viability and count using trypan blue stain from bone marrow and spleenocytes. 8. Detection of DNA, glycogen and protein using cytochemical technique. 9. Preparation of histological slides from testis and ovary. 10. Study of estrous cycle. 	
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Paper Name: Aquatic Biology, Fishery, Entomology, Parasitology

Paper Code: ZOO-3073

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Identify Plankton, Aquatic Insects, Aquatic Macrophytes, indigenous and</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Estimation of soil parameters: pH, Organic Carbon, phosphate. 2. Estimation of primary productivity by LB-DB 	<p>Knowledge, Understand, Apply, Analyze, Evaluate</p>

<p>exotic ornamental fishes</p> <p>CO2: Identify insects belonging to different orders, protozoans, parasites, helminths, arthropods, different types of insect mouth parts, antennae and legs, rectal ciliates in frog</p> <p>CO3: Understand the procedure to dissect and display Salivary gland of honey bee, sting apparatus in honey bee</p> <p>CO4: Apply concepts learnt to culture insect parasitoid on an insect host</p> <p>CO5: Analyze water and soil quality, and Estimate turbidity, primary productivity and soil parameters</p>	<p>Method.</p> <p>3. Collection and Identification of Plankton, Aquatic Insects, Aquatic Macrophytes.</p> <p>4. Estimation of turbidity using Secchi-Disc method.</p> <p>5. Identification of indigenous and exotic ornamental fishes under different families.</p> <p>6. Identification of insects belonging to different orders.</p> <p>7. Identification of different types of insect mouth parts, antennae and legs.</p> <p>8. Salivary gland of honey bee — dissection and temporary mounting.</p> <p>9. Dissection of sting apparatus in honey bee.</p> <p>10. Study of prepared slides and museum specimens of selected parasites of representative groups of protozoans, parasites, helminthes and arthropods.</p> <p>11. Preparation and identification of permanent slide of rectal ciliates in frog.</p> <p>12. Culture and study of insect parasitoid on an insect host.</p>	
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Paper Name: Fish Taxonomy & Study of Fish Growth & Population

PAPER Code: Z -4014

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember taxonomic characters and keys for identification, biogeographic units of Freshwater Biodiversity</p> <p>CO2: Understand the modern Trends in Fish Taxonomy, Study of Growth curve, condition factor, growth rate and ageing, concept of Index of Biotic Integrity</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Taxonomic characterization: taxonomic keys; Taxonomic methods for identification of fresh water fishes. 2. Methods employed for phylogenetic studies and fish identification. 3. Modern Trends in Fish Taxonomy; Fish Barcoding. 4. Fish skeleton as a tool for identification of fresh water fishes. 5. Biogeographic units of Freshwater Biodiversity: Status and distribution of freshwater fish diversity in North East India 	<p>Knowledge, Understand, Apply, Analyze, Evaluate</p>
<p>CO3: Apply the concept learnt for stock assessment and management</p> <p>CO4: Analyze methods employed for phylogenetic studies and fish identification.</p> <p>CO5: Evaluate natural markers and applied markers for morphological analysis, environmental signals, genetic</p>	<p>Unit II:</p> <ol style="list-style-type: none"> 1. Study of Growth curve: Absolute and relative Growth, Length-weight relationships, Condition factor, Relative condition factor — their significance. 2. Hepatosomatic index, Gonadosomatic index, Index of fullness, Ponderal index, Index of propagation — their estimation. 3. Growth rate and ageing. 4. Study of Species Diversity Indices, Fish Species Richness, 	<p>Knowledge, Understand, Apply, Analyze, Evaluate</p>

analysis	<p>Relative abundance.</p> <p>5. Concept of Index of Biotic Integrity (IBI); Jaccard index.</p> <p>6. Stock assessment and management — Stock composition analysis, fecundity analysis.</p> <p>7. Natural markers — morphological analysis, environmental signals, genetic analysis.</p> <p>8. Applied Markers — marking and tagging.</p>	
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Paper Name: Fish Physiology & Fish Genetics

PAPER Code: Z -4024

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Gain knowledge on the different types of physiological systems in fishes</p> <p>CO2: Understand the functioning of Digestive system, Respiratory system, swim bladder, excretion, osmoregulation, endocrine system</p> <p>CO3: Understand the concepts Population Genetics, Hardy-Weinberg principle, Selection</p>	<p>Unit I:</p> <p>1. Physiology of digestion in teleost — Digestive system: anatomical differentiation and modifications. Feeding behavior and feeding adaptation in fishes.</p> <p>2. Respiratory system in Fishes — Gill structure, Mechanism of respiration, Counter-current principle, Exchange of gases. Accessory respiratory organs and respiratory epithelium, Physiological adaptation in air breathing fishes.</p> <p>3. Forms and Functions of swim bladder and</p>	<p>Knowledge, Understand, Apply, Analyze, Evaluate</p>

<p>CO3: Apply the concepts learnt for stock management</p> <p>CO4: Analyze the current scenario of selective breeding programmes in fish</p> <p>CO5: Test the Hardy Weinberg equilibrium and apply in the population</p>	<p>Weberianossicles in teleosts.</p> <p>4. Excretion in fishes — Excretion of nitrogenous wastes, Urea cycle.</p> <p>5. Principles of osmoregulation in Freshwater and Marine Teleosts — Processes and functional aspects.</p> <p>6. Endocrine system in Fish — Hypothalamo-hypophysial system; Neurosecretory system and Neuro-hypophysial hormones; Functional morphology of Pituitary gland; structure and function of Thyroid and Pancreas.</p>	
	<p>Unit II:</p> <p>1. Population Genetics: Individual vs. population; genetic structure of random mating populations.</p> <p>2. Hardy-Weinberg principle: Test of equilibrium, application and properties of equilibrium populations.</p> <p>3. Selection: Scope, application, role of genetics in fish selection and breeding; National and International scenario of selective breeding programmes in fish.</p> <p>4. Stock improvement: sex-</p>	<p>Knowledge, Understand, Apply, Analyze, Evaluate</p>

	reversal, Hybridization, Gynogenesis, Polyploidy, hybrid vigour, introgression.	
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Paper Name: Capture Fisheries & Ecosystem management

PAPER Code: Z -4034

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Identify and remember different types capture fisheries resources, Coldwater Fish & fisheries , Floodplain wetland (beel) fisheries, Coastal fisheries, Estuarine fisheries</p> <p>CO2: Understand principles of preservation, handling and packaging of fish for marketing, Importance and methods of Fish preservation</p> <p>CO3: Make use of Fishing crafts and gears used in inland capture fisheries</p> <p>CO4: Study and analyze fishery bi-products</p>	<p>UNIT I:</p> <ol style="list-style-type: none"> Types of capture fisheries resources. Fishery resources of the major river systems of India; Fish and Fisheries of River Brahmaputra. Coldwater Fish & fisheries of India; Hill stream fisheries of North East India; Mahseer fisheries: prospects and problems with special reference to NE India. Floodplain wetland (beel) fisheries: Fish resources, problems and management approaches. Coastal fisheries of India (Sardine & Mackerel fisheries). Fishing crafts and gears used in inland capture fisheries. Destructive fishing—its impact on fish diversity. Estuarine fisheries (estuarine fisheries resources, problems confronting brackish water capture fisheries). 	<p>Knowledge, Understand, Apply, Analyze</p>

	<p>UNIT II:</p> <p>1. Principles of preservation, handling and packaging of fish for marketing.</p> <p>2. Importance and methods of Fish preservation (Refrigeration and freezing, Drying, Salting, Smoking, Canning, Pickling, pasting and spicing, Fermentation).</p> <p>3. Fishery bi-products, their production and utilization (liver oils, Body oils, Fish meal, Fish flour, Fish Silage, Fish protein, Fish guano, Bone meal).</p>	<p>Knowledge, Understand, Apply, Analyze, Create</p>

Paper Name: Aquaculture & Fish Biotechnology

PAPER Code: Z -4044

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Remember different types of aquaculture systems</p> <p>CO2: Understand breeding and Culture of Air breathing fishes, Larval nutrition, non-conventional methods of fish farming</p>	<p>Unit I:</p> <p>1. Aquaculture systems — Extensive, semi-intensive, intensive and super intensive culture of fish; Pen and Cage culture in lentic and lotic water bodies; Monoculture vs. Composite fish culture.</p> <p>2. Fish Breeding Technology — Brood stock management, nutritional requirements, captive rearing, and maturation; induced breeding techniques: physical and chemical inducing agents.</p> <p>3. Breeding and Culture of Air</p>	<p>Knowledge, Understand, Apply, Create</p>

<p>CO3: Apply concepts for Fish Breeding Technology, aquarium maintenance and Aquaculture Management</p> <p>CO4: Create fish feed formulation, management plans for aquaculture</p>	<p>breathing fishes.</p> <p>4. Non-conventional methods of fish farming — sewage fed fisheries, integrated fish farming.</p> <p>5. Aquarium keeping — Design and construction of tanks; species-wise tank size requirement; heating, lighting, aeration and filtration arrangements; decorations used; common aquarium plants and their propagation.</p>	
	<p>Unit II:</p> <p>6. Nutritional requirements in aquaculture — Protein, carbohydrate, fats, vitamins and minerals.</p> <p>7. Feed formulation — General principles, different steps of feed formulation, classification of feed ingredients.</p> <p>8. Maintenance of Natural Color of fishes in Aquarium.</p> <p>9. Larval nutrition — Importance of live feed and artificial feed, Different types of feed available for larvae.</p> <p>10. Aquaculture Management — Feed, health and water quality management; prophylaxes; quarantine measures.</p>	<p>Knowledge, Understand, Apply, Create</p>

Paper Name: Fish Pathology & Post harvest technology
PAPER Code: Z -4054

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
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<p>After the completion of this course, the students will be able to:</p> <p>CO1: Identify different types of fish diseases, different sources of pollution</p> <p>CO2: Understand the impact of environment on aquaculture, food biotechnology, cell culture, recombinant DNA technology, cryopreservation technology</p>	<p>Unit I:</p> <p>FISH PATHOLOGY</p> <p>1. Fish disease — Types; symptoms; and prophylaxes.</p> <p>2. Disease diagnostics tools: Histopathological methods; Immunoassay; Biochemical assay; Serological techniques.</p> <p>3. Techniques for isolation and identification of fungi; Basics of mycological and virological techniques.</p> <p>4. Isolation and culture of different types of bacteria.</p>	<p>Knowledge, Understand, Apply, Analyze, Create</p>
<p>CO3: Apply disease diagnostics tools, mycological and virological techniques</p> <p>CO4: Compare different types of pollutants , their sources and causes</p> <p>CO5: Analyze indices of water quality</p>	<p>Unit II:</p> <p>ECOSYSTEM MANAGEMENT</p> <p>5. Impact of environment on aquaculture: Raw water source, physical and chemical characteristics, contaminants and pollutants (algae, pathogens, heavy metals, pesticides) and their effect on productivity.</p> <p>6. Biological indicators and indices of water quality.</p> <p>7. Sanitation in aquaculture systems</p> <p>8. Algal blooms and environmental microflora.</p> <p>9. Microbial toxins.</p>	<p>Knowledge, Understand, Apply, Analyze, Create</p>
<p>CO6: Create awareness on impact of environment on aquaculture</p>	<p>Unit III:</p> <p>BIOTECHNOLOGY</p> <p>10. Food biotechnology: Probiotics, single cell proteins, Nutraceuticals.</p>	<p>Knowledge, Understand, Apply, Analyze, Create</p>

	<p>11. Cell lines and cell culture; DNA markers and MAS.</p> <p>12. Application of biotechnological tools: Recombinant DNA, Development of hybridoma and production of monoclonal antibodies; Collection, handling and observation of gametes of finfish and shellfish.</p> <p>13. Cryopreservation technology; Transfer of gene and transgenic species formation.</p>	
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Paper Name: Dissertation

PAPER Code: Z -4064

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Apply learnt concepts in the research field</p> <p>CO2: Experiment with the given subject</p> <p>CO3: Apply learnt techniques in research field</p> <p>CO4: Analyze the data obtained from the experiment</p> <p>CO5: Evaluate the data to draw conclusion</p>	Dissertation	Knowledge, Understand, Apply, Analyze, Evaluate, Create

CO6: Summarize and Interpret drawn from the research work		
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Paper Name: Practical paper-I (Taxonomy, Fish Biology & Aquaculture)

PAPER Code: Z -4072

Course Outcome	Unit/ Topic	Bloom's Taxonomy Level
<p>After the completion of this course, the students will be able to:</p> <p>CO1: Identify commercially important fresh water fish species</p> <p>CO2: Compare and assess Morphometric and Meristic characters of fish, digestive system, nervous system, and Urinogenital system in fish</p> <p>CO4: Analyze gut-content of freshwater fish species, bacterial colony</p> <p>CO4: Determine and Evaluate gonadosomatic index, hepatosomatic index, condition factor and fecundity in fish</p>	<p>Unit I:</p> <ol style="list-style-type: none"> 1. Identification of commercially important fresh water fish species — Indigenous and exotic food and ornamental fishes. 2. Comparative biometric assessment (Morphometry and Meristics) of representative freshwater fish species (carp/catfish/murrel/perch/loach) following proper Taxonomic Keys and tools for their identification. 3. Fish osteology — Alizarin preparation of fish skeleton. 4. Dissection — Comparative digestive system in herbivorous, carnivorous and omnivorous fish; nervous system (brain and cranial nerves - V, VII, IX, X); Urino-genital system (male/female); Weberian ossicle. 5. Gut-content analysis in locally available freshwater fish species. 6. Determination of gonadosomatic index (GSI), 	<p>Knowledge, Understand, Apply, Analyze, Evaluate, Create</p>

<p>CO5: Estimate of DO, TA, TH, Ca and Mg in pond/river water</p> <p>CO6: Perform fish Osteology, Haematological experiment, induce breeding and larval rearing in fishes</p>	<p>hepatosomatic index (HSI), condition factor (CF), and fecundity.</p> <p>7. Water chemistry — Estimation of DO, TA, TH, Ca and Mg in pond/river water.</p> <p>8. Histopathological examination; Bacterial colony count.</p> <p>9. Haematological studies — DLC</p> <p>10. Induced breeding and larval rearing of IMC.</p> <p>11. Viva-Voce</p>	
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