

SUBJECT-ANTHROPOLOGY

PROGRAMME OUTCOMES	<p>Anthropology is the discipline provide Knowledge about the origin, development, and evolution of the Humanity in to–Biologically, Socially and Culturally, across space and time. It Also provide in depth understanding on the foundations, dimensions, and dynamism of culture as a universal phenomenon of human life. They also know the functioning of various Social-Cultural Institutions. It notonly express various function of socio-cultural institution butalso aware about human diversity, social stratification and the ways humans have categorized, both in contemporary and earlier societies.</p> <p>PO1: Knowledge about the significant findings in the major fields of anthropology, i.e.Archaeological anthropology, social-cultural anthropology, linguistic anthropology, and physical anthropology. They have familiarity with the important issues in each if its sub-disciplines.</p> <p>PO2: Knowledge about the history of anthropological thought, theories and its place in understanding human beings, and humanity in detail.</p> <p>PO3: Ability to access various forms of anthropological data and literature using modern ICT and Knowledge on the research methods of each sub-disciplines of anthropology, and develop the ability to apply and appropriate research methods according to the demand and circumstance.</p> <p>PO4: Understanding about the basic models of applying anthropology in different settings and have develop the skills to function as practitioners of them.</p> <p>PO 5: Awareness on the importance and value of anthropology, and anthropological knowledge in contemporary society, and the ability to apply it to existing and upcoming social issues and situations.</p>
PROGRAMME SPECIFIC OUTCOMES	<p>PSO1: Develop a positive attitude and appreciation towards the diversity in past and contemporary societies and cultures.</p> <p>PSO2: Understand and analyses the fundamentals of social structure and the functioning of various social institutions of our society.</p>

	<p>PSO3: Know and understand the social-cultural changes occurred, and their influence and impact on individuals, communities and societies.</p> <p>PSO4: Apply Anthropological knowledge and skills in different situations such as, Identification and finding apt Solutions for existing and upcoming social issues.</p> <p>PSO5: Understand and appreciate the relevance and role of anthropology in their life, work place and the real world.</p>
COURSE OUTCOMES FOR FIRST YEAR	
Semester I	
CC-I Introduction to Biological Anthropology	<p>CO1: Acquire knowledge on the evolution and development of Humans, and the relationship between humans and primates.</p> <p>CO2: Students will comprehensively learn the scope and focal theme of biological anthropology along with its implications.</p> <p>CO3: They will also learn the emergence of mankind in the context of human evolution and variation.</p> <p>CO4: Further they will also learn how evolutionary implications help in bio-cultural adaptation in the context of changing environment.</p>
CC-II Introduction to Socio-Cultural Anthropology	<p>CO1: Acquire knowledge about the origin of Anthropology as a distinctive discipline.</p> <p>CO2: Understand the scope and importance of Anthropology</p> <p>CO3: Acquire knowledge on how the foundation of Anthropology has been laid.</p> <p>CO4: Apply anthropological knowledge in their day-to-day affairs.</p>
Semester II	
CC-III Archaeological Anthropology	<p>CO1: Acquire knowledge on the basics of archaeological anthropology.</p> <p>CO2: Acquire knowledge on the geological changes occurred in the past along with their evidences.</p> <p>CO3: Acquire knowledge on the tool techniques.</p> <p>CO4: Acquire knowledge on how to analyses the time period and the changes undergone by the past artifacts.</p> <p>CO5: Acquire knowledge on the evolution and development of Humans, and the relationship between humans and primates.</p>
CC-IV Fundamentals of Human Origin & Evolution	<p>CO1: Understanding of human variation in light of human origin.</p> <p>CO2: Develop concepts pertaining to the relation of modern humans with living and non-living primates.</p>

	<p>CO3: Students will learn on evolutionary relationships of different extinct/hominids in the context of emergence of modern human beings.</p> <p>CO4: Students will also learn the gradual biological and behavioural processes of becoming human.</p>
	COURSE OUTCOME FOR II YEAR
Semester III	
<p>CC-V Tribes and Peasants in India</p>	<p>CO1: Know anthropology, and key concepts on tribal and peasant society, culture, and community.</p> <p>CO2: Understand the basic concepts of tribes & their characteristics, classification and distribution.</p> <p>CO3: Know various tribes in India, and & understand their problems.</p> <p>CO4: Understand about the problems faced by tribes and the policies implemented for them.</p>
<p>CC-VI Human Ecology</p>	<p>CO1: The students will be trained to identify bio-cultural adaptation strategies that can bring to light the resilience measures communities turn to in times of environmental stress and disaster.</p> <p>CO2: The students can be better equipped to understand the impact of urbanization and industrialization that impact everyday life of people and can critically reflect on adoption of a healthy and environment friendly lifestyle.</p> <p>CO3: The students once familiarized with problems of environmental degradation, agricultural land biodiversity loss, climate change etc. can step forward and offer innovative solutions to promote environmental ethics.</p>
<p>CC-VII Biological Diversity in Human Populations</p>	<p>CO1: Student will have clear understanding of types of biological variation and their role in studying human populations</p> <p>CO2: Should able to critically assess various scientific attempts of clustering of human populations</p> <p>CO3: Should able to associate the inter-relationship between cultural and biological diversity of human populations</p> <p>CO4: Student should appreciate the role of demographic and genetic factors in understanding human adaptations</p>
Semester IV	
<p>CC-VIII Theories of Culture and Society</p>	<p>CO1: Understand various concepts & School of thought in classical Anthropology.</p>

	<p>CO2: Apply knowledge about the social, economic, and political contexts In which anthropology emerged as a distinctive discipline.</p> <p>CO3: Understand methodological issues which would shapeup them to continue practitioners of anthropology and to continue further Research.</p> <p>CO4: Know & understand the relevance of various theoretical framework and interdisciplinary approaches.</p>
CC-IX Human Growth and Development	<p>CO1: Students will be familiar with the latest researches in human growth and development and would be able to understand the association of growth with genes and environment.</p> <p>CO2: They can critically analyze and understand the basic principles of human growth, maturation and development.</p> <p>CO3: Comprehend the significance of growth studies.</p> <p>CO4: Development of practical skills</p>
CC-X Research methodology	<p>CO1: Acquire knowledge about Anthropology and its applications.</p> <p>CO2: Know the importance of research.</p> <p>CO3: Acquire knowledge about anthropological research & its unique Methodology.</p> <p>CO4: Understand various methods of research, including fieldwork & Ethnography.</p> <p>CO5: Appreciate & apply acquired knowledge in practical situations.</p> <p>CO6: Realize the purpose of anthropological research and know the way of making assumptions.</p>
	COURSE OUTCOME FOR III YEAR
Semester V	
CC-XI Prehistoric Archaeology of India	<p>CO1: To understand the evolutionary perspective of human prehistoric society in India with the help of archaeological cultural remains</p> <p>CO2: To learn tool typology and its classification for the reconstruction of prehistoric societies.</p> <p>CO3: Student should understand the landscape of Indian archaeological sites and their relevance in studying prehistoric Indian societies.</p>

	CO4: Student should be able to identify the tools, appreciate the tool typology and classify it appropriately
CC-XII Anthropology in Practice	CO1: The students trained in development anthropology can help NGO's to contemplate on ground realities of urban and rural developmental issues in holistic manner. CO2: The students will be competent in community engagements to understand community problems and even offer bio-social counseling. CO3: The students can wisely choose an anthropological career based on their interest in fields such as tourism, medical, fashion & designing, visual etc. CO4: The students can identify human rights issues pertaining of special category and marginal groups and critically reflect on the remedial policy measures.
Semester VI	
CC-XIII Forensic Anthropology	CO1: Student should be able to identify and collect the biological materials found at crime scenes CO2: Student should be able to use the methods and techniques in forensic anthropology CO3: Student should have the understanding of current knowledge of latest developments in forensic anthropology
CC-XIV Fieldwork and Dissertation	CO1: Know the significance of application of anthropological Knowledge. CO2: Understand the importance of research, scientific research & Anthropological research. CO3: Learn & understand how to conduct anthropological fieldwork by using various research methods & techniques of data collection and also the students know how to classify, segregate, interpret, analyses and present field data. CO4: Know & develop the skill of planning research work, writing a Dissertation, structuring the dissertation .
Discipline Specific Elective Paper	
DSE-1 Anthropology of Religion, Politics and Economy (Compulsory)	CO1: Understand the concepts of religion, belief and related aspects. CO2: Understand, value & appreciate the knowledge acquired on Religion & related aspects in own & different cultural contexts . CO3: Understand the basic concepts in economics and

	<p>economic anthropology</p> <p>CO4: Understand the basic concepts polity, politics & political anthropology.</p>
<p>DSE-2</p> <p>Tribal Cultures of India (Compulsory)</p>	<p>CO1:Adequate understanding of the concept of tribe; the nuances of defining tribe in India</p> <p>CO2:The course seeks to explore various policies formulated for the welfare of the tribes</p> <p>CO3: To understand changes in the social structure of tribes in India due to globalization, development, migration etc.</p> <p>CO4: Students will be able to understand and explain problematic nature of the concept of tribe in India.</p> <p>CO4: Will be able to analyses policies formulated especially for tribes; and identify the gap between policy formulation, implementation and local needs.</p>
<p>DSE-3.1</p> <p>Anthropology of India (Optional)</p>	<p>CO1:The students will be able to identify elements of tradition & values, that guide the social being in nation building</p> <p>CO2: The knowledge of racial/ethnic/gender diversities will help students in critically evaluating existing policies in domains of rural, tribal and urban life suggesting relevant policy measures.</p> <p>CO1: The students can be trained in understanding problems and prospects of and deprived and marginalized communities with special reference to the PVTGs.</p>
<p>DSE-4</p> <p>Human genetics (Optional)</p>	<p>CO1:Student will acquire basic understanding of the structure and function of DNA and the concept of gene</p> <p>CO2: Should understand the inheritance pattern of human traits/diseases and types of chromosomal abnormalities</p> <p>CO3: Should understand the basic methods and techniques used in human genetics</p> <p>CO1: Student should understand the importance of genetic counseling, prenatal diagnosis and newborn screening</p>
<p>COURSE OUTCOMES FOR GENERIC ELECTIVE (GE)</p>	
<p>GE-1</p> <p>Introduction to Biological Anthropology</p>	<p>CO1: Acquire knowledge on the evolution and development of Humans, and the relationship between humans and primates.</p> <p>CO2: Students will comprehensively learn the scope and focal theme of biological anthropology along with its implications.</p> <p>CO3: They will also learn the emergence of mankind in the context of human evolution and variation.</p> <p>CO4: Further they will also learn how evolutionary</p>

	implications help in bio-cultural adaptation in the context of changing environment.
GE-2 Introduction to Socio-Cultural Anthropology	CO1:Acquire knowledge about the origin of Anthropology as a distinctive discipline. CO2: Understand the scope and importance of Anthropology CO3: Acquire knowledge on how the foundation of Anthropology has been laid. CO4: Apply anthropological knowledge in their day-to-day affairs.
GE-3 Archaeological Anthropology	CO1:Acquire knowledge on the basics of archaeological anthropology CO2: Acquire knowledge on the geological changes occurred in the past along with their evidences. CO3: Acquire knowledge on the tool techniques. CO4: Acquire knowledge on how to analyse the time period and the changes undergone by the past artifacts. CO5: Acquire knowledge on the evolution and development of Humans, and the relationship between humans and primates.
GE-4 Anthropology of India	CO1:The students will be able to identify elements of tradition & values, that guide the social being in nation building CO2: The knowledge of racial/ethnic/gender diversities will help students in critically evaluating existing policies in domains of rural, tribal and urban life suggesting relevant policy measures. CO3: The students can be trained in understanding problems and prospects of and deprived and marginalized communities with special reference to the PVTGs.

SUBJECT: BOTANY (UG)	<i>After completion of the course the learner will be able to:</i>
PROGRAMME OUTCOMES	<p>Botany is the broad discipline encompassing various subjects involved with the study of plants. Graduates of B.Sc. Botany program gain comprehensive knowledge of plant biology, practical laboratory, field skills, critical thinking and communication abilities for careers in research, conservation and environment management. Upon completing a B.Sc in Botany, students will:</p> <p>PO1: Acquire a solid understanding of plant biology, including plant structure, function, and classification.</p> <p>PO2: Develop skills in plant identification, anatomy, physiology, and taxonomy.</p> <p>PO3: Gain practical experience in laboratory and field techniques for studying plants and their environments.</p> <p>PO4: Understand plant interactions within ecosystems and their roles in environmental processes.</p> <p>PO5: Be prepared for entry-level positions in research, education, agriculture, horticulture, and conservation, or for further academic study.</p>
PROGRAMME SPECIFIC OUTCOMES For Botany Honours	<p>PSO1: Explain understanding of plant classification systematic, evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics and molecular biology of various life-forms.</p> <p>PSO2: Describe Understanding of various analytical techniques of plant sciences, use of plants as industrial resources or as human livelihood support system and is well versed with the use of transgenic technologies for basic and applied research in plants.</p> <p>PSO3: Explain various life forms of plants, morphology, anatomy, reproduction, genetics, microbiology, molecular biology, recombinant DNA technology, transgenic technology</p>
COURSE OUTCOME	
Semester I	
CC-I Microbiology and Phycology	CO1: State the classification, characteristic features, cell structure and growth and reproduction in viruses, bacteria, and various groups of marine and freshwater algae and their ecological and economic

	importance
CC-II Biomolecules and Cell Biology	<p>CO1: Explain the properties of macromolecules, their cellular activities and biological responses.</p> <p>CO2: Describe Cell metabolism, chemical composition, physiochemical and functional organization of organelle.</p> <p>CO3: Apply Contemporary approaches in modern cell and molecular biology.</p>
GE 1A: Biodiversity (Microbes, Algae, Fungi and Archegoniatae)	<p>CO1: Combination of Theoretical and Practical components will provide comprehensive information and insight into the fascinating world of Microbes and Plants.</p> <p>CO2: Hands on Training will help students learn use of microscope, mounting, section-cutting and staining techniques for the study of plant materials.</p> <p>CO3: Making Drawings in Practical Records will enhance understanding morphological and structural details and related functional aspects in diverse plant groups.</p> <p>CO4: Use of Illustrations, Photographs, Charts, Permanent Slides, Museum and Herbarium Specimens along with ICT Methods will provide an interesting insight into the beautiful world of microbes and plants.</p> <p>CO5: Scope of Biodiversity includes Medicinal field, Industry, Agriculture, Research and Study, Job Opportunities and Environmental Conservation.</p>
SEMESTER-II	
CC-III Mycology and Phyto-pathology	<p>CO1: Describe world of fungi, lichens and pathogens of plants</p> <p>CO2: State characteristics, ecological and economic significance of the fungi and lichens</p> <p>CO3: Describe application of mycology in various fields of economic and ecological Significance</p> <p>CO4: Explain economic and pathological importance of fungi, bacteria and viruses</p> <p>CO5: Identify common plant diseases and their control measures</p>
CC-IV Archegoniate	<p>CO1: The students will be made aware of the group of plants that have given rise to land habit and the flowering plants. Through field study they will be able to see these plants grow in nature and become familiar with the biodiversity.</p> <p>CO2: Create small digital reports of some rare Structure or phenomenon related to these plants.</p>
GE 1B: Plant Ecology and Taxonomy	<p>CO1: After successful completion of the course the student Shall have</p> <p>CO2: Develop proficiency in identifying plant species using</p>

	morphological characteristics and dichotomous keys.
Semester III	
CC-V Anatomy of Angiosperms	<p>CO1: Analyze the fundamental structures and functions of plant tissues, including meristematic, epidermal, and vascular tissues, to understand their roles in growth and development.</p> <p>CO2: Compare and contrast the growth and differentiation processes in various plant organs and tissues, explaining how these processes contribute to overall plant morphology and function.</p> <p>CO3: Evaluate the organization and structure of plant parts in angiosperms, correlating these with their morphology and functions to demonstrate a comprehensive understanding of plant biology.</p>
CC-VI Economic Botany	<p>CO1: Identify various plants used as food and describe the types of nutrients they provide, including proteins, fats, amino acids, vitamins, and minerals.</p> <p>CO2: Perform micro-chemical tests to detect and quantify essential components in plant materials, such as starch, reducing sugars, proteins, and lipids.</p> <p>CO3: Evaluate the uses of fiber plants, beverages, fruits, and vegetables in daily life, focusing on their nutritional benefits and applications.</p> <p>CO4: Explore the regional diversity in food crops and other plants, and their ethno-botanical importance as well.</p>
CC-VII Genetics	<p>CO1: Show interest in Genetics and pursue higher education and research in it.</p> <p>CO2: Describes modes of inheritance of traits/ phenotypes and Phenotype-genotype correlation are the basic learning.</p>
GE 2A: Plant Physiology and Metabolism	<p>CO1: The students are able to correlate morphology, anatomy, cell structure and biochemistry with plant functioning.</p> <p>CO2: The link between theory and practical syllabus is established, and the employability of youth would be enhanced.</p>
SEMESTER IV	
CC-VIII Molecular Biology	<p>CO1: Explain nucleic acid, organization of DNA in prokaryotes and Eukaryotes, DNA replication mechanism, genetic code and transcription process.</p> <p>CO2: Explain Processing and modification of RNA and translation process, function and regulation of expression.</p>

	CO3:Describe Application in biotechnology
CC-IX Plant Ecology & Phytogeography	CO1:Describe complex interrelationship between organisms and environment; make them understand methods to studying vegetation, community patterns and processes, ecosystem functions, and principles of phytogeography. CO2:Evolve strategies for sustainable natural resource management and biodiversityconservation.
CC-X Plant Systematics	CO1:Explain the principles and practices of plant taxonomy, including the identification, classification, and of naming of plants. CO2:State plant diversity, including the major plant families and their distinguishing characteristics. CO3:Explain role of plant systematic in conservation biology and ecosystem management.
GE 2B: Plant Anatomy and Embryology	CO1:Knowledge regarding anatomy equipped the students to identify different types of tissues and make them able to correlate their physiology in a better away. CO2:This will also help them to understand how different plant tissue evolve and modify their structure and functions with respect to their environment. CO3:Knowledge regarding embryology will make them understand how reproduction play significant role in definingpopulations structure,naturaldiversityandSustainabilityof ecosystem mina betterway.
SEMESTER-V	
CC-XI Reproductive Biology of Angiosperms	CO1: Explain flower structure, pollination, fertilization, seed and fruit development, genetic mechanisms, and application in agriculture. CO2:Analyze the ecological and evolutionary significance of angiosperm reproductive strategies CO3:Assess the impact of environmental factors on reproductive success
CC-XII Plant Physiology	CO1: Explain the fundamental processes of plant growth, development, and metabolism. CO2: Explain how plants acquire, transport, and utilize water, nutrients, and gases. CO3: Analyse the responses of plants to environmental stresses and stimuli. CO4:Use physiological principles in agricultural, ecological and

	biotechnological contexts
DSE 1: Analytical Techniques in Plant Sciences	<p>CO1: Use spectroscopy, chromatography, microscopy, and molecular techniques in plant research.</p> <p>CO2: Demonstrate proficiency in data interpretation and experimental design relevant to plant science research.</p> <p>CO3: Apply analytical techniques to investigate physiological, biochemical, and molecular aspects of plants.</p> <p>CO4: Critically assess and integrate analytical data to address research questions in plant biology and agriculture</p>
DSE 2: Natural Resource Management	<p>CO1: Explain the principles and frameworks of natural resource management, including sustainable development and conservation.</p> <p>CO2: Analyze the interactions between human activities and natural ecosystems.</p> <p>CO3: Evaluate strategies for the sustainable use and conservation of natural resources.</p> <p>CO4: Apply interdisciplinary approaches to address environmental challenges and promote ecosystem resilience.</p>
SEMESTER-VI	
CC-XIII Plant Metabolism	<p>CO1: Explain the biochemical pathways and regulatory mechanisms involved in plant metabolism.</p> <p>CO2: Integrate of metabolism with growth, development, and environmental responses in plants.</p> <p>CO3: Analyze metabolic adaptations of plants to diverse ecological niches and stresses.</p> <p>CO4: Apply metabolic engineering and biotechnology in agriculture and industry</p>
CC-XIV Plant Biotechnology	<p>CO1: Explain the principles and techniques used in plant genetic engineering and molecular biology.</p> <p>CO2: Apply biotechnology in crop improvement, including genetic modification and genome editing.</p> <p>CO3: Evaluate ethical, environmental, and regulatory issues related to plant biotechnology.</p> <p>CO4: Apply biotechnological approaches to solve agricultural challenges and enhance crop productivity.</p>
DSE 3: Horticulture practices & post-Harvest	<p>CO1: Explain horticultural crop production techniques, including propagation, cultivation, and management practices.</p> <p>CO2: Explain post-harvest handling, storage, and processing technologies to maintain crop quality and extend shelf life.</p>

<p>technology</p>	<p>CO3: Analyze factors influencing crop post-harvest losses and implement strategies for their reduction.</p> <p>CO4: Apply knowledge to enhance efficiency, sustainability, and profitability in horticultural production and post-harvest management.</p>
<p>DSE 4: Project work</p>	<p>CO1: Students develop research skills, critical thinking, and problem-solving abilities, and gain technical proficiency in relevant tools and methods.</p> <p>CO2: Effective communication through written reports and presentations is emphasized, along with project management skills, including planning and resource allocation.</p> <p>CO3: The course fosters ethical standards, professionalism, and self-directed learning, preparing students for careers or further academic pursuits.</p> <p>CO4: Through independent research and practical application, students enhance their knowledge and readiness for future challenges.</p>

SUBJECT: CHEMISTRY(B.Sc.)	After completion of the course students will be able to:
PROGRAMME OUTCOMES (COs)	<p>PO1: Understand Organic, Inorganic, and Physical Chemistry concepts.</p> <p>PO2: Apply chemistry to everyday life and explore new scientific and technological fields.</p> <p>PO3: Explain the principles behind chemical techniques used in academics and industry.</p> <p>PO4: Practice safe handling of chemicals in research and laboratories.</p> <p>PO5: Use chemistry to address social, economic, and environmental issues.</p> <p>PO6: Perform qualitative and quantitative analysis using various methods.</p> <p>PO7: Identify sustainable chemical processes for environmental benefit.</p> <p>PO8: Communicate complex theories clearly in writing and speaking.</p> <p>PO9: Conduct experiments, analyze data, and interpret results ethically.</p> <p>PO10: Follow safety and chemical hygiene regulations and practices.</p>
PROGRAMME SPECIFIC OUTCOMES (PSOs) <i>(Students will be able to have)</i>	<p>PSO1: Understand fundamental concepts in Organic, Inorganic, and Physical Chemistry.</p> <p>PSO2: Perform scientific experiments effectively using procedural knowledge.</p> <p>PSO3: Apply scientific concepts in industry, medicine, and research, and understand their significance.</p> <p>PSO4: Work in research labs and related fields, and gain skills for employment in chemicals, pharmaceuticals, food, materials industries, and pass national competitive exams.</p>
COURSE OUTCOMES	
SEMESTER-I	
CORE- Paper-I Inorganic Chemistry-I	<p>CO1: Analyze the behavior of gases and apply different laws to real gases.</p> <p>CO2: Explain the liquid state of matter and interpret the pH scale.</p> <p>CO3: Describe the solid state of matter and examine its related properties.</p> <p>CO4: Define and apply concepts such as buffers and solubility products.</p>
CORE--II	CO1: Describe the behavior of gases and apply different laws to real

Physical Chemistry-I	<p>gases.</p> <p>CO2: Explain the liquid state of matter and interpret the pH scale.</p> <p>CO3: Explain the solid state of matter and analyze its related properties.</p> <p>CO4: Define and apply concepts such as buffers and solubility products.</p>
<p>GE-1</p> <p>Atomic structure, Bonding, General Organic Chemistry & Aliphatic Hydrocarbons</p>	<p>CO1: Students will learn how to use Fajan's rules, the Born equation, and Slater's rules to perform specific calculations in chemistry.</p> <p>CO2: Students will gain an understanding of how atoms and molecules are organized and structured.</p> <p>CO3: Students will be able to predict and describe the shapes and arrangements of different molecules.</p> <p>CO4: Students will learn how to create various organic compounds by attaching different functional groups and analyze them.</p> <p>CO5: Students will study how to prepare and understand the properties of various organic compounds.</p>
SEMESTER-II	
<p>CORE-III</p> <p>Organic Chemistry I</p>	<p>CO1: Describe the electronic forces in organic molecules and explain different types of organic reactions. Analyze the stereochemistry of organic molecules, recognize the mechanisms of various reactions, and explain optical activity and geometrical isomerism.</p> <p>CO2: Discuss the preparation and interpret the physical and chemical properties of alkanes, alkenes, and alkynes.</p> <p>CO3: Distinguish between different types of organic reactions and analyze the reactivity of various intermediates.</p> <p>CO4: Apply principles of organic qualitative analysis to identify organic compounds in the CHO system and determine the melting point of pure samples.</p> <p>CO5: Perform chromatographic separation of organic molecules using TLC and paper chromatography techniques.</p>
<p>CORE--IV</p> <p>Physical Chemistry II</p>	<p>CO1: Define thermodynamic terms and laws; calculate energy changes and heat capacities, and predict conditions for thermodynamic equilibrium and reaction spontaneity.</p>

	<p>CO2:Recognize thermodynamic conditions for one-component and two-component systems.</p> <p>CO3:Describe the quantitative treatment of the principle of chemical equilibrium.</p> <p>CO4:Explain colligative properties of different solutions.</p> <p>CO5:Determine the heat capacity of a calorimeter;calculate integral enthalpies of various salts and measure the enthalpy of neutralization of an acid-base mixture.</p>
<p>GE-2 Chemical Energetics, Equilibria & Functional Organic Chemistry</p>	<p>CO1:Calculations related to both ideal and real gases, and use thermodynamic principles to predict chemical equilibrium and the spontaneity of reactions.</p> <p>CO2:Apply their understanding of colloids and gels in practical contexts.</p> <p>CO3:Know in-depth knowledge of the properties and behaviors of solid and liquid states of matter.</p> <p>CO4: Synthesize various organic compounds, including alkyl halides, aryl halides, alcohols, and phenols.</p> <p>CO5:Describe the fundamental concepts of organic chemistry related to compounds such as carboxylic acids, ethers, and esters.</p>
SEMESTER-III	
<p>CORE--V Inorganic Chemistry-II</p>	<p>CO1:Classify different metallurgical operations and describe the HSAB principle.</p> <p>CO2:Compare the structure and bonding in boranes, carboranes, metal clusters, polyamides, and pseudo halogens.</p> <p>CO3:Describe the inert pair effect, different hydrides, and the anomalous behavior of s- and p-block elements.</p> <p>CO4:Compare compounds formed by noble gases and explain different types of inorganic Polymers like silicones and silicates.</p> <p>CO5:Prepare various inorganic compounds, estimate the amount of chlorine in bleaching powder, and standardize the amount of copper in a given solution.</p>
CORE--VI	CO1:Describe the preparation and properties of halogenated

Organic Chemistry-II	<p>hydrocarbons.</p> <p>CO2: Explain various methods for preparing alcohols, aldehydes, ketones, and carboxylic acids, and predict the stereo chemical outcomes of organic reactions based on reaction mechanisms.</p> <p>CO3: Propose mechanisms for named and rearrangement reactions, and select appropriate organic reagents for functional group interconversions.</p> <p>CO4: Perform acetylation, benzylation, bromination, and nitration reactions using conventional methods.</p> <p>CO5: Prepare derivatives using green methods and purify them through recrystallization.</p>
CORE--VII Physical Chemistry-III	<p>CO1: Explain phase equilibrium and interpret phase diagrams.</p> <p>CO2: Describe binary solutions and derive various laws related to them.</p> <p>CO3: Derive rate equations from mechanistic data.</p> <p>CO4: Comprehend the applications and actions of catalysts, and analyze surface phenomena.</p> <p>CO5: Analyze adsorption isotherms and determine distribution coefficients between solvent systems, and calculate reaction kinetics.</p>
GE-III Chemistry Of S- And P- Block Elements, States Of Matter & Chemical Kinetics	<p>CO1: Gain an understanding of the basic principles of metallurgy and the concepts of acids and bases.</p> <p>CO2: Acquire in-depth knowledge about the properties and behaviors of s-block and p-block elements.</p> <p>CO3: Design and conduct experiments to measure the rate of chemical reactions.</p> <p>CO4: Measure the viscosity and surface tension of liquids.</p> <p>CO5: Explore and comprehend the principles of solid-state chemistry.</p>
Semester- IV	
CORE--VIII Inorganic Chemistry-III	<p>CO1: Describe the theory of coordination chemistry, including valence bond theory (inner and outer orbital complexes), the electro neutrality principle, and back bonding.</p> <p>CO2: Evaluate the stability of various oxidation states and</p>

	<p>interpret.m.f. using Latimer and Frost diagrams.</p> <p>CO3:Examine the chemistry of Ti, V, Cr, Mn, Fe, and Co in various oxidation states, excluding their metallurgy.</p> <p>CO4:Discuss the use of chelating agents in medicine.</p> <p>CO5:Examine the role of iron in biological systems, including the functions of haemoglobin and myoglobin.</p>
<p>CORE--IX Organic Chemistry-III</p>	<p>CO1:Explain different nitrogen-containing compounds and the significance.</p> <p>CO2:Elucidate the structure and chemistry of natural products, including terpenes and alkaloids.</p> <p>CO3:Describe the chemistry of heterocyclic compounds and write the mechanisms involved in the reactions of nitrogen-containing compounds.</p> <p>CO4:Apply principles of organic qualitative analysis to identify organic molecules containing extra elements such as nitrogen, sulphur, and halogens.</p> <p>CO5:Identify various nitrogen-containing compounds and prepare derivatives of these compounds for conformation.</p>
<p>CORE--X Physical Chemistry-IV</p>	<p>CO1:Define theories of conductivity, the laws of weak and strong electrolytes, and describe their role in titrimetric analysis.</p> <p>CO2:Explain different types of electrochemical cells.</p> <p>CO3:Describe the theories behind potentiometric and conductometric titrations and apply these methods in practical scenarios.</p> <p>CO4:Explain the electrical properties of microscopic particles.</p> <p>CO5:Handle electrochemical instruments such as conduct meters and Potentiometers to perform qualitative estimations and develop skills for using these instruments effectively.</p>
<p>GE-IV Organometallics, Bioinorganic Chemistry, Poly Nuclear Hydrocarbons And UV, IR Spectroscopy</p>	<p>CO1: Study the properties and uses of 3d transition metals and their key compounds like potassium dichromate and potassium permanganate.</p> <p>CO2: Learn about organometallic compounds, their types, and examples like ferrocene and methyl lithium, and how carbon monoxide interacts with metals.</p>

	<p>CO3: Understand how metal ions like Na⁺, K⁺, Mg²⁺, and Ca²⁺ are important in biological processes such as blood clotting and energy production.</p> <p>CO4: Explore the properties and reactions of aromatic compounds such as naphthalene and pyridine, and learn about active methylene compounds and their uses.</p> <p>CO5: Use UV-Visible and IR spectroscopy to identify and analyze organic molecules, focusing on their functional groups and molecular vibrations.</p>
SEMESTER-V	
CORE--XI Organic Chemistry-IV	<p>CO1: Explain different spectroscopic methods for identifying organic molecules.</p> <p>CO2: Illustrate the principles of UV-Vis, IR, NMR spectroscopy, and Mass spectrometry.</p> <p>CO3: Interpret spectral data of simple molecules and solve related problems.</p> <p>CO4: Comprehend the preparation, properties, structure, and importance of carbohydrates, including mono-, di-, and Polysaccharides.</p> <p>CO5: Perform qualitative analysis of different carbohydrates and unknown organic compounds containing bi-functional groups, estimate the amounts of sugars in a sample, and identify labeled peaks of unknown organic compounds using NMR and IR data.</p>
CORE--XII Physical Chemistry-V	<p>CO1: Describe quantum mechanics and identify its applications in Molecular Orbital and Valence Bond theories, including the construction of hybridization schemes.</p> <p>CO2: Describe the basic principles of molecular spectroscopy and demonstrate the skill to elucidate the structure and chemical composition of samples from various molecular spectra.</p> <p>CO3: Explain chemical bonding in different covalent molecules qualitatively.</p> <p>CO4: Describe the principles of absorption spectra in the visible range and Raman spectra.</p> <p>CO5: Verify the laws of absorption for qualitative estimation of</p>

	<p>inorganic samples,</p> <p>CO6: Estimate different metal cations using the colorimetric method.</p>
<p>DSE-1</p> <p>Polymer Chemistry</p>	<p>CO1: Understand the fundamentals of Polymers, including biopolymers and synthetic Polymer's.</p> <p>CO2: Explain the mechanism and kinetics of Polymerization.</p> <p>CO3: Identify methods for characterizing Polymers.</p> <p>CO4: Describe the preparation, properties, and uses of different Polymers.</p> <p>CO5: Synthesize different Polymer's in the laboratory and identify labeled peaks in the IR spectra of known Polymer's.</p>
<p>DSE-2</p> <p>Green Chemistry</p>	<p>CO1: Comprehend the principles and limitations of green chemistry.</p> <p>CO2: Design chemical syntheses using green chemistry approaches.</p> <p>CO3: Implement real-world reactions using green methods.</p> <p>CO4: Explore future trends in research by applying green chemistry principles.</p> <p>CO5: Synthesize compounds using green methods and utilize safer chemicals for various syntheses.</p>
<p>SEMESTER-VI</p>	
<p>CORE--XIII</p> <p>Inorganic Chemistry-IV</p>	<p>CO1: Explain the classification and bonding in organometallic compounds.</p> <p>CO2: Describe various theories that explain the stability of organometallic compounds and apply these theories to practical scenarios.</p> <p>CO3: Identify the use of different organometallic compounds in synthesis and analyze inorganic salt mixtures qualitatively using the H₂S scheme.</p> <p>CO4: Deduce the thermodynamic and kinetic aspects of organometallic compounds.</p> <p>CO5: Separate and estimate salt mixtures qualitatively, and perform the separation of mixtures containing insoluble components or</p>

	interfering anions.
CORE--XIV Organic Chemistry-V	<p>CO1:Comprehend the classification and properties of amino acids and nucleic acids.</p> <p>CO2:Explain the classification, characteristics, and mechanisms of enzyme action.</p> <p>CO3:Describe various bio-metabolic processes.</p> <p>CO4:Analyze theories related to important pharmaceutical compounds and dyes, identify biologically significant molecules and their roles in human life, and define terminologies used in biological systems.</p> <p>CO5:Prepare different organic compounds, estimate amino acids and vitamin C, determine the iodine number of oils/fats, and develop skills in the quantitative analysis of biomolecules.</p>
DSE-III Industrial Chemicals And Environment	<p>CO1:Identify pollution caused by different industrial chemicals.</p> <p>CO2:Implement measures to control environmental pollution and describe methods for reducing pollution.</p> <p>CO3:Estimate different types of water Pollutants.</p> <p>CO4:Measure dissolved CO₂ in gas samples and prepare environmentally safer chemicals.</p> <p>CO5:Assess the impact of environmental pollution by measuring various testing parameters</p>
DSE-IV Project	<p>CO1:Select appropriate sources for reviewing literature and conduct basic research effectively.</p> <p>CO2:Compile and interpret research data, present findings in a publishable format, and utilize various chemistry software tools while understanding research ethics.</p>

SUBJECT: COMMERCE(B.COM)	
PROGRAMME OUTCOMES	<p>PO1: The Commerce program is designed to provide students with the knowledge, skills, and mind-set needed to navigate the challenges faced by modern business organizations.</p> <p>PO2: The B. Com. (Hons) curriculum offers a carefully chosen mix of subjects including Accounting, Economics, Finance, Management, Tax, Marketing, and Law.</p> <p>PO3: The program focuses on nurturing intellectual, personal, interpersonal, and social skills through a holistic approach to education, preparing graduates to make informed, ethical decisions and excel in leadership roles.</p> <p>PO4: The course encourages reflective and analytical thinking, fostering curiosity and deep insights into the business world, enabling students to address complex situations with enhanced knowledge and wisdom.</p>
PROGRAMME SPECIFIC OUTCOMES	<p>PSO1: Demonstrate the ability to apply fundamental accounting and financial principles to analyze, record, and interpret financial transactions, prepare financial statements, and evaluate financial performance.</p> <p>PSO2: Explain and apply key business laws and regulations, including corporate law, taxation, and contract law, to ensure compliance and effective management within a business environment.</p> <p>PSO3: Design and conduct business research projects using appropriate methodologies, including data collection, analysis, and interpretation, to support decision-making and solve business problems.</p> <p>PSO4: Apply marketing principles and management strategies to develop and implement effective marketing campaigns, manage business operations, and enhance organizational performance.</p> <p>PSO5: Utilize advanced financial and management accounting techniques, including cost analysis, budgeting, and financial forecasting, to support strategic planning and operational efficiency.</p> <p>PSO6: Adapt to Technological Changes in Business: Demonstrate proficiency in using business software and technology for tasks such as financial analysis, data management, and digital marketing, and adapt to emerging technological trends in the business world.</p>
COURSE OUTCOMES	
After completion of the course students will be able to:	
Semester I	
CORE-1	CO1: Comprehensive understanding of the fundamentals of financial

<p>FINANCIAL ACCOUNTING</p>	<p>accounting, including its principles, processes, and reporting standards.</p> <p>CO2: Develop skills in preparing financial statements for various business structures, managing partnership accounts, and handling complex accounting scenarios such as hire purchase systems and branch accounting.</p> <p>CO3: Apply accounting procedures to record business transactions and prepare financial statements.</p> <p>CO4: Analyze and interpret financial statements using relevant reporting standards.</p> <p>CO5: Employ accounting principles to various business situations like partnerships, branches, and specific transactions.</p>
<p>CORE-2 BUSINESS LAW</p>	<p>PO1: Understand the essential principles of contract law, including contract formation, validity, and remedies for breach, as well as the specifics of sales transactions and the rights of unpaid sellers.</p> <p>CO2: Analyze and apply legal principles concerning partnerships and limited liability partnerships (LLPs).</p> <p>CO3: Demonstrate effective communication and critical thinking skills in the context of business law.</p> <p>CO4: Promote ethical conduct and responsible decision-making in business transactions.</p> <p>CO5: Enhance employability skills by applying legal knowledge to real-world business situations.</p>
<p>GE-I MICRO ECONOMICS</p>	<p>CO1:Analyze the concept of demand, including demand functions, laws, and elasticity, and explain consumer behavior using the Marshalling utility approach and Indifference Curve approach.</p> <p>CO2: Describe production functions and cost concepts, including short-run and long-run production, total, average, and marginal products.</p> <p>CO3: Explain the characteristics and equilibrium conditions of a perfectly competitive market, including profit maximization, revenue concepts, and the determination of supply curves and producer surplus.</p> <p>CO4: Evaluate the concept of monopoly, including sources of monopoly power, equilibrium conditions, and price discrimination, and discuss the social costs associated with monopoly.</p> <p>CO5: Assess imperfect competition by explaining monopolistic competition and oligopoly, including non-collusive and collusive models like Sweezy's Kinked Demand Curve and cartel concepts.</p>

SEMESTER II

<p>CORE-3 COST ACCOUNTING</p>	<p>CO1: Acquire a thorough understanding of cost accounting fundamentals, including its concepts, scope, objectives, and various costing methods and techniques.</p> <p>CO2: Apply practical skills in implementing costing systems, preparing cost sheets, and applying job and batch costing methods effectively.</p> <p>CO3: Analyze and manage labor costs using appropriate methods and incentive schemes.</p> <p>CO4: Employ cost allocation and absorption techniques to calculate overhead costs and determine cost variances.</p> <p>CO5: Apply different costing methods (contract and process) to analyze costs in diverse production environments.</p>
<p>CORE-4 CORPORATE LAWS</p>	<p>CO1: Understanding of company law, including the formation, types, and key features of companies as per the Companies Act 2013, and the roles and responsibilities of directors and key managerial personnel.</p> <p>CO2: Analyse about share capital and debentures, including their types, issuance, and management, equipping them with essential knowledge for effective company administration and financial management.</p> <p>CO3: Analyze the roles, responsibilities, and legal framework surrounding promoters and the incorporation process.</p> <p>CO4: Evaluate the function and requirements of a prospectus in the context of capital raising.</p> <p>CO5: Acquire knowledge about the legal framework and the ways and means to deal with the legal aspect of different situations of corporate sector</p>
	<p>CO1: Define and differentiate between microeconomics and macroeconomics, and describe various economic systems.</p> <p>CO2: Explain and calculate key concepts of national income, including GDP, GNP, and per capita income, and address the challenges in measuring them.</p> <p>CO3: Analyze national income equilibrium through concepts such as consumption, savings, investment, and the effects of government and foreign sectors.</p> <p>CO4: Evaluate the economic functions of government, including budget types, revenue sources, expenditure, and public debt.</p> <p>CO5: Analyze macroeconomic problems such as business cycles, unemployment, inflation, and deflation, and assess the role of the RBI and monetary policy.</p>

SEMESTER-III

CORE-5 CORPORATE ACCOUNTING	<p>CO1: Understand how to maintain books of accounts, statutory records, and annual returns, and manage the issue and underwriting of shares and debentures, including the accounting treatment of ESOPs and ESPS.</p> <p>CO2: Acquire clarity on preparing financial statements for companies and valuing goodwill and shares.</p> <p>CO3: Learn the provisions for buyback of shares and the redemption of preference shares and debentures.</p> <p>CO4: Recognize different modes of liquidation and understand their consequences.</p>
CORE-6 INCOME TAX LAW AND PRACTICE	<p>CO1: Define key concepts and terms under the IT Act, such as assessee, assessment year, sources of income, and tax-related terms like tax evasion, avoidance, and planning.</p> <p>CO2: Determine the residential status of individuals and understand the incidence of tax, excluding companies.</p> <p>CO3: Compute income under different heads including salary, house property, profits and gains from business or profession, capital gains, and other sources.</p> <p>CO4: Identify various deductions and exemptions applicable under specific income heads.</p> <p>CO5: Identify and assess incomes that do not form part of total income, except for section 10AA, and understand agricultural versus non-agricultural income.</p> <p>CO6: Apply rules for set off and carry forward of losses, and calculate deductions from gross total income under various sections, including rebate</p> <p>CO7: Determine total income, assess tax liability, and become familiar with filing returns, assessment procedures, and TDS provisions.</p>
CORE-7 MANAGEMENT PRINCIPLES AND APPLICATION	<p>CO1: Understand various management concepts such as planning, organizing, staffing, coordinating, controlling, motivating, and the Managerial Grid.</p> <p>CO2: Apply management principles to decision-making in different types of business organizations.</p> <p>CO3: Identify and develop human, motivational, communication, and conceptual skills required in the industry.</p> <p>CO4: Analyze different leadership styles and qualities, as well as</p>

	coordination and controlling mechanisms for effective management.
GE-III BUSINESS STATISTICS	<p>CO1: Define and classify different types of data (univariate, bivariate, multivariate, time-series, and cross-sectional) and compute measures of central tendency, including arithmetic, geometric, and harmonic means, as well as mode and median, using Excel and statistical software.</p> <p>CO2: Calculate and interpret measures of variation such as range, quartile deviation, mean deviation, and standard deviation, and assess skewness and kurtosis using Excel and statistical software.</p> <p>CO3: Perform correlation and regression analyses, including simple, multiple, and partial correlations, and linear and nonlinear regressions, while understanding the relationships between correlation and regression coefficients and calculating the standard error of estimate using statistical software.</p> <p>CO4: Construct and evaluate index numbers using fixed and chain bases, univariate and composite methods, and apply techniques for base shifting, splicing, and deflating, while addressing problems in index number construction and analyzing consumer price and share price indices.</p> <p>CO5:Analyze time series data by identifying components, applying additive and multiplicative models, fitting trend lines using least squares, and calculating seasonal variations using methods such as simple averages, ratio-to-trend, and ratio-to-moving averages with the help of statistical software.</p>
SEC-1 E-COMMERCE	<p>CO1: Define e-commerce, including its types, business models (B2B, B2C, C2C, C2B), and e-Governance, and analyze real-life examples and forces driving e-commerce.</p> <p>CO2: Explain E-CRM concepts, features, goals, and strategies, and describe the phases and types of E-CRM along with the functional components of a successful E-CRM system.</p> <p>CO3: Describe various digital payment methods (e.g., debit/credit cards, e-money, NEFT, RTGS), explain the functions of digital wallets and payment gateways, and evaluate the risks associated with e-payments.</p> <p>CO4: Define ERP, including its features, modules, and benefits, and analyze the phases of ERP implementation along with its limitations.</p> <p>CO5:Analyze new trends in e-commerce, such as social commerce and digital marketing, and evaluate the objectives, methods, and limitations of advertisement in social media.</p>
SEMESTER-IV	
CORE-8	CO1: Understand the basic principles, objectives, and benefits of GST,

GST AND INDIRECT TAXES	<p>including its constitutional background, pre-GST tax structure, and the dual GST model.</p> <p>CO2: Recognize the key features and provisions of the CGST Act, SGST Act, and IGST Act, and apply procedures for levy, collection, and exemption under these acts.</p> <p>CO3: Explain the processes for registration, returns, and assessment in GST, including the classification of goods and services, and handling of tax invoices and records.</p> <p>CO4:Analyze the roles and functions of the GST Council, CBEC, and other regulatory bodies, and understand the technology and compliance aspects related to GST.</p> <p>CO5: Evaluate practical issues related to GST compliance, including registration, returns, refunds, and dealing with offences and penalties.</p>
CORE-9 FUNDAMENTALS OF DATA MANAGEMENT	<p>CO1: Apply word processing and presentation tools to create and format business documents and graphical representations effectively.</p> <p>CO2: Create and analyze spreadsheets using advanced MS Excel functions and tools to support data-driven decision-making.</p> <p>CO3: Manage and maintain accounting records by using Database Management Systems (DBMS) for efficient data handling.</p> <p>CO4: Utilize web design tools to create and format websites, demonstrating practical application of web technologies.</p> <p>CO5: Evaluate and apply data management techniques in various business scenarios, including accounting and statistical analysis.</p>
CORE-10 MANAGEMENT ACCOUNTING	<p>CO1: Understand the nature, sources, and purpose of management information and apply accounting techniques for effective managerial decision-making.</p> <p>CO2:Analyze and interpret financial data to assist management in forming policies, strategies, and controlling organizational performance.</p> <p>CO3: Develop and apply basic cost and quantitative information for decision-making in various business contexts.</p> <p>CO4: Prepare budgets, compare actual costs with standard costs, analyze variances, and use performance measurements for effective planning and control.</p> <p>CO5: Evaluate and apply management accounting principles to support strategic decision-making and organizational control.</p>
GE-4	<p>CO1: Understand the nature, scope, and importance of marketing,</p>

<p>PRINCIPLES OF MARKETING</p>	<p>differentiate between selling and marketing, and analyze the components of the marketing environment.</p> <p>CO2:Analyze consumer behavior, identify factors influencing buying decisions, and explain market segmentation and its bases.</p> <p>CO3: Explain product concepts, classifications, and the product life-cycle, and describe the processes of branding, packaging, and new product development.</p> <p>CO4: Evaluate pricing strategies and policies, and analyze factors affecting pricing decisions, as well as understand distribution channels and physical distribution.</p> <p>CO5: Assess various promotion methods and their characteristics, and explore recent developments in marketing such as social marketing, online marketing, and consumerism.</p>
<p>(SEC-2) ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS ETHICS</p>	<p>CO1: Define entrepreneurship and creative behavior, identify its elements and determinants, and analyze the importance of entrepreneurship in micro, small, and medium enterprises, including the role of family business and contemporary Indian business role models.</p> <p>CO2: Identify and evaluate sources of business ideas, and apply feasibility tests to develop a comprehensive business plan or project proposal, including business processes, location, layout, and project report preparation.</p> <p>CO3: Assess the public and private systems of support for entrepreneurship, including finance, marketing, technology, and industrial accommodation, and evaluate the roles of business incubators, angel investors, venture capital, and private equity funds.</p> <p>CO4:Analyze strategies for mobilizing resources for startups, including accommodation, utilities, preliminary contracts with stakeholders, and address common startup problems.</p> <p>CO5: Define business ethics and corporate social responsibility, explore various types and factors influencing business ethics, and analyze ethical dilemmas, principles, and arguments for and against business ethics.</p>
<p>SEMESTER-V</p>	
<p>CORE-11 COMPUTERIZED ACCOUNTING & E-FILING OF TAX RETURNS</p>	<p>CO1: Demonstrate the use of computerized accounting software by performing tasks such as company creation, ledger management, order processing, inventory handling, bank reconciliation, and managing vouchers, including TDS and GST.</p> <p>CO2: Design and implement a computerized accounting system using a DBMS package by creating tables, queries, forms, and reports, and developing voucher entry forms, ledgers, and financial statements like</p>

	<p>trial balance, profit & loss account, and balance sheet.</p> <p>CO3: Develop and manage a payroll accounting system using a DBMS package, including designing forms, queries, and reports for payroll processing.</p> <p>CO4: Prepare and submit income tax returns (ITR) online and offline for individual taxpayers, including the use of DSC, EVC, e-tax calculators, and e-payment methods, and perform tasks related to viewing and verifying e-filed returns.</p> <p>CO5: Utilize backup and restore functions, and manage data export and import processes in computerized accounting systems to ensure data integrity and accessibility.</p>
<p>CORE-12 FUNDAMENTALS OF FINANCIAL MANAGEMENT</p>	<p>CO1: Explain key functions of financial management, including profit vs. value maximization, the role of the CFO, and concepts of time value of money, annuities, and perpetuities.</p> <p>CO2: Analyze various sources of finance, compute the cost of capital, including weighted average and marginal costs, and understand the relevance of these costs to financing decisions.</p> <p>CO3: Evaluate capital expenditure decisions using methods such as Discounted Payback Period, Net Present Value, and Internal Rate of Return, and understand their merits and demerits.</p> <p>CO4: Develop dividend policies by analyzing types of dividends, payout and retention ratios, and applying dividend theories like Walter's and Gordon's models.</p> <p>CO5: Manage working capital by estimating needs, analyzing working capital cycles, and implementing policies for current assets, including conservative, aggressive, and balanced approaches.</p>
<p>DSE-1 ACCOUNTING & FINANCE (Financial Markets, Institutions, & Services)</p>	<p>CO1: Analyze the theoretical framework of the financial system, including its stability factors, development finance vs. universal banking, and the roles of financial intermediaries and innovations, with a focus on central banking and the RBI.</p> <p>CO2: Evaluate the performance and historical perspectives of major financial institutions such as IDBI, ICICI, LIC, and commercial banks, and assess issues related to competition, interest rates, NPAs, and capital adequacy norms.</p> <p>CO3: Understand the evolution and regulatory control of non-banking financial institutions (NBFIs) by RBI and SEBI, and analyze the role and features of entities like Unit Trust of India, mutual funds, and commercial paper markets.</p> <p>CO4: Examine asset-based and fee-based financial services, including lease finance, consumer credit, factoring, venture capital, and advisory</p>

	<p>services like stock broking and credit rating, and evaluate their functions and advantages.</p> <p>CO5: Describe the operations related to financial assets and instruments, including rights issues, debentures, and equity shares, and analyze the regulatory framework governing primary and secondary markets, focusing on SEBI and company law provisions.</p>
<p>DSE-2 ACCOUNTING & FINANCE (Financial Statement Analysis & Reporting)</p>	<p>CO1: Define the key concepts of financial statements, including their nature, objectives, and types such as income statements, balance sheets, fund flow statements, cash flow statements, and notes to accounts, and recognize their limitations.</p> <p>CO2: Compare traditional and modern approaches to financial statement analysis, and apply various techniques including comparative statements, common-size statements, trend ratios, and ratio analysis to interpret financial data and address common analysis problems.</p> <p>CO3: Classify and interpret various financial ratios, apply practical methods of ratio analysis such as time series, cross-sectional, residual, and multivariate analysis, and understand the application of statistical tools in financial analysis.</p> <p>CO4:Analyze cash flow statements as per AS 3, and evaluate both statutory and non-statutory corporate reports, including the principles of integrated and sustainability reporting.</p> <p>CO5: Evaluate the application and limitations of univariate versus multivariate ratio analysis, and understand how statistical tools enhance financial statement analysis.</p>
	<p>SEMESTER-VI</p>
<p>CORE-13 AUDITING AND CORPORATE GOVERNANCE</p>	<p>CO1: Define and apply fundamental concepts of auditing, including its objectives, principles, techniques, and procedures, and differentiate between internal controls mechanisms such as internal check and internal audit.</p> <p>CO2:Analyze the role and responsibilities of company auditors, including their qualifications, appointment, rights, duties, and the various types of auditor reports, and understand their liabilities under the Companies Act 2013.</p> <p>CO3: Evaluate special types of audits, including cost audit, tax audit, and management audit, and assess recent trends in auditing, such as auditing in an EDP environment and relevant standards and case studies.</p> <p>CO4: Explain the conceptual framework of corporate governance, analyze major corporate scandals, and understand common governance problems and reforms, including codes and standards on corporate governance.</p>

	<p>CO5: Assess the strategic planning and implementation of corporate social responsibility (CSR), including its relationship with corporate sustainability, business ethics, and governance, and understand CSR provisions and committees under the Companies Act 2013.</p>
<p>CORE-14 BUSINESS MATHEMATICS</p>	<p>CO1: Perform matrix operations, including finding inverses, and solve systems of linear equations with unique solutions using matrix inversion and Cramer's Rule.</p> <p>CO2:Analyze mathematical functions, including linear, quadratic, polynomial, exponential, logarithmic, and logistic functions, and apply differentiation rules to find maxima and minima.</p> <p>CO3: Apply integration techniques, including substitution, integration by parts, and partial fractions, to compute definite integrals and solve problems related to marginal analysis, consumers and producer's surplus, and learning curves.</p> <p>CO4: Calculate compounding and discounting of sums, evaluate different types of annuities (ordinary, due, deferred, continuous, and perpetual), and determine their present and future values using various interest rates, and understand depreciation of assets.</p> <p>CO5: Formulate and solve linear programming problems (LPP) using graphical and simplex methods, analyze cases of unique, multiple, unbounded, and infeasible solutions, and apply PERT and CPM techniques for project management using mathematical software.</p>
<p>DSE-III Accounting & Finance (Fundamentals of Corporate Tax Planning)</p>	<p>CO1: Explain the concepts of tax planning, tax management, tax avoidance, and tax evasion, and differentiate between assessment year and financial year in the context of corporate tax in India.</p> <p>CO2:Analyze the residential status of corporations and its tax implications, including the calculation of tax liability and the application of Minimum Alternate Tax (MAT).</p> <p>CO3: Evaluate the carry forward and set-off of losses and unabsorbed depreciation across different heads of income, understanding the impact on corporate tax computation.</p> <p>CO4: Develop tax planning strategies related to depreciation, capital gains, and scientific research expenditures to optimize corporate tax liabilities.</p> <p>CO5: Understand the processes of corporate tax return filing and assessment, including penal provisions for non-compliance and the mechanisms for double taxation relief.</p>
<p>DSE-IV Business Research Methods and Project</p>	<p>CO1: Define key concepts in business research, including the meaning, scope, and purposes of research, and differentiate between units of</p>

Work	<p>analysis such as individuals, organizations, groups, and data series.</p> <p>CO2: Outline the research process, including problem identification, definition, and selection of appropriate research methods such as field studies, surveys, and longitudinal studies.</p> <p>CO3: Design and apply measurement scales, including nominal, ordinal, interval, and ratio scales, and develop appropriate data collection methods using tools like Likert scales and semantic differential scaling.</p> <p>CO4: Conduct hypothesis testing using various statistical methods, including tests concerning means and proportions, ANOVA, Chi-square tests, and non-parametric tests, and understand their application in hypothesis testing and regression analysis.</p> <p>CO5: Prepare and organize a research report, including understanding different types of reports, report layout, citation practices, bibliography, and the JEL classification system.</p>
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SUBJECT: COMPUTER SCIENCE (B.Sc.)	<i>After completion of the course students will be able to:</i>
PROGRAMME OUTCOMES	<p>Computer Science is the scientific and practical approach to computation and its applications. It involves the study of algorithms, data structures, software, hardware, and the underlying principles of computing. The goal is to understand how to solve problems efficiently and effectively using computers.</p> <p>PO1. Scientific Knowledge: This outcome emphasizes the application of fundamental scientific principles, mathematical techniques, and computational methods to solve intricate problems.</p> <p>PO2. Problem Analysis: This involves recognizing and defining complex problems, researching existing solutions, and analyzing them using mathematical and scientific principles.</p> <p>PO3. Design/Development of Solutions: Graduates should be able to design effective solutions and systems that address complex issues</p> <p>PO4. Modern tools usage: Graduates should be skilled in using contemporary tools and techniques for scientific tasks, including prediction and modeling.</p> <p>PO6. The Software Engineer and Society: This outcome highlights the need for graduates to understand and address the broader societal, health, safety, legal, and cultural issues related to their professional work, ensuring responsible practice.</p> <p>PO7. Project management: Demonstrate the scientific and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.</p> <p>PO8. Life-long Learning Life-long learning is a crucial competency that underscores the importance of continually acquiring new knowledge and skills throughout one's career and personal life.</p>
PROGRAMME SPECIFIC OUTCOMES <i>For Computer Science (Honors)</i>	<p>A graduate with a B.Sc. in Computer Science will have the ability to</p> <p>PSO1: Demonstrate core knowledge in the following areas:</p> <ul style="list-style-type: none"> • Data Structures and Programming Languages • Databases, Software Engineering, and Development • Computer Architecture and Security

	PSO2: Demonstrate problem-solving skills and the application of computer science knowledge to solve real-world problems.
COURSE OUTCOMES:	<i>After completion of the course the students will be able to:</i>
SEMESTER-I	
CORE-I Programming Using “C”	<p>CO1. Grasp fundamentals of C programming, explore various programming constructs, and write C programs utilizing operators and control structures.</p> <p>CO2. Develop C programs utilizing pointers and arrays, and perform pointer arithmetic.</p> <p>CO3. Implement code reusability through functions, manage dynamic memory allocation, and handle command line arguments.</p> <p>CO4. Manage files using different file handling mechanisms, and solve problems employing derived data types.</p>
CORE-II Digital Logic	<p>CO1: Define different logic gates, illustrate the realization of Boolean expressions in SOP and POS form, and design these using logic gates.</p> <p>CO2: Design logic circuits such as adders and subtractors.</p> <p>CO3: Design and test combinational circuits.</p> <p>CO4: Design and develop sequential circuits.</p>
GE-I COMPUTER FUNDAMENTAL	<p>CO1: Understand the definition and data representation of a computer.</p> <p>CO2: Know the different devices and memory of a computer.</p> <p>CO3: Apply concepts of computer organization and architecture in practical life.</p> <p>CO4: Explain recent emerging technologies and their applications.</p>
SEMESTER-II	
Core Paper III Programming Using C++	<p>CO1: Understand the difference between structure-oriented programming and object-oriented programming.</p> <p>CO2: Apply various object-oriented features such as classes, objects, constructors, and destructors to solve computing problems using C++.</p> <p>CO3: Understand and apply concepts of inheritance and</p>

	<p>operator overloading.</p> <p>CO4: Write programs that perform various operations on files.</p>
<p>Core Paper IV Data Structure</p>	<p>CO1: Implement performance analysis of algorithms and various operations on arrays and linked lists.</p> <p>CO2: Implement basic operations of stacks and queues to solve real-world problems.</p> <p>CO3: Implement data representation using trees for various real-life applications.</p> <p>CO4: Implement various sorting algorithms to solve real-world problems.</p>
<p>GE-II C and DataStructure</p>	<p>CO1: Implement and formulate algorithms for programs (in C language) and develop programs using the basic elements like control statements.</p> <p>CO2: Implement modular programming approaches and recursion mechanisms to solve complex problems.</p> <p>CO3: Implement programs with pointers and use pre-processors.</p> <p>CO4: Implement the basic operations of stacks and queues and various sorting algorithms to solve real-world problems.</p>
SEMESTER-III	
<p>Core Paper V OperatingSystem</p>	<p>CO1: Understand and implement the differences between different types of modern operating systems, virtual machines, their structure, and applications.</p> <p>CO2: Understand the differences between processes and threads, issues of scheduling user-level processes/threads, and the use of locks, semaphores.</p> <p>CO3: Understand and implement concepts of deadlock in operating systems, and how they can be managed/avoided in multiprogramming systems.</p> <p>CO4: Understand and implement the design and management concepts, issues, and challenges of main memory, virtual memory, and file systems.</p>
<p>Core Paper VI Database System</p>	<p>CO1: Implement the basics of database management systems.</p> <p>CO2: Implement Structured Query Language (SQL) for database creation and manipulation.</p> <p>CO3: Implement and demonstrate the working of different concepts of DBMS.</p>

	<p>CO4: Implement a database using data definition, data manipulation, and control languages.</p> <p>CO5: Implement and test a project developed for an application, and apply mathematical and formal techniques for solving problems in computer science related to database applications.</p>
<p>Core Paper VII Discrete Mathematical Structures</p>	<p>CO1: Apply statements using propositional and predicate logic, prove theorems using mathematical induction, and understand sets, functions, and relations and their properties.</p> <p>CO2: Apply counting principles, permutations, combinations, and the pigeonhole principle to solve counting problems, and solve linear and non-linear recurrence relations using generating functions.</p> <p>CO3: Apply principles and concepts of graph theory to solve real-world problems.</p> <p>CO4: Apply and model DFAs, NFAs, grammars for different languages, minimize DFAs, and apply the pumping lemma to prove a language is not regular.</p>
<p>GE-III Programming in python</p>	<p>CO1. Implement Basic Python Syntax and Programming Constructs: Students will be able to implement and understand Python syntax, control structures (such as loops and conditionals), and basic programming constructs like functions and data types.</p> <p>CO2. Develop and Debug Python Programs: Students will be able to develop, test, and debug Python programs using standard libraries and modules, applying best practices in coding and software development.</p> <p>CO3. Apply Object-Oriented Programming (OOP) Concepts: Students will be able to apply OOP principles by creating and utilizing classes and objects in Python, understanding inheritance, polymorphism, and encapsulation.</p> <p>CO4. Utilize Python for Data Manipulation and Analysis: Students will be able to utilize Python libraries such as NumPy, pandas, and Mat plot lib to perform data manipulation, analysis, and visualization.</p> <p>CO5. Build Real-World Applications Using Python: Students will be able to design, implement, and deploy real-world applications using Python, including web</p>

	development with frameworks like Flask or Django, and automation scripts.
SEMESTER-IV	
Core Paper VIII Java Programming	CO1: Implement basic concepts of OOP, and introduction to classes and objects through Java Language. CO2: Implement the concepts of constructors, overloading, parameter passing, access control, and inheritance. CO3: Implement the use of packages and interfaces. CO4: Implement exception handling, threads, and access and manipulate databases.
Core Paper IX Computer Networks	CO1: Understand various types of signals, transmissions, multiplexing, and networks. CO2: Understand error detection and error correction techniques. CO3: Understand IPv4 and IPv6 and various transport layer protocols. CO4: Understand email and protocols used to transfer data.
Core Paper X Computer Graphics	CO1: Apply the background processes involved in computer graphics displays, understanding of algorithms. CO2: Apply mathematics in vectors, create segments, and apply clipping to different shapes. CO3: Apply algorithms used in computer graphics. CO4: Apply methods suitable for 2D and 3D transformations such as translation, rotation, scaling, reflection, and shear. CO5: Apply clipping algorithms for viewing transformation.
GE-IV Web Technology	CO1: Develop simple webpages using HTML and Cascading Stylesheets. CO2: Develop web pages using DHTML and Cascading Stylesheets. CO3: Develop dynamic webpages using JavaScript (client-side programming). CO4: Develop interactive web applications using PHP.
SEMESTER-V	
Core Paper XI Web Technologies	CO1: Develop simple webpages using HTML and Cascading Stylesheets. CO2: Develop web pages using DHTML and Cascading Stylesheets. CO3: Develop dynamic webpages using JavaScript (client-side programming). CO4: Develop interactive web applications using PHP.
Core Paper XII Software Engineering	CO1: Apply the ability to gather and specify requirements of software projects. CO2: Apply the ability to analyze software requirements

	<p>with existing tools.</p> <p>CO3: Apply the understanding of and basic project management practices in real-life projects.</p> <p>CO4: Apply the ability to differentiate different testing methodologies.</p>
<p>DSC-1</p> <p>Numerical Techniques</p>	<p>CO1: Apply knowledge of computer arithmetic and truncation errors in detail.</p> <p>CO2: Apply numerical techniques to find the roots of algebraic equations and check the accuracy of the solutions.</p> <p>CO3: Apply various interpolating methods and several numerical methods to real-life problems.</p> <p>CO4: Apply numerical methods to find numerical integration and numerical solutions of ordinary differential equations</p>
<p>DSC-2</p> <p>Unix Shell Programming</p>	<p>CO1: Learn the basics of UNIX OS, UNIX commands, and the file system.</p> <p>CO2: Learn about the Linux environment.</p> <p>CO3: Learn the fundamentals of shell scripts and shell programming.</p> <p>CO4: Learn to write simple programs using UNIX.</p>
<p>SEMESTER-VI</p>	
<p>CorePaperXIII</p> <p>Artificial Intelligence</p>	<p>CO1: Develop an understanding of the basic concepts of AI principles and approaches.</p> <p>CO2: Develop a basic understanding of the building blocks of AI.</p> <p>CO3: Develop the ability to represent knowledge.</p> <p>CO4: Develop an understanding of the basic concepts of Natural Language Processing..</p>
<p>CorePaperXIV</p> <p>Algorithm Design Techniques</p>	<p>CO1: Apply sorting algorithms, analyze the efficiency of algorithms using asymptotic notations, and argue the correctness of algorithms using loop invariants.</p> <p>CO2: Apply the concept of hashing, describe and apply the divide-and-conquer paradigm, and derive and solve recurrences describing the performance of divide-and-conquer algorithms. CO3: Apply greedy and dynamic programming algorithms, and solve and analyze several problems using greedy and dynamic programming techniques.</p> <p>CO4: Apply major graph algorithms and analyze their time complexity.</p>
<p>DSEIII:</p> <p>DataScience</p>	<p>CO1: Apply knowledge gained from various courses to do innovative work.</p> <p>CO2: Apply knowledge of the complete project lifecycle, project time estimation, and project management.</p> <p>CO3: Apply knowledge of various simulation tools.</p> <p>CO4: Apply skills to work effectively in a team.</p>
<p>DSEIV:</p> <p>Project Work /Dissertation OR</p>	<p>CO1: Develop innovative work by applying the knowledge gained from various courses undertaken in earlier years.</p>

Data Mining	CO2: Develop an understanding of the complete project lifecycle, project time estimation, and project management. CO3: Develop knowledge of various simulation tools. CO4: Develop the ability to work effectively in a team.
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SUBJECT – ECONOMICS (B.A.)

<p>Programme Outcomes (PO)</p>	<p>Economics is a dynamic and versatile discipline that equips students with the analytical tools and knowledge necessary to understand and address complex economic issues. The program prepares students for a variety of career paths including academia, financial services, policy analysis, and more.</p> <p>PO1: Economics Knowledge and Application Develop a comprehensive understanding of economic theories and principles for professional careers.</p> <p>PO2: Analytical and Quantitative Skills Enhance students' abilities to use quantitative methods and statistical tools for economic analysis.</p> <p>PO3: Environmental Economics and Sustainability Educate students on the economic aspects of environmental issues and sustainable development.</p> <p>PO4: Research and Innovation Foster a research-oriented mindset and encourage innovative thinking in economic studies.</p>
<p>Programme Specific Outcomes (PSO) for Economics (B. A.)</p>	<p>PSO1: Apply advanced practical areas of economics to achieve a professional qualification and real-world expertise.</p> <p>PSO2: Understand basic economic concepts and analyze economic behavior in various practical contexts.</p> <p>PSO3: Develop and apply the economic way of thinking to solve real-world problems and scenarios.</p> <p>PSO4: Communicate complex economic ideas and concepts effectively using appropriate methods and tools.</p> <p>PSO5: Integrate interdisciplinary issues with economic theories to evaluate and understand societal aspects. PSO6: Conduct scientific research in economics by utilizing rigorous methods and developing analytical skills.</p> <p>PSO7: Predict the impact of economic variables on growth and development at national and international levels using quantitative and qualitative methods.</p>

COURSE OUTCOME FOR 1st YEAR	
Semester I	
<p>CORE-1 and GE-III</p> <p>Introductory Micro Economics</p>	<p>CO1: Understand and apply the ten principles of economics to decision-making and economic analysis.</p> <p>CO2: Analyze the market forces of demand and supply, and determine market equilibrium and the effects of shifts in these curves.</p> <p>CO3: Calculate and evaluate the price elasticity of demand and supply, including determinants and computation of income and cross elasticity.</p> <p>CO4: Explain the theory of consumer choice, including budget constraints, preferences, indifference curves, and the derivation of demand curves.</p> <p>CO5: Understand and assess the various cost concepts, measures of cost, and the behavior of cost curves in both short-run and long-run scenarios.</p> <p>CO6: Evaluate the characteristics and outcomes of firms in competitive markets, including profit maximization and supply decisions in short-run and long-run contexts.</p> <p>CO7: Analyze the demand and supply for labor and other factors of production, and determine equilibrium in the labor market, including the interplay between work, leisure, and other factors.</p>
<p>CORE-2:</p> <p>Mathematical Methods in Economics-I</p>	<p>CO1: Understand and apply set theory, Cartesian products, relations, and functions to foundational economic models.</p> <p>CO2: Analyze different types of functions (constant, polynomial, rational, exponential, logarithmic) and interpret their graphs, limits, and continuity.</p> <p>CO3: Evaluate limits and continuity of functions using limit theorems and apply these concepts to mathematical problems in economics.</p>

	<p>CO4: Understand and compute derivatives to determine rates of change, slopes of curves, and apply differentiation rules to economic functions.</p> <p>CO5: Analyze the relationship between total, average, and marginal functions using derivative techniques in economic contexts.</p> <p>CO6: Understand and apply partial differentiation techniques, including geometric interpretations and economic applications such as elasticity.</p> <p>CO7: Understand matrix algebra and determinants, solve systems of equations using Cramer's rule and matrix inversion, and apply these methods to economic models.</p>
Semester II	
<p>CORE-3 and GE-IV Macro Economics</p>	<p>CO1: Differentiate between macroeconomic and microeconomic concepts, and understand the limitations of macroeconomics.</p> <p>CO2: Comprehend and apply the concepts of national income, including GDP, GNP, NDP, NNP, and disposable personal income.</p> <p>CO3: Evaluate output, income, and expenditure approaches to measuring national income and analyze the difficulties in estimating national income.</p> <p>CO4: Illustrate the circular flow of income in 2, 3, and 4-sector economies and assess the relationship between national income and economic welfare, including green accounting.</p> <p>CO5: Understand the evolution and functions of money, analyze the quantity theory of money, and evaluate different approaches to the value of money.</p> <p>CO6: Analyze the causes and effects of inflation and deflation, and evaluate various anti-inflationary and anti-deflationary measures using classical, Keynesian, monetarist, and modern theories.</p> <p>CO7: Examine classical and Keynesian approaches to income determination, apply the principles of aggregate demand and</p>

	supply, and calculate changes in national income using the simple investment multiplier.
CORE-4: Mathematical Methods in Economics-II	<p>CO1: Understand and apply Leontief's open and static input-output model to solve for equilibrium output in a three-industry model.</p> <p>CO2: Compute and interpret second and higher-order derivatives, including curvature, concavity, convexity, and points of inflection of functions.</p> <p>CO3: Apply techniques for finding higher-order partial derivatives and the derivative of implicit functions.</p> <p>CO4: Understand and utilize various integration techniques, including substitution, integration by parts, partial fractions, and interpret definite integrals as area under curves.</p> <p>CO5: Identify and analyze optimum values, relative maxima and minima using first and second derivative tests, and apply these concepts to economic problems.</p> <p>CO6: Apply optimization techniques for multivariable functions, using first and second order conditions, and interpret convex functions and convex sets in economic contexts.</p> <p>CO7: Solve optimization problems with equality constraints using the Lagrange-Multiplier method and analyze the first and second order conditions using the Bordered Hessian determinant.</p>
COURSE OUTCOME FOR II YEAR	
Semester III	
CORE-5: Micro Economics I	<p>CO1: Understand and analyze the axioms of rational choice, preferences, and utility functions to determine consumer behavior.</p> <p>CO2: Apply mathematical tools to maximize utility and make optimal consumption choices in both two-good and multi-good scenarios.</p> <p>CO3: Understand and evaluate the properties of expenditure functions, and apply expenditure minimization principles in consumer theory.</p>

	<p>CO4: Analyze the income and substitution effects on demand functions and construct individual and compensated demand curves.</p> <p>CO5: Understand and analyze production functions, marginal productivity, and the rate of technical substitution, and apply cost minimization principles.</p> <p>CO6: Evaluate cost functions, and distinguish between short-run and long-run cost curves, including shifts in cost curves and cost optimization.</p> <p>CO7: Understand and apply the principles of profit maximization, including marginal revenue and the relationship between average and marginal revenue for price-taking firms.</p>
<p>CORE-6: Macro Economics I</p>	<p>CO1: Understand and analyze the consumption - income relationship, and evaluate the factors influencing consumption functions using various consumption hypotheses.</p> <p>CO2: Identify and explain the determinants of autonomous and induced investment, and apply theories such as the Marginal Efficiency of Capital (MEC) and the Accelerator to investment decisions.</p> <p>CO3: Evaluate classical, neoclassical, and Keynesian approaches to the demand for money, and understand the theory of money supply determination and money multipliers.</p> <p>CO4: Derive and analyze the IS and LM curves, and determine equilibrium levels of employment, output, prices, and investment through their interaction.</p> <p>CO5: Understand the derivation of aggregate demand and aggregate supply curves, and evaluate the impact of changes in IS and LM curves on macroeconomic equilibrium.</p>

	<p>CO6: Analyze the trade-off between inflation and unemployment using the Phillips Curve, and evaluate the implications of adaptive and rational expectations in policy effectiveness.</p> <p>CO7: Understand and critically evaluate various theories of trade cycles, including Hawtrey's Monetary Theory, Hayek's Over-investment Theory, and Keynes' views on trade cycles.</p>
<p>CORE-7: Statistical Methods for Economics</p>	<p>CO1: Understand and apply basic statistical concepts such as population, sample, parameters, and statistics. Collect and present data using various methods, including frequency distributions, graphical, and diagrammatic representations.</p> <p>CO2: Calculate and evaluate measures of central tendency (mean, median, mode, geometric mean, harmonic mean) and dispersion (range, mean deviation, standard deviation, coefficient of variation, quartile deviation), and assess their merits and demerits.</p> <p>CO3: Analyze relationships between variables using correlation methods, including scatter diagrams, Karl Pearson's correlation coefficient, and Spearman's rank correlation coefficient, and interpret their properties and errors.</p> <p>CO4: Apply two-variable linear regression analysis to estimate regression lines and coefficients using the least squares method, and interpret the results and standard error of the estimate.</p> <p>CO5: Understand and apply methods for measuring trends in time series data, including free-hand, semi-average, moving average, and least squares methods, and analyze seasonal components.</p> <p>CO6: Define and calculate various index numbers, including price, quantity, and value relatives, and evaluate methods</p>

	<p>such as Laspeyres' and Fisher's indices. Identify problems and limitations in index number construction and test for ideal index numbers.</p> <p>CO7: Understand and apply basic probability concepts, including addition and multiplication rules and conditional probability. Differentiate between probability and non-probability sampling methods, including simple random, systematic, multi-stage, and quota sampling, and identify sampling and non-sampling errors.</p>
Semester IV	
<p>CORE-8: Micro Economics II</p>	<p>CO1: Analyze market environments and apply concepts of pure competition to firm supply decisions. Calculate and interpret supply functions, producer's surplus, and industry supply curves.</p> <p>CO2: Understand the Edgeworth Box for analyzing trade and Pareto efficiency. Evaluate equilibrium existence and welfare theorems in production contexts.</p> <p>CO3: Identify and analyze barriers to entry and price discrimination under monopoly. Evaluate monopolistic competition, including price-output determination and excess capacity.</p> <p>CO4: Understand and apply Nash equilibrium, mixed strategies, and the Prisoner's Dilemma. Analyze repeated games, cartel enforcement, and sequential games.</p> <p>CO5: Analyze strategies in oligopoly settings, such as quantity and price leadership. Evaluate Cournot equilibrium, collusion, and simultaneous price and quantity setting.</p> <p>CO6: Calculate and interpret producer's surplus and economic rent. Understand their impact on market equilibrium and supply decisions.</p> <p>CO7: Understand the welfare theorems and analyze their implications for production efficiency and market outcomes.</p>

<p>CORE-9: Macro Economics II</p>	<p>CO1: Analyze economic growth models including the Solow Model, Golden rule level of capital, population growth, and technological progress.</p> <p>CO2: Evaluate open economy macroeconomic policies through balance of payments, exchange rate determination, the Mundell- Fleming model, and fiscal and monetary policy effectiveness.</p> <p>CO3: Compare Classical and Keynesian macroeconomic theories focusing on employment and output determination, Say's law, Keynes's General Theory, and the Phillips curve.</p> <p>CO4: Understand the orthodox monetarist school, including the Quantity Theory of Money, the expectations-augmented Phillips curve, and views on stabilization policy.</p> <p>CO5: Explore New Classical Economics, including the influence of Robert E. Lucas Jr., the Rational Expectations hypothesis, and policy implications.</p>
<p>CORE-10: Research methodology</p>	<p>CO1: Understand the meaning, objectives, and significance of research. Identify the qualities of a good researcher and the research process.</p> <p>CO2: Define and select research problems effectively. Apply techniques to clearly outline research problems and design research plans.</p> <p>CO3: Assess measurement scales and sources of error in research. Apply ethical guidelines and understand intellectual property rights in research.</p> <p>CO4: Design and evaluate various research designs, including experimental designs. Understand the features of a good research design.</p> <p>CO5: Develop a research proposal and conduct a literature review. Utilize library and internet resources, and ensure academic integrity.</p>

	CO6: Improve report writing skills, including structure and style. Apply citation styles and evaluate the quality of research reports.
COURSE OUTCOME FOR III YEAR	
Semester -V	
CORE-11 and GE-I Indian Economy I	<p>CO1: Analyze the evolution of the Indian economy from the pre- British period to the present. Evaluate the impacts of colonialism and state policies on economic development.</p> <p>CO2: Examine the relationship between population growth and economic development. Assess demographic issues, including urbanization, migration, and human resource development.</p> <p>CO3: Identify trends in national and per capita income, and analyze sectoral shifts and regional disparities. Evaluate poverty, inequality, and unemployment issues and policies.</p> <p>CO4: Evaluate the rationale, features, and achievements of economic planning in India. Compare different Five Year Plans and understand the transition from planning to NITI.</p> <p>CO5: Analyze the changes in sectoral composition and regional growth disparities. Apply analytical frameworks to understand economic challenges and opportunities.</p> <p>CO6: Review major economic policy debates and paradigm shifts in post-Independence India. Assess the impact of rapid changes on current economic indicators and policies.</p>
CORE-12: Development Economics I	<p>CO1: Define economic development and differentiate it from economic growth. Evaluate characteristics and obstacles of underdeveloped countries, and apply various measures of economic development.</p> <p>CO2: Compare classical, Marxian, Schumpeterian, and Rostow's stages of growth theories. Analyze the Solow model and its implications for convergence with population</p>

	<p>growth and technological progress.</p> <p>CO3: Measure poverty using indices such as Head Count Ratio and FGT Ratio. Assess inequality with Lorenz curves and Kuznets' hypothesis. Evaluate the relationship between growth, poverty, and inequality.</p> <p>CO4: Examine the role of agriculture and industrialization in economic development. Analyze barriers and interdependencies between agriculture and industry, and assess the functioning of markets in agrarian societies.</p> <p>CO5: Identify key characteristics of effective institutions and evaluate their role in economic development. Assess different measures of institutional quality and the impact of democracy on economic progress.</p> <p>CO6: Analyze the impact of governance, property rights, and corruption on economic development. Evaluate market failures and propose solutions for improving market conditions and tackling corruption.</p>
Discipline Specific Elective Paper	
<p>DSE- 1: Public Economics</p>	<p>CO1: Define public finance and compare it with private finance. Explain public versus private goods and maximum social advantage. Discuss market failure and the government's role. Describe types of public budgets and their classifications. Understand balanced vs. unbalanced budgets and their economic implications.</p> <p>CO2: Explain public expenditure, including its classification, principles, and effects. Discuss its growth causes and related theories, such as Wagner's law and the Peacock-Wiseman hypotheses.</p> <p>CO3: Identify sources of public revenue and describe taxation. Discuss tax classification, impact, and incidence. Explain the benefit and ability-to-pay approaches, and analyze trends in tax revenue for central and state</p>

	<p>governments in India.</p> <p>CO4: Discuss sources and effects of public debt. Compare Classical/Ricardian and Keynesian views on debt burden. Explain intergenerational equity and debt management methods. Analyze the trade-off between taxation and debt financing.</p> <p>CO5: Analyze how government policies affect economic efficiency and equity. Evaluate the implications of public finance theories on real-world economic issues. Understand the role of public budgets, expenditure, revenue, and debt in shaping economic policy.</p>
<p>DSE-2: Money Banking and Financial Market</p>	<p>CO1: Define and describe the functions of money. Identify types such as legal tender and bank money. Explain the value of money using index numbers like WPI, CPI, and GDP deflator. Discuss demand and supply of money, including classical, Keynesian, and Friedman's theories.</p> <p>CO2: Understand the roles and functions of commercial banks. Analyze credit creation and limitations. Discuss banking sector reforms in India and lessons from the Global Financial Crisis.</p> <p>CO3: Explain the functions of a central bank. Differentiate between quantitative and qualitative credit control methods. Describe India's current monetary policy, including tools like Repo, reverse repo, and MSF.</p> <p>CO4: Define financial markets and their types. Discuss the roles of money and capital markets. Explain the functions of stock exchanges and SEBI. Analyze the impact of financial markets on economic development.</p>
<p>Semester VI</p>	
<p>CORE-13 and GE-II Indian Economy II</p>	<p>CO1: Assess Indian agriculture's nature and importance. Analyze production trends, land reforms, and the Green Revolution. Evaluate rural credit systems and marketing</p>

	<p>practices.</p> <p>CO2: Examine trends in industrial output and productivity. Discuss industrial policies from 1948 to 1991, including licensing and their impacts. Evaluate issues in small-scale industries, finance, and labor.</p> <p>CO3: Analyze the growth and contribution of the tertiary sector to GDP and employment. Understand human development concepts and their measurement. Evaluate India's foreign trade trends, policies, and foreign capital sources.</p> <p>CO4: Evaluate key environmental policies and acts, such as the Environment Protection Act and National Environmental Policy. Discuss global climate change responses and India's role and impact.</p> <p>CO5: Apply sector-specific knowledge to assess economic indicators. Evaluate empirical evidence and policy debates, considering rapid changes in India.</p> <p>CO6: Integrate insights from different sectors to understand economic trends. Analyze how agricultural, industrial, tertiary, and environmental policies shape economic outcomes.</p>
<p>CORE-14: Development Economics II</p>	<p>CO1: Understand demographic concepts: birth rates, age structure, and fertility. Analyze the Malthusian population trap and household theories. Evaluate the effects of population growth and migration models.</p> <p>CO2: Explore geographic, social, and technological dualism. Discuss Myrdal's theory and regional inequalities. Examine international inequality and the dualistic development thesis.</p> <p>CO3: Analyze the link between development and the environment. Discuss poverty, environmental degradation, and resource management. Understand sustainable development and climate change basics.</p> <p>CO4: Evaluate trade's role in development, focusing on</p>

	<p>export-led growth and the Prebisch-Singer Hypothesis. Compare trade strategies like import substitution vs. export promotion and international agreements.</p> <p>CO5: Examine saving, capital formation, and their impact on development. Discuss the financial sector's role, taxation, public borrowing, inflation, and foreign finance.</p> <p>CO6: Integrate knowledge from population, dualism, environment, and trade. Apply this to evaluate development strategies and policies.</p>
Discipline Specific Elective Paper	
<p>DSE- 3:</p> <p>Environmental Economics</p>	<p>CO1: Explain the scope of environmental economics and its interaction with the economy. Discuss the environment as a public good and identify major environmental problems in developing countries. Analyze global environmental issues and international cooperation for environmental protection.</p> <p>CO2: Understand pollution as an externality and the market approach to optimal pollution. Discuss property rights, Coase theorem, and Pigouvian taxation. Examine climate change, including its causes, effects, and management strategies.</p> <p>CO3: Identify methods for valuing environmental damage and discuss difficulties in valuation. Differentiate between economic value, use value, option value, and existence value. Apply direct and indirect valuation methods such as hedonic pricing, contingent valuation, and travel cost approach.</p> <p>CO4: Classify natural resources as renewable and exhaustible. Discuss the tragedy of the commons and the role of community management in resource conservation. Explain sustainable development concepts, indicators, and sustainability rules.</p> <p>CO5: Analyze real-world environmental issues using economic principles. Evaluate policies and strategies for</p>

	<p>environmental protection and resource management.</p> <p>Apply concepts of environmental valuation and sustainability in practical scenarios.</p>
<p>DSE- 4: Project</p>	<p>CO1: Connect textbook and classroom economics with real-world applications. Provide empirical evidence to understand economics in practical contexts.</p> <p>CO2: Undertake a detailed investigation of a topic chosen by the student. Expose students to the social and real-world applications of classroom concepts with faculty guidance.</p> <p>CO3: Work under a faculty supervisor for topic selection, investigation, and report writing. Receive mentorship throughout the project to ensure thorough exploration and analysis.</p>

SUBJECT: EDUCATION (B.A)	
PROGRAMME OUTCOMES	<p>PO1: Create responsible citizenry through the holistic development of students by integrating social, moral, cultural, ethical, and professional conduct.</p> <p>PO2: Apply critical thinking and analytical skills to enhance tech-pedagogical approaches within the educational field.</p> <p>PO3: Develop managerial, analytical, communicative, creative, employability, and strategic skills to effectively address the dynamic challenges of a globalized world.</p> <p>PO4: Demonstrate advanced knowledge and comprehensive awareness in the domain of education.</p> <p>PO5: Critically evaluate educational research and integrate findings into practical, everyday educational practices.</p> <p>PO6: Analyze and assess educational policies within the socio-cultural context of India and international perspectives.</p> <p>PO7: Understand and implement various learning models, evaluation techniques, and strategies for effective education.</p> <p>PO8: Analyze and interpret data from both qualitative and quantitative research methods.</p> <p>PO9: Construct academic writings tailored for diverse audiences including peers, researchers, educators, and the broader professional community.</p> <p>PO10: Foster inclusive education practices to accommodate diverse learning needs and promote equitable educational opportunities.</p>

<p>PROGRAMME SPECIFIC OUTCOMES</p>	<p>PSO1: Pursue further professional and advanced courses such as Training programme for teacher and higher education</p> <p>PSO2: Cultivate a passion for interdisciplinary research by exploring perspectives from Sociology, Psychology, Philosophy, History, Economics, and Political Science.</p> <p>PSO3: Gain practical knowledge and skills through engaging in fieldwork, internships, research projects, community activities, and both formal and informal interactive sessions.</p> <p>PSO4: Identify and develop new dimensions of knowledge by selecting and engaging with diverse open electives to address contemporary societal needs.</p> <p>PSO5: Synthesize insights from various interdisciplinary fields to inform and enhance research and professional practices.</p> <p>PSO6: Evaluate and apply practical experiences from various activities to support continuous personal and professional growth.</p> <p>PSO7: Critically evaluate and apply innovative assessment methods to measure learning outcomes in classroom teaching and learning.</p> <p>PSO8: Develop competency in using ICT tools for teaching, learning, assessment, and content creation.</p> <p>PSO9: Integrate inquiry-based learning and hands-on activities to promote scientific literacy and critical thinking skills in students.</p>
<p>COURSE OUTCOME</p>	<p>After completion of the course students will able to:</p>
<p>Semester-I</p>	
<p>Core Paper I & GE-I EDUCATIONAL PHILOSOPHY</p>	<p>CO1: Understand education by exploring both its narrow definition as formal instruction and its broader role in personal and social development.</p> <p>CO2: Establish the connection between philosophical theories and their impact on educational practices and policies.</p> <p>CO3: Recognize the common characteristics shared by Indian and Western philosophical traditions.</p> <p>CO4: Describe the major Indian philosophical schools and their</p>

	<p>branches, along with their influence on contemporary educational theories.</p> <p>CO5: Appreciate the contributions of influential educational thinkers at national, international, and local levels and their impact on educational practice</p>
<p>Core Paper II EDUCATIONAL PSYCHOLOGY</p>	<p>CO1: Explain the concept of educational psychology and its relationship with psychology.</p> <p>CO2: Analyze the relationship between education and psychology to understand their interconnections and impacts on learning processes.</p> <p>CO3: Identify the common characteristics and scope of Educational Psychology to gain a comprehensive understanding of its domain.</p> <p>CO4: Describe various methods employed in Educational Psychology to evaluate their applications and effectiveness in research and practice.</p> <p>CO5: Understand the contributions of Educational Psychology to teachers, students, and the overall teaching-learning process to appreciate its practical significance.</p> <p>CO6: Explain the principles of growth and development and their interrelationship to understand the foundational aspects of human development.</p>
SEMESTER II	
<p>Core Paper III & GE-II EDUCATIONAL SOCIOLOGY</p>	<p>CO1: State the relationship between education and society.</p> <p>CO2: Understand the meaning of Educational Sociology and function of education as a social system.</p> <p>CO3: State different agencies of education and their functions. Justify the importance of education for social change.</p> <p>CO4: Describe the role of education in modernization and globalization.</p> <p>CO5: Describe the function of education to ensure equality and equity.</p>
<p>Core Paper IV CHANGING PEDAGOGICAL PERSPECTIVE</p>	<p>CO1: Explain the concept of pedagogy</p> <p>CO2: Differentiate pedagogy from other allied concepts</p> <p>CO3: Explain different teaching task with example</p> <p>CO4: Understand common characteristics of teaching and learning in actual classroom setting</p> <p>CO5: Describe the concept, nature and different theories of teaching in details.</p> <p>CO6: Explain the core teaching skills used in the real classroom setting and prepare lesson plans following different designs.</p>

SEMESTER III	
Core Paper V & GE-IV EDUCATIONAL ASSESSMENT AND EVALUATION	<p>CO1: State the nature, purpose and types of educational assessment and evaluation.</p> <p>CO2: Develop and use different types of tools and techniques for continuous and comprehensive assessment of learning in the school situation.</p> <p>CO3: Explain the importance of assessment for learning and its processes for enhancing the quality of learning and teaching.</p> <p>CO4: Describe the characteristic of a good test.</p> <p>CO5: Analyze the trends and issues in learning and learner assessment.</p> <p>CO6: Analyze and interpret results of the assessment using standard score.</p> <p>CO7: Illustrate the principles of test construction in education.</p>
Core Paper VI EDUCATIONAL RESEARCH	<p>CO1: Describe nature, scope and limitation of educational research.</p> <p>CO2: Understand different types and methods of educational research.</p> <p>CO3: Describe the process of research in education.</p> <p>CO4: Analyze research design in education.</p> <p>CO5: Illustrate procedure of collecting and analysing data.</p> <p>CO7: Prepare the research report.</p>
Core Paper VII STATISTICS IN EDUCATION	<p>CO1: Explain the significance of statistics in education to understand its role in educational research and decision-making.</p> <p>CO2: Organize and represent educational data effectively in both tabular and graphical forms to facilitate clear communication and analysis.</p> <p>CO3: Calculate and apply statistical measures of average, variation, and bi-variate distribution to analyze and interpret educational data accurately.</p> <p>CO4: Describe the concept and importance of the normal probability curve and interpret test scores using this curve to understand data distributions.</p>
SEMESTER IV	
Core Paper VIII HISTORY OF EDUCATION IN INDIA	<p>CO1: Analyze the features of ancient Vedic and Buddhist learning systems, including their aims, curriculum, teaching methods, and the role of teachers.</p> <p>CO2: Describe the education system in Medieval India and evaluate the relevance of Islamic education during that period.</p> <p>CO3: Examine the development of education in Pre-Independence India and during British rule to understand its</p>

		<p>historical evolution.</p> <p>CO4: Explain the evolution of education in post-Independence India through the analysis of various commissions and reports.</p> <p>CO5: Investigate the recommendations for educational development made by different committees and commissions to assess their impact and implementation.</p>
Core Paper CURRICULUM DEVELOPMENT	IX	<p>CO1: Differentiate between curriculum, courses of study, and textbooks to clarify their distinct roles and functions in education.</p> <p>CO2:Analyze the bases and sources of curriculum to understand the foundational elements that shape educational content.</p> <p>CO3: Describe various types of curricula to identify their characteristics and applications in different educational contexts.</p> <p>CO4: Critically examine the National Curriculum Frameworks of 2000 and 2005 to assess their impact and effectiveness in educational reforms.</p> <p>CO5: Describe the process of curriculum development and differentiate among various models of curriculum development to understand their methodologies and implications.</p> <p>CO6: Evaluate curricula using different evaluation models to determine their effectiveness and areas for improvement.</p>
Core Paper X GUIDANCE AND COUNSELLING	AND	<p>CO1: State the concept, need, principles, and bases of guidance to understand its foundational elements and importance.</p> <p>CO2: Apply various tools and techniques of guidance in appropriate contexts to effectively support and assist individuals.</p> <p>CO3: Explain the role of schools in organizing diverse guidance programs to enhance student development and support.</p> <p>CO4: Define the concept, scope, and types of counselling to grasp its broad applications and objectives.</p> <p>CO5: Narrate the process, tools, and techniques of counselling to understand its methodology and implementation.</p> <p>CO6: Explain the essential qualities and role of a counsellor to identify key attributes and responsibilities in providing effective support.</p> <p>CO7: Describe various programs designed for differently-abled children to understand tailored approaches for inclusive</p>

	education.
SEMESTER V	
Core Paper XI DEVELOPMENT OF EDUCATION IN ODISHA	<p>CO1: Grasp the structure of the educational system in Odisha to understand its organization and components.</p> <p>CO2: State the functions of institutions and units at both the state and district levels to clarify their roles in the educational framework.</p> <p>CO3: Narrate the learning objectives and implementation processes of major education schemes by the central and state governments in Odisha such as DPEP, SSA, KGVB etc.</p> <p>CO4: Explain the roles of various state and district-level institutions in education to understand their contributions to the educational system.</p> <p>CO5: Analyze the current state of higher and technical education in Odisha to evaluate its development and challenges.</p> <p>CO6: state the roles of DIET, CTE, IASE and SCERT.</p>
Core Paper XII INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION	<p>CO1: Establish the relationship between technology and education to understand their interconnected impact on teaching and learning.</p> <p>CO2: Understand the concept, nature, scope, approaches, innovations, and importance of educational technology to appreciate its role in modern education.</p> <p>CO3: Describe the concept, nature, scope, relevance, content, and pedagogy of ICT in education to grasp its comprehensive role and application.</p> <p>CO4: Explain the use of software and ICT assessment tools in education to assess their effectiveness and application in evaluating educational outcomes.</p> <p>CO5: Critically reflect on various ways ICT facilitates global connections in both academic and other life aspects to understand its broader impact.</p> <p>CO6: Describe the importance of free and open source software in education .</p>
SEMESTER VI	
Core Paper XIII & GE-III CONTEMPORARY TRENDS AND ISSUES IN INDIAN	<p>CO1: Understand the significance of pre-school and elementary school education to appreciate their foundational role in the educational system.</p>

EDUCATION	<p>CO2:Analyze various problems and issues affecting the quality of education to identify and address challenges in ensuring effective learning outcomes.</p> <p>CO3: State the importance of secondary education and analyze issues impacting its quality to evaluate and improve secondary education systems.</p> <p>CO4: Enumerate the significance of higher education and analyze challenges affecting its quality to understand and enhance higher education standards.</p> <p>CO5: Justify the importance of teacher education and analyze problems and issues impacting its quality to ensure effective teacher preparation and professional development.</p> <p>CO6:Analyze emerging concerns in Indian education to understand and address contemporary challenges and trends in the educational landscape.</p>
Core Paper XIV EDUCATIONAL MANAGEMENT AND LEADERSHIP	<p>CO1: Describe the concept, types, and importance of educational management to understand its role and significance in the educational system.</p> <p>CO2: Outline the structure of educational management across various levels, from national to institutional, to grasp its hierarchical organization.</p> <p>CO3: Explain different aspects and the significance of educational management to appreciate its comprehensive impact on educational effectiveness.</p> <p>CO4: Describe the concept, theories, and styles of leadership within educational management to understand various approaches to effective leadership.</p> <p>CO5:Analyze the principles, concepts, and structures of the Total Quality Management approach in education to assess its role in enhancing educational quality.</p>
Discipline Specific Electives	
Discipline Elective Paper-I A.PEDAGOGY OF LANGUAGE (ENGLISH)	<p>CO1:Analyze issues related to the role of English in the school curriculum, skill acquisition, and language policies from NPE 1986 and NCF 2005.</p> <p>CO2: Apply various methods, approaches, and strategies to teach English and create lesson plans that cover all aspects of the language.</p> <p>CO3: Develop test items to assess English learning, provide feedback, and prepare additional materials to enhance learning.</p>

		<p>CO4: Use phonetics to help students improve their English speaking skills.</p> <p>CO5: Plan effective teaching strategies for the prescribed English content to ensure successful classroom instruction.</p>
Discipline Elective Paper-I A.PEDAGOGY	Specific OF LANGUAGE (ODIA)	<p>CO1: State the importance of Odia as a mother tongue in the school curriculum and its role in education.</p> <p>CO2: Develop strategies to address challenges in learning Odia within a multilingual context.</p> <p>CO3: Use various techniques to help students acquire language skills in Odia effectively.</p> <p>CO4: Select appropriate teaching methods to deliver different types of lessons in Odia.</p> <p>CO5: Create effective tools for assessing learning in Odia comprehensively.</p> <p>CO6: Explain the basics of Odia linguistics and how they apply to teaching the language.</p> <p>CO7: Plan effective teaching approaches for the prescribed Odia texts for classes at elementary and secondary level</p>
Discipline Elective Paper-II A.PEDAGOGY	Specific OF SOCIAL SCIENCE	<p>CO1: State the meaning, scope, and importance of Social Science to understand its role and relevance in education.</p> <p>CO2: Specify the skills and competencies needed to create specific learning objectives for History and Political Science lessons.</p> <p>CO3: Identify various methods and skills for teaching History and Political Science to effectively deliver the content.</p> <p>CO4: Explain the importance of time sense in teaching History and create or use timelines to enhance historical instruction.</p> <p>CO5: Prepare Unit and Lesson Plans for History and Political Science to structure effective teaching and learning.</p> <p>CO6: Develop and administer diagnostic achievement tests, analyze the results, and provide feedback to improve learning outcomes.</p>
Discipline Elective Paper-III <i>(A student has to choose any one from A & B under DSE-III)</i> A.POLICY	Specific AND	<p>CO1: Explain the policies and practices of school education, including intervention programs and associated challenges.</p> <p>CO2: Understand the policies and practices of secondary and higher secondary education, along with intervention programs</p>

<p>PRACTICES IN SCHOOL EDUCATION IN INDIA</p>	<p>and challenges.</p> <p>CO3: Describe the policies and practices of vocational education at various levels, including related issues and challenges.</p> <p>CO4: Appreciate the introduction of inclusive education, its issues and challenges, and the policies designed to address them.</p> <p>CO5: Critically reflect on policies addressing access and equity in education for different vulnerable and marginalized groups.</p>
<p>Discipline Specific Elective Paper-III (A student has to choose any one from A & B under DSE-III)</p> <p>B.POLICY AND PRACTICES IN HIGHER EDUCATION IN INDIA</p>	<p>CO1: Establish the relationship between policy practices and education to understand their impact on educational outcomes.</p> <p>CO2: Understand the policies and practices in higher education by examining various reform bodies and their influences.</p> <p>CO3: Describe the future of higher education, focusing on intervening programs, progress, and institutional autonomy.</p> <p>CO4: Appreciate curriculum and assessment practices in higher education to ensure quality assurance and continuous improvement.</p> <p>CO5: Critically reflect on the educational management systems in higher education to evaluate their effectiveness and areas for enhancement.</p>
<p>Discipline Specific Elective Paper-IV INCLUSIVE EDUCATION</p>	<p>CO1: Define the meaning and scope of inclusive education to understand its fundamental principles and objectives.</p> <p>CO2: Identify the assumptions about disability in current general and special education to assess underlying perspectives and practices.</p> <p>CO3: Understand the recommendations from recent commissions on educating children with disabilities to achieve the goal of "Universalization of Education."</p> <p>CO4: Explore and apply pedagogical approaches that support students with diverse learning profiles in inclusive and respectful ways.</p> <p>CO5: Explain the concept and implications of Universal Design for Learning (UDL) to enhance classroom pedagogy and accessibility.</p> <p>CO6: Examine various support services and collaborative practices essential for effective inclusive education.</p>
<p>DSE Paper – IV</p>	<p>CO1: Conduct independent research on an educational problem</p>

DISSERTATION/ RESEARCH PROJECT	<p>or issue, demonstrating critical thinking and analytical skills.</p> <p>CO2:Design and implement appropriate research methodologies to gather and analyze data effectively.</p> <p>CO3:Communicate research findings clearly and effectively through written and oral presentations.</p> <p>CO4:Contribute to the body of knowledge in the field of education through original research.</p>
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SUBJECT: BA ENGLISH	
<p>PROGRAMME OUTCOME</p> <p>(B.A. ENGLISH)</p>	<p>PO1: Develop emotional, mental, spiritual, professional and academic competencies.</p> <p>PO2: Build awareness of self and society by adopting an inter-disciplinary approach to reading.</p> <p>PO3: Enhance love for and understanding of literary and cultural texts, leading to research so as to enhance humane values.</p> <p>PO4: Comprehend the semiotics and thematic undercurrents of any given texts.</p> <p>PO5: Foster excellence and creativity in communication skills.</p>
<p>PROGRAMME SPECIFIC OUTCOMES</p> <p>(B.A. ENGLISH)</p>	<p>PSO1: Demonstrate advanced skills in reading, writing, listening, and speaking in English, with a strong grasp of grammar, syntax, and vocabulary.</p> <p>PSO2: Analyze and critically evaluate literary texts and other forms of written communication, understanding various perspectives and interpretations.</p> <p>PSO3: Appreciate and understand diverse cultural and historical contexts reflected in literature, including the ability to compare and contrast different literary traditions.</p> <p>PSO4: Develop and present coherent arguments and ideas both verbally and in writing, employing appropriate rhetorical strategies and styles.</p> <p>PSO5: Apply theoretical frameworks and literary criticism to interpret texts, understanding their structure, themes, and significance.</p> <p>PSO6: Engage in creative writing and other forms of artistic expression, demonstrating originality and creativity in producing literary works.</p> <p>PSO7: Reflect on ethical issues and social responsibilities related to literature and language, including the impact of literature on society and vice versa.</p>
COURSE OUTCOMES FOR B.A. ENGLISH	

<p>Core Paper-I</p> <p>British Poetry And Drama: 14th To 17th Centuries</p>	<p>CO1: Understand: Describe the key characteristics and themes of 14th-century poetry, Renaissance drama, and the impact of the Reformation on literature and society.</p> <p>CO2: Analyze: Examine the narrative structure and moral lessons in Geoffrey Chaucer's "The Pardoner's Tale" to understand its critique of societal vices.</p> <p>CO3: Apply: Interpret and relate the themes of love and beauty in Spenser's "Sonnet 34" to the broader context of Elizabethan sonnet tradition.</p> <p>CO4: Evaluate: Assess the use of imagery and metaphor in Shakespeare's "Sonnet 73" to explain how it reflects the theme of aging and the nature of enduring love.</p> <p>CO5: Create: Construct an argument about the psychological and moral conflicts in Shakespeare's "Macbeth," integrating insights from the play's characterization and thematic elements.</p>
<p>Core Paper II</p> <p>British Poetry And Drama: 17th And 18th Century</p>	<p>CO1: Understand: Identify and describe the major literary forms and movements of the 17th and 18th centuries, including metaphysical poetry, cavalier poetry, and neoclassicism.</p> <p>CO2: Analyze: Compare and contrast the thematic elements and stylistic features of metaphysical poetry and cavalier poetry from the 17th century.</p> <p>CO3: Apply: Interpret the themes and poetic techniques in Milton's "Lycidas" and explain how they reflect the characteristics of 17th-century poetry.</p> <p>CO4: Evaluate: Assess the use of irony and satire in Andrew Marvell's "To His Coy Mistress" to understand its effectiveness in conveying the poem's message.</p> <p>CO5: Create: Develop an analytical essay on how Dryden's "All For Love" uses dramatic elements to explore themes of love and honor, integrating insights from the play's structure and character development.</p>

<p>Core Paper III</p> <p>British Prose: 18th Century</p>	<p>CO1: Understand: Explain the key characteristics of the Restoration period, the Glorious Revolution, Neoclassicism, and the Enlightenment, and their impact on English literature.</p> <p>CO2: Analyze: Analyze the arguments presented by Mary Wollstonecraft in Chapter 1 of "A Vindication of the Rights of Women" to understand her views on gender equality and social justice.</p> <p>CO3: Apply: Apply the concepts of friendship, good nature, and wit from Joseph Addison's essays to contemporary discussions on social behavior and moral philosophy.</p> <p>CO4: Evaluate: Evaluate Samuel Johnson's perspectives in "Narratives of Travellers Considered" and "Obstructions of Learning" to assess their relevance to the understanding of 18th-century travel literature and education.</p> <p>CO5: Create: Construct a comparative analysis of the Enlightenment ideals reflected in the works of Mary Wollstonecraft and Samuel Johnson, integrating insights from their respective essays and historical context.</p>
<p>Core Paper IV</p> <p>Indian Writing In English</p>	<p>CO1: Understand: Describe the historical context of Indian writing in English, including the impact of the East India Company, Macaulay's 1835 Minutes of Education, the first war of independence, and the development of Western education in India.</p> <p>CO2: Analyze: Examine and interpret the themes and literary techniques used in Sarojini Naidu's "The Bangle Sellers" to understand its representation of Indian culture and social issues.</p> <p>CO3: Apply: Apply critical thinking to A.K. Ramanujan's "Obituary" to analyze how the poem reflects personal and cultural perspectives on death and memory.</p> <p>CO4: Evaluate: Assess the portrayal of familial relationships and cultural heritage in Jayanta Mahapatra's "Grandfather" and Nissim Ezekiel's "Night of the Scorpion" to understand their significance in Indian poetry.</p> <p>CO5: Create: Develop an analytical essay on R.K. Narayan's "The Guide," focusing on its narrative structure, character development, and themes to evaluate its contribution to Indian English literature.</p>

<p>Core Paper V</p> <p>British Romantic Literature</p>	<p>CO1: Understand: Explain the key characteristics of Romanticism and its reaction against Classicism, including its focus on the relationship between man and Nature, individual liberty, and the influence of the French Revolution.</p> <p>CO2: Analyze: Analyze the themes and emotional tone of Thomas Gray’s “Elegy Written in a Country Churchyard” to understand its reflection on mortality and rural life.</p> <p>CO3: Apply: Apply an understanding of Romantic themes to interpret the symbolism and social critique in William Blake’s poems “A Poison Tree” and “The Chimney Sweeper.”</p> <p>CO4: Evaluate: Evaluate the use of imagery and emotional expression in William Wordsworth’s “Tintern Abbey,” S. T. Coleridge’s “Kubla Khan,” John Keats’s “Ode to a Nightingale,” and P. B. Shelley’s “Ode to the West Wind” to assess their contributions to Romantic poetry.</p> <p>CO5: Create: Develop a critical essay on William Wordsworth’s Preface to the 2nd edition of "Lyrical Ballads," focusing on how Wordsworth articulates the principles of Romantic poetry and their impact on literary tradition.</p>
<p>Core Paper VI</p> <p>British Literature 19th Century</p>	<p>CO1: Understand: Describe the major socio-political developments of the 19th century, such as industrialization and urbanization, and their impact on British literature during the Romantic Movement and beyond.</p> <p>CO2: Analyze: Analyze the themes and emotional impact of Tennyson’s “Break, Break, Break” and Robert Browning’s “My Last Duchess” to understand their contributions to 19th-century poetry.</p> <p>CO3: Apply: Apply the critical concepts from Matthew Arnold’s “The Study of Poetry” to evaluate the effectiveness of various poetic techniques and their role in literary analysis.</p> <p>CO4: Evaluate: Assess the portrayal of social and economic issues in Charles Dickens’s “Hard Times” to understand its critique of industrialization and its effects on society.</p> <p>CO5: Create: Construct a comparative essay on Jane Austen’s “Pride and Prejudice” and its representation of social class and gender, integrating insights from the socio-political context of the</p>

<p>Core Paper VII</p> <p>British Literature: Early 20th Century</p>	<p>19th century.</p> <p>CO1: Understand: Describe the impact of the First World War on Western society and literature, including the effects of Marx's class struggle and Freud's theory of the unconscious on literary and social perspectives.</p> <p>CO2: Analyze: Analyze the themes and stylistic innovations in T.S. Eliot's "The Love Song of J. Alfred Prufrock" and Yeats's "The Second Coming" to understand their reflections on modernist concerns and the changing nature of human experience.</p> <p>CO3: Apply: Apply the critical principles from T.S. Eliot's "Tradition and the Individual Talent" to evaluate the techniques and originality in the poetry of Wilfred Owen's "Strange Meeting" and Siegfried Sassoon's "Suicide in the Trenches."</p> <p>CO4: Evaluate: Assess the portrayal of psychological and social issues in Virginia Woolf's "Mrs. Dalloway" to understand its contribution to modernist literature and its exploration of stream-of-consciousness narration.</p> <p>CO5: Create: Develop an analytical essay on J.M. Synge's "Riders to the Sea," focusing on its thematic exploration of rural Irish life and its dramatic representation of fate and family dynamics.</p>
<p>Core Paper IX</p> <p>European Classical Literature</p>	<p>CO1: Understand: Describe the key features of Classical Antiquity, including the rise and decline of the Roman Empire and the cultural and geographical significance of the Greco-Roman world centered around the Mediterranean Sea.</p> <p>CO2: Analyze: Analyze the narrative structure and themes in Book I of Homer's "Odyssey" to understand its depiction of heroism and adventure in ancient Greek epic poetry.</p> <p>CO3: Apply: Apply critical concepts from Aristotle's "Poetics" (Chapters 6, 7, 8) to evaluate the dramatic elements and character development in Sophocles' "Oedipus the King."</p> <p>CO4: Evaluate: Assess the effectiveness of the tragic elements in "Oedipus the King" based on Aristotle's theories of tragedy, including concepts such as catharsis and the tragic flaw.</p> <p>CO5: Create: Develop a comparative analysis of epic poetry and tragedy, using Homer's "Odyssey" and Sophocles' "Oedipus the King" to illustrate how different literary forms address themes of</p>

	human experience and morality.
<p>Core Paper X</p> <p>Women's Writing</p>	<p>CO1: Understand: Explain the main themes and arguments presented in Chapter 1 of Virginia Woolf's "A Room of One's Own," focusing on its discussion of women's rights and creative freedom.</p> <p>CO2: Analyze: Analyze the character development and social critique in Charlotte Brontë's "Jane Eyre" to understand its portrayal of gender and class issues in the 19th century.</p> <p>CO3: Apply: Apply the themes of identity and self-expression in Kamala Das's "An Introduction" and Sylvia Plath's "Mirror" to explore how these poems reflect the personal and social struggles of women.</p> <p>CO4: Evaluate: Assess the representation of women and societal norms in Eunice de Souza's "Women in Dutch Painting" and Shanta Acharya's "Homecoming" to understand their contributions to contemporary feminist literature.</p> <p>CO5: Create: Develop a comparative essay on the portrayal of women's experiences in Ashapura Devi's "The Distant Window" and the selected poems by Kamala Das, Sylvia Plath, Eunice de Souza, and Shanta Acharya, analyzing how these works address themes of identity, freedom, and societal expectations.</p>
<p>Core Paper XIII</p> <p>Postcolonial Literatures</p>	<p>CO1: Understand: Explain the fundamental concepts of post colonialism, including the meaning of "the post in Postcolonial," key movements and theories against Empire, and the contributions of leading postcolonial thinkers like Frantz Fanon, Edward Said, Gayatri Spivak, and Homi Bhabha.</p> <p>CO2: Analyze: Analyze the portrayal of colonial and postcolonial themes in Raja Rao's "Kanthapura" to understand how the novel reflects the impact of colonialism on Indian society and culture.</p> <p>CO3: Apply: Apply postcolonial theoretical concepts to Jean Rhys's "Wide Sargasso Sea" to explore its critique of colonial power dynamics and its representation of identity and displacement.</p> <p>CO4: Evaluate: Assess the depiction of racial and social tensions in Athol Fugard's "Blood Knot" to understand its commentary on</p>

	<p>apartheid and its impact on South African society.</p> <p>CO5: Create: Develop a comparative analysis of how Raja Rao's "Kanthapura" and Jean Rhys's "Wide Sargasso Sea" address themes of colonialism and resistance, incorporating insights from postcolonial theory to evaluate their contributions to the understanding of postcolonial narratives.</p>
<p>Discipline Specific Elective Paper-I</p> <p>Literary Theory</p>	<p>CO1: Students will analyze New Criticism through Cleanth Brooks's concepts in "Language of Paradox."</p> <p>CO2: Students will apply Marxist Criticism to literature using Terry Eagleton's ideas from "Literature and Ideology."</p> <p>CO3: Students will evaluate feminist perspectives on literature based on Simone de Beauvoir's introduction in <i>The Second Sex</i>.</p> <p>CO4: Students will interpret the fundamentals of Structuralism through Saussure's "The Nature of the Linguistic Sign."</p>
<p>Discipline Specific Elective Paper- II</p> <p>World Literature</p>	<p>CO1: Students will analyze the existential themes and narrative style in Albert Camus's "The Outsider".</p> <p>CO2: Students will interpret the socio-political and cultural themes in V.S. Naipaul's "A Bend in the River".</p> <p>CO3: Students will evaluate character development and thematic elements in Alice Munro's short stories "The Bear Came Over the Mountain" and "Face."</p> <p>CO4: Students will assess the imagery and thematic concerns in Pablo Neruda's "Tonight I Can Write" and "Every Day You Play," and Octavio Paz's "Between Going and Staying the Day Wavers" and "Motion."</p>

<p>Discipline Specific Elective Paper- III PARTITION LITERATURE</p>	<p>CO1. Students will define and discuss the key concepts of partition literature based on Ritu Menon and Kamla Bhasin’s introduction in *Borders and Boundaries*.</p> <p>CO2. Students will analyze the themes and emotional impact of partition-related poetry by W.H. Auden, Agha Shahid Ali, and Faiz Ahmad Faiz.</p> <p>CO3. Students will interpret the depiction of partition and its effects in Bapsi Sidhwa’s Ice-Candy-Man.</p> <p>CO4. Students will evaluate the portrayal of partition themes and human suffering in Sadat Hassan Manto’s “Toba Tek Singh,” Rajinder Singh Bedi’s “Lajwanti,” and Lalith ambika Antharjanam’s “A Leaf in the Storm.”</p>
<p>Discipline Specific Elective Paper- IV Writing For Mass Media</p>	<p>CO1. Students will understand the history and status of English in India, including its role in journalism and how Indian writers adapt English as a non-native variety.</p> <p>CO2. Students will learn to write news stories, features, and editorials for print media, with practical examples from mass media.</p> <p>CO3. Students will develop skills in writing for electronic media, including creating effective advertisement captions and taglines for both print and digital formats.</p> <p>CO4. Students will gain proficiency in composing professional emails, blogs, and social media content, and understand the principles of internet journalism.</p>
<p>Generic Elective Paper II Gender And Human Rights</p>	<p>CO 1. Students will analyze gender sensitivity concepts using Unit I and II of the UNESCO Module 5.</p> <p>CO2. Students will examine the social and historical implications of caste as discussed by Dr. Babasaheb Ambedkar in “Castes in India.”</p> <p>CO3. Students will explore feminist perspectives and arguments presented in Chimamanda Ngozi Adichie’s “We Should All Be Feminists”.</p> <p>CO4. Students will interpret the themes and narrative techniques of gender and social critique in Rokeya Sakhawat Hossain’s novella “Sultana’s Dream”.</p>

<p>Generic Elective Paper III Nation, Culture, India</p>	<p>CO1. Students will analyze M.K. Gandhi’s experiences and philosophical insights on non-violence and personal transformation in Part V of “My Experiments With Truth”.</p> <p>CO2. Students will evaluate Amartya Sen’s arguments on secularism and its challenges as presented in “Secularism and Its Discontents” from “The Argumentative Indian”.</p> <p>CO3. Students will explore Rabindranath Tagore’s perspectives on Indian nationalism and its implications in “Nationalism in India” from “Nationalism”.</p> <p>CO4. Students will examine Sri Aurobindo’s views on the Indian Renaissance and its impact on modern India from “The Renaissance in India” and other essays.</p>
<p>Generic Elective Paper IV Language And Linguistics</p>	<p>CO1: Understand: Describe the basic concepts of language, including the definitions and branches of linguistics, the scope of applied linguistics, and the phenomena of global Englishes, including language variation, postcolonial English, pidgin, and creole.</p> <p>CO2: Analyze: Analyze the principles of phonology and morphology to understand how sound patterns and word structures function in different languages, including the variation seen in global Englishes.</p> <p>CO3: Apply: Apply the rules of syntax to parse and construct sentences, demonstrating an understanding of sentence structure and grammatical relationships in both standard and non-standard varieties of English.</p> <p>CO4: Evaluate: Assess different semantic theories and their application to analyze meaning in language, focusing on how semantics explains the interpretation of words and sentences in various contexts.</p> <p>CO5: Create: Develop an integrative analysis that combines knowledge of phonology, morphology, syntax, and semantics to study language variation and use in global Englishes, illustrating how these linguistic components interact in real-world language contexts.</p>

SUBJECT: GEOGRAPHY(B.A.)	
PROGRAMME OUTCOMES	<p>PO1: Demonstrate a comprehensive understanding of geographic concepts, including physical, human, and environmental geography, and their interconnections.</p> <p>PO2: Apply critical thinking and analytical skills to interpret and evaluate spatial data using various geographic tools and techniques, such as GIS, remote sensing, and cartography.</p> <p>PO3: Conduct independent research by formulating research questions, employing appropriate methodologies, and analyzing data to address complex geographical problems and contribute to the field.</p> <p>PO4: Communicate geographic information effectively through written reports, presentations, and visualizations, tailored to different audiences and purposes.</p> <p>PO5: Assess and propose solutions to contemporary environmental and societal issues, considering the impacts of human activities and natural processes on different scales.</p> <p>PO6: Integrate knowledge of geographical theories and models to analyze urbanization patterns, population dynamics, and resource management in diverse contexts.</p> <p>PO7: Demonstrate an understanding of regional geography through detailed case studies, exploring physical, economic, and socio-cultural aspects, and their implications for planning and development.</p>
PROGRAMME SPECIFIC OUTCOMES	<p>PSO1: Utilize Geographic Techniques: Apply geographic tools and techniques, including GIS, remote sensing, and cartography, to gather, analyze, and interpret spatial data for solving complex geographical problems.</p> <p>PSO2: Conduct Spatial Research: Design and implement research projects using appropriate methodologies to investigate physical, human, and environmental geographical phenomena.</p> <p>PSO3: Analyze Geographic Processes: Understand and assess the physical and human processes that shape the Earth's surface, including their impacts on various scales and their implications for sustainable development.</p> <p>PSO4: Communicate Geographic Information: Effectively present geographic findings through written reports, presentations, and visualizations, ensuring clear and accurate communication tailored to diverse audiences and purposes.</p>
COURSE OUTCOMES	
SEMESTER-I	
CC I: Geomorphology	CO1: Analyze the fundamental concepts, nature, and scope of geomorphology and its application in understanding Earth's

	<p>surface processes.</p> <p>CO2: Explain the interior structure of the Earth and the principles of isostasy, including Airy and Pratt's models.</p> <p>CO3: Describe the theory of plate tectonics and its role in shaping Earth's surface.</p> <p>CO4: Explain the processes of weathering and mass wasting, and their effects on landscape evolution.</p> <p>CO5:Analyze the formation and characteristics of fluvial, karst, aeolian, glacial, and coastal landforms.</p>
CC II: Cartography	<p>CO1:Analyse the scientific basis of cartography and its role as a tool for human communication, including its various branches.</p> <p>CO2: Explain the concepts of spherical, ellipsoidal, and geoid Earth, and apply geographical coordinates and scale construction techniques in map creation.</p> <p>CO3: Describe the purpose and historical development of map projections, and analyze the transformation of area, distance, and direction using simple cylindrical and conical projections.</p> <p>CO4: Interpret geological maps by analyzing bedding planes, strike and dip structures, and apply methods for determining slope, including Wentworth's and Smith's methods.</p>
SEMESTER-II	
CC III: Human Geography	<p>CO1: Define human geography, explaining its nature, scope, major themes, and contemporary relevance, including the Man-nature relationship.</p> <p>CO2:Analyze the role of race, religion, and language in shaping cultures, and evaluate the concept of cultural regions globally.</p> <p>CO3: Assess factors affecting population distribution and growth, understand population composition, and apply the Demographic Transition Theory to analyze population problems in the underdeveloped world.</p> <p>CO4: Describe the types and patterns of rural settlements, classify towns functionally, and examine trends in world urbanization.</p>
CC IV: Climatology	<p>CO1:Describe the atmospheric composition and structure, including how it varies with altitude, latitude, and season.</p> <p>CO2:Analyze factors influencing insolation and temperature distribution, the heat budget, and temperature inversion.</p> <p>CO3: Describe atmospheric pressure and winds, including</p>

	<p>planetary winds, forces affecting winds, general circulation, and jet streams.</p> <p>CO4: Examine atmospheric moisture processes, including evaporation, humidity, condensation, fog, clouds, precipitation types, stability, and climatic regions according to the Köppen classification.</p> <p>CO5: Discuss cyclones, differentiating between tropical and extra-tropical cyclones, and analyze the origin and mechanism of monsoons.</p>
SEMESTER-III	
CC V: Oceanography	<p>CO1: Describe the bottom relief of the Atlantic, Indian, and Pacific Oceans, including key features and their significance.</p> <p>CO2:Analyze the determinants and distribution of ocean temperature and salinity, and interpret T-S (Temperature-Salinity) diagrams.</p> <p>CO3: Explain the movement of ocean water, including waves, currents in the Atlantic, Pacific, and Indian Oceans, and the types and theories of tides.</p> <p>CO4: Examine ocean deposits and their types and distribution, and discuss the different types of coral reefs and theories of their origin, including those proposed by Darwin, Dana, and Louis Agassiz.</p>
CC VI: Statistical Methods in Geography	<p>CO1: Identify and utilize different sources of geographical data, understanding the data matrix and various scales of measurement, including nominal, ordinal, interval, and ratio.</p> <p>CO2: Apply tabulation techniques and descriptive statistics to analyze data distributions, and calculate measures of central tendency, such as mean, median, and mode.</p> <p>CO3: Compute and interpret measures of dispersion, including mean deviation, standard deviation, variance, and coefficient of variation.</p> <p>CO4: Evaluate measures of association and correlation, including rank correlation, product moment correlation, and simple linear regression, to analyze relationships between variables.</p>

<p>CC VII: Geography of Odisha</p>	<p>CO1: Describe the physiographic features of Odisha, including its drainage systems, climate, soil types, and natural vegetation.</p> <p>CO2:Analyze the production and distribution of key agricultural products in Odisha, such as rice, pulses, and oilseeds, and assess the agricultural problems and prospects in the region.</p> <p>CO3: Examine the distribution of major minerals and power resources in Odisha, including iron ore, bauxite, and coal, and evaluate the significance of related industries like iron and steel, aluminum, and cotton textiles.</p> <p>CO4: Investigate the distribution and growth of Odisha's population, and analyze the transportation infrastructure, focusing on roadways and railways.</p>
<p>SEMESTER-IV</p>	
<p>CC VIII: Evolution of Geographical Thought</p>	<p>CO1: Describe the geographical concepts of the ancient and classical periods, including those from Greek, Roman, and Indian traditions.</p> <p>CO2:Analyze the contributions of key figures in modern geographical thought, such as Carl Ritter, Friedrich Ratzel, and Paul Vidal de la Blache.</p> <p>CO3: Compare and contrast major dichotomies in geography, including environmental determinism vs. possibilism, systematic vs. regional, and ideographic vs. nomothetic approaches.</p> <p>CO4: Evaluate recent developments in geographical thought, including the Quantitative Revolution, the Behavioral approach, and radicalism in geography.</p>
<p>CC IX: Economic Geography</p>	<p>CO1: Explain the concept and classification of economic activities, analyze factors affecting the location of economic activities with a focus on agriculture, and apply Von Thünen's and Weber's theories to the location of economic activities.</p> <p>CO2: Describe the types and problems associated with primary activities such as agriculture, and examine the agricultural regions of the world, as well as issues related to forestry and fishing.</p> <p>CO3:Analyze secondary activities, including manufacturing sectors like cotton textiles and iron and steel, and evaluate the significance of Special Economic Zones and their regional impacts.</p> <p>CO4: Assess tertiary activities, focusing on transport infrastructure (roads, railways, air, and water) and trade, and their role in economic development and connectivity.</p>
<p>CC X:</p>	<p>CO1: Define Environmental Geography, explaining its</p>

Environmental Geography	<p>concept and scope, and analyze environmental contrasts (biotic, abiotic, global, continental, and local), as well as the environmental controls of light, temperature, water, topography, and edaphic factors.</p> <p>CO2: Describe the concept, structure, and functions of ecosystems, including trophic levels, food chains, biogeochemical cycles (such as nitrogen and carbon), and energy flow within ecosystems.</p> <p>CO3: Evaluate environmental problems across tropical, temperate, and polar ecosystems, and analyze issues related to water and air pollution.</p> <p>CO4: Assess major global and national environmental programs and policies, including the concept of spaceship Earth, the Earth Summit 1992, the Wildlife Act of India 1972, the Water Pollution Control Act of India 1974, and the National Environmental Tribunal of India 1995.</p>
SEMESTER-V	
CC XI: Regional Planning and Development	<p>CO1: Define the concept of a region and explain the evolution and types of regional planning, including formal, functional, and planning regions, as well as the need for regional planning and characteristics of an ideal planning region.</p> <p>CO2: Describe the process of delineating planning regions, including various approaches and methods, and analyze the planning regions of India.</p> <p>CO3: Evaluate theories and models for regional planning, such as the Growth Pole Model by Perroux, and the contributions of Myrdal, Hirschman, and Rostow.</p> <p>CO4: Assess policies and programs for rural and regional development planning in India, and explain the concept of the Human Development Index (HDI) and its relevance in development planning.</p>
CC X II: Remote Sensing and GIS	<p>CO1: Define remote sensing and GIS, detailing their components, platforms, types, and principles, and analyze the advantages and limitations of remote sensing technology.</p> <p>CO2: Describe the principles, types, and geometry of aerial photography, and explain the interaction of electromagnetic radiation (EMR) with the atmosphere and Earth's surface.</p> <p>CO3: Explain GIS data structures, including spatial and non-spatial types, and differentiate between raster and vector data structures, while also describing the elements and uses of GPS.</p> <p>CO4: Apply manual image interpretation and analysis techniques to identify image elements and perform land use/land cover mapping from satellite images.</p>

<p>DSE I: Population Geography</p>	<p>CO1: Define the field of Population Geography, including its nature and scope, and identify key sources of data relevant to India, such as Census, Vital Statistics, and NSS.</p> <p>CO2:Analyze population size, distribution, and growth patterns, and apply theories of population growth, including Malthusian Theory and Demographic Transition Theory.</p> <p>CO3: Examine population dynamics by evaluating measures, determinants, and implications of fertility, mortality, and migration.</p> <p>CO4: Describe population composition and characteristics, focusing on age-sex composition, rural and urban distribution, and literacy rates.</p> <p>CO5: Assess contemporary population issues, including aging populations, declining sex ratios, HIV/AIDS impacts, and other population-related problems.</p>
<p>DSE II: Resource Geography</p>	<p>CO1: Define natural resources, including their concept, classification, and techniques used for their management and assessment.</p> <p>CO2:Analyze the distribution and utilization of land and water resources, assessing their significance and impact on the environment.</p> <p>CO3: Evaluate the distribution and utilization of forest and energy resources, including their role in sustainability and economic development.</p> <p>CO4: Identify problems associated with the management of land, water, forest, and energy resources, and propose strategies for effective management and conservation.</p> <p>CO5: Assess and propose methods for the appraisal and conservation of natural resources, focusing on water, forest, and land resources, to ensure their sustainability and minimize environmental degradation.</p>
<p>SEMESTER-VI</p>	
<p>CC X III: Geography of India</p>	<p>CO1: Describe the physiographic divisions of India, including soil types, vegetation, and climate characteristics and classifications.</p> <p>CO2:Analyze the distribution and demographic structure of India's population, and examine trends in population growth.</p> <p>CO3: Evaluate the distribution and utilization of mineral and power resources in India, including iron ore, coal, petroleum, and natural gas.</p>

	<p>CO4: Assess agricultural production and distribution of key crops and analyze the development of major industries in India.</p>
<p>CC XIV: Disaster Management</p>	<p>CO1: Define hazards and disasters, differentiating between natural and man-made hazards, and explain the concepts of disaster management, vulnerability, and risk.</p> <p>CO2: Describe the disaster management cycle, including strategies for pre-disaster management, during disaster management, and post-disaster review, as well as techniques for prevention, mitigation, preparedness, and adaptation.</p> <p>CO3:Analyze the nature and characteristics of specific hazards, including floods, cyclones, droughts, earthquakes, and man-made hazards such as industrial accidents and fires.</p> <p>CO4: Examine indigenous community-based disaster preparedness and evaluate the roles of various organizations in disaster management, including NDMA, NIDM, NDRF, OSDMA, ODRAF, and the contributions of NGOs and government organizations.</p>
<p>DSE III:Urban Geography</p>	<p>CO1: Define urban geography, including its nature, scope, and the history of urbanization, and analyze urban morphology and its components.</p> <p>CO2: Examine trends and patterns of urbanization in developed and developing countries, and apply Christaller's central place theory to understand urban growth and organization.</p> <p>CO3: Evaluate functional classifications of cities using both quantitative and qualitative methods, and analyze urban morphology and the sphere of influence of urban settlements.</p> <p>CO4: Identify and address key urban issues, including problems related to housing, slums, civic amenities (such as water and transport), air pollution, and noise pollution.</p> <p>CO5: Conduct case studies of major Indian cities (Delhi, Mumbai, Kolkata, Chennai, and Chandigarh) to assess land use patterns and urban issues specific to each city.</p>
<p>DSE IV DISSERTATION/ PROJECT WORK</p>	<p>CO1: Formulate a research question or problem related to a real-life situation in Geography, demonstrating the application of disciplinary knowledge and critical thinking skills.</p> <p>CO2: Conduct a comprehensive literature review and employ appropriate research methodologies to collect, analyze, and interpret data relevant to the chosen problem.</p> <p>CO3: Synthesize findings and propose practical solutions or recommendations based on the analysis, showcasing the ability to address complex issues and contribute to the field of Geography.</p>

	<p>CO4: Prepare and present a well-structured project report, demonstrating clear communication of research objectives, methods, results, and conclusions, adhering to academic standards and ethical considerations.</p>
<p>GENERIC ELECTIVE (GE) (It is for other Honours students)</p>	
<p>(SEMESTER-1) GE I: Geography of India</p>	<p>CO1: Describe the physical geography of India, including its physiographic divisions, soil types, vegetation, and climate characteristics and classifications.</p> <p>CO2: Analyze the distribution, growth, and structure of India's population, focusing on demographic trends and patterns.</p> <p>CO3: Evaluate the distribution and utilization of mineral and power resources in India, including iron ore, coal, petroleum, and natural gas, and assess agricultural production and industrial development, particularly in the automobile and information technology sectors.</p> <p>CO4: Examine the social aspects of India, including the distribution of the population by race, caste, religion, language, and tribes, and analyze their spatial and social implications.</p> <p>CO5: Assess the transport infrastructure in India, including road, rail, and airways, and evaluate their role in economic development and connectivity.</p>
<p>(SEMESTER-2) GE II: Geography of Odisha</p>	<p>CO1: Describe the physiographic features and drainage systems of Odisha, analyzing their impact on the region's landscape.</p> <p>CO2: Examine the climate, soil types, and natural vegetation of Odisha, and evaluate their influence on the region's ecological and agricultural patterns.</p> <p>CO3: Analyze the production and distribution of key agricultural products in Odisha, such as rice, pulses, and oil seeds, and assess agricultural problems and prospects in the region.</p> <p>CO4: Evaluate the distribution of mineral and power resources in Odisha, including iron ore, bauxite, and coal, and assess the significance of industries such as iron and steel, aluminum, and cotton textiles.</p> <p>CO5: Investigate the population distribution and growth trends in Odisha, and analyze the transport infrastructure, including roadways and railways, and their impact on regional development.</p>
<p>(SEMESTER-3) GE III: Climatology</p>	<p>CO1: Describe the atmospheric composition and structure, including variations in atmospheric properties with altitude, latitude, and season.</p>

	<p>CO2:Analyze the factors influencing insolation and temperature distribution, and explain the heat budget.</p> <p>CO3: Examine atmospheric pressure and winds, including the roles of planetary winds, forces affecting winds, general circulation patterns, and jet streams.</p> <p>CO4: Assess atmospheric moisture processes, including evaporation, humidity, condensation, fog, clouds, precipitation types, and the concepts of stability and instability.</p> <p>CO5: Investigate cyclones, focusing on tropical and extra-tropical cyclones, and explain the origin and mechanism of monsoon systems</p>
<p>(SEMESTER-4) GE IV: Human Geography</p>	<p>CO1: Define Human Geography, outlining its major themes and contemporary relevance.</p> <p>CO2:Analyze the concept of space in Human Geography by exploring cultural regions and their significance in shaping human activities and interactions.</p> <p>CO3: Examine global societal aspects, including race, religion, and language, and assess their impact on cultural and social dynamics worldwide.</p> <p>CO5: Describe the types of rural and urban settlements, and analyze trends and patterns in world urbanization, focusing on the factors driving these changes and their implications.</p>

Subject (Geology) BSc.	<i>After completion of the course the student will be able to :</i>
Programme Outcomes	<p>PO1: Analyze geological data and interpret the results to understand Earth's processes and history.</p> <p>PO2: Apply geological principles and methodologies to solve complex geological problems in field and laboratory settings.</p> <p>PO3: Evaluate the impact of geological phenomena on the environment and society, integrating sustainability considerations.</p> <p>PO4: Create geological maps and cross-sections to represent spatial relationships and geological structures effectively.</p> <p>PO5: Demonstrate proficiency in using geological tools and technologies for data collection and analysis.</p> <p>PO6: Compare different geological theories and models to explain Earth's processes and phenomena.</p> <p>PO7: Develop research proposals based on current geological challenges and conduct independent investigations.</p> <p>PO8: Synthesize information from various geological sources to draw comprehensive conclusions about geological issues.</p> <p>PO9: Communicate geological findings clearly and effectively through written reports, presentations, and scientific papers.</p> <p>PO10: Critique geological literature and research to identify gaps in knowledge and suggest areas for further study.</p>
Programme Specific Outcomes	<p>PSO1: Analyze geological field data to identify and characterize mineral deposits, rock formations, and structural features in various geological settings.</p> <p>PSO2: Apply advanced geophysical and geochemical techniques to investigate subsurface conditions and assess natural resource potential.</p> <p>PSO3: Evaluate the geological hazards and risks associated with natural events such as earthquakes, landslides, and volcanic eruptions, and propose mitigation strategies.</p> <p>PSO4: Design and conduct geological surveys and experiments to gather evidence for research projects and practical applications in environmental and resource management.</p> <p>PSO5: Interpret geological maps, cross-sections, and remote sensing data to assess geological features and inform decision-making in land use and environmental planning.</p>
Course Outcomes	
Semester 1	

<p>Core-1 (General Geology And Quaternary Geology)</p>	<p>CO1: Describe the fundamental characteristics and origin of the Universe, Solar System, and the Earth, including its size, shape, mass, density, and the parameters of its rotation and revolution.</p> <p>CO2: Analyze the internal structure of the Earth, including the formation of the core, mantle, and crust, and explain the processes of convection, radioactivity, and their impact on Earth's magnetic field and age.</p> <p>CO3: Evaluate the various types of volcanoes and earthquakes, including their causes, intensity, distribution, and impact on the Earth's surface and environment.</p> <p>CO4: Explain the processes of weathering, erosion, and mass wasting, and assess the geological work of rivers, glaciers, wind, underground water, and oceans in shaping landforms.</p> <p>CO5: Investigate Quaternary geological phenomena such as climate change, eustatic movements, and glaciation, and interpret their effects on landforms and deposits, with a specific focus on India.</p>
<p>Core-2 (Tectonics And Remote Sensing)</p>	<p>CO1: Explain the processes of epeirogeny and orogeny related to tectonic movements.</p> <p>CO2: Analyze the concept of isostasy and evaluate its significance in geological processes. Compare and contrast different theories of mountain building. Describe the origin of oceans, continents, mountains, and rift valleys based on geological evidence.</p> <p>CO3: Define plate tectonics and classify types of plate margins. Evaluate the evidence and causes of continental drift. Describe the process of sea-floor spreading and its implications. Analyze features such as mid-oceanic ridges, trenches, and transform faults in plate tectonics. Explain the formation and characteristics of island arcs.</p> <p>CO4: Apply principles of aerial photography to Analyze. Apply digital image processing techniques to enhance geological data from remote sensing.</p> <p>CO5: Describe the relief features of the ocean floor and their formation processes. Classify marine sediments based on their characteristics and origin. Evaluate the significance of aquatic resources in geological and environmental contexts. Analyze the formation and characteristics of submarine canyons, seamounts, and guyots. Explain the formation and ecological importance of coral reefs.</p>
<p>Semester 2</p>	
<p>Core-3 (Crystallography and Mineralogy)</p>	<p>CO1: Define crystallography and differentiate between various crystal systems based on their symmetry and atomic arrangements, Apply crystallographic principles to analyze</p>

	<p>and predict the geometric shapes and symmetry of crystals from different mineral groups.</p> <p>CO2: Evaluate the physical properties of minerals, including hardness, cleavage, and specific gravity, based on their crystal structures.</p> <p>CO3: Describe the chemical composition of minerals and classify them according to their chemical formulas and structural groups.</p> <p>CO4: Classify silicate minerals based on the arrangement of silica tetrahedra in their crystal structures and analyze their geological significance. Compare and contrast the physical and chemical properties of different silicate mineral groups, such as feldspars, quartz, and micas.</p>
Core-4 (Optics and Geochemistry)	<p>CO1: Explain the nature of light, including its wave and particle properties, and analyze its interaction with minerals.</p> <p>CO2: Apply principles of mineral optics to interpret the optical properties of minerals, including pleochroism, birefringence, and extinction angles.</p> <p>CO3: Analyze the concept of geochemistry and its role in understanding the distribution and behavior of elements in Earth's systems.</p> <p>CO4: Evaluate the cosmic abundance of elements and compare their distribution in the universe and within planetary bodies Classify elements based on their cosmic abundance and geological importance, and evaluate their roles in planetary evolution and Earth's composition</p> <p>CO5: Explain the concept of atomic substitution in minerals and analyze its implications for mineralogical properties and geochemical processes.</p>
Semester 3	
Core-5 (Igneous petrology)	<p>CO1: Define the fundamental concepts of igneous petrology, including magma genesis, crystallization processes, and classification schemes.</p> <p>CO2: Differentiate between the various forms of igneous rocks (intrusive and extrusive) based on their textures, structures, and geological settings.</p> <p>CO3: Interpret the origin and geological significance of different types of igneous rocks based on their mineral assemblages, textures, and geochemical compositions.</p> <p>CO4: Classify igneous rocks, and discuss their petrogenetic implications.</p>
Core-6 (Sedimentary petrology)	<p>CO1: Explain the processes and mechanisms involved in the origin of sediments, including weathering, erosion, transportation, and deposition.</p>

	<p>CO2: Analyze sedimentary textures such as grain size, sorting, rounding, and sedimentary structures like bedding, cross-bedding, and ripple marks, to interpret depositional environments.</p> <p>CO3: Evaluate the environmental conditions and depositional settings (e.g., fluvial, marine, aeolian) based on sedimentary textures, structures, and fossil content.</p> <p>CO4: Describe the methods and techniques used in sedimentary provenance analysis to determine the source areas of sediments, including mineralogy, geochemistry, and isotopic signatures.</p> <p>CO5: Describe the petrography of different sedimentary rocks based on their mineralogical, and textural criteria.</p>
<p>Core-7 (Metamorphic petrology)</p>	<p>CO1: Define the controls of metamorphism and classify different types (e.g., regional, contact, dynamic) based on their geological settings and processes.</p> <p>CO2: Differentiate between metamorphic facies and grades, categorizing them according to mineral assemblages, pressure-temperature conditions, and metamorphic reactions.</p> <p>CO3: Analyze the relationship between metamorphism and tectonism, examining how plate tectonics and crustal movements influence metamorphic processes and rock transformations.</p> <p>CO4: Classify metamorphic rocks based on their metamorphic grade (low-grade to high-grade) and facies (e.g., greenschist, amphibolite, granulite) and discuss their petrogenetic implications.</p> <p>CO5: Synthesize knowledge of metamorphic controls, types, facies, grades, and petrography to interpret metamorphic histories and their implications for geological evolution and resource formation.</p>
<p>Semester-4</p>	
<p>Core-8 (Palaeontology)</p>	<p>CO1: Define the controls of metamorphism and classify different types (e.g., regional, contact, dynamic) based on their geological settings and processes. Analyze the fossil record to interpret the evolutionary history and biodiversity of life forms through geological time.</p> <p>CO2: Classify and identify major groups of invertebrate fossils based on their taxonomy, morphology, and stratigraphic distribution. Compare and contrast the evolutionary trends and adaptations observed in different classes of invertebrate fossils, such as molluscs, arthropods, and echinoderms.</p> <p>CO3: Describe the principles and methods used in vertebrate palaeontology to study fossilized remains of vertebrates, including dinosaurs, mammals, and early humans. Analyze vertebrate fossils to interpret their paleobiology, evolutionary</p>

	<p>relationships, and paleoecological interactions.</p> <p>CO4: Classify and identify fossilized plant remains based on their morphological characteristics and ecological significance. Evaluate the role of paleobotany in reconstructing ancient environments, climate change, and plant evolution throughout Earth's history.</p>
Core-9 (Stratigraphy)	<p>CO1: Explain the fundamental principles of stratigraphy, including the laws of superposition, original horizontality, and cross-cutting relationships. (Understand). Apply the code of stratigraphic nomenclature to classify and name rock units based on stratigraphic principles and hierarchical classification systems.</p> <p>CO2: Analyze Precambrian stratigraphy, categorizing and correlating geological formations and events to reconstruct Earth's early geological history.</p> <p>CO3: Compare and contrast the stratigraphy of the Paleozoic Era in India, including the identification of key formations, fossils, and depositional environments.</p> <p>CO4: Evaluate the stratigraphy of the Mesozoic Era in India, examining major geological events, stratigraphic sequences, and tectonic influences.</p> <p>CO5: Analyze the stratigraphy of the Cenozoic Era in India, interpreting sedimentary records, paleoclimate indicators, and evolutionary trends of flora and fauna.</p>
Core-10 (Structural Geology)	<p>CO1: Explain the processes and mechanisms of rock deformation under various geological conditions, including stress, strain, and deformation mechanisms along with classify different types of rock deformation structures such as folds, faults, joints, unconformities, foliations, and lineations based on their geometrical characteristics and geological settings.</p> <p>CO2: Analyze the formation and classification of folds in rocks, interpreting their geometry, axial planes, and hinge lines to reconstruct deformation histories.</p> <p>CO3: Evaluate the characteristics and classification of faults, including types (normal, reverse, strike-slip), fault planes, and fault zones, to interpret tectonic processes and stress regimes.</p> <p>CO4: Describe the formation and significance of joints in rocks, analyzing their spatial distribution, orientation, and effects on rock mass properties. (Describe)</p> <p>CO5: Interpret unconformities in stratigraphic sequences, including types (angular unconformity, nonconformity, disconformity), to reconstruct geological histories and depositional hiatuses. (Interpret)</p> <p>CO6: Analyze the development of foliation and lineation in metamorphic rocks, interpreting their orientations, mineral</p>

	alignments, and structural implications. (Analyze)
Semester-5	
Core-11 (Processes of formation and Mineral economics)	<p>CO1: Explain the magmatic processes involved in the formation of ore deposits, including fractional crystallization, magma differentiation, and mineralization mechanisms.</p> <p>CO2: Analyze the hydrothermal processes responsible for the formation of hydrothermal ore deposits, including fluid-rock interactions, deposition mechanisms, and mineral assemblages.</p> <p>CO3: Evaluate secondary processes of ore formation, such as weathering, erosion, transportation, and sedimentary deposition, and their role in forming secondary ore deposits.</p> <p>CO4: Analyze the distribution and geological significance of energy resources, including fossil fuels (coal, oil, natural gas) and renewable energy sources (solar, wind, hydroelectric), in relation to geological processes and economic considerations.</p> <p>CO5: Analyze the global distribution of mineral resources and energy reserves, resource depletion, and sustainability issues.</p>
CC-12 (Economic Geology)	<p>CO1: Define ores and gangues, classify them based on mineralogy and economic significance, and explain their geological occurrence.</p> <p>CO2: Classify metallic minerals according to their chemical composition, physical properties, and industrial uses.</p> <p>CO3: Identify industrial minerals and evaluate their geological occurrences, economic importance, and applications in various industries.</p> <p>CO4: Describe mineral exploration methods and techniques, including geological mapping, geophysical surveys, remote sensing, and geochemical sampling. (Describe)</p> <p>CO5: Distribution of different metallic and non-metallic minerals in India and their uses.</p>
DSE-1 (Fuel Geology)	<p>CO1: Describe the formation, types, and classification of coal, including its geological origins and stages of coalification.</p> <p>CO2: Explain the properties and uses of coal as a fuel, including its combustion characteristics, energy content, and environmental impact.</p> <p>CO3: Analyze the processes of coal formation and its conversion into energy, including the impact of different coal types on combustion efficiency and emissions.</p> <p>CO4: Explain the formation, composition, and types of petroleum, including the processes of hydrocarbon generation, migration, and accumulation.</p> <p>CO5: Analyze the characteristics of petroleum reservoirs, including their geological settings, porosity, permeability, and fluid</p>

	<p>properties.</p> <p>CO6: Describe the different types of petroleum traps (e.g., structural, stratigraphic) and their roles in the accumulation and extraction of hydrocarbons. (Describe)</p> <p>CO7: Compare the extraction and processing techniques for coal and petroleum, considering factors such as resource efficiency, environmental impact, and technological advancements. (Compare)</p>
DSE-2 (Climate Change And Disaster Management)	<p>CO1: Explain the types of natural disasters (e.g., earthquakes, hurricanes, floods, volcanic eruptions) and their impacts on human societies and ecosystems.</p> <p>CO2: Analyze strategies and methods for managing natural disasters, including preparedness, response, recovery, and mitigation measures.</p> <p>CO3: Describe the fundamental elements of climatology, including temperature, precipitation, humidity, and atmospheric pressure, and their role in climate systems.</p> <p>CO4: Analyze the world weather circulation patterns, including the roles of trade winds, westerlies, polar easterlies, and major atmospheric pressure systems, in shaping global weather.</p> <p>CO5: Explain the mechanisms of climate change, including natural and anthropogenic factors, greenhouse gases, and feedback loops, and their impacts on global climate systems.</p> <p>CO6: Evaluate the evidence for climate change, including temperature records, ice core data, and climate models, to assess trends and predict future climate scenarios.</p> <p>CO7: Compare the climate change impacts on different regions, considering factors such as temperature changes, sea level rise, and extreme weather events. (Compare)</p>
Semester-6	
Core-13 (Groundwater and Engineering Geology)	<p>CO1: Explain the water-bearing characteristics of geological formations, including concepts such as aquifers, aquicludes, and permeability.</p> <p>CO2: Analyze methods for groundwater exploration, including geophysical surveys, drilling techniques, and hydrogeological assessments, to evaluate groundwater availability and quality.</p> <p>CO3: Evaluate groundwater quality parameters, such as chemical composition, contamination levels, and suitability for various uses, to ensure safe and sustainable water resources.</p> <p>CO4: Describe the engineering properties of construction materials, including strength, durability, and thermal conductivity, and their implications for building design and stability.</p> <p>CO5: Analyze the geological considerations in the design and construction of dams, including rock mechanics, fault zones,</p>

	<p>and the impact of geological conditions on dam stability, tunnel and bridge construction and safety.</p> <p>CO6: Explain the principles of designing earthquake-resistant structures, including seismic load analysis, material selection, and structural reinforcement techniques.</p> <p>CO7: Apply knowledge of soil properties, such as compaction, shear strength, and settlement, to assess soil suitability for construction and foundation design.</p>
Core-14 (Mining and Environmental geology)	<p>CO1: Describe the fundamental principles and techniques of mining, including extraction methods, processing, and the role of geology in resource identification.</p> <p>CO2: Analyze the impacts of mining activities on the environment, including soil, water, and air quality, and assess methods for mitigating these effects.</p> <p>CO3: Evaluate disaster management strategies, including risk assessment, preparedness, response, recovery, and mitigation measures, to effectively handle natural and anthropogenic disasters.</p> <p>CO4: Explain the principles of resource management, including sustainable practices, resource conservation, and the balance between economic development and environmental protection.</p> <p>CO5: Describe the key concepts of environmental geology, including the interactions between geological processes and human activities, and their effects on ecosystems and communities.</p>
DSE- 3 (Earth Climate) And	<p>CO1: Explain the components and dynamics of the climate system, including the roles of the atmosphere, hydrosphere, lithosphere, and biosphere in regulating climate.</p> <p>CO2: Analyze the Earth's heat budget, including the processes of solar radiation absorption, heat distribution, and energy balance between incoming and outgoing radiation.</p> <p>CO3: Evaluate the mechanisms and impacts of monsoons on regional and global climate, including seasonal wind patterns, precipitation, and their effects on weather and agriculture.</p> <p>CO4: Describe the interactions between the atmosphere and hydrosphere, including processes such as evaporation, condensation, and precipitation, and their roles in the water cycle.</p> <p>CO5: Analyze the evidence and climatic changes associated with glacial periods, including glacial advance and retreat, ice core data, and impacts on global sea levels and climate patterns.</p>
DSE–4 (Project)	Project

<p>Subject : History (B.A.)</p>	<p><i>After completion of the course students will be able to</i></p>
<p>PROGRAMME OUTCOMES</p>	<p>CO1: Analyze and synthesize historical developments in Odisha’s political, economic, and social contexts, demonstrating the ability to prepare for and participate in competitive exams with a nuanced understanding of regional and national history</p> <p>CO2: Evaluate the significance of key political and economic milestones in Odisha, such as the integration of princely states, industrial growth, and the impact of community development programs, applying critical thinking and evidence assessment skills to enhance scholarly understanding</p> <p>CO3: Articulate the evolution of political and social structures in Odisha, including coalition politics, Panchayati Raj Institutions, and peasant movements, and their implications for contemporary global and regional relations, thereby contributing to a broader historical and cultural awareness .</p> <p>CO4: Investigate the impact of religious, cultural, and economic changes on Odisha’s identity, including the growth of art and craft, and assess these developments within the context of global historical patterns, enhancing comprehension of diverse human experiences .</p> <p>CO5: Differentiate and interpret major historical periods, figures, and events in Odisha’s history, such as the Hirakud Dam Project and the rise of various political and social movements, using disciplinary analysis to construct and defend well-supported historical arguments.</p>
<p>PROGRAMME SPECIFIC OUTCOMES</p>	<p>SO1: Analyze historical changes across various regions of the world by understanding both factual details and conceptual frameworks.</p> <p>SO2: Evaluate historical events by thinking contextually and critically, to gain insights into human experiences and their significance.</p> <p>SO3: Investigate the causes and consequences of historical events by verifying evidence and constructing well-supported arguments.</p> <p>SO4: Develop research papers by designing comprehensive studies, integrating primary and secondary sources, and articulating findings clearly.</p> <p>SO5: Deliver logical oral presentations by organizing and communicating factual and theoretical knowledge effectively.</p> <p>SO6: Cultivate rational, humanitarian, democratic, and secular perspectives by applying historical knowledge to contemporary societal, economic, and political issues.</p>

COURSE OUTCOMES	
SEMESTER - 1	
CORE-1: History of India-I	<p>CO1: Analyze early Indian notions of history and evaluate the sources of historical writings, including the major Harappan sites and the Sixteen Mahajanapadas, to reconstruct a detailed understanding of ancient Indian history.</p> <p>CO2: Examine the technological and economic developments of Paleolithic, Mesolithic, and Neolithic cultures, and assess the beginning of agriculture and food production in ancient India, highlighting the evolution from hunter-gatherer societies to settled agricultural communities.</p> <p>CO3: Investigate the origins, settlement patterns, and town planning of the Harappan Civilization, and evaluate its economic life, including agriculture, craft production, and trade, as well as its social, political, and religious organizations.</p> <p>CO4: Assess the societal, political, and religious developments of the Early Vedic Age, and analyze the transition to the Later Vedic Age with a focus on social stratification, including Varna and gender roles, as well as changes in polity, religion, and culture.</p> <p>CO5: Synthesize and interpret the evolution of ancient Indian cultures from the Harappan Civilization through the Vedic Ages, constructing well-supported arguments about the continuity and change in social, political, and economic structures.</p>
CORE-2: Social Formation and Cultural Patterns of Ancient World	<p>CO1: Analyze the evolution of early human societies, focusing on the Paleolithic and Mesolithic cultures, to understand the development of early human societies and their technological advancements.</p> <p>CO2: Evaluate the transition to Neolithic culture, including the advancements in food production, agriculture, and animal husbandry, to assess the impact of these developments on societal structures and economies.</p> <p>CO3: Investigate the characteristics and achievements of Bronze Age civilizations, specifically Egypt, Mesopotamia (Sumeria & Babylonia), and Shang China, to understand their contributions to early urbanization and state formation.</p> <p>CO4: Examine the political and economic systems of Ancient Greece,</p>

	<p>focusing on the contrasting developments in Athens and Sparta, and analyze their cultural achievements and contributions to Western civilization.</p> <p>CO5: Synthesize and compare the developments in human societies from the Paleolithic through the Bronze Age and into Ancient Greece, to construct a comprehensive understanding of early human progress and its impact on subsequent historical periods.</p>
<p>AECC-I: Environmental Studies and Disaster Management</p>	<p>CO1: Analyze the components of the environment, including the atmosphere, lithosphere, hydrosphere, and biosphere, and evaluate the impact of various types of pollution on these components. Assess the effectiveness of environmental laws such as the Water Act 1974 and the Air Act 1981 in addressing pollution and protecting natural resources.</p> <p>CO2: Examine the causes and effects of climate change, including global warming and carbon footprints, and evaluate the steps taken towards sustainable development, such as the ban on single-use plastics and the promotion of electric vehicles. Discuss the Sustainable Development Goals (SDGs) and the Agenda 21 of the Rio Earth Summit.</p> <p>CO3: Identify and classify different types of disasters (both natural and man-made) and their causes and effects. Conduct vulnerability assessments and risk analyses for various disasters, and evaluate the roles and effectiveness of institutional frameworks like the NDMA and ODRAF in disaster management.</p> <p>CO4: Describe and differentiate between communicable and non-communicable diseases, including specific examples such as cardiovascular diseases, cancer, and COVID-19. Analyze the dynamics of disease transmission, including modes of transmission, immunity types, and incubation periods, and propose prevention and control measures for epidemics and pandemics.</p> <p>CO5: Develop strategies for effective public health management by assessing lifestyle management techniques such as diet, physical exercise, and yoga. Evaluate the roles of various sectors in managing health disasters, including government, community, civil society, and NGOs, to enhance overall health outcomes and disaster preparedness.</p>
<p>GE-I: History of India-I</p>	<p>CO1: Analyze the sources of historical writings from ancient India and evaluate their contributions to our understanding of the Vedic</p>

<p>(Early times to 1750 AD)</p>	<p>Age, including aspects of society, polity, and culture. Discuss the principles and impacts of Buddhism and Jainism on ancient Indian history.</p> <p>CO2: Examine the administration and conquests of the Mauryan Empire, assess the societal structures and land grants during the Gupta period, and analyze the political achievements of Harshavardhan. Evaluate the transition from the Gupta Empire to early medieval feudal society.</p> <p>CO3: Investigate post-Gupta trade and commerce, analyze the administrative and military strategies of the Delhi Sultanate, and evaluate the impact of Bhakti and Sufi movements on Indian society and culture. Assess the development of regional languages and literature during this period.</p> <p>CO4: Assess Sher Shah's administrative reforms and their influence on the subsequent Mughal administration. Analyze Mughal administrative institutions such as Zabti, Mansab, and Jagir, and evaluate the principles of religious tolerance embodied in Sulh-i-Kul.</p> <p>CO5: Explore the evolution of Mughal art and architecture, compare it with earlier Indian architectural styles, and synthesize the administrative practices and cultural developments leading up to the Mughal era, demonstrating a comprehensive understanding of their historical significance.</p>
<p>Semester-II</p>	
<p>CORE-3: History of India-II (300 BCE to 750 CE)</p>	<p>CO1: Analyze the expansion of the agrarian economy from circa 300 BCE to CE 300, including production relations and urban growth related to trade and commerce. Evaluate the impact of social stratification based on class, Varna, Jati, and gender on the economy and society of the period.</p> <p>CO2: Examine the political formations and administrative strategies of the Mauryan Empire under Chandragupta Maurya and Asoka, and compare these with the post-Mauryan polities, including the Kushanas, Satavahanas, and the Cholas, to understand their contributions to political and administrative developments.</p> <p>CO3: Investigate the agrarian expansion, land grants, and evolving peasant rights during the Gupta Age, and analyze the changing norms of Varna and Jati, including marriage and property norms. Evaluate the nature of polities during and after the Gupta Empire, focusing on</p>

	<p>the Pallavas, Chalukyas, and Vardhanas.</p> <p>CO4: Assess the consolidation of the Brahmanical tradition, including concepts such as Dharma, Varnashram, and Purusharthas. Analyze the major principles of Buddhism (Hinayana and Mahayana) and Jainism, and evaluate their influence on society and culture (Unit IV).</p> <p>CO5: Explore and compare the development of art and architecture from the Mauryan to the Gupta period, analyzing their significance in the context of religious, cultural, and societal changes. Synthesize the contributions of these art forms to the broader historical and cultural.</p>
<p>CORE-4: Social Formation and Cultural Patterns of Medieval World</p>	<p>CO1: Analyze the political structure and expansion of the Roman Empire, including the crises leading to the rise and fall of Julius Caesar. Evaluate the agrarian economy and the impacts of urbanization and trade on the Roman Empire.</p> <p>CO2: Examine the economic developments in Europe from the 7th to the 14th centuries, focusing on agricultural production, the evolution of towns and trade, and the dynamics of feudalism, including its origin, growth, and eventual decline.</p> <p>CO3: Investigate the role and influence of the medieval Church, monastic communities, and the papacy in shaping European religious and cultural landscapes. Assess how these institutions contributed to the broader societal and cultural developments of medieval Europe.</p> <p>CO4: Explore the tribal background and the rise of Islam in the Central Islamic lands, including the emergence of sultanates. Analyze the religious developments, particularly the origins and implementation of Shariah, and their impact on Islamic societies.</p> <p>CO5: Synthesize and compare the political, economic, and religious developments in ancient Rome, medieval Europe, and the Central Islamic lands. Evaluate the interconnections and influences across these regions to construct a comprehensive understanding of their historical contexts.</p>
<p>MIL (ALTERNATIVE ENGLISH)</p>	<p>CO1: Analyze the thematic elements and narrative techniques in the short stories by Jim Corbett, Dash Benhur, DinanathPathy, Alexander Baron, and Will F. Jenkins. Evaluate the characters, plot development, and settings in each story to understand their impact on the reader.</p> <p>CO2: Examine and critically assess the ideas presented in the prose</p>

	<p>writings of Mahatma Gandhi, S. Radhakrishnan, C.V. Raman, Harold Nicolson, and Claire Needell Hollander. Interpret their contributions to discussions on equal distribution, youth, water, education, and learning.</p> <p>CO3: Demonstrate proficiency in reading comprehension by interpreting a given passage and answering related questions accurately. Apply critical thinking and analytical skills to extract and evaluate key information from the text.</p> <p>CO4: Apply advanced vocabulary, usage, and grammar skills to complete language exercises. Assess and correct language usage, including grammar and vocabulary, to enhance written and verbal communication skills.</p> <p>CO5: Integrate understanding from the short stories and prose with language exercises to synthesize a comprehensive approach to literary analysis and language proficiency. Develop and apply effective strategies for improving both interpretative and communicative abilities.</p>
<p>GE-II: History of India-II (1750 AD to 1950)</p>	<p>CO1: Evaluate the strategic significance of the Battle of Plassey (1757) and the subsequent conquest of Bengal, Mysore, and Maharashtra. Analyze the impact of the Subsidiary Alliance and Doctrine of Lapse on the expansion of British rule in India.</p> <p>CO2: Examine the nature and significance of the Revolt of 1857, and assess the effectiveness of various peasant and tribal resistance movements against British rule, including the Sanyasi Rebellion, Kondh Rebellion, and Santal Rebellion.</p> <p>CO3: Analyze the socio-religious reform movements initiated by the BrahmoSamaj, AryaSamaj, Theosophical Society, and the Aligarh Movement. Assess the role of these movements in shaping modern Indian society, focusing on issues related to caste, gender, and the growth of press and education.</p> <p>CO4: Investigate the political strategies of the Moderates and Extremists during the Indian National Movement from 1885 to 1920. Evaluate the impact of Gandhian mass movements, including the Non-Cooperation, Civil Disobedience, and Quit India Movements, on the struggle for independence.</p> <p>CO5: Synthesize insights from the British consolidation and expansion strategies, socio-cultural policies, and Indian responses to</p>

	British rule to construct a comprehensive understanding of the Indian National Movement and the eventual formation of a democratic constitution.
Semester-III	
CORE-5: History of India-III (750 AD to 1206 AD)	<p>CO1: Analyze primary sources, including literary texts and archaeological evidence, to evaluate the evolution of political structures in early medieval India, focusing on the Rajputs and Cholas, and examine the role of Brahmanas and temples in the legitimization of kingship.</p> <p>CO2: Investigate the agrarian structures of early medieval India by assessing agricultural expansion, land ownership patterns, and the proliferation of castes. Evaluate the impact of these factors on the social changes, including the peasantization of tribes.</p> <p>CO3: Explore the dynamics of trade and commerce during the early medieval period by analyzing inter-regional and maritime trade routes, the process of urbanization, and the role of merchant guilds in South India.</p> <p>CO4: Examine the religious and cultural developments of early medieval India, including Puranic traditions, Buddhism, and Jainism. Assess the contributions of Islamic intellectual traditions through figures such as Al-Biruni, and analyze the evolution of regional languages, literature, and temple architecture styles.</p> <p>CO5: Integrate knowledge from political structures, agrarian and social changes, trade dynamics, and religious and cultural developments to construct a comprehensive understanding of early medieval Indian society and its transformations.</p>
CORE-6: Rise of the Modern West-I	<p>CO1: Evaluate the transition from feudalism to capitalism by analyzing the problems associated with economic expansion, industrial production, trade, commerce, and urban development. Assess how these factors influenced town life and contributed to societal changes.</p> <p>CO2: Examine the early colonial expansion by exploring the motives, voyages, and explorations that drove European conquests of the Americas. Analyze the economic impact of mining, plantation systems, and the use of African slaves on colonial economies.</p> <p>CO3: Investigate the Renaissance and Reformation by exploring their</p>

	<p>social roots, the spread of humanism, and their impact on art, architecture, sculpture, painting, and literature. Assess the origins and spread of Reformation movements and the emergence of the European state system in Spain, France, England, and Russia.</p> <p>CO4: Analyze the economic developments of the sixteenth century by assessing the shift in economic balance from the Mediterranean to the Atlantic. Evaluate the causes and nature of the Commercial Revolution and its impact on the growth of industries.</p> <p>CO5: Synthesize insights from the transition to capitalism, early colonial expansion, Renaissance and Reformation, and economic developments of the sixteenth century to construct a comprehensive understanding of the transformative processes shaping early modern Europe.</p>
<p>CORE-7: History of India-IV (1206 AD to 1526 AD)</p>	<p>CO1: Analyze the political structures of the Sultanate of Delhi by examining sources such as Persian Tarikh tradition, vernacular histories, and epigraphy. Evaluate the consolidation efforts of key rulers like Balban, AlauddinKhalji, and Muhammad bin Tughluq, and interpret the theories of kingship and the roles of ruling elites, including the Ulema, Sufis, and the significance of imperial monuments.</p> <p>CO2: Investigate the emergence of regional identities in the medieval period by exploring the political, cultural, and architectural contributions of the Bahamanis, Vijayanagar, and Odisha. Assess the development of regional art, architecture, and literature in these areas, focusing on their distinctive features and influences.</p> <p>CO3: Evaluate the economic and societal structures of the Sultanate period by analyzing the iqta system and revenue-free grants. Assess the advancements in agricultural production, technology, market regulations, and the growth of urban centers. Examine the dynamics of trade, commerce, and Indian overseas trade during this era.</p> <p>CO4: Examine the religious, social, and cultural developments by exploring the doctrines and practices of Sufi Silsilas, such as Chishtis and Suhrawardis, and their social roles. Analyze the Bhakti movements and the contributions of figures like Kabir, Nanak, Ravidas, and Sri Chaitanya. Assess the social impact of the Bhakti tradition, including its influence on liberal thought, equality, and gender relations.</p> <p>CO5: Synthesize insights from the political structures, regional</p>

	<p>identities, economic practices, and religious movements of the medieval period to construct a comprehensive understanding of how these factors shaped the historical and cultural landscape of the era.</p>
<p>SEC-I: Communicative English</p>	<p>CO1: Identify and differentiate between various types of communication (horizontal, vertical, interpersonal, and grapevine) and examine their uses in diverse contexts including inter-cultural communication. Analyze the impact of globalization on English usage and the distinct features of indigenization and alternative texts in language learning.</p> <p>CO2: Develop effective listening skills by practicing both passive and active listening techniques. Enhance speaking skills to ensure intelligibility and clarity. Apply methods of reading, such as skimming, scanning, and searching for information, to interpret literal, metaphorical, and suggested meanings. Identify various tones in texts and evaluate the viewpoints expressed by different authors.</p> <p>CO3: Apply grammatical rules and composition techniques by performing exercises such as filling in blanks, correcting errors, and choosing appropriate forms. Utilize formal and informal styles effectively and analyze the information structure of sentences including topic-focus relationships and logical connectors. Develop cohesive and coherent writing through various strategies such as structural compression and logical connectors.</p> <p>CO4: Demonstrate proficiency in writing by executing precise writing, note-taking, and report writing exercises. Apply guidelines for official correspondence including making enquiries, complaints, and replies. Compose effective job application letters, CVs, letters to editors, and social appeals in various formats.</p> <p>CO5: Synthesize skills from listening, speaking, reading, and writing to create comprehensive and coherent communication strategies. Evaluate the effectiveness of different communication methods and materials in various contexts, ensuring appropriate use of language and style for different audiences and purposes.</p>
<p>GE-III: Rise of the Modern West-I</p>	<p>CO1: Analyze the transition from feudalism to capitalism by examining economic expansion, industrial production, and their impact on trade, commerce, and urban development. Evaluate how these factors contributed to changes in town life and social structures.</p> <p>CO2: Investigate the motives, voyages, and explorations of early</p>

	<p>colonial expansion. Assess the effects of these expansions on the conquests of America, mining, plantation economies, and the role of African slaves. Explore the impact of these developments on global trade and colonial societies.</p> <p>CO3: Identify the social roots and spread of humanism during the Renaissance. Examine the major achievements in art, architecture, sculpture, painting, and literature of the period. Describe the origins and spread of Reformation movements and their influence on the emergence of the European state system.</p> <p>CO4: Assess the shift of economic balance from the Mediterranean to the Atlantic in the sixteenth century. Analyze the causes and nature of the Commercial Revolution, including its impact on global trade dynamics. Evaluate the growth of industries and their broader economic and social implications.</p> <p>CO5: Synthesize insights from the transition from feudalism to capitalism, early colonial expansion, Renaissance and Reformation, and sixteenth-century economic developments to construct a comprehensive understanding of their interconnections and impacts on global history. Apply this understanding to evaluate historical and contemporary economic and social structures.</p>
Semester-IV	
CORE-8: Rise of the Modern West-II	<p>CO1: Analyze the socio-economic and political crises of 17th century Europe and evaluate how these conditions led to the English Revolution. Identify major political and intellectual currents of the time, including the development of parliamentary monarchy and patterns of absolutism in Europe.</p> <p>CO2: Trace the development of modern science from the Renaissance through the 17th century. Assess the impact of these scientific advancements on European society, including changes in thought, technology, and daily life.</p> <p>CO3: Examine the origins and spread of mercantilism in Europe. Evaluate its effects on the European economy, including its influence on trade practices, colonial expansion, and economic policies. Analyze the agricultural and scientific developments that contributed to the Industrial Revolution.</p> <p>CO4: Investigate the political currents and socio-economic issues leading up to the American Revolution. Assess the significance of the American Revolution in shaping modern democratic principles and its</p>

	<p>impact on both American and global history.</p> <p>CO5: Synthesize insights from the English Revolution, the rise of modern science, the era of mercantilism, and the American Revolution to construct a cohesive understanding of their interconnections and effects on European and American history. Apply this understanding to critically analyze their influence on subsequent historical developments.</p>
<p>CORE-9: History of India-V (1526 AD to 1750 AD)</p>	<p>CO1: Evaluate the establishment of Mughal rule in India by analyzing the military technology of firearms, assessing the significance of Sher Shah's administrative and revenue reforms, and interpreting the political landscape on the eve of the Mughal era.</p> <p>CO2: Assess the consolidation of Mughal rule through examining the incorporation of Rajputs and other indigenous groups into Mughal nobility. Analyze the evolution of administrative institutions such as zabti, mansab, jagir, and madad-i-maash, and explore the rise of the Marathas, focusing on Shivaji and the expansion under the Peshwas.</p> <p>CO3: Investigate the social and economic structures of Mughal India by examining land rights and the revenue system involving zamindars and peasants. Analyze trade routes, patterns of internal and overseas commerce, and explore the role of urban centers, crafts, and technology in economic development.</p> <p>CO4: Explore the cultural ideals of Mughal India by evaluating religious tolerance and the concept of sulh-i-kul. Analyze the impact of Sufi mystical and intellectual interventions on Mughal society and culture.</p> <p>CO5: Analyze Mughal art and architecture, and examine the themes and perspectives in Mughal and Rajput paintings. Compare these cultural elements to understand their contributions to the broader artistic and cultural heritage of the period.</p>
<p>CORE-10: Historical Theories and Methods</p>	<p>CO1: Define the nature, scope, and value of history, and distinguish its relationship with science and morality. Assess the significance of historical inquiry in understanding past human experiences.</p> <p>CO2: Analyze the traditions of historical writing by exploring the contributions of key figures such as Herodotus, Thucydides, Polybius, Livy, Tacitus, St. Augustine, and IbnKhalidun. Compare their methodologies and interpretations of historical events.</p> <p>CO3: Evaluate history as an interdisciplinary practice by examining its connections with archaeology, anthropology, psychology,</p>

	<p>literature, and political science. Integrate these perspectives to enhance a comprehensive understanding of historical phenomena.</p> <p>CO4: Identify and apply various sources of history including written, oral, visual, and archaeological evidence. Interpret historical facts and examine the principles of historical causation and objectivity in constructing historical narratives.</p> <p>CO5: Assess the impact of different historical methodologies and formulate critical analyses of historical objectivity. Develop skills in evaluating and synthesizing diverse historical sources to construct well-supported historical arguments.</p>
<p>SEC-II: Quantitative Aptitude and Logical Reasoning</p> <p>I. QUANTITATIVE APTITUDE & DATA INTERPRETATION</p>	<p>CO1: Solve problems involving whole numbers, integers, rational and irrational numbers, fractions, square roots, cube roots, surds, and indices, and apply long division methods for finding square roots.</p> <p>CO2: Apply basic concepts and different formulae related to percentages, profit and loss, discount, simple interest, ratio and proportion, and mixtures to solve practical problems.</p> <p>CO3: Analyze problems related to time and work, pipes and cisterns, and determine relationships among time, distance, and speed.</p> <p>CO4: Understand and apply concepts of angles, various polygons (triangles, rectangles, squares), the Pythagorean Theorem, and calculate the perimeter and area of triangles, rectangles, and circles.</p> <p>CO5: Interpret raw and grouped data, and create and analyze bar graphs, pie charts, and statistical measures such as mean, median, and mode. Determine probability based on events and sample spaces.</p>
<p>II. LOGICAL REASONING</p>	<p>CO1: Identify and analyze analogies based on different types of relationships, including simple analogy, patterns, and series involving numbers, letters, and figures. Decode and encode information using numbers, letters, and symbols, and evaluate blood relation scenarios.</p> <p>CO2: Construct and evaluate logical statements using two-premise and multi-premise arguments with connectives to derive valid conclusions.</p> <p>CO3: Apply Venn diagrams to solve problems involving set relationships, interpret mirror images, and analyze problems related to</p>

	cubes and dice.
III. ETHICS AND VALUES	<p>CO1: have changes in their perceptions and practices towards women and even proper attitude towards women and value their work and contribution</p> <p>CO2: come forward to challenge the unethical treatments against women</p> <p>CO3: end gender-based hierarchy and hegemony, remove the feeling that women are counter to men and bring about a complementarity among the hitherto existing gender binary</p> <p>CO4: pioneer in creating a gender equal society where the well-being, happiness and security of the women will be well protected & contributing towards a better and happier society.</p>
GE-IV: Rise of the Modern West-II	<p>CO1: Examine the socio-economic and political crises in 17th-century Europe and analyze their impact on the English Revolution and European politics. Identify key political and intellectual currents that influenced parliamentary monarchy and absolutism.</p> <p>CO2: Trace the development of modern science from the Renaissance through the 17th century and evaluate its impact on European society. Interpret how scientific advancements influenced cultural and societal changes during this period.</p> <p>CO3: Investigate the origins and spread of mercantilism and assess its impact on the European economy. Analyze the relationship between mercantilism, agricultural practices, and scientific advancements in the context of the Industrial Revolution.</p> <p>CO4: Analyze the political currents and socio-economic issues that led to the American Revolution. Evaluate the significance of the American Revolution in shaping modern political and economic systems.</p> <p>CO5: Compare patterns of absolutism and parliamentary monarchy across Europe and evaluate their influence on the political landscape. Assess the interplay between scientific progress, economic theories, and revolutionary movements in shaping European and American histories.</p>
Semester-V	
CORE-11: History of Modern Europe-I (1780 AD to 1880 AD)	CO1: Analyze the socio-religious, economic, and political conditions that led to the French Revolution of 1789, and evaluate the influence of intellectual currents and the role of the middle classes in driving

	<p>revolutionary change.</p> <p>CO2: Assess the key legislative bodies and their roles during the French Revolution, including the National Constituent Assembly and the National Legislative Assembly. Examine the impact of Napoleonic reforms and the consolidation of the empire on European politics and society.</p> <p>CO3: Examine the outcomes of the Congress of Vienna and its role in restoring old hierarchies. Compare the July Revolution of 1830 and the February Revolution of 1848 in terms of their causes, impacts, and outcomes on revolutionary and radical movements across Europe.</p> <p>CO4: Investigate the processes of capitalist development during the late 18th and 19th centuries, focusing on the agrarian and industrial revolutions in England and the German states. Evaluate how these developments transformed socio-economic structures and class relations.</p> <p>CO5: Analyze the formation of national identities and the role of popular movements in shaping modern states in Germany, Italy, and Ireland. Evaluate the interactions between socio-economic transformations and the remaking of states during the late 18th to late 19th centuries.</p>
<p>CORE-12: History of India-VII (1750 AD to 1857 AD)</p>	<p>CO1: Analyze the mechanisms and impacts of early economic exploitation by the colonial powers in Bengal, and evaluate the dynamics of expansion with specific focus on Bengal, Mysore, and Odisha.</p> <p>CO2: Examine the structure and functions of the colonial state's institutions, including the army, police, and legal systems. Assess the influence of imperial ideologies such as Orientalism and Utilitarianism, and compare indigenous and modern educational practices.</p> <p>CO3: Evaluate the different land revenue systems implemented by the British, including Permanent, Ryotwari, and Mahalwari. Investigate the consequences of the commercialization of agriculture and the drain of wealth, and analyze the growth and impact of modern industry in colonial India.</p> <p>CO4: Investigate the causes and consequences of key popular resistance movements, including the Santhal Uprising (1856-57), the Indigo Rebellion (1860), and the 1857 Movement. Assess their impact</p>

	<p>on colonial policies and the socio-political landscape of the time.</p> <p>CO5: Critique the overall effects of colonial expansion and consolidation on Indian society and economy. Synthesize knowledge of the colonial state's structure, economic policies, and popular resistance movements to construct a comprehensive understanding of colonial rule in India.</p>
<p>DSE-I: History and Culture of Odisha-I</p>	<p>CO1: Analyze the historical geography of ancient Odisha, including the regions of Kalinga, Utkal, and Kosal. Evaluate the significance of the Kalinga War (261 B.C.) and assess the career and achievements of Kharavela.</p> <p>CO2: Identify and compare the contributions of the Matharas, Eastern Gangas, Sailodbhavas, Bhaumakaras, and Somavamsis to the political and cultural history of Odisha.</p> <p>CO3: Examine the administrative and cultural impact of the Imperial Gangas and SuryavamsiGajapatis on Odisha. Trace the political developments post-Gajapati rule up to 1568 and evaluate their effects on the region.</p> <p>CO4: Investigate the social and cultural life in Early and Medieval Odisha. Analyze the growth and decay of urban centers, and assess the role of trade, commerce, taxation, and land revenue in shaping the region's economy and society.</p> <p>CO5: Synthesize information across the units to construct a comprehensive understanding of Odisha's historical evolution, including its political dynamics, cultural transformations, and economic developments from ancient to early modern times.</p>
<p>DSE-II: History and Culture of Odisha-II</p>	<p>CO1: Evaluate the impact of Afghan conquest, Mughal administration, Maratha rule, and early British colonial administration on Odisha. Analyze the changes in land revenue systems, salt policies, and police administration across these periods.</p> <p>CO2: Examine the causes and consequences of major resistance movements in Odisha, including the Ghumsar Rebellion, Paik Rebellion, Revolt of 1857, SurendraSai'sKeonjhar Uprisings. Assess the impact of the Famine of 1866 on the region and analyze the role of the growth of education and the language movement.</p> <p>CO3: Trace the development of nationalism in Odisha, analyze the</p>

	<p>factors leading to the formation of a separate province of Orissa, and evaluate the objectives and outcomes of the Prajamandal Movement.</p> <p>CO4: Investigate the role of nationalist politics in Odisha during the Quit India Movement, and assess the process and implications of the merger of princely states in the region.</p> <p>CO5: Synthesize information from the units to construct a comprehensive understanding of Odisha's political, social, and economic transformations from the Mughal period to post-independence, focusing on administration, resistance movements, and nationalist activities.</p>
Semester-VI	
<p>CORE-13: History of India-VIII (1857 AD to 1950 AD)</p>	<p>CO1: Analyze the impact of the advent of printing on cultural changes and evaluate the contributions of socio-religious reform movements such as the BrahmaSamaj, AryaSamaj, and Aligarh Movement. Assess the significance of women's emancipation, Sanskritization, and anti-caste movements in shaping modern Indian society.</p> <p>CO2: Investigate the evolution of Indian nationalism up to 1919 by examining the political ideologies and organizations, including the formation of the Indian National Congress (INC). Compare the strategies of Moderates and Extremists, and evaluate the roles of the Swedish Movement and revolutionaries in the nationalist struggle.</p> <p>CO3: Evaluate Mahatma Gandhi's perspectives and methods of Gandhian nationalism after 1919. Analyze the impact of the Non-Cooperation, Civil Disobedience, and Quit India movements on Indian politics. Assess the contributions of Subhas Chandra Bose and the Indian National Army (INA) and examine the role of different social groups, including peasants, tribes, Dalits, and women, in the nationalist movement.</p> <p>CO4: Critically assess the ideologies and practices of key communal organizations such as the Muslim League and Hindu Mahasabha. Analyze the factors leading to the Partition of India and the subsequent independence movement, and examine the process of making the Indian Constitution.</p> <p>CO5: Synthesize the knowledge from all units to construct a cohesive understanding of the evolution of socio-religious reforms, nationalist movements, and communal tensions in India. Evaluate how these factors collectively influenced the political and social landscape leading up to and following independence.</p>

<p>CORE-14: History of Modern Europe-II (1880 AD to 1939 AD)</p>	<p>CO1: Analyze the development and impact of parliamentary democracy and civil liberties in Britain, evaluate various forms of protest during early capitalism, including food riots, Luddites, and Chartism, and assess the evolution of early socialist thought, particularly Marxian socialism.</p> <p>CO2: Examine the process and effects of the emancipation of serfs in Russia, analyze the causes and consequences of the Revolutions of 1905 and the Bolshevik Revolution of 1917, and evaluate the program of socialist construction in post-revolutionary Russia.</p> <p>CO3: Investigate the growth of militarism and the formation of power blocks and alliances leading up to World War I. Assess the rise of fascism and Nazism, analyze the causes and impact of the Spanish Civil War, and evaluate the origins and factors leading to the outbreak of World War II.</p> <p>CO4: Explore the major intellectual trends since circa 1850, including the expansion of mass education and literacy. Assess the institutionalization of disciplines such as history, sociology, and anthropology, and analyze the contributions of key figures like Darwin and Freud to modern intellectual.</p> <p>CO5: Integrate knowledge from all units to construct a comprehensive understanding of how the struggle for democracy, socialist movements, imperialism, and intellectual developments shaped the socio-political and cultural landscape of the 19th and 20th centuries. Critically evaluate the interconnections between these historical phenomena and their impact on modern society.</p>
<p>DSE-III: History and Culture of Odisha-III</p>	<p>CO1: Examine the historical development and influence of Buddhism, Jainism, and Saivism in Odisha, and analyze their roles in shaping the region's religious and cultural landscape.</p> <p>CO2: Evaluate the emergence and impact of Saktism and Tantricism in Odisha, assess the growth of Vaishnavism with a focus on the Cult of Jagannath, and critically analyze the contributions of Sarala Mahabharata and Pancha-Sakha literature to Odia literature.</p> <p>CO3: Analyze the characteristics and significance of Buddhist and Jainaart, evaluate the evolution of temple architecture in Odisha, including key examples such as Parsurameswar, Mukteswar, Lingaraja, Jagannath, and Konarka.</p> <p>CO4: Assess the contributions of Christian missionaries to education</p>

	<p>and health in Odisha, examine the Mahima Movement and its socio-cultural impact, and analyze the influence of Neo-Hindu movements such as BrahmaSamaj and AryaSamaj on the region.</p> <p>CO5: Integrate knowledge from all units to construct a comprehensive understanding of the religious, literary, and architectural developments in Odisha. Synthesize insights to evaluate the broader impact of these movements and trends on the region's cultural and social evolution.</p>
<p>DSE-IV History of Contemporary Odisha (1947 to 1980) OR Project:</p>	<p>CO1: Analyze the political developments in Odisha from 1946 to 1980 by examining the integration of princely states, the establishment of the new capital, and the impact of the Hirakud Dam project, as well as evaluating the achievements of the Second Congress Ministry and BijuPatnaik's first ministry.</p> <p>CO2: Assess the effectiveness of coalition politics in Odisha, evaluate the contributions of political leaders such as R.N. Singdeo and SadasibaTripathy, and examine the achievements and challenges faced by these initiatives.</p> <p>CO3: Investigate the economic development of Odisha by evaluating the growth of key industries such as the Rourkela Steel Plant and Odisha Sponge Iron Ltd., analyzing improvements in irrigation, agriculture infrastructure, and assessing advancements in transport and communication.</p> <p>CO4: Critically assess the impact of government community development programs on Odisha's society, analyze the causes and effects of peasant movements, and examine the growth of traditional art and craft in regions like Raghunathpur, Pipli, and Bargarh.</p> <p>CO5: Synthesize insights from all units to construct a comprehensive understanding of Odisha's political, economic, and social transformations from 1946 to 1980, evaluate their interconnections, and formulate an informed perspective on their long-term impacts on the region's development.</p>
<p>Project:</p>	<p>CO1: Develop an idea of how to prepare a comprehensive and well-structured research report, including the organization of content, formulation of conclusions, and presentation of findings.</p> <p>CO2: Gain knowledge of various research methods, including qualitative, quantitative, and mixed-methods approaches, and understand their application in different research contexts.</p>

	<p>CO3: Acquire skills in conducting subjective analysis, including the ability to interpret and evaluate qualitative data and apply critical thinking to analyze research findings.</p> <p>CO4: Understand the procedures and benefits of conducting field visits as part of the research process, including data collection, observation, and contextual understanding of study subjects.</p>
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SUBJECT: MATHEMATICS	
	<i>After completion of the course students will be able to:</i>
PROGRAMME OUTCOMES	<p>PO1:-provide students with a comprehensive foundation in various mathematical disciplines, which includes Algebra, Linear Algebra, Real and Complex Analysis, Partial and Ordinary Differential Equations, Probability, Linear Programming Problems, Calculus, Discrete Mathematics, MATLAB and Numerical Analysis.</p> <p>PO2:-The Graduate Students will develop strong analytical and problem-solving skills, enabling them to tackle complicated mathematical problems and apply mathematical principles to real-world situations.</p> <p>PO3:- The program prepares students for diverse career opportunities in academia, industry, finance, and research, as well as for advanced studies in mathematics and related fields.</p> <p>PO4:- Through rigorous coursework and practical applications, students will gain proficiency in mathematical reasoning, computational techniques, and theoretical understanding</p>
PROGRAMME SPECIFIC OUTCOMES	<p>PSO1:-The undergraduate mathematics program in India aims to provide students with a comprehensive understanding of various mathematical disciplines.</p> <p>PSO2:- Students will master algebra, including groups, rings, fields and vector spaces; linear algebra, including matrix theory and Eigen values; and real and complex analysis, understanding limits, continuity, differentiation, integration, and analytic functions.</p> <p>PSO3:- They will learn to solve partial and ordinary differential equations, applying methods like separation of variables and transform techniques.</p> <p>PSO4:- The program covers probability theory, including random variables and distributions; linear programming problems, using methods like the simplex algorithm; and calculus, mastering differentiation and integration of functions.</p> <p>PSO5:- Students will also gain knowledge in discrete mathematics, covering logic, set theory, combinatory and graph theory, as well as numerical analysis, learning computational techniques for solving mathematical problems.</p> <p>PSO6:- prepare graduates for diverse careers in academia, industry, finance, research, and advanced studies in mathematics.</p>

	COURSE OUTCOMES
	SEMESTER-I
CORE-I CALCULUS	<p>CO1: Apply hyperbolic functions and higher-order derivatives to solve mathematical problems.</p> <p>CO2: Analyze concavity, inflection points and asymptotes and trace, Curves in Cartesian and polar coordinates.</p> <p>CO3: Utilize L' Hospital's rule to solve limit problems and integrate. Its applications in business, economics and life sciences.</p> <p>CO4: Evaluate integrals using Riemann integration, integration by parts, reduction formulas, and substitution methods.</p> <p>CO5: Compute volumes and arc lengths using slicing, disks, washers, cylindrical shells, and parametric equations, and classify conic sections.</p>
CORE-II DISCRETE MATHEMATICS	<p>CO1: Analyze sets, relations, and various mathematical properties and theorems, including equivalence relations, partial ordering, well- ordering and axiom of choice, Zorn's lemma, and the well-ordering property of positive integers.</p> <p>CO2: Apply the principles of mathematical induction, pigeonhole principle and principle of inclusion and exclusion to solve problems related to permutations, combinations, and the binomial and multinomial theorems, as well as recurrence relations and generating functions.</p> <p>CO3: Evaluate matrices and their properties, including determinants, minors, cofactors, ad joint, inverse, rank, and nullity, and solve systems of linear equations using row reduction and echelon forms, including finding Eigen values and eigenvectors.</p> <p>CO4: Examine graph theory concepts such as graph terminology, types of graphs, sub graphs, isomorphic graphs, adjacency and incidence matrices, paths, cycles, connectivity, Eulerian and Hamiltonian paths, and planar graphs.</p> <p>CO5: Utilize various mathematical tools and theorems, such as the division algorithm, Euclidean algorithm, congruence relations, modular arithmetic, Chinese remainder theorem, and Fermat's little theorem, to solve integer-related problems and construct logical arguments and proofs using truth tables and the algebra of propositions.</p>
	SEMESTER-II
CORE--III REAL ANALYSIS	<p>CO1: Understand the fundamental properties of the real number system, including order properties, bounds, and completeness, and apply the Bolzano-Weierstrass Theorem to sets.</p> <p>CO2: Analyze sequences and series, including their convergence and divergence, using various convergence tests and</p>

	<p>theorems such as Bolzano-Weierstrass and Cauchy's Convergence Criterion.</p> <p>CO3: Evaluate limits of functions using the epsilon-delta approach, and examine criteria for continuity, uniform continuity and related theorems such as Bolzano's Intermediate Value Theorem.</p> <p>CO4: Differentiate functions using rules and theorems such as Caratheodory's theorem and the Mean Value Theorem, and apply these to solve practical problems involving in equalities and extremum points.</p> <p>CO5: Synthesize the abstract concepts and rigorous methods of real analysis to solve practical mathematical problems involving sequences, series, limits, continuity and differentiability.</p>
CORE--IV DIFFERENTIAL EQUATIONS	<p>CO1: Understand and apply various types of solutions to differential equations, including exact, separable, linear, and Bernoulli's equations and use special integrating factors and transformations.</p> <p>CO2: Model real-world problems using differential equations, such as exponential ldecay, lake pollution, drugassimilation and population growth, and analyze these models qualitatively.</p> <p>CO3: Solve second-order homogeneous differential equations using the principle of super position, Wronskian and methods like undetermined coefficients and variation of parameters, and extend these methods to higher-order equations.</p> <p>CO4: Interpret phase planes and analyze models such as predatory-prey, epidemic, and battle models to understand equilibrium points and dynamics.</p> <p>CO5: Implement and simulate differential equation models using computational tools like MATLAB or Mathematica, and visualize the solutions to understand their behavior and implications in practical scenarios.</p>
	SEMESTER-III
CORE--V THEORY OF REAL FUNCTIONS	<p>CO1: Apply L'Hospital's Rule, intermediate forms and Taylor's theorem to solve problems involving limits and utilize these tools to expand functions into Taylor and Maclaurin series.</p> <p>CO2: Understand Riemann integration, including the conditions for integrability and properties of the Riemann integral, and apply the Fundamental Theorems of Calculus to solve integrals.</p>

	<p>CO3: Evaluate improper integrals and analyze the convergence of Beta and Gamma functions, and determine the point wise and uniform convergence of sequences of functions.</p> <p>CO4: Analyze the convergence of series of functions using criteria like Cauchy's criterion and Weierstrass M-Test and apply theorems on the continuity, derivability, and integrability of limit functions.</p> <p>CO5: Investigate power series, including their radius of convergence, differentiation and integration and apply Abel's Theorem and the Weierstrass Approximation Theorem to practical problems.</p>
<p>CORE-VI GROUP THEORY-I</p>	<p>CO1: Understand the basic concepts and properties of groups, including symmetries, Dihedral groups, permutation groups, and quaternion groups, and identify examples and subgroups.</p> <p>CO2: Analyze the structure and properties of cyclic groups, classify subgroups of cyclic groups and apply cycle notation for permutations, including the distinction between even and odd permutations.</p> <p>CO3: Apply Lagrange's theorem to understand the properties of cosets and explore the external direct product of groups, normal subgroups, and factor groups.</p> <p>CO4: Utilize Cauchy's theorem for finite abelian groups, understand group homeomorphisms and isomorphism's and apply Cayley's theorem and the first, second, and third isomorphism theorems.</p> <p>CO5: Extend the knowledge of group theory to solve problems in advanced mathematics courses and related fields such as physics, computer science, economics, and engineering.</p>
<p>CORE-VII PARTIAL DIFFERENTIAL EQUATIONS AND SYSTEM OF ODEs</p>	<p>CO1: Understand and classify basic concepts and definitions of first-order partial differential equations (PDEs), and apply methods like characteristics and separation of variables to solve them.</p> <p>CO2: Derive and classify second-order linear equations such as the heat equation, wave equation, and Laplace equation, and reduce these equations to their canonical forms.</p> <p>CO3: Solve Cauchy problems and initial boundary value problems for PDEs, including non-homogeneous boundary conditions, using methods such as separation of variables.</p>

	<p>CO4: Analyze systems of linear differential equations, and apply operator methods to solve linear systems with constant coefficients, focusing on homogeneous linear systems.</p> <p>CO5: Implement solutions for PDEs and systems of ODEs using computational tools, and visualize solutions to understand their behavior in practical scenarios.</p>
	SEMESTER-IV
<p>CORE-VIII NUMERICAL METHODS AND SCIENTIFIC COMPUTING</p>	<p>CO1: Understand and apply error analysis and approximation techniques in scientific computing, including concepts of convergence, stability, and accuracy, and use appropriate numerical methods for solving non-linear equations.</p> <p>CO2: Solve systems of linear algebraic equations using methods such as Gaussian elimination, Gauss-Jordan, Gauss-Jacobi, and Gauss-Seidel, and analyze their convergence properties.</p> <p>CO3: Implement polynomial interpolation methods, including Lagrange, Newton, Hermite and spline interpolation, and evaluate errors in interpolation techniques.</p> <p>CO4: Apply numerical integration techniques, including Newton-Cotes rules, Trapezoidal rule, Simpson's rule and Richardson extrapolation, and perform numerical differentiation and integration using software tools.</p> <p>CO5: Develop and test numerical programs using computer-aided software (CAS) for various methods such as root-finding algorithms, linear system solvers, and interpolation techniques, and assess the accuracy and reliability of numerical results.</p>
<p>CORE-IX TOPOLOGY OF METRIC SPACES</p>	<p>CO1: Identify and analyze concepts related to metric spaces, including sequences, Cauchy sequences, completeness, and properties of open and closed sets.</p> <p>CO2: Understand and apply countability axioms, separability, and Baire's Category Theorem in the context of metric spaces and subspaces.</p> <p>CO3: Examine and apply continuity concepts, including continuous mappings, uniform continuity, and extension theorems, and recognize homeomorphisms and equivalent metrics.</p> <p>CO4: Explore and apply contraction mappings, connectedness, local connectedness, and the properties of compact sets, and evaluate continuous functions on compact spaces.</p> <p>CO5: Develop foundational knowledge in topology of metric spaces, which prepare students for advanced courses in</p>

		analysis and topology.
CORE-X THEORY	RING	<p>CO1: Define and explain the basic concepts of rings, including properties of rings, subrings, integral domains, and fields, and identify ideals and their operations.</p> <p>CO2: Analyze and apply properties of prime and maximal ideals, and understand ring homeomorphisms and the Isomorphism Theorems I, II, and III.</p> <p>CO3: Utilize polynomial rings over commutative rings, apply the division algorithm and examine principal ideal domains, polynomial factorization, and irreducibility tests.</p> <p>CO4: Discuss divisibility in integral domains, and examine concepts related to irreducibles, primes, unique factorization domains, and Euclidean domains.</p> <p>CO5: Prepare for advanced courses in ring theory and related algebraic structures by developing a solid foundation in modern algebraic concepts.</p>
		SEMESTER-V
CORE-XI MULTIVARIATE CALCULUS		<p>CO1: Calculate and analyze functions of several variables, including limits, continuity, partial derivatives and directional derivatives, and apply the chain rule for multiple independent parameters.</p> <p>CO2: Determine extrema of functions of two variables, use the method of Lagrange multipliers for constrained optimization and evaluate vector fields, divergence, and curl.</p> <p>CO3: Perform double and triple integrals, including in polar, cylindrical, and spherical coordinates, and apply these integrals for volume calculations and changing variables.</p> <p>CO4: Compute line integrals, apply them to physical contexts such as mass and work, and understand concepts of conservative vector fields and independence of path.</p> <p>CO5: Apply fundamental theorems of vector calculus, including Green's theorem, Stokes' theorem, and the Divergence theorem, to solve problems involving surface and volume integrals.</p>
DSC PAPER –XII LINEARALGEBRA		CO1: Identify and work with vector spaces and subspaces, including linear combinations, linear independence, basis, and dimension, and analyze linear transformations, their null spaces, ranges, ranks, and nullities.

	<p>CO2: Represent linear transformations using matrices, understand the algebra of linear transformations, isomorphism, and dual spaces, and compute matrix representations, inverses, and changes of coordinates.</p> <p>CO3: Compute eigen values and eigen vectors, determine diagonalizability, and apply the Cayley-Hamilton theorem. Perform orthogonalization using the Gram-Schmidt process and analyze inner product spaces.</p> <p>CO4: Apply concepts of orthogonal complements, Bessel's inequality, and least squares approximation. Work with normal and self-adjoint operators, and apply the Spectral theorem for understanding orthogonal projections and solving linear systems.</p>
	SEMESTER-VI
CORE-XIII COMPLEX ANALYSIS	<p>CO1: Understand the basic properties of complex numbers and the complex plane. Analyze continuous and holomorphic functions, perform integration along curves, and work with power series.</p> <p>CO2: Apply Cauchy's Theorem and Goursat's Theorem to evaluate complex integrals. Utilize Cauchy's integral formulas for practical computations and solve problems involving local existence of primitives.</p> <p>CO3: Explore Morera's Theorem and sequences of holomorphic functions. Apply the Schwarz reflection principle and analyze zeros and poles of holomorphic functions.</p> <p>CO4: Examine meromorphic functions and the residue formula. Apply the argument principle to solve problems and work with the complex logarithm.</p>
CORE-XIV GROUP-THEORY-II	<p>CO1: Understand and analyze automorphisms, including inner automorphisms and automorphism groups of finite and infinite cyclic groups. Apply factor groups to automorphism groups and explore characteristic subgroups.</p> <p>CO2: Investigate the commutator subgroup, its properties, and the fundamental theorem of finite abelian groups. Examine external and internal direct products, and understand the structure of the group of units modulo.</p> <p>CO3: Explore group actions, including stabilizers, kernels, and</p>

	<p>permutation representations. Apply group actions to derive generalized Cayley's theorem and the index theorem.</p> <p>CO4: Analyze groups acting on themselves by conjugation, using the class equation and its consequences. Apply Sylow theorems to study p-groups, and understand conjugacy in symmetric groups (S_n). Prove results such as the simplicity of $A_n, n \geq 5$ and test for non- simplicity.</p>
<p>DSE-2 PROBABILITY AND STATISTICS</p>	<p>CO1: Understand and analyze basic concepts in probability, including probability distributions, expected value, variance and standard deviation. Apply these concepts to solve problems involving discrete and continuous random variables.</p> <p>CO2: Apply probability rules and theorems, such as Bayes' Theorem and the Law of Large Numbers, to solve real-world problems. Understand the concept of independence and conditional probability.</p> <p>CO3: Perform hypothesis testing and confidence interval estimation for population parameters.</p> <p>CO4: Understand and apply regression analysis and correlation to examine relationships between variables. Use techniques like linear regression. Understand the basic of GAME Theory</p>

SUBJECT: PHYSICS	PO, PSO and COs
<p>Program Outcomes</p>	<p>The Program outcome for the 3-year B. Sc. Physics is the following, in which the students will:</p> <p>PO1: Inculcate a solid understanding of core physical principle and fundamental aspects of physical phenomena in various fields such as Mechanics, Electromagnetism, Thermodynamics, Quantum Physics and Statistical methods etc.</p> <p>PO2: Develop analytical and problem-solving skills to formulate and solve complicated core subject problems using mathematical and computational physics.</p> <p>PO3: Learn Hands-on experiments and Lab set-up skills to independently run experiments and analyze the data.</p> <p>PO4: Learn data interpretation and evaluation of experimental results within the specific allowed error bars.</p> <p>PO5: Learn and develop presentation skills and debate about the learned phenomena from laboratory experiments and classroom understanding of theory.</p> <p>PO6: Develop research ability through research projects.</p>
<p>Program specific outcomes (PSOs)</p>	<p>Through this 3-year Bachelors degree in Physics program the students should be able to:</p> <p>PSO1: Apply fundamental principles of physics to solve complex problems in various domains such as mechanics, electromagnetism, and thermodynamics.</p> <p>PSO2: Utilize mathematical tools and computational techniques to model physical systems and analyze experimental data.</p> <p>PSO3: Demonstrate proficiency in conducting laboratory experiments, including the proper use of instruments and adherence to scientific methods.</p> <p>PSO4: Integrate theoretical knowledge with practical applications to develop innovative solutions and approaches in both academic and industrial contexts.</p> <p>PSO5: Communicate scientific findings effectively through written</p>

	<p>reports, oral presentations, and collaborative projects, adhering to academic and professional standards.</p> <p>PSO6: Evaluate emerging technologies and research trends in physics, contributing to advancements in science and engineering fields.</p>
Course outcomes:	
DSC1: Mathematical Physics-I	<p>CO1: Plot and analyse functions, understanding and identifying continuous and differentiable functions, and represent curves graphically.</p> <p>CO2: Apply approximation techniques using Taylor and binomial series for function expansion and approximation in practical problems.</p> <p>CO3: Solve first-order differential equations using integrating factors and second-order homogeneous differential equations with constant coefficients, including applications of the Wronskian and understanding the general solution.</p> <p>CO4: Evaluate initial value problems by understanding the statement and implications of the existence and uniqueness theorem.</p> <p>CO5: Analyze vector algebra concepts such as scalar and vector products, scalar triple products, and their interpretations in terms of area and volume.</p> <p>CO6: Derive and apply orthogonal curvilinear coordinates, and compute gradient, divergence, curl, and Laplacian in Cartesian, spherical, and cylindrical coordinate systems.</p> <p>CO7: Understand the Dirac delta function, including its definition, representation as limits of Gaussian and rectangular functions, and its properties.</p> <p>CO8: Compute directional and normal derivatives, and apply vector differentiation techniques to find gradients, divergences, and curls, understanding their geometric interpretations.</p> <p>CO9: Evaluate vector integrals, including line, surface, and volume integrals, and apply integral theorems such as Gauss' divergence theorem, Green's theorem, and Stokes' theorem to various problems</p>
DSC-2 Mechanics	<p>CO1: Analyze the centre of mass and its motion, and apply concepts of angular momentum and its conservation to particles and systems of</p>

	<p>particles, including the moment of inertia and rotational kinetic energy.</p> <p>CO2: Calculate the moment of inertia for various bodies using perpendicular and parallel axis theorems and Routh's rule, and apply Euler's equations of rigid body motion to problems involving both translation and rotation.</p> <p>CO3: Understand non-inertial reference frames and fictitious forces, including centrifugal and Coriolis forces, and apply these concepts to rotating coordinate systems.</p> <p>CO4: Apply principles of elasticity to relate elastic constants, analyze twisting torques on cylinders or wires, and determine bending moments and flexural rigidity in beams, including cantilever configurations.</p> <p>CO5: Study fluid motion and kinematics, including Poiseuille's equation for flow through capillary tubes, and analyze surface tension and viscosity effects.</p> <p>CO6: Compute gravitational potential energy, fields, and forces for spherical bodies, solve the two-body problem, and apply Kepler's laws to planetary motion, including the concepts of geosynchronous orbits and GPS systems.</p> <p>CO7: Investigate simple harmonic oscillations, including the calculation of kinetic, potential, and total energy, and analyze damped and forced oscillations, resonance, and quality factors in various oscillatory systems.</p> <p>CO8: Explain the principles of Special Theory of Relativity, including Lorentz transformations, time dilation, Lorentz contraction, and relativistic effects on velocity, energy, and momentum.</p> <p>CO9: Apply relativistic concepts to analyze phenomena such as mass-energy equivalence, relativistic Doppler effect, and transformations in energy and momentum.</p>
<p>DSC-3 Electricity and Magnetism</p>	<p>CO1: Apply Gauss's Law to calculate electric fields for various charge distributions, and understand the concepts of electric potential, potential of a dipole, and electrostatic energy of charged systems.</p> <p>CO2: Analyze magnetic fields and forces using Biot-Savart's Law and Ampere's Circuital Law, including the behavior of current loops as magnetic dipoles and the application of these concepts to devices such as</p>

	<p>solenoids and toroids.</p> <p>CO3: Explain the dielectric properties of materials, including polarization, susceptibility, and capacitance of capacitors with dielectric materials, as well as the magnetic properties of matter, including magnetization, susceptibility, and ferromagnetism.</p> <p>CO4: Solve AC circuit problems using Kirchhoff's laws, complex reactance, impedance, and network theorems, and analyze transient currents in RC and LR circuits, including resonance, power dissipation, and quality factors in series and parallel LCR circuits.</p>
<p>DSC-4 Wave and Optics</p>	<p>CO1: Apply Fermat's principle to analyze reflection and refraction at plane interfaces, use matrix formulation for geometrical optics, and understand cardinal points and planes in optical systems.</p> <p>CO2: Understand the electromagnetic nature of light and apply Huygens' principle to describe wave fronts, as well as analyze temporal and spatial coherence in wave optics.</p> <p>CO3: Analyze wave motion including plane and spherical waves, longitudinal and transverse waves, and apply superposition principles to study harmonic oscillations and Lissajous figures.</p> <p>CO4: Explain and apply principles of interference and diffraction, including the Young's double slit experiment, interference in thin films, and Fraunhofer and Fresnel diffraction patterns, as well as the resolving power of telescopes and gratings</p>
<p>DSC-5 Wave and Optics</p>	<p>CO1: Derive Fourier series expansions for periodic functions, apply orthogonality principles, and compute Fourier coefficients for both sine and cosine series, including complex representations and applications to non-periodic functions.</p> <p>CO2: Apply the Frobenius method to solve differential equations with singular points and analyze special functions such as Legendre and Hermite polynomials, including their generating functions, orthogonality, and applications.</p> <p>CO3: Utilize recurrence relations and series expansions for Legendre and</p>

	<p>Hermite polynomials, and solve problems involving associated Legendre polynomials and spherical harmonics, including applications to physical problems.</p> <p>CO4: Solve partial differential equations using separation of variables, applying techniques to Laplace’s equation and the wave equation for problems with rectangular, cylindrical, and spherical symmetries, including the analysis of conducting and dielectric spheres in external electric fields.</p>
<p>DSC-6 Thermal Physics</p>	<p>CO1: Explain the fundamental laws of thermodynamics, including the Zeroth, First, and Second Laws, and apply these concepts to analyze reversible and irreversible processes, Carnot’s theorem, and the concept of entropy in both reversible and irreversible contexts.</p> <p>CO2: Apply thermodynamic potentials such as internal energy, enthalpy, Helmholtz free energy, and Gibbs free energy to various thermodynamic problems, including phase transitions and the effect of surface films and temperature on surface tension.</p> <p>CO3: Utilize kinetic theory to analyze the distribution of velocities in gases, including Maxwell-Boltzmann distribution, mean free path, and the law of equipartition of energy, and apply this understanding to transport phenomena such as viscosity, thermal conductivity, and diffusion.</p> <p>CO4: Analyze the behavior of real gases using the Virial equation and Van der Waals equation, including deviations from ideal gas behavior, critical constants, and the Joule-Thomson effect, and apply these concepts to experimental results and real-world applications.</p>
<p>DSC-7 Analog Systems and Applications</p>	<p>CO1: Analyze the operation and characteristics of semiconductor diodes, including P-N junction formation, barrier potential, and the current flow mechanisms in forward and reverse bias conditions, as well as applications in rectifiers, Zener diodes, LEDs, photo diodes, and solar cells.</p> <p>CO2: Understand the structure and behavior of Bipolar Junction Transistors (BJTs), including n-p-n and p-n-p configurations, current</p>

	<p>gains, load line analysis, and biasing techniques, as well as analyze their operation in active, cut-off, and saturation regions.</p> <p>CO3: Design and evaluate transistor amplifiers, including single-stage common-emitter (CE) amplifiers using the hybrid model, and understand their classification (class A, B, C) and the concept of push-pull amplifiers. Analyze coupled amplifiers and their frequency responses.</p> <p>CO4: Apply operational amplifier (Op-Amp) concepts to design and analyze various analog circuits, including inverting and non-inverting amplifiers, adders, subtractors, differentiators, integrators, log amplifiers, and Wein bridge oscillators, while understanding characteristics such as CMRR, slew rate, and virtual ground.</p>
<p>DSC-8 Mathematical Physics 3</p>	<p>CO1: Analyze complex functions using Cauchy-Riemann conditions to determine analyticity, and apply concepts of singularities, residues, and the residue theorem to evaluate integrals and solve problems involving analytic functions.</p> <p>CO2: Apply Fourier transforms to various functions, including trigonometric, Gaussian, and finite wave trains, and use the Fourier transform to represent the Dirac delta function and solve differential equations related to wave and heat flow problems.</p> <p>CO3: Utilize properties of Fourier transforms, including the convolution theorem and its application to three-dimensional transforms, and analyze their role in solving differential equations and other mathematical problems.</p> <p>CO4: Apply Laplace transforms to solve ordinary differential equations, including those related to damped harmonic oscillators and electrical circuits, and use properties of Laplace transforms for analyzing and transforming functions, including unit step and Dirac delta functions.</p>
<p>DSC-9 Elements of Modern Physics</p>	<p>CO1: Analyze atomic spectra using classical and quantum models, including the limitations of the Rutherford model and the Bohr model, and explain the corrections for the finite mass of the nucleus and discrete energy exchanges by atoms.</p>

	<p>CO2: Understand and apply concepts of wave packets, including phase and group velocities, Gaussian wave packets, and the time development and spatial localization of wave packets, as well as wave-particle duality and complementarity.</p> <p>CO3: Explain and utilize the Heisenberg Uncertainty Principle in various contexts, including gamma-ray microscope thought experiments and electron diffraction, and estimate ground state energies for systems such as the harmonic oscillator and hydrogen atom.</p> <p>CO4: Describe nuclear physics concepts including the structure and size of atomic nuclei, nuclear forces, radioactivity, decay processes, and the principles of nuclear fission and fusion, and discuss applications such as nuclear reactors and stellar energy production.</p>
<p>DSC-10 Digital systems and applications</p>	<p>CO1: Describe the fundamental concepts of integrated circuits (ICs), including the differences between active and passive components, the advantages and drawbacks of ICs, and the various scales of integration (SSI, MSI, LSI, VLSI) along with examples of linear and digital ICs.</p> <p>CO2: Understand digital circuit design by explaining the difference between analog and digital circuits, binary number systems, and the use of basic logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR) in constructing and simplifying logic circuits, including applications such as parity checkers.</p> <p>CO3: Analyze and simplify logic circuits using Boolean algebra, including De Morgan's Theorems, fundamental products, and methods for converting truth tables to logic circuits using Sum of Products and Karnaugh Maps.</p> <p>CO4: Apply knowledge of data processing circuits, including multiplexers, de-multiplexers, decoders, encoders, and arithmetic circuits for binary operations (addition, subtraction) and timing applications (IC 555), as well as understand basic computer organization concepts such as memory organization, interfacing, and shift registers and counters.</p>
<p>DSC-11</p>	<p>CO1: Derive and solve the time-dependent Schrödinger equation for</p>

<p>Quantum Mechanics and Application</p>	<p>different systems, analyze the properties of wave functions, and apply the principles of normalization, linearity, and superposition to describe wave packets and their evolution over time.</p> <p>CO2: Understand and utilize operators in quantum mechanics, including position, momentum, angular momentum, and energy operators. Apply commutator algebra, Hermitian operators, and expectation values to analyse physical observables and their uncertainties.</p> <p>CO3: Solve the time-independent Schrödinger equation in one, two, and three dimensions for various potential models, including the square well potential, harmonic oscillator, and infinitely rigid box. Apply these solutions to study quantum mechanical phenomena such as bound states, energy eigenfunctions, and tunnelling.</p> <p>CO4: Explore the interaction of atoms with electric and magnetic fields, including the effects of electron spin, the Stern-Gerlach experiment, and the Zeeman effect. Analyse the implications of L-S and J-J coupling, as well as the normal and anomalous Zeeman effects on atomic spectra.</p>
<p>DSC-12 Solid State Physics</p>	<p>CO1: Analyze and describe the crystal structures of solids, including the concepts of lattice translation vectors, unit cells, Miller indices, and reciprocal lattices. Apply Bragg's law to understand X-ray diffraction and the factors affecting atomic and geometrical contributions to diffraction patterns.</p> <p>CO2: Understand and explain the basic principles of lattice vibrations and phonons in solids, including acoustic and optical phonons, and their impact on thermal properties. Compare and apply Einstein and Debye theories to the specific heat of solids and discuss the implications of the T^3 law.</p> <p>CO3: Explore and characterize the magnetic and dielectric properties of materials. Analyze different types of magnetic materials (diamagnetic, paramagnetic, ferrimagnetic, and ferromagnetic) and their behaviors, including Langevin's and Weiss's theories. Understand dielectric polarization, susceptibility, and the Clausius-Mosotti equation.</p> <p>CO4: Explain and apply the fundamentals of laser operation, including</p>

	<p>Einstein's coefficients, optical pumping, and population inversion. Differentiate between three-level and four-level laser systems and describe specific examples such as Ruby and He-Ne lasers. Additionally, understand the basic concepts of band theory, including the Kronig-Penney model, and the properties of conductors, semiconductors, and insulators, as well as the phenomenon of superconductivity and its experimental results, critical temperatures, and types of superconductors.</p>
<p>DSC-13 Electromagnetic Theory</p>	<p>CO1: Comprehend and apply Maxwell's equations, including the displacement current, vector and scalar potentials, and gauge transformations (Lorentz and Coulomb). Analyze boundary conditions at interfaces between different media and solve wave equations to understand plane wave propagation in dielectric media. Utilize the Poynting theorem to determine electromagnetic energy density and its physical implications.</p> <p>CO2: Analyze and describe electromagnetic wave propagation in unbounded media, including vacuum and isotropic dielectric media. Evaluate the transverse nature of plane waves, refractive index, dielectric constant, and wave impedance. Understand and compute propagation characteristics in conducting media, including relaxation time, skin depth, and applications to ionized gases and the ionosphere.</p> <p>CO3: Evaluate and explain the behavior of electromagnetic waves in bounded media. Apply boundary conditions at plane interfaces between different media to understand reflection and refraction of plane waves. Utilize Fresnel's formulas for different polarization cases, apply Brewster's law, and analyze phenomena such as total internal reflection, evanescent waves, and metallic reflection.</p> <p>CO4: Understand and interpret the polarization of electromagnetic waves, including linear, circular, and elliptical polarization. Explore the behavior of light in uniaxial and biaxial crystals, including double refraction, and apply Nicol prisms and phase retardation plates (quarter-wave and half-wave plates). Investigate optical rotation, Biot's laws, Fresnel's theory of optical rotation, and use experimental tools like</p>

	<p>CO2: Utilize Hamilton's principle and the calculus of variations to derive Euler-Lagrange equations. Apply Hamiltonian mechanics to solve problems such as finding the shortest distance between two points in a plane, geodesic problems, minimum surfaces of revolution, and the Brachistochrone problem. Analyze the equations of motion and first integrals, canonical momenta, Hamilton's equations, and applications to central force motion and coupled oscillators, including the motion of charged particles in external electric and magnetic fields.</p> <p>CO3: Understand and explain the postulates of special relativity, including Lorentz transformations and Minkowski space. Analyze concepts such as the invariant interval, light cone, and world lines, and describe phenomena like time dilation, length contraction, and the twin paradox. Derive and apply the mass-energy relation to understand how mass varies with velocity.</p> <p>CO4: Explore and apply the concept of four-vectors, including space-like, time-like, and light-like vectors. Analyze four-velocity, four-momentum, and energy-momentum relations, and interpret Doppler effects from a four-vector perspective. Understand the concept of four-force and conservation of four-momentum, and apply these concepts to the two-body decay of an unstable particle.</p>
<p>DSE-2 Nuclear and Particle Physics</p>	<p>CO1: Understand and describe the general properties of atomic nuclei, including their constituents (protons and neutrons) and intrinsic properties such as mass, radius, charge density, and binding energy. Analyze the variation of binding energy with mass number and the main features of the binding energy versus mass number curve. Evaluate properties such as angular momentum, parity, magnetic moment, electric moments, and nuclear excited states.</p> <p>CO2: Analyze and explain the processes of radioactive decay, including alpha decay, beta decay, and gamma decay. Understand the theory behind alpha emission, including the Gamow factor and Geiger-Nuttall law. Apply energy kinematics to beta decay processes, including positron emission and electron capture, and understand the neutrino hypothesis.</p>

	<p>Develop an elementary understanding of gamma decay and its significance.</p> <p>CO3: Apply and evaluate nuclear models, including the liquid drop model and semi-empirical mass formula. Discuss the significance of various terms in the mass formula and conditions for nuclear stability. Analyze two-nucleon separation energies and evidence for nuclear shell structure, including nuclear magic numbers and basic assumptions of shell models.</p> <p>CO4: Identify and describe different types of detectors for nuclear radiation. Understand the principles of gas detectors, including ionization chambers and Geiger-Müller counters, as well as scintillation detectors and photomultiplier tubes (PMTs). Explore semiconductor detectors (Si and Ge) for charge particle and photon detection, and understand the concept of charge carriers and mobility. Develop knowledge of neutron detectors and their applications.</p> <p>CO5: Explain and apply the principles of particle accelerators, including the Van de Graaff generator (Tandem Accelerator), linear accelerators, cyclotrons, and synchrotrons. Understand their basic construction and operation principles, as well as their applications in particle physics research.</p> <p>CO6: Understand and analyze the basic features of particle interactions and types of particles and their families. Discuss symmetries and conservation laws, including energy and momentum, angular momentum, parity, baryon number, lepton number, isospin, strangeness, and charm. Develop elementary ideas of quarks and gluons and their role in particle physics.</p>
<p>DSE-3 Nanomaterials and Applications</p>	<p>CO1: Understand and describe the fundamental concepts of nanoscale systems, including length scales in physics, types of nanostructures (1D, 2D, 3D) such as nanodots, thin films, nanowires, and nanorods. Analyze the band structure and density of states of materials at the nanoscale, and discuss size effects and quantum confinement in nano systems. Apply the Schrödinger equation to model quantum confinement in 3D, 2D, and 1D</p>

	<p>nanostructures, and understand the consequences of these effects on their properties.</p> <p>CO2: Explain and apply various synthesis techniques for nanostructured materials. Differentiate between top-down and bottom-up approaches, and describe methods including photolithography, ball milling, gas-phase condensation, vacuum deposition (thermal and e-beam evaporation), pulsed laser deposition, chemical vapor deposition (CVD), sol-gel, electrodeposition, spray pyrolysis, hydrothermal synthesis, colloidal methods, and molecular beam epitaxy (MBE) growth of quantum dots.</p> <p>CO3: Identify and utilize different characterization techniques for nanostructures. Discuss the principles and applications of X-Ray Diffraction (XRD), Optical Microscopy, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), and Scanning Tunneling Microscopy (STM). Understand how these techniques are used to analyze the structure and properties of nanomaterials.</p> <p>CO4: Explore and evaluate the applications of nanotechnology in various fields. Analyze the use of nanoparticles, quantum dots, nanowires, and thin films in photonic devices such as LEDs and solar cells. Discuss single-electron devices, carbon nanotube-based transistors, and nanomaterial devices including quantum dot heterostructure lasers, optical switching, optical data storage, magnetic quantum wells, magnetic dots for data storage, and the role of Micro Electromechanical Systems (MEMS) and Nano Electromechanical Systems (NEMS) in technology advancements.</p>
<p>DSE-4 Project</p>	<p>CO1: Learn Hands-on experiments and Lab set-up skills to independently run experiments and analyze the data.</p> <p>CO2: Learn data interpretation and evaluation of experimental results within the specific allowed error bars.</p> <p>CO3: Learn and develop presentation skills and debate about the learned phenomena from laboratory experiments and classroom understanding of theory.</p>

	<p>CO4: Develop research ability through research projects.</p>
<p>GE-1</p>	<p>CO1: Mechanics and Properties of Matter</p> <ul style="list-style-type: none"> • Understand and apply the concepts of moment of inertia including parallel axis and perpendicular axis theorems, and compute the moments of inertia for common solid shapes such as spheres and cylinders. • Analyze gravitational potential and fields due to spherical bodies, and solve problems related to gravitational effects at both internal and external points. • Apply the concepts of elastic constants, surface tension, and viscous flow in various physical contexts, including the calculation of depression in cantilevers and the use of Poiseuille's formula for viscous flow. <p>CO2: Oscillations and Waves</p> <ul style="list-style-type: none"> • Describe and analyze simple harmonic motion (SHM), including different damping scenarios (under-damped, over-damped, and critically damped), and understand the principles of forced vibration and resonance. • Derive and solve the wave equation for longitudinal and transverse waves in elastic media, and analyze the composition of SHM through the study of Lissajous figures for various frequency ratios. <p>CO3: Thermal Physics</p> <ul style="list-style-type: none"> • Explain the concepts of entropy, the second law of thermodynamics, and Carnot's theorem, and calculate efficiencies and changes in entropy for reversible and irreversible processes. • Apply the differential equations for heat flow and understand thermal conductivity, Maxwell's thermodynamic relations, and the Clausius-Clapeyron equation. • Discuss black-body radiation and apply Planck's radiation formula to understand thermal radiation characteristics. <p>CO4: Electricity and Magnetism</p> <ul style="list-style-type: none"> • Apply Gauss's law to compute electrostatic fields and solve problems involving magnetic induction using Biot-Savart law and

	<p>Ampère's circuital law.</p> <ul style="list-style-type: none"> Analyze electromagnetic equations, their differential and integral forms, and understand the significance of Maxwell's equations. Understand AC circuit behavior, including growth and decay of currents, time constants, impedance, power factor, and resonance in RL, RC, and LCR circuits. Describe the operation and characteristics of semiconductors, including PN-junctions, rectifiers, transistors (PNP and NPN), JFET, and their applications in electronic circuits.
<p>GE-II</p>	<p>CO1: Optics-I</p> <ul style="list-style-type: none"> Understand Monochromatic Aberrations: Explain the types of monochromatic aberrations in optical systems and methods for their minimization. Analyze Chromatic Aberration: Discuss chromatic aberration, its effects, and achromatic combinations used to correct it. Apply Interference and Diffraction Theory: Describe the theory of interference and diffraction, including Young's double slit experiment, measurement of wavelength using a biprism, and the phenomena of Newton's rings and thin film colors. Explore Diffraction: Analyze Fresnel and Fraunhofer diffraction, and solve problems involving diffraction by a single slit and plane transmission gratings. <p>CO2: Optics-II</p> <ul style="list-style-type: none"> Electromagnetic Nature of Light: Explain the electromagnetic nature of light and its implications. Understand Polarization: Differentiate between polarized and unpolarized light, and describe polarization by reflection, refraction, Brewster's Law, and Malus's Law. Double Refraction: Explain the phenomenon of double refraction and the concepts of ordinary and extraordinary rays. <p>CO3: Atomic Physics</p> <ul style="list-style-type: none"> Classical Physics and Quantum Theory: Discuss the inadequacy

of classical physics in explaining atomic phenomena, including Rayleigh-Jeans theory and Planck's quantum theory of radiation.

- **Quantum Nature of Light and Matter:** Analyze the photoelectric effect, Compton effect, and dual nature of radiation. Explain de Broglie's hypothesis, matter waves, and wave-particle duality, including experimental evidence from the Davisson-Germer experiment.
- **Bohr's Theory:** Explain Bohr's theory of the hydrogen atom, including its ability to explain hydrogen spectra, corrections for the finite mass of the nucleus, and the correspondence principle. Discuss the limitations of Bohr's theory and discrete energy exchange in atoms.

CO4: Quantum Mechanics and Relativity

- **Quantum Mechanics:** Understand the Heisenberg Uncertainty Principle and solve problems involving the time-dependent Schrödinger wave equation in one and three dimensions. Discuss the physical interpretation of the wave function, including probability density, probability current density, and the equation of continuity. Calculate expectation values of observables and apply Ehrenfest's theorem. Solve the time-independent Schrödinger equation for a particle in a box, and determine energy eigenvalues and eigenfunctions.
- **Nuclear Physics:** Discuss the properties of the nucleus, including charge, size, spin, magnetic moment, mass defect, binding energy, and nuclear forces. Explain radioactive decay laws, average life, half-life, and the concepts of nuclear fission and fusion. Describe linear accelerators and cyclotrons.
- **Relativity:** Explain the limitations of Newtonian relativity, the Michelson-Morley experiment, and the postulates of special relativity. Understand Lorentz transformations, length contraction, time dilation, and the mass-energy relation.

SUBJECT: POLITICAL SCIENCE(B.A.)	
<p>PROGRAMME OUTCOMES (POs)</p> <p>BA (POL.SC)</p>	<p>PO1. Provide a strong foundation in political theories, ideologies, and systems.</p> <p>PO2. Enhance understanding of political institutions, processes, and governance.</p> <p>PO3. Develop critical thinking and analytical skills for evaluating political issues.</p> <p>PO4. Increase awareness of current political events and challenges.</p> <p>PO5. Prepare students for active civic engagement and careers in public service.</p> <p>PO6. Build research skills for independent political analysis and scholarly work.</p> <p>PO7. Foster knowledge of comparative politics and international relations.</p> <p>PO8. Cultivating among students a scientific temper, tolerance etc., through the learning experience and undertaking a comparative analysis of the global socio-political and cultural phenomena.</p> <p>PO9. Equipping with research-based skills for pursuing advanced research by applying critical thinking and analytical learning.</p> <p>PO10. Developing problem-solving capabilities to deal with various socio-economic, cultural, and political challenges.</p>
<p>PROGRAMME SPECIFIC OUTCOMES (PSOs)</p>	<p>PSO 1. The students will be able to acquire in depth knowledge, and develop a broad understanding on the core subject of political science.</p> <p>PSO 2. The students will be enabled for professing a career on the subject of political science or civil service.</p> <p>PSO 3. The students will be able to distinguish between theoretical discourse and practical knowledge.</p> <p>PSO 4. The students will be motivated to go for higher studies and to conduct advanced research after equipping them with research skills, critical thinking and analytical understanding.</p> <p>PSO 5. The students will be aware of the social , economic and political scenario of the contemporary world, and also enable them to do a comparative analysis of the global north with global south.</p>

<p>Core Paper I</p> <p>Understanding Political Theory</p>	<p>CO 1. Define and distinguish concepts like politics and political, and various approaches to study political theory.</p> <p>CO 2. Critically assess different perspectives in political theory viz., feminism, modernism and postmodernism and their impacts upon the society.</p> <p>CO 3. Consider whether procedural or substantive notion of democracy is more vital for the society.</p> <p>CO 4. Analyze the significance of people’s participation and representation in a democracy.</p>
<p>Core Paper II</p> <p>Constitutional Government And Democracy In India</p>	<p>CO 1. Define the ideals of constitution and constitutionalism, and their necessity in a democratic polity.</p> <p>CO 2. Trace the areas in which both the Centre and States can keep a co-ordination for their mutual benefits.</p> <p>CO 3. Identify the prevailing issues and challenges in India’s federal structure.</p> <p>CO 4. Demonstrate the essence of decentralization in the administration.</p>
<p>Core Paper III</p> <p>Political Theory- Concepts And Debates</p>	<p>CO 1. Applying the normative concepts of political theory like freedom, right, equality and justice in their normal course of lives.</p> <p>CO 2. Discussing the idea of three generations of rights and its implication on the lives of the individuals.</p> <p>CO 3. Explaining the need for affirmative action in the society.</p> <p>CO 4. Evaluate the essence of multiculturalism in the contemporary world.</p>
<p>Core Paper IV</p> <p>Political Process In India</p>	<p>CO 1. Analyze how the actual politics in India quite diverges from constitutional and legal rules.</p> <p>CO 2. Examine the voting behaviour of the electorates through the techniques of castes, class, gender and religion.</p> <p>CO 3. Distinguish the space between the politicization of caste and caste-cization of politics, and their mutual interaction.</p> <p>CO 4. Spell out the developmental, welfare, and coercive dimensions of the Indian state.</p>

<p>Core Paper V</p> <p>Introduction To Comparative Government And Politics</p>	<p>CO 1. Understand different approaches to the study of comparative politics.</p> <p>CO 2. Explain globalization in a holistic manner that impacts the developed and developing countries.</p> <p>CO 3. Critically analyze the growth or development of capitalism and socialism in Global Politics.</p> <p>CO 4. Compare and contrast the governmental structures of United States and China.</p>
<p>Core Paper VI</p> <p>Introduction To Public Administration</p>	<p>CO 1. Explain the public administration with a special emphasis on various classical and contemporary theories viz., Scientific Management, Administrative Management, Human Relations Theory, Rational Decision Making and so on.</p> <p>CO 2. Design, formulate and execute public policies; and list out various challenges in the process of their implementation.</p> <p>CO 3. Analyse the impact of greater democratization on public administration.</p> <p>CO 4. Apply the feminist perspective in governance.</p>
<p>Core Paper VII</p> <p>Perspectives On International Relations</p>	<p>CO 1. Assess the nature of globalization and its alternative perspectives.</p> <p>CO 2. Analyse the dynamic nature of the world economy, and the interaction between state and various transnational actors.</p> <p>CO 3. Critically examine some of the imperative global issues like nuclear proliferation, international terrorism, ecological issues, migration, and human security.</p> <p>CO 4. Assess the shifts in global power and governance.</p>
<p>Core Paper VIII</p> <p>Political Processes And Institutions In Comparative Perspective</p>	<p>CO 1. Apply various conceptual tools or approaches to study several issues and events in comparative politics.</p> <p>CO 2. Outline the meaning and procedures of different electoral system.</p> <p>CO 3. Explain the meaning and evolution of nation-state in western Europe, and the debate around the nation and state post-colonial context.</p> <p>CO 4. Analyse the democratic situation in post-colonial societies.</p>

<p>Core Paper IX</p> <p>Public Policy And Administration In India</p>	<p>CO 1. Outline characteristics and models of public policy in India.</p> <p>CO 2. Design and shape public welfare policies and programmes.</p> <p>CO 3. Analyse the issues of decentralization, financial management (budget), administration and social welfare from a non-western point of view.</p> <p>CO 4. Showcase the talent to resolve the public grievances via RTI, Lokpal and E-Governance.</p>
<p>Core Paper X</p> <p>Global Politics</p>	<p>CO 1. Assess the nature of globalization and its alternative perspectives.</p> <p>CO 2. Analyse the dynamic nature of the world economy, and the interaction between state and various transnational actors.</p> <p>CO 3. Critically examine some of the imperative global issues like nuclear proliferation, international terrorism, ecological issues, migration, and human security.</p> <p>CO 4. Assess the shifts in global power and governance.</p>
<p>Core Paper- XI</p> <p>Western Political Philosophy</p>	<p>CO 1. Trace the Greek antiquity and determine the manner in which political questions were initially posed.</p> <p>CO 2. Elucidate importance of Machiavelli as the forerunner of modern politics.</p> <p>CO 3. Compare the notion of freedom as enunciated by Thomas Hobbes, John Locke and J J Rousseau with the contemporary notion of freedom.</p> <p>CO 4. Apply the ideas of Karl Marx and M. K. Gandhiji on the state into modern politics.</p>
<p>Core Paper XII</p> <p>Indian Political Thought (Ancient And Medieval)</p>	<p>CO 1. Elaborate basic elements of Indian political thought.</p> <p>CO 2. Explain the VedVyasa's concept of Rajadharma and its significance.</p> <p>CO 3. Critically assess the relevance of Manu's social laws in present context.</p> <p>CO 4. Compare and contrast the ideas of Kautilya and Machiavelli.</p>
<p>Core Paper XIII</p> <p>Contemporary Political Philosophy</p>	<p>CO 1. Draw the interrelationship between philosophy and politics.</p> <p>CO 2. Examine Lenin's ideas of revolution.</p> <p>CO 3. Explain the impact of Gramscian notion of hegemony on contemporary global order.</p> <p>CO 4. Evaluate the notions of procedural justice and substantive justice in reference to the Indian context.</p>

<p>Core Paper XIV</p> <p>Modern Indian Political Thought</p>	<p>CO 1. Ascertain the significance of Raja Rammohan Roy as the man of the renaissance in India.</p> <p>CO 2. Explain Pandita Ramabai's concept of gender and critique of orthodoxy.</p> <p>CO 3. Compare and contrast the ideas of Gandhi and Ambedkar.</p> <p>CO 4. Critically assess Savarkar's conception of Hindutva vis-à-vis Nehruvian secularism.</p>
<p>Discipline Specific Elective Paper-I</p> <p>Introduction To Human Rights</p>	<p>CO 1. Develop a broader conception of human rights.</p> <p>CO 2. Spell out the rights as mentioned in Indian and South African constitutions.</p> <p>CO 3. Explain the significance of international refugees' laws and international humanitarian laws.</p> <p>CO 4. Critically assess the humanitarian interventions in the context of the protection of human rights.</p>
<p>Discipline Specific Elective Paper -II</p> <p>Development Process And Social Movements In Contemporary India (Project)</p>	<p>CO 1. Assess the developmental process in India since independence.</p> <p>CO 2. Explain the developmental paradigms of India in the era of globalization.</p> <p>CO 3. Create a perception about agricultural development, and list out various causes of the agricultural crisis in India.</p> <p>CO 4. Assess the necessity and constraints of different social movements viz., women's movements, environmental movements, Dalit movements, and tribal movements in a democratic space of India.</p>
<p>Discipline Specific Elective Paper- III</p> <p>India's Foreign Policy In A Changing World</p>	<p>CO 1. Elucidate the evolution, major determinants and different phases of India's foreign policy.</p> <p>CO 2. analyse India's growing relationship with the superpowers during the period of cold war, and a dynamic shift in its relations with US in post cold war power structures of international politics.</p> <p>CO 3. Evaluate Sino-Indian relations in the light of mutual interest and mutual benefits.</p> <p>CO 4. Appreciate India as an emerging global power; and assess the challenges and opportunities associated with it.</p>

<p>DSE Paper – IV (Dissertation Research Project)</p>	<p>CO 1. Independently prepare a research design to carry out a research project.</p> <p>CO 2. Review the related research papers to find out a research problem and relevant hypotheses.</p> <p>CO 3. Understand the dynamics of citizen – administrative interface and administrative behaviours.</p> <p>CO 4. Learn the use of statistical techniques for interpretation of data Learn the APA style of reporting a research project.</p>
<p>GE-I Feminism: Theory And Practice</p>	<p>CO 1. Distinguish between sex and gender and public man and private woman.</p> <p>CO 2. Examine divergent theories of feminism.</p> <p>CO 3. Explain various policy initiatives carried out by Indian state for the women empowerment.</p> <p>CO 4. Identify the causes of violence against women, and list out the measures to check them.</p>
<p>GE-II Governance: Issues And Challenges</p>	<p>CO 1. Decipher the nature and types of governance.</p> <p>CO 2. Analyse the idea of sustainable development vis-à-vis governance.</p> <p>CO 3. Assess the significance of people’s participation and democratic decentralization in the administration.</p> <p>CO 4. Spell out the initiatives for good governance in India.</p>
<p>GE- III Gandhi And The Contemporary World</p>	<p>CO 1. Explain the principles of Satyagraha and Ahimsa in Gandhian theory and their role in social and political activism.</p> <p>CO 2. Discuss the concepts of Swaraj and Swadeshi as envisioned by Gandhi and their significance in the Indian independence movement.</p> <p>CO 3. Analyze Gandhi’s perspectives on environmental issues, women’s rights, and social harmony.</p> <p>CO 4. Evaluate the relevance of Gandhian philosophy in promoting global peace and its application in contemporary global contexts.</p>

<p>GE- IV</p> <p>United Nations And Global Conflicts</p>	<p>CO 1. Outline the historical development of the United Nations and its foundational principles and objectives.</p> <p>CO 2. Describe the structures and functions of key UN bodies, including the General Assembly, Security Council, Economic and Social Council, International Court of Justice, and specialized agencies like ILO, UNESCO, WHO, UNICEF, UNDP, and UNHCR.</p> <p>CO 3. Examine the UN's roles in peacekeeping, peacemaking, enforcement, peace building, and the Responsibility to Protect, along with its Millennium Development Goals.</p> <p>CO 4. Analyze major global conflicts since World War II, such as the Korean War, Vietnam War, Afghanistan War, and conflicts in the Balkans (Serbia and Bosnia).</p> <p>CO 5. Evaluate the effectiveness of the United Nations as an international organization, including the need for reforms and the process of implementing those reforms.</p>
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SUBJECT: SANASKRIT (B.A.)	<i>After completion of the course students will be able to:</i>
PROGRAMME OUTCOMES	<p>PO1: Analyze the moral and ethical teachings in stories and popular texts to develop personal and behavioral competence.</p> <p>PO2: Apply basic communication skills in Sanskrit, including listening, speaking, reading, and writing, through an understanding of Paninian Grammar.</p> <p>PO3: Evaluate social values and concerns reflected in classical Sanskrit literature to enhance social competence and transformation.</p> <p>PO4: Critique both ancient and modern Sanskrit poetics to develop knowledge of fundamental principles of literary criticism.</p> <p>PO5: Interpret the timeless wisdom of Vedic literature and its applicability to contemporary society.</p> <p>PO6: Assess socio-political thoughts and ethical literature from ancient India to understand social problems and dynamics.</p> <p>PO7: Facilitate the development of life skills such as self-respect and effective communication through the study of personal problem-solving techniques.</p>
PROGRAMME SPECIFIC OUTCOMES	<p>PSO1: Cultivate a robust sense of ethical and moral values in personal and professional contexts by critically examining Sanskrit texts.</p> <p>PSO2: Integrate and apply the ethical teachings of the Hitopadesa to shape and reinforce a positive mindset in students.</p> <p>PSO3: Interpret and apply the wisdom of Yaksaprasna to foster and enhance a constructive mindset in students.</p> <p>PSO4: Master the foundational aspects of Sanskrit grammar by accurately identifying and utilizing key words and roots.</p> <p>PSO5: Synthesize ethical and moral principles from Sanskrit literature to elevate personal and professional conduct.</p> <p>PSO6: Analyze and implement advanced communication strategies through the practical application of Sanskrit grammar and vocabulary.</p> <p>PSO7: Develop the sense of higher studies in Sanskrit language and research for its development.</p>
COURSE OUTCOMES	
SEMESTER-1	
Core-1: CC-I: Moral Teachings and Basics of Sanskrit	<p>CO1: Develop a strong sense of ethical and moral values in personal and professional life through the analysis of key Sanskrit texts.</p> <p>CO2: Apply the lofty teachings of the Hitopadesa to establish and</p>

	<p>reinforce a positive mindset in students.</p> <p>CO3: Integrate the wisdom from Yaksaprasna to cultivate and sustain a positive mind set in students.</p> <p>CO4: Enhance communication skills by mastering Sanskrit grammar, including the effective use of basic words and roots.</p>
CC-II: Drama-I and History of Sanskrit Literature –I	<p>CO1: Translate and interpret textual verses from <i>Abhijnanasakuntalam</i> (Acts I-IV) with an emphasis on accurate representation of Sanskrit grammar, including sandhi, karaka, vibhakti, and samasa.</p> <p>CO2: Analyze and summarize the historical and thematic elements of the Ramayana and Mahabharata, including general outlines of Puranas, to understand their impact on Sanskrit literature.</p> <p>CO3: Evaluate and compare the major characteristics and contributions of Mahakavyas and Sanskrit dramas by Ashvaghosa, Kalidasa, Bharavi, Magha, Sriharsa, Bhasa, Sudraka, Visakhadatta, and Bhattanarayana.</p> <p>CO4: Explain the key features of Sanskrit literary genres and texts, including Mahakavyas and dramas.</p>
GE-1: Moral Teachings and Basics of Sanskrit	<p>CO1: Develop ethical and moral values in personal and professional contexts through critical analysis of Sanskrit texts and teachings.</p> <p>CO2: Apply the lofty teachings of Hitopadesa to construct and reinforce a positive mindset in students.</p> <p>CO3: Integrate the wisdom from Yaksaprasna to foster and sustain a constructive and positive mindset among students.</p> <p>CO4: Master communication skills by applying Sanskrit grammar rules and analyzing basic words and roots to enhance comprehension and usage.</p>
SEMESTER -2	
CC-III: Drama II and Dramaturgy	<p>CO1: Analyze the themes of love and romance in Kalidasa's <i>Abhijnanasakuntalam</i> to understand their representation and impact on youth.</p> <p>CO2: Negotiate and interpret Sanskrit texts independently to demonstrate proficiency and appreciate the nuances of Sanskrit literature.</p> <p>CO3: Evaluate and apply the key rhetorical principles from the <i>Sahityadarpana</i> of Viswanath Kaviraja to enhance understanding of classical Sanskrit aesthetics.</p> <p>CO4: Examine and synthesize aesthetic values in Sanskrit literature to appreciate and articulate their significance in the broader context of literary studies</p>
CC-IV: An Introduction to the technique of Paninian Grammar and	<p>CO1: Analyze Paninian grammar to understand the principles of phonology, morphology, syntax, and semantics in Sanskrit linguistics.</p> <p>CO2: Identify and apply relevant vocabulary and organize Paninian</p>

Prosody.	<p>grammatical rules to enhance comprehension of Sanskrit grammar.</p> <p>CO3: Interpret technical aspects of Paninian rules to demonstrate an in-depth awareness of the Sanskrit language.</p> <p>CO4: Evaluate various meters and appreciate the stylistic elements of Sanskrit slokas to derive aesthetic pleasure and understanding.</p>
GE-II: Khanada kavya and Darsana kavya	<p>CO1: Explore and analyze geographical and cultural concepts related to India, including boundaries, places, and relationships, to enhance understanding of regional diversity.</p> <p>CO2: Examine and appreciate the profound impact of India's age-old heritage on contemporary life and culture to recognize its enduring significance.</p> <p>CO3: Apply the principles of Purusottama Yoga (Chapter XV) from the Bhagavadgita to develop a robust framework for character-building and personal growth.</p> <p>CO4: Cultivate self-management skills such as self-control, emotional regulation, consistency, persistence, and perseverance to excel in various aspects of life.</p>
SEMESTER-III	
CC-V: Poetry and History of Sanskrit Literature-II	<p>CO1: Investigate and evaluate geographical concepts, cultural values, and relationships within India to enhance understanding of its diverse regions and historical contexts.</p> <p>CO2: Demonstrate proficiency in explaining and translating texts from Sanskrit to Odia to facilitate accurate and effective language conversion.</p> <p>CO3: Analyze and appreciate the profound impact of India's age-old heritage on contemporary life and culture to recognize its lasting influence.</p> <p>CO4: Outline and interpret the key characteristics of Classical Sanskrit Literature, focusing on Champu and GadyaKavya, to understand their contributions to literary tradition.</p>
CC-VI: Meta Rules of Paninian Grammer, Poetics & Figure of Speech.	<p>CO1: Enhance understanding of the meta-rules of Panini to strengthen the grammatical foundation of students.</p> <p>CO2: Identify and analyze the key features of kavyas in Sanskrit literature to build foundational knowledge of classical poetic works.</p> <p>CO3: Construct sentences and apply the three powers of Sanskrit grammar to demonstrate proficiency in sentence formation.</p> <p>CO4: Recite Sanskrit slokas with appropriate figures of speech and analyze their poetic elements to improve clarity and fluency in Sanskrit learning.</p>
CC-VII: Case Endings in Paninian Grammar and	<p>CO1: Explain and apply the key sutras, vrttis, and vartikas related to Prathama and Dvitiyavibhakti from Siddhantakaumudi to demonstrate</p>

<p>Translation.</p>	<p>mastery of fundamental grammatical concepts.</p> <p>CO2: Interpret and apply the sutras, vrttis, and vartikas associated with Trtiyavibhakti to enhance understanding of Sanskrit grammatical structures.</p> <p>CO3: Analyze and utilize the sutras, vrttis, and vartikas related to Caturthivibhakti to develop proficiency in advanced grammatical principles.</p> <p>CO4: Translate an unseen Sanskrit passage into Odia or English to demonstrate comprehension and apply translation skills effectively.</p>
<p>GE III: Technical Literature in Sanskrit (Jyotisa &Vastu)</p>	<p>CO1: Analyze the concepts of Graha and Nakshatra from <i>Jyotihshara – Ratnavali, Chapter 1</i> to develop a comprehensive understanding of their roles in Jyotisha.</p> <p>CO2: Interpret and apply the principles of Jyotihshara, focusing on Graha and Nakshatra, to demonstrate proficiency in basic astrological concepts.</p> <p>CO3: Examine the techniques of Bhuparigraha from <i>Vasturatnakara, Chapter 1</i> to understand and apply the foundational principles of Vastu.</p> <p>CO4: Evaluate and apply the Vastu principles outlined in <i>Vasturatnakara</i> to develop a practical understanding of spatial and architectural guidelines.</p>
SEMESTER-IV	
<p>CC-VIII: Upanisad , Ramayan and Bhagavadgita</p>	<p>CO 1: Develop a strong concept of character-building by analyzing the Upanisadic story of Nachiketa.</p> <p>CO 2: Demonstrate the skill of explanation and translation of mantras from the texts.</p> <p>CO 3: Apply human values such as non-violence and kindness, as instructed by Devi Sita to Lord Ram in the Ramayana, and enhance gender sensitization by promoting respect towards women in society.</p> <p>CO 4: Cultivate self-management skills including self-control, emotional regulation, consistency, perseverance, and persistence to achieve excellence in various aspects of life.</p>
<p>CC-IX: Cases and Case-endings of PaninianGrammer, Translation and Lexicon.</p>	<p>CO 1: Analyze and explain any two sutras, Vrttis, or Vartikas from the Siddhanta kaumudi (Karakā – Vibhakti V – VI), focusing on CASE V and CASE VI & VII.</p> <p>CO 2: Translate an unseen passage of Odia into Sanskrit, ensuring accuracy and fluency in translating at least eight sentences.</p> <p>CO 3: Write short notes on any two topics out of four asked from the Amarakosa (Devata, Svarga, Visnu, Laksmi, Durga, Surya, Brahma, Siva, Kartikeya, Ganesa, Sarasvati from Svargavarga).</p>
<p>CC-X : Ornate Prose in Classical Sanskrit</p>	<p>CO1: Analyze the historical and cultural significance of the Girnar inscription of Rudradaman, the Prayaga (Allahabad) stone pillar</p>

	<p>inscription of Samudragupta, and the Mandasore inscription of Yasovarman.</p> <p>CO2: Compare and contrast the styles and content of these inscriptions to understand the political and social contexts of their respective eras.</p> <p>CO3: Interpret the linguistic and epigraphic features of these inscriptions,</p> <p>CO4: evaluate their impact on the understanding of ancient Indian history.</p>
SEMESTER-V	
CC-XI: Ornate Poetry in Sanskrit	<p>CO1: Analyze character development through the study of popular books, such as Sisupalabadham, to understand how characters are portrayed and evolved in classical literature.</p> <p>CO2: Develop and demonstrate skills in translating and explaining classical texts, ensuring accuracy and clarity in both translation and interpretation.</p> <p>CO3: Evaluate the role of women in society as depicted in the text of Kiratarjuniyam, and discuss how these roles reflect historical and cultural contexts.</p> <p>CO4: Enhance translation and explanation skills through practical exercises and analysis of texts from Kiratarjuniyam, focusing on effective communication and interpretive strategies.</p>
CC-XII: Veda, Vedic Grammar and History of Vedic Literature	<p>CO1: Understand the significance of Vedas, Upanishads, and other ancient Indian texts as the intellectual property of ancient India, and appreciate how they inspire and uplift human lives socially, morally, and spiritually.</p> <p>CO2: Acquire proficiency in the explanation and translation of Vedic mantras, ensuring accurate interpretation and contextual understanding of these ancient texts.</p> <p>CO3: Apply knowledge of Vedic grammar to analyze and interpret Vedic texts, facilitating a deeper comprehension of their linguistic and philosophical content.</p> <p>CO4: Explore the historical development of Vedic literature, and evaluate its evolution and impact on subsequent literary and cultural traditions.</p>
(DSE-I): Socio-Political thought in Ancient India	<p>CO1: Analyze the principles and concepts presented in <i>Arthashastra</i>, and evaluate their relevance to ancient Indian political and administrative systems.</p> <p>CO2: Interpret the key verses of <i>Dharmashastra</i>, focusing on their legal and social implications within the context of ancient Indian law and society.</p> <p>CO3: Compare and contrast the methodologies and content of</p>

	<p><i>Arthashastra</i> and <i>Dharmashastra</i> to understand their contributions to ancient Indian thought on governance and legal practices.</p> <p>CO4: Discuss the historical and philosophical context of the sections studied in both <i>Arthashastra</i> and <i>Dharmashastra</i>, and explain how these texts reflect the socio-political and legal frameworks of their time.</p> <p>CO5: Apply the analytical skills developed through studying these texts to critically assess their influence on subsequent legal and political theories in ancient and medieval India</p>
(DSE-II): Ethical Literature in Sanskrit	<p>CO1: Examine the core principles and strategies outlined in Chapters I-IV of <i>Cāṇakyanītidarpaṇa</i>, and evaluate their application to governance and statecraft as envisioned by Cāṇakya.</p> <p>CO2: Interpret the key teachings of <i>Nītiśataka</i> by Bhartrhari (Verses 1-50), focusing on their philosophical and ethical insights into human behavior and morality.</p> <p>CO3: Compare and contrast the political and ethical philosophies presented in <i>Cāṇakyanīti</i> and <i>Nītiśataka</i>, and analyze their influence on ancient Indian thought and literature.</p> <p>CO4: Discuss the historical and cultural context of the texts studied, and explain how these contexts shape the ideas and advice offered by Cāṇakya and Bhartrhari.</p> <p>CO5: Apply the principles and teachings from <i>Cāṇakyanīti</i> and <i>Nītiśataka</i> to critically assess their relevance and impact on contemporary discussions of ethics and governance.</p>
SEMESTER-VI	
CC-XIII: Ayurveda and Vrksayurveda	<p>CO1: Analyze the principles and concepts presented in the DhirghamJivitiyadhyaya of <i>Carakasamhita</i> (Sutrasthana, Verses 51 and onward), and evaluate their approach to promoting longevity and overall well-being.</p> <p>CO2: Explain the methodologies and therapeutic practices outlined in the <i>Carakasamhita</i>, and demonstrate their application in the context of traditional Ayurvedic medicine.</p> <p>CO3: Interpret the content of the Vrksayurvedadhyaya from <i>Brahatsamhita</i>, and assess its significance in the study of plant-based medicine and botanical health practices.</p> <p>CO4: Discuss the historical and cultural context of Ayurvedic texts, and analyze how these contexts influence the medical and botanical knowledge presented in both <i>Carakasamhita</i> and <i>Vrksayurveda</i>.</p> <p>CO5: Apply the theoretical knowledge gained from these texts to develop practical insights into Ayurvedic practices and botanical medicine, and articulate their relevance to contemporary health and wellness.</p>

	<p>CO6: Translate selected verses and passages from different Sanskrit scripture into modern languages with precision and clarity, ensuring that the original meanings and insights are preserved.</p>
<p>CC-XIV: Technical Literature (Jyotisa &Vastu)</p>	<p>O1: Identify and explain the key concepts and terminology related to planets (Graha) and constellations (Naksatra) as presented in <i>Jyotih-sararatnavali</i>, Chapter I.</p> <p>CO2: Analyze the principles of planetary and stellar influences on human life and events as described in the <i>Graha-Naksatra-Paricayaprakaranam</i>, and evaluate their application in traditional astrology.</p> <p>CO3: Compare and contrast the astrological theories from <i>Jyotih-sararatnavali</i> with other classical astrological texts, and assess their contributions to the understanding of Jyotisa (astrology).</p> <p>CO4: Discuss the historical and cultural significance of the <i>Jyotih-sararatnavali</i> in the development of astrological knowledge, and explain its impact on contemporary astrological practices.</p> <p>CO5: Interpret the principles and guidelines for land measurement and site selection as outlined in the <i>Bhuparigraha-Prakaranam</i> of <i>Vasturatnakara</i>.</p> <p>CO6: Analyze the methods and criteria for assessing the suitability of land for construction according to traditional VastuShastra, and evaluate their relevance to modern architectural practices.</p>
<p>(DSE-III): Translation, Editing and Writing skill</p>	<p>CO1: Translate a selected paragraph from Odia or English into Sanskrit, demonstrating proficiency in both linguistic accuracy and classical Sanskrit grammar.</p> <p>CO2: Apply advanced translation techniques to ensure clarity and fidelity in conveying the original meaning and context of the source text.</p> <p>CO3: Summarize a given Sanskrit paragraph to one-third of its original length, identifying and retaining the core ideas and essential details.</p> <p>CO4: Suggest an appropriate title for the summarized paragraph that reflects its primary theme and content effectively.</p> <p>CO5: Correct errors in two incorrectly printed Sanskrit verses from the prescribed text, ensuring accuracy and conformity to the original text.</p> <p>CO6: Transliterate two Sanskrit verses from the prescribed text into Roman/Italic script with diacritical marks, demonstrating correct application of transliteration conventions.</p> <p>CO7: Compose an essay in Sanskrit on a given topic, demonstrating comprehensive understanding, coherent argumentation, and effective use of classical Sanskrit language and style.</p> <p>CO8: Develop clear and structured content in the essay, showcasing</p>

	proficiency in Sanskrit composition and analytical skills.
DSE-IV: Indian Philosophy: General Ideas/ Project works	<p>CO1: Describe the twenty-five elements of Samkhya philosophy, explaining their role and significance within the framework of Samkhya.</p> <p>CO2: Analyze the concept of Satkaryavada in Samkhya philosophy and its implications for understanding creation and causation.</p> <p>CO3: Interpret the principles of Astangayoga as outlined in the Yogadarsana, demonstrating an understanding of its eightfold path and its application in achieving spiritual goals.</p> <p>CO4: Examine and compare the Asatkaryavada theory, Saptapadarthas, Arambhavada, and Paramanuvada within the context of Nayavaisesika philosophy, highlighting their contributions to the understanding of reality and causation.</p> <p>CO5: Evaluate the philosophical arguments and theories presented in Nayavaisesika, and discuss their impact on the development of Indian metaphysical thought.</p> <p>CO6: Analyze the concept of Saktidvaya of Maya in Vedanta and discuss its implications for understanding the nature of reality and illusion.</p>
Project*	<p>CO 1 - Student will have an idea about the research methods.</p> <p>CO 2 - Student will have an idea about the subjective analysis. CO 3 - Student will have an idea about the field visit for study.</p> <p>CO 4 - Students will have vast scope for research in ancient treatises.</p>

SUBJECT: SOCIOLOGY(B.A)	
PROGRAMME OUTCOMES (PO)	<p>PO1: Develop a holistic understanding of various sociological concepts, social processes and social institutions that man encounters as a member of society.</p> <p>PO2: Gain knowledge about the interrelationship between individual and society, its types and various social processes that contribute to sustain the society over a period of time.</p> <p>PO3: Examine the theoretical relevance and analytical utility of the premises, methodology and conclusion of the diverse perspectives in understanding society and change.</p> <p>PO4: Enable the students to comprehend the heterogeneities in culture, institutions and their functions, changes seen in these institutions in contemporary times, and the contrasts found between different societies.</p> <p>PO5: Acquaint the students with the scientific ways of studying social phenomena and enable them to capture the most relevant data in an objective manner.</p> <p>PO6: Gain insight into emerging issues and contemporary debates within the development discourse.</p> <p>PO7: Help develop rational thinking, critical temper and scientific outlook to enhance productivity and demand of the learner in the market.</p> <p>PO8: Learners will be more sensitive, socially responsible, endowed with humane values and creativity.</p> <p>PO9: Will reinforce cultural heritage, ethical values and moral standards in the thought process and behaviour of the learner.</p> <p>PO10: Equip the students with conceptual, theoretical and empirical clarity about various social structures and help them plan, monitor and evaluate various developmental programmes at the local and national level.</p>
PROGRAMME SPECIFIC OUTCOMES (PSO) for Sociology(B.A.)	<p>PSO1: The students will become well-versed with various research methods, both qualitative and quantitative, that is highly demanded in academics, fundamental research and policy research undertaken both by Government and Non- Government agencies.</p> <p>PSO2: Sociology provides an intellectual background for students considering careers in business, social services, public policy, government service, nongovernmental organizations, foundations, or academia.</p> <p>PSO3: Comprehend the various features of Indian Society and culture, including unity in diversity; Indian social structure and have better understanding about rural, urban and tribal India.</p> <p>PSO4: It prepares an individual to become a useful member of society and nation at large. It will help the students identify various problems prevalent in society and think of measures to eradicate them.</p>
COURSE OUTCOME	
SEMESTER I	
CORE 1: INTRODUCTION TO SOCIOLOGY - I	<p>CO1: Develop knowledge about the emergence, nature and scope of the subject.</p> <p>CO2: Can get to know the convergence and divergence of Sociology with other social sciences.</p> <p>CO3: Can get to know about the basic concepts used in the subject.</p>

	CO4: Can generate ideas about the social processes and social institutions that man encounters as a member of the society.
CORE 2: INTRODUCTION TO SOCIOLOGY -II	CO1: Develop knowledge about the subject matter, nature and scope of the key topics and its subject matter. CO2: Develop knowledge about individual and society. CO3: Can get acquainted with the basic concepts used in the subject. CO4: Can generate ideas about the social processes and social institutions.
GE-1 INTRODUCTION TO SOCIOLOGY	CO1: Get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach. CO2: Develop knowledge about its historicity. CO3: Can get acquainted with the basic concepts used in the subject. CO4: Generate ideas about the social processes and social institutions man encounters as a member of the society
SEMESTER II	
CORE 3: INDIAN TO SOCIETY	CO1: Become familiar with the diverse composition of Indian society-racial, religious, linguistic and identify various factors which contributes to unity in diversity. CO2: Understand the very bases of Hindu society which sustains it. CO3: Gain insights into the working of important social institutions and deciphering changes in the functioning of these institutions in contemporary times. CO4: Decode a complex social institution like caste system and identifying the changes in the system in contemporary times.
CORE-4: SOCIOLOGY OF ENVIRONMENT	CO1: Understand the interaction between different components of environment and society CO2: Acquire knowledge about specific environmental movements in India. CO3: Gain awareness about the current and critical environmental issues. CO4: Get familiarized with environmental protection efforts at different levels and by different stakeholders.
GE-2 INDIAN SOCIETY	CO1: Describe diverse composition of Indian society-racial, religious, linguistic and identify various factors which contributes to unity in diversity. CO2: Understand the very bases of Hindu society which sustains it. CO3: Gain insights into the working of important social institutions and deciphering changes in the functioning of these institutions in contemporary times. CO4: Decode a complex social institution like caste system and identifying the changes in the system in contemporary times.
SEMESTER III	
CORE 5: CLASSICAL SOCIOLOGICAL THINKERS	CO1: Broaden understanding and knowledge about theoretical and methodological contributions of classical sociological thinkers. CO2: Realise the contemporary relevance of the classical sociological theories. CO3: Acquire the ability to make comparative analysis of different classical sociological theoretical perspectives. CO4: Have a strong grasp over sociological theory on the foundation of

	which modern sociological theory is built.
CORE 6: SOCIAL CHANGE AND DEVELOPMENT	<p>CO1: Understand the meaning and nature and various factors of social change</p> <p>CO2: Conceptualized the various theories of social change.</p> <p>CO3: Able to critically analyse different models of social development.</p> <p>CO4: Distinguish different processes of social change and their impact on Indian society.</p>
CORE 7: SOCIOLOGY OF GENDER	<p>CO1: Develop sensitivity towards gender.</p> <p>CO2: Work towards creation of a gender-neutral social world.</p> <p>CO3: Learn to integrate gender aspects with development practices.</p> <p>CO4: Become aware of the changing status of women in Indian society and relate it to their status in contemporary times.</p>
GE-3 SOCIAL CHANGE AND DEVELOPMENT	<p>CO1: Have a clear understanding about meaning and nature and various factors of social change</p> <p>CO2: Get familiarized with various theories of social change</p> <p>CO3: Critically analyse different models of social development.</p> <p>CO4: Distinguish different processes of social change and their impact on Indian society.</p>
SEMESTER IV	
CORE 8: RURAL SOCIOLOGY	<p>CO1: Understand the meaning, scope and significance of rural sociology.</p> <p>CO2: Comprehend the rural social structure and analyze changes in the structure</p> <p>CO3: Develop sensitivity towards those who are affected by various rural social problems including poverty, unemployment, rural factionalism, etc.</p> <p>CO4: Gain awareness about various past and current rural development programs implemented by the government while gaining an insight as to how the programs address the rural social problems.</p>
CORE 9: GLOBALISATION & SOCIETY	<p>CO1: Understand the meaning nature, and historical moorings of globalization.</p> <p>CO2: Gain knowledge about various dimensions of globalization.</p> <p>CO3: Analyze impact of globalization on environment and society</p> <p>CO4: Acquire the ability to logically study the impact of globalization on different institutions and groups of Indian society.</p>
CORE 10: MARRIAGE, FAMILY & KINSHIP	<p>CO1: Gain knowledge about the institution of marriage, the principles governing this institution and factors responsible for bringing changes in this institution in contemporary times.</p> <p>CO2: Understand the importance of the institution of family, norms sustaining this institution and various forces at work responsible for changes in this institution.</p> <p>CO3: Get acquainted with the meaning of kinship and various terminologies and usages associated with it.</p> <p>CO4: Reflect on contemporary social issues like migration, domestic violence, dowry and divorce.</p>
GE-4 RURAL SOCIOLOGY	<p>CO1: Understand the meaning, scope and significance of rural sociology.</p> <p>CO2: Comprehend the rural social structure and analyze changes in the structure.</p> <p>CO3: Develop sensitivity towards those who are affected by various rural social problems including poverty, unemployment, rural factionalism, etc.</p> <p>CO4: Gain awareness about various past and current rural development programs implemented by the government while</p>

	gaining an insight as to how the programs address the rural social problems.
SEMESTER V	
CORE 11: RESEARCH METHODOLOGY	<p>CO1: Get acquainted with scientific ways to analyse social phenomena.</p> <p>CO2: Understand the meaning, types, characteristics of different kind of hypotheses and will be able to use various sampling techniques while undertaking research.</p> <p>CO3: Prepare different tools and techniques of data collection during field work.</p> <p>CO4: Apply statistical methods to analyze data and prepare reports.</p>
CORE 12: SOCIAL MOVEMENTS IN INDIA	<p>CO1: Comprehend the concept, nature and characteristics, causes and various types of social movement.</p> <p>CO2: Get critical insights into causes and consequences of various peasant movements in India.</p> <p>CO3: Gain a broader understanding of the backward castes and tribal movements in India.</p> <p>CO4: Relate women's movement in India down the ages with overall growing women's empowerment.</p>
DSE 1: SOCIOLOGY HEALTH	<p>CO1: Gain knowledge on the Sociology of health and medicine.</p> <p>CO2: Can get an insight on socio-cultural dimension in the construction of illness and medical knowledge.</p> <p>CO3: Can gain understanding on health sector reforms of Government of India.</p> <p>CO4: Gain knowledge on medical pluralism for treatment of disease</p>
DSE 2: SOCIOLOGY OF EDUCATION	<p>CO1: Understand concept relating to sociology of education and gain insight into interrelationship between education and society.</p> <p>CO2: Internalize different theoretical perspectives on sociology of education and apply them to the current issues and challenges in the field of education.</p> <p>CO3: Gain ability to relate education to social processes like socialization, social mobility and development.</p> <p>CO4: Acquire factual knowledge about laws, policies and programs relating to education, and be in a position to critically analyze them.</p>
SEMESTER VI	
CORE 13: POPULATION & SOCIETY	<p>CO1: Understand the meaning, scope and importance of population studies.</p> <p>CO2: Acquire knowledge about various population theories apply those theories in contemporary times.</p> <p>CO3: Able to identify determinants of population growth and suggest measures to curb population growth.</p> <p>CO4: Learn about population composition in India.</p>
CORE 14: SOCIAL DISORGANIZATION & DEVIANCE	<p>CO1: Understand the concept of deviant behavior leading to social disorganization.</p> <p>CO2: Get acquainted with various theoretical frameworks designed to comprehend deviant behavior.</p> <p>CO3: Probe into various types of crime, their causes, consequences and get familiarized with different forms of punishment.</p> <p>CO4: Become aware about various social problems plaguing the society and suggest measures to overcome those problems.</p>
DSE-3: URBAN SOCIOLOGY	<p>CO1: Understand the specific traits of urban areas and its historical patterns of growth</p> <p>CO2: To critically study the urban sociological theories.</p>

	<p>CO3: Develop knowledge about urban social institutions and problems.</p> <p>CO4: Gain insight into urban developmental plans, programmes and efforts.</p>
DSE 4: FIELD WORK AND DISSERTATION	<p>CO1: Get exposed to field visits and equip her with skills required for doing research</p> <p>CO2: Enhance their capacity to collect data from secondary sources and sharpen their ability to review existing literature.</p> <p>CO3: Improve their capability to collect the right kind of data.</p> <p>CO4: Write a report after having analysed data thoroughly.</p>

SUBJECT:ZOOLOGY (B.Sc.)	
PROGRAMME OUTCOMES	<p>Zoology is the broad discipline encompassing various subjects involved with the study of animals. Present trend has been shifted to frontier areas of animal sciences at the cost of traditional zoology. There is need to maintain a balance of the traditional zoology and modern science and applied approach. It enables the learners to prepare them for future employment in various fields including academics as well as competitive exams.</p> <p>PO1: Diversity of in vertebrates and chordates, their habitat, morphology and reproduction.</p> <p>PO2: Genetics and molecular biology of animals.</p> <p>PO3: Protozoans and disease causing protozoans and helminthes.</p> <p>PO4: Economic value of animals and their use in Genetic Engineering.</p>
PROGRAMME SPECIFIC OUTCOMES For Zoology Honors	<p>PSO1:Pursue advanced studies and professional courses such as M.Sc, Graduate Diplomas, Certificates, and PhD programs in various scientific fields.</p> <p>PSO2:Cultivate a passion for research in areas like molecular biology, immunology, genetics, cell biology, developmental biology, chronobiology, and biochemistry.</p> <p>PSO3:Gain practical experience through projects, field visits, and seminars to apply theoretical knowledge in real-world settings.</p> <p>PSO4:Enhance observational, computational, and analytical skills necessary for emerging trends in genetics, molecular biology, and cell biology.</p> <p>PSO5:Develop a strong understanding of ethical practices in scientific research and apply them in studies related to genetics and molecular biology.</p>
COURSE OUTCOME :	<i>After completion of the course the students will be able to:</i>
Semester I	
Core-I Non-chordates I: Protista to Pseudocoelomates	<p>CO1:Identify and describe the classification, cell structure, and reproductive methods of Protista, including Amoeba, Euglena, Plasmodium, and Entamoeba.</p> <p>CO2:Compare and contrast the classification, characteristic features, polymorphism, and alternation of generations in Cnidarian, and explain the evolutionary relationships of Ctenophora.</p> <p>CO3:Analyze the classification, characteristic features, and life cycle of Platyhelminthes, and assess the pathogenicity of Fasciola hepatica and Taenia solium.</p> <p>CO4:Investigate the life cycle and pathogenicity of Ascaris</p>

	<p>lumbricoides and <i>Wuchereria bancrofti</i>, and evaluate their adaptations to adverse environments.</p> <p>CO5: Apply knowledge of non-chordate classification and characteristics to synthesize insights into their evolutionary significance and ecological roles.</p>
<p>Core-II Principles of Ecology</p>	<p>CO1: Define the meaning and types of ecology, differentiate between types of ecosystems, food chains, food webs, and ecological pyramids, analyze energy flow, nutrient cycles, and physical factors in environments, and evaluate the role of ecology in wildlife conservation.</p> <p>CO2: Examine the attributes of populations, classify types of population regulation, and analyze various population interactions.</p> <p>CO3: Describe the characteristics of ecological communities, explain the concepts of ecotone, edge effect, ecological succession, and compare theories of climax communities.</p> <p>CO4: Interpret biological data through graphical representations (frequency polygon, histogram), apply sampling techniques, and calculate measures of central tendency (mean, median, mode) and dispersion (range, quartile deviation, mean deviation, standard deviation).</p> <p>CO5: Apply statistical methods to test hypothesis by using Chi-square tests and t-tests; analyze and interpret statistical results to draw meaningful conclusions from ecological and biological data.</p>
<p>GE-1 Animal Diversity</p>	<p>CO1: Identify the general characteristics and life cycles of protozoa, porifera, cnidaria, platyhelminthes, and nemathelminthes, including the life cycle of <i>Plasmodium</i>, the canal system of sponges, polymorphism in cnidarians, the life cycle of <i>Taeniasolium</i>, and the parasitic adaptations of helminths.</p> <p>CO2: Describe the general characteristics of annelida, arthropoda, mollusca, and echinodermata, including metamerism in annelids, social behavior in insects, torsion and pearl formation in mollusks, and the larval forms of echinoderms.</p> <p>CO3: Explain the key features of protochordata, osmoregulation and migration in fishes, as well as the general characteristics, terrestrial adaptations, and parental care of amphibians.</p> <p>CO4: Understand the origin and terrestrial adaptations of amniotic reptiles, as well as the origin and flight adaptations in birds, and early evolution and dentition in mammals.</p>
<p>SEC 1: Environmental Studies</p>	<p>CO1: Understand the environment, different types of ecosystems, and the role of biogeochemical cycles in maintaining the environment, as well as various types of environmental pollution</p>

<p>and Management</p> <p>Disaster</p>	<p>and laws for pollution control.</p> <p>CO2:Explore population characteristics and growth, and gain insight into climate change and sustainable development.</p> <p>CO3:Learn about disaster management, including risk analysis, vulnerability assessment, institutional frameworks, preparedness measures, and survival skills for disasters.</p> <p>CO4:Study the dynamics and transmission of communicable and non-communicable diseases, including prevention of epidemics and pandemics, lifestyle management, and the role of different sectors in managing health disasters.</p>
<p>SEMESTER-II</p>	
<p>Core Paper III</p> <p>Non- Chordates II:</p> <p>Coelomates</p>	<p>PO1: Explain how coelom and segmentation evolved in coelomates and annelids, including their main features, classification, and excretion methods.</p> <p>PO2: Describe the main traits and classification of Arthropoda and Onychophora, focusing on Arthropod vision, respiration, insect metamorphosis, and social behaviors in bees and termites, and the role of Onychophora in evolution.</p> <p>PO3: Identify the main characteristics and classification of Mollusca, covering how they breathe, the processes of torsion and detorsion in Gastropoda, and the importance of the trochophore larva in evolution.</p> <p>PO4: Outline the characteristics and classification of Echinodermata, including the water-vascular system in starfish, different larval forms, and their connections to Chordates.</p> <p>PO5: Use information from “Ruppert and Barnes (2006) Invertebrate Zoology” to compare and understand the main features and evolutionary adaptations of major invertebrate groups.</p>

<p>Core Paper IV Cell Biology</p>	<p>PO1: Understand the basic types of cells, viruses, viroids, mycoplasma, and prions, and explain different models of plasma membrane structure and how substances move across membranes.</p> <p>PO2: Explain the structure and function of the cytoskeleton components and the endomembrane system.</p> <p>PO3: Describe the structure and function of mitochondria and peroxisomes, including the semi-autonomous nature of mitochondria, the endosymbiotic hypothesis, mitochondrial respiratory chain, and the chemiosmotic hypothesis.</p> <p>PO4: Identify the structure of the nucleus; understand chromatin types and their packaging, and explain the processes of mitosis, meiosis, and cell cycle regulation.</p> <p>PO5: Explain cell signaling mechanisms, particularly GPCRs and the role of second messengers like cAMP in cellular processes.</p>
<p>GE-II Aquatic Biology</p>	<p>CO1: Explore aquatic biomes, including freshwater ecosystems, estuaries, intertidal zones, oceanic pelagic zones, marine benthic zones, and coral reefs.</p> <p>CO2: Understand the classification and characteristics of lakes, the development of streams, and the adaptations of hill-stream fishes.</p> <p>CO3: Investigate sea water salinity and density, adaptations of deep-sea organisms, and the features of continental shelves, coral reefs, and seaweeds.</p> <p>CO4: Analyze water pollution from agricultural, industrial, sewage, thermal, and oil spills, including concepts like eutrophication, BOD, COD, and water quality assessment.</p>
<p>SEC 2: M.I.L.(Odia/Alternative English)</p>	<p>CO1: Understand cultural and social statuses in ancient, medieval, and modern civilizations.</p> <p>CO2: Analyze the status of women in various societies and evaluate the contributions of poets, writers, and philosophers to the development of civilization.</p> <p>CO3: Develop vocabulary skills and apply grammar rules effectively.</p>
<p>SEMESTER-III</p>	
<p>Core Paper V Diversity and distribution of Chordates</p>	<p>PO1: Analyze the characteristics, classification, and evolutionary theories of protochordates and the origin of chordates.</p> <p>PO2: Compare the general characteristics, classification, and</p>

	<p>evolutionary significance of Agnatha, Pisces, and Amphibia.</p> <p>PO3:Describe the general characteristics and classifications of Reptilia and Aves, including their adaptations and evolutionary connections.</p> <p>PO4:Summarize the general characteristics and classifications of Mammals and discuss their adaptive radiation and zoogeographic distribution.</p> <p>PO5:Interpret the distribution of vertebrates across different zoogeographical realms and evaluate the effects of plate tectonics and continental drift.</p>
<p>Core Paper VI Physiology: Controlling and Coordinating Systems</p>	<p>PO1:Describe the structure, location, classification, and functions of epithelial, connective, muscular, and nervous tissues, as well as bone and cartilage types, ossification, bone growth, and resumption.</p> <p>PO2:Explain the histology and molecular basis of muscle contraction, neuron structure, action potential propagation, synaptic transmission, reflex actions, and the physiology of hearing and vision.</p> <p>PO3:Describe the histology and physiology of the male and female reproductive systems including the hypothalamus-pituitary-gonadal axis, puberty, ovarian cycle, contraception methods, and placental hormones.</p> <p>PO4:Identify the histology and functions of endocrine glands, including the hypothalamus, pineal, pituitary, thyroid, parathyroid, pancreas, and adrenal glands, and explain their hormone mechanisms of action.</p> <p>PO5:Classify the hormonal mechanisms and effects of different endocrine glands and their impact on physiological processes.</p>
<p>Core Paper VII Fundamentals of Biochemistry</p>	<p>PO1:Explain the structures and biological significance of carbohydrates and lipids.</p> <p>PO2:Elucidate the structure and classification of amino acids, their physiological roles, the bonds that stabilize protein structures, levels of protein organization, and the processes of renaturation and denaturation, including detailed features of immunoglobulins.</p> <p>PO3:Understand the structures and functions of nucleic acids, including purines, pyrimidines, nucleosides, nucleotides, base pairing, DNA denaturation and renaturation with types of DNA and RNA, and the principles of DNA complementarity and hyperchromaticity.</p>

	<p>PO4: Define enzyme nomenclature, enzyme specificity, mechanisms of enzyme action, enzyme kinetics including the Michaelis-Menten equation, K_m, V_{max}, and Lineweaver-Burk plot, as well as enzyme inhibition and allosteric regulation.</p> <p>PO5: Describe the factors influencing enzyme-catalyzed reactions, including multi-substrate reactions, enzyme inhibition, and the regulatory mechanisms controlling enzyme activity.</p>
<p>GE-III Human Physiology</p>	<p>CO1: Explain the structure and function of digestive glands, digestion and absorption processes, nervous and hormonal control of digestion, and the mechanics of respiration and gas transport.</p> <p>CO2: Describe the structure of neurons and the propagation of nerve impulses, as well as the structure of skeletal muscles, muscle contraction mechanisms, and the function of the neuromuscular junction.</p> <p>CO3: Understand the functional anatomy of the kidney, urine formation and regulation, heart structure, heartbeat coordination, cardiac cycle, and ECG.</p> <p>CO4: Identify the structure and function of endocrine glands, and explain spermatogenesis, oogenesis, and the menstrual cycle</p>
<p>SEC 3: Communicative English</p>	<p>Understand techniques for reading comprehension and develop interest in pronouns, nouns, adverbs, and adjectives. Learn about different types of tenses and verb classifications, and appreciate the importance of business communication.</p> <p>CO2: Enhance skills in reading comprehension through various techniques.</p> <p>CO3: Master the use of pronouns, nouns, adverbs, and adjectives in written and spoken language.</p> <p>CO4: Apply knowledge of tenses and verb classifications to improve grammar accuracy and recognize the significance of effective business communication in professional settings.</p>
<p>SEMESTER-IV</p>	
<p>Core Paper VIII Comparative Anatomy of Vertebrates</p>	<p>PO1: Analyze vertebrate evolution patterns and the organization and functions of various systems.</p> <p>PO2: Compare the integument and skeletal components across different vertebrates, noting their functions and modifications.</p> <p>PO3: Explain the evolution of the heart, modifications in aortic arches, and the structure of respiratory organs in aquatic, terrestrial, and aerial vertebrates, along with digestive system</p>

		<p>adaptations to various diets.</p> <p>PO4:Describe the evolution of the brain, sense organs, and excretory organs, emphasizing their complexity and development in mammals.</p> <p>PO5:Assess the structural and functional adaptations in vertebrates related to their evolutionary changes and ecological roles.</p>
<p>Core Paper IX Physiology: Sustaining Systems</p>	<p>Life</p>	<p>PO1:Explain the structure and function of the digestive system and associated glands, including the processes of digestion, absorption, and hormonal regulation of gastric secretions.</p> <p>PO2:Describe the mechanism of respiration, including the transport of oxygen and carbon dioxide, the oxygen dissociation curve, and the control of respiration.</p> <p>PO3:Analyze the structure and function of the kidneys, including the regulation of acid-base balance, blood components, and blood groups.</p> <p>PO4:Describe the structure and function of conducting myocardial fibers, the cardiac cycle, cardiac output, and blood pressure regulation.</p> <p>PO5:Assess the physiological processes and regulatory mechanisms involved in digestion, respiration, renal function, and cardiovascular performance.</p>
<p>Core Paper X Biochemistry Metabolic Processes</p>	<p>of</p>	<p>PO1:Analyze catabolism, anabolism, compartmentalization of metabolic pathways, the role of ATP as the energy currency of the cell, and the regulatory mechanisms involved.</p> <p>PO2:Explain the processes and regulation of carbohydrate metabolism, including glycolysis, the citric acid cycle, gluconeogenesis, and glycogenesis.</p> <p>PO3:Describe the oxidation and biosynthesis of fatty acids, the catabolism of amino acids, and the fate of carbon skeletons from various amino acids.</p> <p>PO4:Identify the components of the mitochondrial respiratory chain and the effects of inhibitors on the electron transport chain.</p> <p>PO5:Evaluate how metabolic processes are integrated and regulated to maintain cellular function and energy balance.</p>
<p>GE-IV Animal Biotechnology</p>		<p>CO1:Explain gene manipulation techniques like genetic engineering, cloning vectors, and transformation methods.</p> <p>CO2:Describe animal cell culture techniques and key methods</p>

	<p>like gel electrophoresis, DNA sequencing, and PCR.</p> <p>CO3: Compare different fermentation processes and downstream techniques for processing products.</p> <p>CO4: Understand how to create transgenic animals and use them for making vaccines and proteins.</p>
<p>SEC-4 Quantitative & Logical Thinking</p>	<p>CO1: Understand quantitative aptitude and data interpretation skills.</p> <p>CO2: Explore logical reasoning concepts, including Venn diagrams, mirror images, cube and dice problems, simple analogies, and logical statements.</p> <p>CO3: Learn about different polygons, such as triangles, squares, rectangles, and right-angled triangles, and calculate their area and perimeter.</p> <p>CO4: Analyze bar graphs and pie charts, and apply statistical measures like mean, median, and mode, as well as concepts of events, sample space, and probability.</p>
<p>SEMESTER-V</p>	
<p>Core Paper XI Molecular Biology</p>	<p>PO1: Describe the main features of DNA and RNA, how DNA replicates in both prokaryotes and eukaryotes, and how DNA repairs itself.</p> <p>PO2: Explain how cells make RNA and proteins, including how transcription and translation work in prokaryotes and eukaryotes, and the role of various molecules in this process.</p> <p>PO3: Analyze how eukaryotic RNA is modified after transcription, including how genes are spliced and edited.</p> <p>PO4: Illustrate how gene expression is regulated in prokaryotes and eukaryotes, including examples like the lac operon and gene silencing.</p> <p>PO5: Compare the processes of making proteins and regulating genes in prokaryotes versus eukaryotes.</p>
<p>Core Paper XII Principles of Genetics</p>	<p>PO1: Explain the principles of inheritance including Mendelian genetics, incomplete dominance, co-dominance, multiple alleles, and other genetic interactions, as well as linkage, crossing over, and chromosomal mapping.</p> <p>PO2: Identify different types of gene mutations and chromosomal aberrations, and describe how mutations are caused by UV light and chemical mutagens, along with methods to detect these</p>

	<p>mutations.</p> <p>PO3:Describe the mechanisms of sex determination in different organisms and explain the criteria and examples of extra-chromosomal inheritance, including mitochondrial mutations and maternal effects.</p> <p>PO4:Explain recombination processes in bacteria and viruses, including conjugation, transformation, and transduction, as well as the function of transposable genetic elements like transposons and their role in various organisms.</p> <p>PO5:Compare the different mechanisms of genetic recombination and inheritance across bacteria, viruses, and eukaryotes, focusing on their implications for genetics and evolution.</p>
<p>DSC-1 Animal Behaviour and Chronobiology</p>	<p>CO1: Understand the history of ethology and key experiments by Frisch, Pavlov, Lorenz, and Tinbergen, including concepts like innate behavior, sign stimuli, and code breakers.</p> <p>CO2: Explain stereotyped behaviors, instincts, learning types (associative, classical, operant), habituation, and imprinting.</p> <p>CO3: Explore social behaviors like communication, altruism, foraging, and sexual behaviors including mate choice, selection, and conflict.</p> <p>CO4: Describe the history of chronobiology and the importance of biological rhythms, including circadian, circannual, tidal, and lunar cycles, and the roles of photoperiod and melatonin.</p>
<p>DSC-2 Immunology</p>	<p>CO1:Understand innate and adaptive immunity, including immune system cells, humoral and cell-mediated responses, and autoimmunity related to Rheumatoid arthritis and AIDS.</p> <p>CO2:Learn about antigens, immunogens, haptens, adjuvants, B and T cell epitopes, immunoglobulin structure, antigen-antibody interactions, and techniques like ELISA and RIA.</p> <p>CO3:Explore MHC molecules and cytokines, and the pathways of antigen processing and complement systems.</p> <p>CO4:Review gene classification, types of hypersensitive reactions, and various vaccines.</p>
<p>SEMESTER-VI</p>	
<p>Core Paper XIII Developmental Biology</p>	<p>PO1:Understand the historical perspective and fundamental concepts of developmental biology, including phases of development, cell-cell interactions, pattern formation,</p>

	<p>differentiation, growth, gene expression, and the processes of gametogenesis and fertilization.</p> <p>PO2:Describe early embryonic development, focusing on cleavage patterns, types of blastula, fate maps, and early development stages in frogs and chicks up to gastrulation.</p> <p>PO3:Discuss late embryonic development, including the fate of germ layers, extra-embryonic membranes in birds, human embryo implantation, and the structure and functions of the placenta.</p> <p>PO4:Explain post-embryonic development processes such as metamorphosis and hormonal regulation, various modes of regeneration, and concepts of aging, including teratogenesis, in vitro fertilization, stem cells, and amniocentesis.</p> <p>PO5:Evaluate the implications of developmental biology techniques and concepts, including the impact of stem cell therapy and the role of teratogens in embryonic development.</p>
<p>Core Paper XIV Evolutionary Biology</p>	<p>PO1:Understand the theories and evidence of evolution, including the origins of life, historical evolutionary concepts, and evidence from the fossil record, variations, and extinction events.</p> <p>PO2:Explain the processes of evolutionary change, including population genetics, Hardy-Weinberg equilibrium, natural selection, genetic drift, and the roles of migration and mutation in allele frequency changes.</p> <p>PO3:Describe the species concept, modes of speciation, and adaptive radiation, focusing on micro evolutionary changes and isolating mechanisms.</p> <p>PO4:Describe the origin and evolution of humans, including key hominine characteristics, primate phylogeny, and methods for analyzing human evolution through phylogenetic trees and molecular data.</p> <p>PO5:Evaluate evolutionary processes and evidence, using concepts and examples to understand species formation, adaptation, and the evolutionary history of humans.</p>
<p>DSEIII: Fishand Fisheries</p>	<p>CO1:Understand systemic positions, types of fins, locomotion, scales, gills, swim bladders, electric organs, bioluminescence, mechanoreceptors, schooling, and migration in fishes.</p> <p>CO2:Explore inland and marine fisheries, factors affecting seasonal variations, fishing crafts and gears, resource depletion, and fisheries laws and regulations.</p> <p>CO3:Learn about sustainable aquaculture, polyculture, composite fish culture, induced breeding methods, fish hatchery</p>

	<p>management, aquarium maintenance, and factors affecting aquaculture.</p> <p>CO4:Examine diagnosis and treatment of viral, bacterial, and protozoan fish diseases, fish processing, fish byproducts, and the concept of transgenic and zebra fish.</p>
DSEIV: Project	<p>CO1: Prepare scientific projects related to courses of study.</p> <p>CO2: Prepare and Present a PowerPoint presentation of the project work.</p>

DEPARTMENT OF TEACHER EDUCATION (B.Ed.)

PROGRAMME OUTCOMES

The two-year B.Ed program aims to prepare individuals for careers in teaching by focusing on several key objectives. Firstly, it aims to develop a strong foundation in educational theory and practice, equipping students with essential pedagogical skills and knowledge of educational psychology. This prepares them to effectively manage classrooms, design curriculum, and employ various teaching methodologies tailored to diverse learner needs. Secondly, the program emphasizes subject-specific proficiency, ensuring that prospective teachers possess in-depth understanding and expertise in their chosen teaching subjects. This enables them to impart accurate and comprehensive knowledge to students at the school level.

On the completion of the course, the pupil-teacher-teacher shall:

PO1: Understand the central concepts, tools of inquiry, and structures of the disciplines and can create learning experiences that make these aspects of subject matter meaningful.

PO2: Apply knowledge and competencies of content and pedagogy to set goals and objectives for learning based on the set standard of a professional teacher.

PO3: Create a learning environment which integrates theory and practice.

PO4: Understand how children learn and develop; how they differ in their approaches to learning and create learning opportunities that are adapted to diverse learners and learning contexts.

PO5: Draw out latent talents and creativity through varied curricular and co- curricular programs.

PO6: Use effective and appropriate, verbal and non-verbal, written and media communication, techniques in the teaching, professional collaboration and interaction with stakeholders

PO7: Demonstrate the understanding of intellectual/ cognitive, social and emotional development and other characteristics of the diversity of learners and implement it in the classroom procedure, behavior management and organization of the learning environment.

PO8: Demonstrate critical awareness of professional ethics and an ability to engage in reflective practices.

PO9: Apply the meaningful learning experiences to seek better employment and generate resources for the economy.

PO10: Understand and use formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social and physical developments of the learner.

	<p>PO11: Engage in the process of self-directed learning through the use of innovative practices.</p> <p>PO12: Engage in culturally responsive teaching practices to nurture diverse learners.</p> <p>PO13: Demonstrate their commitment to continuous self-improvement by engaging in professional learning, collaborative practices and contribute to renewal of the teaching profession.</p> <p>PO14: Develop self-identity as a teacher through school-based experiences and reflective practices that continually evaluate the effects of his/her choices and actions.</p>
<p>PRPGRAMME SPECIFIC OUTCOMES</p>	<p>After completion of the course the students will be able to:</p> <p>PSO1:Design and implement effective lesson plans that incorporate diverse teaching strategies and cater to different learning styles and needs.</p> <p>PSO2:Demonstrate proficiency in assessing student learning through various evaluation methods, including formative and summative assessments.</p> <p>PSO3:Apply educational theories and principles to create inclusive classroom environments that support students' social, emotional, and cognitive development.</p> <p>PSO4:Develop and utilize educational resources and technology to enhance teaching and learning experiences in the classroom.</p> <p>PSO5:Facilitate the development of critical thinking and problem-solving skills among students through innovative instructional practices.</p> <p>PSO6:Collaborate with colleagues, parents, and community members to support student learning and address educational challenges.</p> <p>PSO7:Implement classroom management techniques that promote positive behavior, student engagement, and a conducive learning environment.</p> <p>PSO8:Reflect on teaching practices and student feedback to continuously improve instructional strategies and professional growth.</p>

	<p>PSO9: Integrate principles of child development and psychology into teaching practices to address diverse student needs and learning stages.</p> <p>PSO10: Conduct action research in educational settings to investigate teaching practices, student learning outcomes, and improve educational effectiveness.</p>
	COURSE OUTCOMES
COURSE (PAPER)	B.Ed. 1st Year
	<i>On completing the course, the pupil-teacher:</i>
PE 1: Education, School and Society	<p>CO1:-States narrow and broad meaning of education.</p> <p>CO2:-Analyses and explains the basic educational concepts, contexts as well as meaning, nature and process of education.</p> <p>CO3: Explains the foundations of education and the aims of education as recommended by different commissions on education policies and educational thinkers.</p> <p>CO4:-States the relationship between school and education, school and community; and among education society and culture</p> <p>CO5: Elaborate the linkage between education and national development.</p> <p>CO6:-Discusses the constitutional provisions for education in the context of national development, development of human resources and inclusive development.</p> <p>CO7:-Analyses the role of education as a sub-system of the social system and its role in social change and modernization.</p>
PE2: Childhood and Growing Up	<p>CO1:-Explain the concepts of growth and development of human child and the underline general principles of growth and development.</p> <p>CO2:-Specify the contexts and factors influencing development.</p> <p>CO3:-Explain the theories of socio-emotional, cognitive and language development and their education a implications.</p> <p>CO3:-Describe the developmental characteristics of childhood development and their bearing on school and classroom practices.</p> <p>CO4:-Elaborate the developmental characteristics, contextual needs and tasks during adolescence and the role of school and teachers in addressing the challenges during this period of development.</p> <p>CO5:-State the different forms and characteristics of individual</p>

	<p>differences and the ways of meeting the classroom issues arising out of the differences.</p> <p>CO6:- identify the learning needs during the different stages of development and adopt appropriate strategies in and out of school to meet the learning needs.</p>
<p>PE3: Learning and Teaching</p>	<p>CO1:-Discuss the broad perspectives of behaviouristic, social cognitive and constructivist views of learning and their educational implications.</p> <p>CO2:-Explain the process of learning as meaning making and the ways of facilitating meaningful learning in and out of the school.</p> <p>CO3:-Employ the processes of teaching and managing classroom situations for meaningful learning.</p> <p>CO4:-Elaborate the processes of preparation and continuing development of professional teacher in the context of a professional ethics of teaching profession.</p> <p>CO5:-Identifies the differential learning needs of the learners.</p> <p>CO6:-Distinguishes learning as transmission and reception vs. learning as construction.</p> <p>CO7:-Elaborates theoretical perspectives of learning including the constructivist perspective.</p> <p>CO8:-Explains nature and strategies of meaningful and concept learning, role of multiple intelligence.</p>
<p>PE4: Contemporary Concerns in Education</p>	<p>CO1:-Describe the prevailing social inequities, diversities and marginalization in India and their implication for education.</p> <p>CO2:-State the relevant Constitutional provisions, policy recommendations and the provisions in different acts relating to education specifically to school education.</p> <p>CO3:Explainthevariousconcernsandissuesofschooleducation</p> <p>CO4: State the roles of teachers in addressing the concerns and issues.</p> <p>CO5:-Develop a set of professional values required to address the issues and concerns through curricular, and co-curricular practices</p>
<p>B.CURRICULUM ANDPEDAGOGIC STUDIES (CPS)</p>	
<p>CPS2: Learning Assessment</p>	<p>CO1:-state nature, purpose and types of educational assessment and evaluation.</p> <p>CO2:-State the types and use of assessment and evaluation in classroom situation.</p> <p>CO3:- Develop and use different types of tools and techniques for continuous and comprehensive assessment of learning in the school situation.</p>

	<p>CO4: Explain the importance of assessment for learning and its processes for enhancing the quality of learning and teaching.</p> <p>CO5:-Analyze the trends and issues in learning and learner assessment.</p> <p>CO6:-Analyze and interpret results of the assessment using elementary statistical methods.</p>
<p>CPS3(a&b): Pedagogy of Mathematics</p>	<p>CO1:- Narrate the evolution and nature of Mathematics and its importance in the school curriculum in context of the recent curricular reforms.</p> <p>CO2:-Specifies the objectives of teaching and learning mathematics at the secondary and higher secondary levels of school education.</p> <p>CO3:-Use various methods and approaches of teaching and learning mathematics</p> <p>CO4:-Plan lessons in Mathematics using traditional and Constructive isapproaches for effective classroom transactions.</p> <p>CO5;-Develop and collect activities and resource materials for their use in enhancing the quality of learning Mathematics at the secondary level.</p> <p>CO6:- Develops long term and short term plans for conducting continuous and comprehensive assessment of and for students learning mathematics at the school stage.</p> <p>CO7: Explain the concepts in Mathematics included in the secondary school curriculum and make pedagogical analysis of those concepts.</p>
<p>CPS3 (a&b): Pedagogy of Biological Science</p>	<p>CO1:-State the nature and importance of Biological Science and its relevance in secondary school curriculum in context with recent curriculum reforms in School Curriculum.</p> <p>CO2:-Use various methods and approaches to teaching-learning Biological Science suitable for the secondary school classes.</p> <p>CO3:Plan units' lessons in Biological Science using traditional and constructivist approaches for effective classroom transactions.</p> <p>CO4:-Develop and collect activities and resource materials from surrounding and everyday experiences for their use in enhancing quality of learning of Biological Science at the secondary level</p> <p>CO5:-Use appropriate tools and techniques for continuous and comprehensive assessment of learning in Biological Science.</p>

	CO6:State the concepts in Biological Science included in the secondary school curriculum and make pedagogical analysis of those concepts
CPS3(a&b): Pedagogy of Language (Odia)	CO1:-State the importance and place of Odia as mother tongue in school curriculum. CO2:-Use of various strategies for facilitating the acquisition of language skills in odia. CO3: Apply appropriate pedagogic approaches to transact different types of lessons in Odia. CO4: Prepare appropriate tools for comprehensive assessment of learning in odia. CO5: Explain the fundamentals of Odia linguistics and their relevance in teaching learning Odia. CO6: Plan appropriate pedagogic treatment of the prescribed textual contents (in Odia) of classes IX and X.
CPS3 (a&b): Pedagogy of Language (English)	CO1:-Analyze the issues relating to importance and place of English in school curriculum, acquisition of skills in English, realization of aims and objectives of learning English and language policy as conceived in NPE,1986andNCF–2005. CO2:-Use various methods, approaches and strategies for teaching-learning English and transact various types of lesson plans covering all aspects of English language following different approaches. CO3:-Develop test items to assess learning in English and provide feedback as well as prepare enrichment materials. CO4:-Use the understanding of phonetics for facilitating students' speaking in English CO5:-Plan appropriate pedagogical treatment of the prescribed contents for effective classroom transaction.
	COURSE ENHANCING PROFESSIONAL CAPACITIES(EPC)
EPC-3: Fine Art	CO1:-Explain different Art forms. CO2:-Prepare two dimensional and three dimensional teaching aids CO3:-Collect materials from the locality and prepare low cost and no cost teaching aids. CO4:-Organize exhibitions of different Art forms. CO5:-Expresses ideas and emotions about different aspects of life through different art forms. CO6:-Appreciates and experiments with different art forms.. CO7:-Combines the knowledge of art with daily life through different media and techniques.

<p style="text-align: center;">EPC4: Physical Education and Yoga</p>	<p>CO1:-Understand the importance of Physical Education in Human life.</p> <p>CO2:-List the different programmes of Physical Education.</p> <p>CO3:-Practice Yoga for peaceful and harmonious living.</p> <p>CO4:-Enumerate the relationship between Yoga and goals of life.</p> <p>CO5:-Analyzes the concept of holistic health, its various dimensions and determinants for all round development.</p> <p>CO6:-Builds right habits about exercise, games and sports, sleep, rest and relaxation.</p> <p>CO7:-Discusses various policies and programs related to health, physical education and yoga.</p>
<p>D. OPTIONAL COURSES FOR SKILL DEVELOPMENT (OCSD)</p>	
<p style="text-align: center;">OCSD-1: Fruit and Vegetable Preservation</p>	<p>CO1:-Develop economic values through fruit and vegetable preservation</p> <p>CO2:-Gain knowledge about fruit preservation industry</p> <p>CO3:-List different type of preservatives for different types of preservation</p> <p>CO4:-Use fruits and vegetables appropriately by avoiding wastage and spoilage.</p>
<p style="text-align: center;">OCSD-2: Spinning and Weaving</p>	<p>CO1:-Explain process of cotton processing for Khadi</p> <p>CO2:-Master the skill of spinning and weaving</p> <p>CO3:-Develop proficiency in spinning yarn of counts (10-25)</p> <p>CO4:-Organize exhibitions of different spinning and weaving materials</p> <p>CO5:-Appreciate use of khadi in daily life.</p>
<p style="text-align: center;">OCSD-3: Tailoring</p>	<p>CO1:-Stitch, mend and cut the garments accurately</p> <p>CO2:-Develop aesthetic and creative abilities through tailoring</p> <p>CO3:-Design different garments</p> <p>CO4:-Organize exhibition in various type of designed garments</p>
<p style="text-align: center;">OCSD-4: Woodwork</p>	<p>CO1:-Lists different types of timbers for preparing various finished products</p> <p>CO2:-Describes process of protecting wooden materials</p> <p>CO3:-Describes different types of tools and their safe uses</p> <p>CO4:-Prepares wooden Products like pointer, duster, black board, chair, table stool etc.</p>
<p>B.Ed. SECOND YEAR</p>	

<p>PE5: Knowledge and Curriculum</p>	<p>CO1:-State and explain the nature of knowledge. CO2:-Describe the process of constructing knowledge. CO3:-Differentiate different types of curriculum. CO4:Explain the processes and principles of curriculum planning development CO5:-Elaborate the transaction, evaluation and renewal processes of curriculum.</p>
<p>PE6: Educational Management</p>	<p>CO1:-Spell out the structure of educational management at different levels—from national to institution level CO2:-Explain the implications of various policies and provisions in respect to educational management. CO3:-Identify and utilize various s resources for effective school functioning. CO4:-Actively participate in the preparation of school development plan CO5:-Explain the role of monitoring and feedback mechanism for effective school functioning.</p>
<p>PE7a: Creating an Inclusive School</p>	<p>CO1:-Explain the changing concepts related to inclusive education. CO2:-Elaborate the different categories of children with special needs, their problems in schooling and need of inclusive education to address their educational problems. CO3:-State the barriers of inclusion in the existing schools. CO4:-State the characteristics and dimensions of an inclusive school CO5:-Describe the process of developing an inclusive school.</p>
<p>PE 7b: Gender, School and Society</p>	<p>CO1:-State the key concepts related to the gender issues. CO2:-Identifies key gender issues in school, curriculum, textbooks and pedagogical process. CO3: Understands the ways to address gender issues in and out of school context.</p>
<p>PE8a: Action Research and Innovation</p>	<p>CO1:-Explain the concept, need and importance of action research and its differences with the pure and applied researches in Education. CO2:-Conduct action research selecting and using the appropriate methods. CO3:-Follow the approved format and style in reporting the action research CO4:-Evaluate an action research project in terms of its objectives, processes and implications</p>
<p>PE8b: Guidance and Counseling</p>	<p>CO1:-State the concept, need and principles of guidance. CO2:-Explain the role of school in organizing different guidance programs. CO3:-Use various tools and techniques of guidance in appropriate contexts. CO4:-Narrate the process, tools and techniques of counseling. CO5:-Explain the qualities and role of a school counselor.</p>

B.CURRICULUM AND PEDAGOGIC STUDIES (CPS)	
CPS1: Language across the Curriculum	<p>CO1:-Identify the language back grounds of students and facilitate their movement from home/regional language to standard language.</p> <p>CO2:-Analyze the nature of classroom discourse and devise strategies to improve communication skills of students.</p> <p>CO3:-Develop the appropriate skills of reading and writing among the learners and facilitate reading writing connection.</p> <p>CO4:Envision their roles as facilitator of learners' language enrichment irrespective of the subjects they teach.</p> <p>CO5:-Demonstrates better communication skills.</p> <p>CO6:-Uses different strategies and approaches for language and curriculum transactions in the classroom.</p>
CPS3 (a&b): Pedagogy of Physical Science	<p>CO1: State the nature and importance of physical science and its relevance in secondary school curriculum.</p> <p>CO2:-Determines the aims and objectives of learning physical science.</p> <p>CO3:-Use various methods and approaches to teaching-learning Physical Science suitable for the secondary school classes.</p> <p>CO4:- Plan lesson in physical science for effective class room transactions.</p> <p>CO5:Develop and collect activities and resource materials for the enhancing the quality of learning of Physical Science at the secondary level.</p> <p>CO6:- Use appropriate tools and techniques for continuous and comprehensive assessment of learning in Physical Science.</p>
CPS3 (a&b): Pedagogy of Social Science (History and Political Science)	<p>CO1:-State the meaning, scope and importance of History and political science</p> <p>CO2:-Specify the skills and competencies to formulate specific learning outcomes for different History and Political Science lessons</p> <p>CO3:-Identify the different methods and skills of teaching History and Political Science for transacting the contents effectively.</p> <p>CO4:-Explain the importance of time sense and prepare/ utilize timelines for effecting teaching of History</p> <p>CO5:-Prepare Unit Plans and Lesson Plans in History and Political science.</p> <p>CO6:-Develop diagnostic achievement test, administer them and analyses the results for providing feedback</p>
C.ENGAGEMENT WITH THE FIELD	
Courses on Enhancing Professional Capacities (EPC)	
EPC-1: Critical Understanding of ICT	<p>CO1:- Describe a computer system</p> <p>CO2:- Describe the working of a computer</p> <p>CO3:- Operate the windows operating system</p> <p>CO4:- Use word processing package</p>

	<p>CO5:-Use internet for educational purpose</p> <p>CO6:-Use the word processing package in education</p> <p>CO7:-Appreciate the use of ICT in teaching and learning</p> <p>CO8:-Acquire the skill of trouble-shooting whenever there are problems in the working of computer</p>
EPC-2: Understanding the Self	<p>CO1:- Explain that any Self is a human resource to exercise all the resources: cognitive, affective and psychomotor.</p> <p>CO2:- Realize that the Self does not have independent existence but related to Nature, other selves and the ‘Unknown’ causing it and this great design of the Universe.</p> <p>CO3:- Perform one’s function to the possible extent as any part of the Nature is silently doing so; thereby developing self-actualization and self-esteem.</p> <p>CO4:- Realizethatoneisresponsibleasapersonandasateacherfortheintegrated development of oneself and one’s pupils: Physical, cognitive, social, emotional, aesthetic, moral and spiritual developments.</p> <p>CO5:- Realize the commonness and uniqueness prevalent in Nature and human nature and feel equality as the reality and contribute to the furtherance of evolution at mental level.</p> <p>CO6:- Elaborates the concepts of ‘self’ and ‘identity’ and identifies the factors that shape the understanding of ‘self’.</p> <p>CO7:- Develops effective communication skills including the ability to listen, observe etc.</p> <p>CO8:- Appraises the critical role of teachers in promoting the ‘self’ and student’s wellbeing.</p>
SCHOOL INTERNSHIP: 1ST YEAR & 2ND YEAR	
SCHOOL INTERNSHIP IP <i>(PART-I & II)</i>	<p>CO1:-Developing professional capacities, teacher sensibilities and sustained engagement of student-teachers (prospective teachers) with learners and schools.</p> <p>CO2:-Equipping the student-teachers with required skills and competencies to cater to diverse needs of the learners in schools</p> <p>CO3:-Exposing the student-teachers to multicultural contexts of the society which influence the school environment and its functioning</p> <p>CO4:-Validating the theoretical understanding of the student-teachers developed through various perspective and pedagogic courses</p> <p>CO5:- Enabling the student-teachers internalize the role of a teacher—as a facilitator of learning, class room manager, resource mobilizer and manager, innovator, evaluator of learner performance, planner and organizer of other curricular activities, mentor and counselor for children, service provider for the community and parents, developer and</p>

	<p>evaluator of curriculum text books and other TLMsetc.</p> <p>CO6:-States clearly the general and specific objectives of teaching the subject, the different units, and the individual lessons.</p> <p>CO7:-Plans and organizes classroom for elementary level students.</p> <p>CO8:-Assess students' progress at different stages of learning.</p> <p>CO9:-Appraises peer teaching.</p> <p>CO10:-Conducts action research.</p> <p>CO11:-Plans, organizes and guides various co-curricular activities, which are important constituents of a rich education for the citizens of tomorrow.</p> <p>CO12:-Plans and organizes classroom for elementary level students.</p> <p>CO13:-Assess students' progress at different stages of learning.</p> <p>CO14:-Appraises peer teaching.</p> <p>CO15:-Conducts action research.</p> <p>CO16:-Plans, organizes and guides various co-curricular activities, which are important constituents of a rich education for the citizensof tomorrow.</p>
COMMUNITY ACTIVITY	
<p>COMMUNITY ACTIVITY (PART-I & II)</p>	<p>CO1:-Develops understanding of social realities working within the society or community.</p> <p>CO2:-Develops the dignity of labor among student-teachers.</p> <p>CO3:-Spreads awareness regarding various educational problems and needs of the society.</p> <p>CO4:-Creates interest in social and economic reconstruction of the country.</p> <p>CO5:- Executes actions leading to sustainable development.</p> <p>CO6:-Builds the personality of the student teacher through community service.</p>

SUBJECT: BOTANY (PG)	
PROGRAMME OUTCOMES BOTANY (PG)	<p>The M.Sc. Botany programme is designed to equip students with essential knowledge and technical skills to study plants in a holistic manner. Upon completing M.Sc. in Botany, graduates will possess advanced knowledge of plant biology, including anatomy, physiology, taxonomy, and ecology. They will be adept in designing and conducting research, utilizing modern techniques and methodologies. Graduates will master plant identification, data analysis, and apply their expertise to address agricultural, conservation, and environmental challenges. They will communicate effectively through scientific writing and presentations, and address ethical issues in botanical research. Prepared for careers in research, education, agriculture, and conservation, or for further doctoral studies, they will integrate their knowledge to contribute to the field of botany and environmental management.</p> <p>PO1: Develop an aptitude towards science and nature.</p> <p>PO2: Equip the students with the basic skills in identifying and labeling different plants.</p> <p>PO3: To sensitize the students towards the need for keeping the environment clean and conserve our natural resources.</p> <p>PO4: Students would also become aware about the social and environmental significance of plants and their relevance to the national •</p> <p>PO5: To develop an aptitude towards science and nature.</p> <p>PO6: To equip the students with the basic skills in identifying and labeling different plants.</p> <p>PO7: To impart quality education in the field of Botany enabling our students to confidently face the job market.</p> <p>PO8: Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p>
PROGRAMME SPECIFIC OUTCOMES	<p>After completing the programme the learner will able to:</p> <p>PSO1:- Describe different specializations of Botany such as systematics, evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy,</p>

	<p>reproduction, genetics and molecular biology of various life-forms.</p> <p>PSO2: Apply various analytical techniques of plant and transgenic technologies basic and applied research in plants.</p> <p>PSO3: Identify various life forms of plants, design and execute experiments related to basic studies on evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics, microbiology, molecular biology, recombinant DNA technology, proteomics and transgenic technology. Students are also familiarized with the use of bioinformatics tools and databases and in the application of statistics to biological data.</p> <p>PSO4: Execute short research projects incorporating various tools and techniques plant Sciences.</p>
COURSE OUTCOME	
SEMESTER I	
BOT-411 Microbial Diversity	<p>After completion of the course the learner will be able to</p> <p>CO1: Describe the vast diversity of microorganisms, including bacteria, archaea, fungi, viruses, and protists along with classification and phylogenetic relationships among microorganisms.</p> <p>CO2: State ecological roles and interactions of microbes in various environments</p> <p>CO3: Apply modern techniques in microbial isolation, cultivation, and identification</p> <p>CO4: Apply knowledge of microbial processes to biotechnology, medicine, agriculture, and environmental science.</p>
BOT-412 Diversity of Cryptogams and Gymnosperm	<p>CO1: Classify cryptogams (algae, fungi, bryophytes, and pteridophytes) and gymnosperms.</p> <p>CO2: Explain structural features, adaptations ecological roles, life cycles, and environmental adaptation of cryptogams and gymnosperms.</p> <p>CO3: Explain importance of conserving cryptogam and gymnosperm diversity.</p> <p>CO4: Apply cryptogam and gymnosperm diversity. in various industries, including agriculture, medicine, and biotechnology.</p>
BOT-413 Biochemist	CO1: Explain the structure, function, and interactions of biological

	<p>macromolecules such as proteins, nucleic acids, lipids, and carbohydrates.</p> <p>CO2: Describe pathways and regulation of cellular metabolism, including anabolic and catabolic processes.</p> <p>CO3: Solve complex biochemical problems.</p>
BOT-414 Analytical Techniques	<p>CO1: Describe a wide range of analytical techniques, including spectroscopy, chromatography, mass spectrometry, electro analytical methods, and thermal analysis.</p> <p>CO2: Describe underlying principles and theoretical foundations of instrumental analysis. Use analytical instruments in professional life.</p> <p>CO3: Make quantitative and qualitative analysis of samples accurately.</p>
BOT-414 PRACTICAL	CO: Develop different project work in different natural diversity.
SEMESTER-II	
BOT-421 Systematics of Angiosperm	<p>CO1: Explain the diversity and classification of angiosperms.</p> <p>CO2: State characteristics of major families, genera, and species of flowering plants.</p> <p>CO3: Explain principles and methods used in plant systematics and taxonomy.</p> <p>CO4: Use historical and modern approaches to classifying plants.</p> <p>CO5: Explain the key morphological and anatomical features used in angiosperm classification.</p>
BOT-422 Plant Physiology and Metabolism	<p>CO1: Explain fundamental physiological processes in plants, including photosynthesis, respiration, transpiration, nutrient uptake, and hormone regulation.</p> <p>CO2: Describe primary and secondary metabolic pathways in plants, including carbon, nitrogen, and sulphur metabolism.</p> <p>CO3: Explain biosynthesis, signalling, and functions of plant hormones such as auxins, gibberellins, cytokinins, ethylene, and abscisic acid.</p> <p>CO4: Describe the physiological and molecular responses of plants to various biotic (pathogen and insect) and abiotic stresses such as drought, salinity, temperature extremes, and nutrient deficiencies.</p>
BOT-423	CO1: Explain cell structure, function, and molecular mechanisms, including

Cell and Molecular Biology	<p>gene expression and regulation.</p> <p>CO2: Apply various concepts from different biological disciplines for a comprehensive understanding of cellular and molecular processes.</p> <p>CO3: Apply knowledge and understanding to innovate and solve complex biological problems, contributing to advancements in biotechnology and medicine.</p>
BOT-424 Ecology and Biostatistics	<p>CO1: Explain ecological principles, including ecosystem dynamics, species interactions, and biodiversity.</p> <p>CO2: Apply advanced bio statistical methods to analyze ecological data and interpret results.</p> <p>CO3: Address ethical issues in ecological research and data analysis.</p> <p>CO4: Apply knowledge of ecology and biostatistics to address complex environmental issues.</p>
BOT-425	CO: Develop the practical field work in the field of natural science.
Semester III	
BOT-511 Plant Embryology and Anatomy	<p>CO1: State embryonic development, including fertilization, embryo formation, and seed development.</p> <p>CO2: Identify and describe various plant structure and their developmental processes.</p> <p>CO3: Explain plant anatomical structures and functions, from cellular to organ levels.</p> <p>CO4: Design and conduct experiments to study plant embryology and anatomy.</p>
BOT-512 Genetics, Plant Breeding and Evolution	<p>CO1: Describe principles of genetics, including gene function, inheritance patterns, and genetic variation.</p> <p>CO2: Explain mechanisms of evolution and influence of evolution plant diversity and adaptation.</p> <p>CO3: Apply knowledge to agricultural and conservation challenges.</p> <p>CO4: Address ethical issues in genetic research and breeding.</p>
BOT-513 Plant Pathology	<p>CO1: Identify and understand plant diseases, including their causes (pathogens) and effects on plants.</p> <p>CO2: Apply strategies for managing and controlling plant diseases, including cultural, chemical, and biological methods.</p>

	CO3: Explain the life cycles and epidemiology of plant pathogens.
BOT-514 Natural Resource, Conservation and Utilization	CO1:State types and importance of natural resources, including water, soil, minerals, and biodiversity. CO2:Explain principles and practices of conservation, including sustainable management and protection strategies. CO3:Make sustainable utilization of natural resources to balance ecological, economic, and social needs. CO4:Plan and implement natural resource management projects and policies successfully. CO5:Apply knowledge to real-world challenges in conservation, policy-making, and sustainable development
BOT-415	CO: Engage in different field of natural diversities activity.
SEMESTER-IV	
BOT-521 Advance Plant Biotechnology	CO1:Explain techniques required for plant related research CO2: Apply the techniques to evaluate research findings and problem solving CO3:Describe theories, models, laws, principles and concepts of biotechnology and plant sciences CO4: Think and act scientifically
BOT-522 Environmental Biotechnology	CO1:Explain principles of biotechnology and their application to environmental management and protection. CO2: Use biological organisms to clean up environmental pollutants and manage waste. CO3: Apply biotechnology to promote sustainable practices in agriculture, industry, and conservation. CO4:Conduct experiments to evaluate and develop biotechnological applications for environmental issues.
BOT-523 E-B Molecular Stress Biology	CO1:Understand the molecular mechanisms of cellular responses to various stressors, including heat, oxidative, and chemical stress. CO2:Identify and describe key signaling pathways and molecular players involved in stress responses. CO3: Learn about mechanisms of adaptation and resilience in cells and organisms under stress.

	CO4:Apply knowledge of stress mechanisms to engineer or select organisms with enhanced stress tolerance for agriculture or biotechnology
BOT-524 Environment and Waste Management	CO1:Describe principles and practices of waste management, including waste minimization, recycling, and disposal. CO2: Assess the environmental impacts of different types of waste and the effectiveness of various management strategies. CO3: Explain environmental regulations and policies related to waste management and hazardous materials. CO4: Address ethical issues related to waste management and environmental protection.
BOT- 525 Project	CO1: Write research papers, reports, and grant proposals. CO2:Develop oral communication skills through presentations and discussions of scientific topics. CO3: Enhance research skills through designing, conducting, and analyzing experiments. CO4:Formulate hypotheses, design experiments, and interpret data. CO5:Develop problem-solving abilities to address analytical challenges.

Program Outcomes, Program Specific Outcomes and Course Outcomes
DEPARTMENT OF CHEMISTRY
Programme Outcomes: M. Sc. Chemistry

Department of Chemistry	After successful completion of course in Chemistry students will be able to:
Programme Outcomes	<p>PO1: Demonstrate, solve and understand major concepts in all disciplines of Chemistry.</p> <p>PO2: Solve the problem and also think methodically, independently and draw a logical conclusion.</p> <p>PO3: Employ critical thinking and the scientific knowledge to design, carry out, record and analyse the results of chemical reactions.</p> <p>PO4: Create an awareness of the impact of Chemistry on the environment, society, and development outside the scientific community.</p> <p>PO5: Find out the green route for chemical reaction for sustainable development.</p> <p>PO6: To inculcate the scientific temperament in the students and outside the scientific community.</p> <p>PO7: Use modern techniques, various equipment and Chemical software.</p>
Programme Specific Outcomes	<p>PSO1: Gain the knowledge of Chemistry through theory and practical experiments.</p> <p>PSO2: Explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.</p> <p>PSO3: Identify chemical formulae and solve numerical problems.</p> <p>PSO4: Understand the basic principles of Organic, Inorganic, Physical and Analytical Chemistry and its applications through Various laboratory experiments.</p> <p>PSO5: Use modern chemical tools, Models, Chem-draw, Charts and Equipments.</p> <p>PSO6: Apply good laboratory practices and safety.</p> <p>PSO7: Develop research oriented skills.</p>
Course Outcomes of M. Sc. Chemistry	
Semester-I	
CH-411 [Inorganic Chemistry-I]	<p>CO1: Understand the various symmetry elements, their matrix representation and its application in spectroscopy.</p> <p>CO2: Understand theories of Metal-Ligand bindings of magnetic properties of metal Complexes.</p>
CH-412 [Organic Chemistry-I]	<p>CO1: Describe the knowledge on localised and delocalised bonding patterns.</p> <p>CO2: Explain the energy change pertaining to the</p>

	<p>delocalised of pi-bonds.</p> <p>CO3: Draw free energy diagrams of different reaction intermediates and Transition states.</p> <p>CO4: Illustrate Thermodynamic and kinetic controlled reactions.</p> <p>CO5: Elaborate the different substitutions reactions in aromatic and aliphatic systems.</p> <p>CO6: General stereochemistry around estrogenic centre.</p>
CH-413 [Physical Chemistry-I]	<p>CO1: Describe Chemical Kinetics and transition state theories, homogeneous and heterogenous catalyst, adsorption and absorptions.</p> <p>CO2: Explain Phase rule and different component systems.</p> <p>CO3: Define Polymerization process and kinetics of step growth and condensation polymers.</p>
CH -414 [Instrumental Methods Of Analysis]	<p>CO1: Describe atomic absorption and flame emission Spectroscopy, electro analytical and Thermo analytical analysis of compounds</p> <p>CO2: Explain Different chromatography techniques for isolation of compounds.</p>
CH -415 [Inorganic Practical-I]	CO: Analyse the mixture containing radicals.
CH -416 [Organic Practical-I]	CO: Identify and isolate of different organic compounds.
Semester-II	
Course No. CH-421 [Inorganic Chemistry-II]	<p>CO1: Describe metal carbonyl and metal clusters, their structure and properties associate with it.</p> <p>CO2: Explain Bimolecular storage, transportation of different ions and bio-molecular catalysts.</p>
CH -422 [Organic Chemistry-II]	<p>CO1: Examine the Addition and Elimination reactions in details.</p> <p>CO2: Define Mechanistic considerations of different reaction intermediates and corresponding reactions.</p> <p>CO3: Understand different reaction paths and population ratio.</p>
CH-423 [Physical Chemistry-II]	<p>CO1: Understand basic idea on classical thermodynamics, especially to open systems</p> <p>CO2: Apply Advanced approaches of statistical thermodynamics to distinguishable and non-distinguishable cases</p> <p>CO3: Usage of computers in chemistry.</p>
CH -424 [Atomic & Molecular Spectroscopy]	<p>CO1: Describe the principles of various atomic and molecular spectroscopies</p> <p>CO2: Apply spectroscopy in various fields of chemistry</p>
CH -425 [Inorganic Practical-II]	<p>CO1: Estimation of Ca and Mg in cement.</p> <p>CO2: Preparation and characterization of various inorganic compounds</p>

CH -426 [Organic Practical-II]		CO1: Setup reaction to synthesise simple compounds and Isolate them.
Semester-III		
CH -511 [Inorganic Chemistry-III]		CO1: Explain on kinetic application of CFT and substitution in various complexes and redox reactions CO2: Describe nuclear chemistry, reactors and future trends CO3: Create Basic and advanced idea on solid state chemistry
CH -512 [Organic Chemistry-III]		CO1: Use of different metal catalyst in redox reactions. CO2: Elaborate Photochemistry and pericyclic reaction Synthetic design of Organic molecules.
CH -513 [Physical Chemistry-III]		CO1: Understand on Quantum mechanical on various fundamental particles CO2: Application Quantum mechanical to molecules.
CH -514 [Analytical Techniques In Organic Chemistry]		CO1: Advanced spectroscopic technique for identification of organic compounds CO2: Describe optical rotatory dispersion and circular dichroism
CH -515 [Physical Chemistry Practical]		CO1: Know the instrumental applications in detecting various physical parameters CO2: Describe various adsorptions of chemicals
CH -516 [Computational Chemistry Practical]		CO: Known the application of computer and advanced software in analysing chemical information
Semester-IV		
CH -521 Advanced Organometallic Chemistry		CO1: Basics of organometallic chemistry and its reactions CO2: Neutral spectator ligands and alkene metathesis reactions
CH -522	[Advanced Organic Synthesis]	CO1: Synthesis and characterisation of Heterocyclic compounds. CO2: Know the Synthetic use of Organometallic reagents. CO3: Describe modern synthetic use of Organometallic compounds.
	Advanced Analytical Chemistry	CO1: Find out reliability of analytical data, errors, sampling process CO2: Describe microscopy in chemistry
	Photophysical Chemistry	CO1: Understand the influence of sunlight in chemistry CO2: Elaborate instrumentation in photochemistry
CH -523	Supramolecular Chemistry	CO1: Explain Fundamentals of supramolecular chemistry and its applications
	Chemistry Of Nanomaterials	CO1: Know the Application of nano-materials in advanced chemistry. CO2: Know the polymers and their application

	Molecular Modelling	CO1: Define the DFT of molecules CO2: Illustrate Computational designs on drugs and functional materials
CH -524	Project	Develop exposure to practical challenges and solutions by doing project work.
CH -525	Comprehensive Viva	Develop the skills of presentation and speaking fluency.
CH -526	Seminar	Develop the skill of presentation, explanation and elaboration.

<p>SUBJECT: COMMERCE(M.COM)</p>	<p><i>After completion of the course students will be able to:</i></p>
<p>PROGRAM OUTCOMES (POs):</p>	<p>PO 1:Develop managerial, analytical, communication, employability, and strategic skills to navigate the evolving business landscape.</p> <p>PO 2:Enhance expertise in accountancy, taxation, laws, business strategy, finance, auditing, accounting standards, reporting, entrepreneurship, and contemporary commerce topics.</p> <p>PO 3:Prepare students for success in international professional courses and certifications.</p> <p>PO 4:Familiarize students with dynamic organizational culture and effective leadership qualities.</p> <p>PO 5:Apply information technology and digital tools effectively within the field of commerce.</p> <p>PO 6:Conduct advanced research by utilizing critical thinking and analytical reasoning in business and commerce.</p> <p>PO 7:Achieve proficiency to excel in competitive and professional examinations.</p> <p>PO 8:Promote holistic development to foster responsible citizenship through adherence to social, moral, ethical, and professional standards.</p> <p>PO 9:Bridge the gap between academic knowledge and industry practice to enhance problem-solving skills and drive excellence.</p> <p>PO 10:Plan and develop start-up and entrepreneurial ventures independently using acquired skills and knowledge.</p>
<p>PROGRAM SPECIFIC OUTCOMES (PSOs):</p>	<p>PSO-1:Pursue further professional courses such as CA, CS, CMA, CFA, and UPSC by leveraging the foundational knowledge and skills acquired.</p> <p>PSO-2:Cultivate a passion for research in diverse areas including accountancy, finance, marketing, human resources, and entrepreneurship.</p> <p>PSO-3:Gain practical experience through internships, field visits, industrial tours, and research projects to enhance real-world learning.</p> <p>PSO-4:Explore and develop new knowledge dimensions through open electives to address the evolving needs of the industry.</p>

COURSE OUTCOMES:	
SEMESTER-1	
MCO 101: Principles of Management and Organisational Behaviour	<p>CO1:Analyze various schools of management thought and their implications on managerial functions to enhance organizational effectiveness.</p> <p>CO2: Evaluate organizational behavior concepts and their impact on individual and group dynamics within organizations.</p> <p>CO3: Apply motivational theories to develop strategies that improve employee performance and satisfaction.</p> <p>CO4: Assess leadership styles and theories to identify effective approaches for team development and organizational growth.</p> <p>CO5: Develop strategies for effective communication and conflict resolution to foster a positive organizational culture and manage change efficiently.</p>
MCO: 102 Accounting for Managerial Decisions	<p>CO1:Describe the role and responsibilities of management accountants and the significance of responsibility centres in managerial decision-making and control.</p> <p>CO2: Apply managerial costing techniques and break-even analysis to optimize cost management and make informed decisions regarding sales mix, product line, and resource allocation.</p> <p>CO3: Develop and implement various budgeting methods, including zero-base and performance budgeting, to enhance financial planning and control within organizations.</p> <p>CO4:Analyze and interpret variances through standard costing and variance analysis to improve cost control and operational efficiency.</p> <p>CO5: Conduct horizontal, vertical, and ratio analysis, and perform cash flow analysis to support effective reporting and management decision-making.</p>
MCO: 103 Quantitative Techniques	<p>CO1: Apply operations research techniques, including decision trees and sensitivity analysis, to make informed decisions under conditions of uncertainty and risk.</p> <p>CO2: Utilize linear programming methods, such as the graphic and simplex methods, to solve optimization problems and address transportation and assignment issues.</p> <p>CO3: Implement various programming techniques, including goal, integer, and dynamic programming, to develop solutions</p>

	<p>for complex decision-making scenarios.</p> <p>CO4:Analyze inventory control models and apply queuing theory to optimize inventory management and service efficiency.</p> <p>CO5: Employ game theory and simulation techniques, including Monte Carlo methods, and use network analysis tools like PERT and CPM for project management and cost optimization.</p>
MCO: 104 Economics for Managers	<p>CO1:Analyze fundamental principles of managerial economics, including incremental, marginal, and equi-marginal principles, to enhance decision-making in business environments.</p> <p>CO2: Evaluate demand and supply dynamics, including elasticity and forecasting methods, to develop strategies for effective market analysis and demand estimation.</p> <p>CO3: Apply production and cost analysis techniques to assess cost-output relationships and optimize production processes.</p> <p>CO4: Examine different market structures, including perfect competition, monopoly, and monopolistic competition, to understand pricing mechanisms and market behavior.</p> <p>CO5: Assess national income concepts, fiscal and monetary policies, and their impact on economic stability and growth, to inform investment and economic policy decisions.</p>
MCO 105: Computer Application in Business	<p>CO1: Identify and configure various computer hardware and software components to optimize information processing and enhance managerial decision-making.</p> <p>CO2: Utilize modern information technologies, including LAN, WAN, email, and internet tools, to improve communication and access to information in a business environment.</p> <p>CO3: Operate and leverage different operating systems and software applications, such as MS-WORD and UNIX, for effective document creation, formatting, and data management.</p> <p>CO4: Apply spreadsheet software like Excel and presentation tools like PowerPoint to create and manage financial data, charts, and presentations for business analysis and reporting.</p> <p>CO5: Implement accounting packages for voucher preparation, inventory management, and financial reporting to streamline accounting processes and improve accuracy.</p>
SEMESTER-II	

<p>MCO: 201 Emerging Business Law</p>	<p>CO1:Analyze the development and framework of intellectual property laws in India, including patents, trademarks, copyrights, and geographical indications, to effectively manage intellectual property assets.</p> <p>CO2: Evaluate competition laws under the Competition Act, 2002, and their implications for anti-competitive practices and compliance, to ensure fair business practices and market competition.</p> <p>CO3: Apply the provisions of the Right to Information Act, 2005, to understand the rights of information access, the obligations of public authorities, and the process for information requests and appeals.</p> <p>CO4: Interpret and implement the regulations and policies related to FEMA, EXIM policies, and key intellectual property statutes like the Patent Act, Trademark Act, and Copyright Act, for effective legal compliance in business operations.</p> <p>CO5: Assess and apply cyber laws, including the IT Act, 2000, and relevant amendments to securities and company laws, to ensure legal compliance and protection in digital and corporate</p>
<p>MCO: 202 Business Environment</p>	<p>CO1:Analyze the meaning, scope, and significance of business environments, including internal and external factors, to understand their impact on organizational operations and strategy.</p> <p>CO2: Evaluate the economic, political, and legal environments affecting business, including various economic systems and government roles, to comprehend their influence on business practices and policies.</p> <p>CO3: Assess the social and cultural environments, including the impact of foreign culture, traditional values, and social responsibility, to develop strategies that align with societal expectations and competitive forces.</p> <p>CO4: Examine the natural and technological environments, including innovation, technology management, and globalization, to leverage technological advancements for business growth and competitive advantage.</p> <p>CO5: Interpret and apply regulations related to competition, foreign exchange, monetary and fiscal policies, and capital markets, including the roles of RBI and SEBI, to ensure compliance and informed decision-making in financial and investment activities.</p>
<p>MCO 203: Marketing Management</p>	<p>CO1:Analyze the nature, scope, and corporate orientations of marketing, including environment scanning and marketing</p>

	<p>information systems, to effectively assess and respond to market dynamics.</p> <p>CO2: Evaluate consumer and industrial markets through market segmentation, targeting, and positioning strategies, and make informed decisions regarding product mix, life cycle, and new product development.</p> <p>CO3: Develop and implement effective promotion strategies by utilizing various elements of the promotion mix, including advertising, sales promotion, publicity, and personal selling.</p> <p>CO4: Manage marketing channels by selecting, cooperating, and resolving conflicts with wholesalers, retailers, and distribution systems to optimize product delivery and market reach.</p> <p>CO5: Assess and control marketing efforts by addressing contemporary issues such as globalization, consumerism, green marketing, and legal concerns, to ensure strategic alignment and regulatory compliance.</p>
<p>MCO 204: Financial Management</p>	<p>CO1:Analyze the Indian financial system, including financial markets, instruments, and regulatory authorities, to understand the scope, functions, and objectives of financial management.</p> <p>CO2: Evaluate corporate cost of capital by estimating components, calculating weighted average cost of capital, and applying valuation techniques for bonds and equities, including risk-return assessments.</p> <p>CO3: Apply capital budgeting techniques to assess investment decisions through methods like NPV and IRR, and manage working capital effectively by addressing cash, receivables, and inventory.</p> <p>CO4: Assess leverage impacts on business risk and financial risk, including operating and financial leverage, and analyze capital structure theories to optimize financial decision-making.</p> <p>CO5: Evaluate mergers and acquisitions, including valuation techniques, and apply international financial management principles to manage foreign exchange risk and analyze international capital investments.</p>
<p>MCO 205: Research</p>	<p>CO1: Understand the nature, scope, and significance of</p>

Methodology	<p>research methodology, including problem formulation and research objective statement, to lay a strong foundation for conducting effective research.</p> <p>CO2: Differentiate between research methods and methodology, and apply appropriate research designs such as exploratory, descriptive, and experimental to structure research projects.</p> <p>CO3: Utilize various data collection methods, including observational and survey techniques, to design effective questionnaires, measure attitudes and motivations, and implement sampling strategies.</p> <p>CO4: Select and apply suitable statistical techniques for data analysis, including chi-square tests and ANOVA, to interpret data and draw meaningful conclusions from research findings.</p> <p>CO5: Apply multivariate analysis techniques, such as discriminant analysis, principal component analysis, factor analysis, and cluster analysis, and effectively interpret results for comprehensive research reporting.</p>
Semester-III	
MCO 301: E-Commerce	<p>CO1: Explain the fundamental concepts of e-commerce, including its distinctions from traditional commerce, the need for e-commerce, and the role of media convergence and business applications.</p> <p>CO2: Analyze various e-commerce business models and infrastructures, including supply chain management, product and service digitization, online marketing strategies, and the necessary e-commerce resources.</p> <p>CO3: Evaluate the processes and practices involved in Business-to-Consumer (B2C) and Business-to-Business (B2B) e-commerce, focusing on order management, cost estimation, pricing, and fulfillment in B2C, and alternative models in B2B.</p> <p>CO4: Assess security issues in e-commerce, including types of threats, sources of threats, and security tools, and develop a rational security policy to address risks, including understanding the I.T Act 2000 and regulatory frameworks.</p> <p>CO5: Examine electronic payment systems, including their special features, types of e-payment methods (e-cash, e-cheques, credit cards, smart cards), and associated business, economic, operational, and legal risks.</p>

<p>MCO 302: Entrepreneurship & MSME Management</p>	<p>CO1: Define and differentiate between entrepreneurship and intrapreneurship, and analyze the role of entrepreneurship in economic development, including the impact of various factors on entrepreneurial emergence.</p> <p>CO2: Develop and evaluate business ideas using methods of innovation and creativity, and create a comprehensive business plan while identifying common reasons for business plan failures.</p> <p>CO3: Formulate a marketing plan for new ventures, including environmental analysis, and assess various financing options such as debt, equity, and venture capital to support entrepreneurial initiatives.</p> <p>CO4: Examine the management practices and ethical considerations specific to Micro, Small, and Medium Enterprises (MSMEs), and compare the management processes of small versus large enterprises, including strategic cost analysis and entrepreneurship development models.</p> <p>CO5: Apply functional management principles to MSMEs, focusing on human resource management, financial health analysis, risk management, and operational aspects such as product life cycle management, pricing policy, promotional activities, and distribution strategies.</p>
<p>MCO 303 A: Corporate Tax Planning</p>	<p>CO1: Understand the concepts of tax planning, management, evasion, and avoidance, and evaluate their scope and justification within the corporate sector for effective tax strategy development.</p> <p>CO2: Compute corporate tax liabilities, including the carry forward and set off of losses, minimum alternate tax, and tax on distributed profits, to accurately determine tax obligations for corporate enterprises.</p> <p>CO3: Assess the implications of tax concessions and incentives on corporate decisions, including business setup, location, and nature, to optimize tax benefits and strategic planning.</p> <p>CO4: Apply tax planning techniques to financial management decisions such as capital structure, dividend policy, and investment strategies, and make informed managerial decisions regarding asset management and operations.</p> <p>CO5: Analyze the impact of foreign collaborations on domestic taxation and apply provisions for relief from double</p>

	<p>taxation, including key Double Taxation Avoidance Agreements with countries like the USA, UK, Germany, and France.</p>
<p>MCO 304 A: Accounting Theory and Practice</p>	<p>CO1: Understand and apply the fundamental postulates, principles, and concepts of accounting theory, including syntactical, semantical, and behavioral approaches, to formulate and interpret accounting practices.</p> <p>CO2: Evaluate the recognition, measurement, and disclosure of financial statement elements, including incomes, expenses, assets, and liabilities, and analyze annual reports for accurate financial reporting.</p> <p>CO3: Analyze the institutional framework and regulatory policies affecting accounting practices in India, including the roles of relevant bodies such as the Ministry of Corporate Affairs and the Institute of Chartered Accountants of India.</p> <p>CO4: Assess different income measurement concepts, including accounting income, economic income, and comprehensive income, and apply capital maintenance concepts to evaluate income accurately.</p> <p>CO5: Examine and apply theories related to the valuation of assets, liabilities, and equities, and address depreciation accounting and price changes to ensure effective asset management and reporting.</p>
<p>MCO 305 A: Corporate Reporting and Analysis</p>	<p>CO1: Analyze the concept, objectives, and characteristics of financial reporting, and evaluate the framework and issues in accounting standard setting, including the role of IASB and accounting standards in India.</p> <p>CO2: Examine recent developments in Indian and international accounting standards, including IFRS and Ind AS, and address issues related to corporate reporting and disclosure requirements.</p> <p>CO3: Assess contemporary reporting issues such as interim reporting, corporate social reporting, and sustainability reporting, and understand their importance, benefits, and role in global accounting harmonization.</p> <p>CO4: Apply accounting principles and methods to business combinations, including mergers, goodwill treatment, purchase consideration, and accounting for subsidiaries and holding companies.</p>

	<p>CO5: Evaluate issues in corporate reporting disclosure requirements, segment reporting, and global convergence of accounting standards, and analyze the advancements in the convergence of accounting standards with IFRS.</p>
Semester IV	
MCO 401: Strategic Management	<p>CO1: Define and analyze core concepts in strategic management, including the development of strategic vision, mission, objectives, and policies, and evaluate factors that shape and craft a company's strategy through industry and competitive analysis.</p> <p>CO2: Apply environmental scanning techniques, including SWOT analysis, to identify and assess strategic opportunities and competitive advantages in diversified companies, and evaluate the role of strategic leadership and human capital in achieving strategic goals.</p> <p>CO3: Formulate strategies using frameworks such as Porter's Value Chain Analysis and competitive advantage tools, and develop strategies at corporate, business, and functional levels, including restructuring, diversification, and turnaround strategies.</p> <p>CO4: Implement strategies effectively by aligning organizational structure, leadership, and culture, and design strategies for competing in global markets and the internet economy while managing resource allocation and planning systems.</p> <p>CO5: Evaluate and control strategies by establishing strategic controls, measuring performance using qualitative and quantitative benchmarking, and applying strategic information systems to address performance measurement challenges and conduct strategic audits.</p>
MCO 402: Business Ethics and Corporate Governance	<p>CO1: Define and analyze fundamental concepts in business ethics, including ethical theories, business values, and ethical programs, and evaluate the benefits of adopting ethics in business practices through the development of codes of ethics and ethics committees.</p> <p>CO2: Examine the concept and importance of corporate governance, identifying its needs, benefits, and concerns on both national and international levels, and assess its impact on various stakeholders.</p> <p>CO3: Compare and contrast different corporate governance systems and models, such as the Anglo-American, German,</p>

	<p>Japanese, and Indian models, and apply relevant theories including Agency Theory, Stewardship Theory, and Stakeholder Theory to understand governance mechanisms.</p> <p>CO4:Analyze the evolution of corporate governance practices, including key developments, influential committees, and significant regulations such as the Sarbanes-Oxley Act and OECD Principles, and evaluate their impact on governance standards globally and in India.</p> <p>CO5: Assess the role of Corporate Social Responsibility (CSR) in relation to corporate governance, exploring CSR concepts, issues, models, and their integration into business practices, and evaluate how CSR initiatives impact environmental and social dimensions within Indian industries.</p>
MCO 403: Dissertation	CO:Applyresearch skill in the field of corporate, monetary or other commercial area.
MCO 404 A: Advanced Accounting	<p>CO1:Analyze the accounting treatment for holding companies and subsidiary companies, including consolidation of financial statements, minority interest, and the cost of control.</p> <p>CO2: Evaluate the processes and principles involved in revaluation of assets and liabilities, and apply consolidation techniques for profit and loss accounts and balance sheets.</p> <p>CO3: Examine the special features and accounting practices of banking companies, including profit and loss accounts and balance sheets as per the Banking Regulation Act, 1949.</p> <p>CO4: Apply accounting principles to insurance companies, including classification of insurance business, statutory books maintenance, and preparation of revenue accounts and balance sheets for life and general insurance.</p> <p>CO5: Compare and apply the double accounts system with the single account system, and understand the preparation of final accounts, including revenue accounts, net revenue accounts, capital accounts, and general balance sheets, while also addressing company statutory records and new trends in accounting such as inflation accounting and human resources accounting.</p>
MCO 405 A: International Accounting	CO1: Understand and evaluate the concept, scope, and importance of international accounting, including harmonization efforts, international accounting standards (IFRS), and the challenges and factors influencing international accounting practices.

	<p>CO2:Analyze and apply methods for recording and translating foreign transactions, including different currency translation techniques and their impact on financial reporting.</p> <p>CO3: Assess international perspectives on inflation accounting and financial reporting, and develop skills to manage and report international financial information systems.</p> <p>CO4:Analyze foreign financial statements and financial systems, and apply financial management techniques to multinational entities for effective financial decision-making.</p> <p>CO5: Evaluate transfer pricing techniques and international taxation strategies, including</p>
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SUBJECT: ECONOMICS (M.A.)	
<p>PROGRAMME SPECIFIC OUTCOMES (PSOs)</p> <p>ECONOMICS (M.A)</p>	<p>PSO1: Critically evaluate the underlying assumptions driving economic theories and policy decisions, and their implications for economic analysis.</p> <p>PSO2: Clearly convey economic concepts, data interpretations, and analytical findings in both English and an Indian language, through various communication formats including written reports and oral presentations.</p> <p>PSO3: Collaborate effectively with peers and stakeholders to integrate diverse view points, mediate differing opinions, and achieve collective goals in economic projects and discussions.</p> <p>PSO4: Demonstrate the ability to develop and implement innovative economic strategies and entrepreneurial ventures, leveraging economic theories and market insights.</p> <p>PSO5: Assess and apply ethical frameworks to economic issues, ensuring that economic practices and decisions align with principles of fairness, transparency, and social responsibility.</p> <p>PSO6: Address environmental challenges within economic contexts, promoting strategies and solutions that support sustainable development and responsible resource management.</p>
COURSE OUTCOME FOR FIRST YEAR	
Semester I	
<p>ECO-411:</p> <p>Micro Economic Theory I</p>	<p>CO2: Analyze the theory of production and cost, focusing on production functions, returns to scale, least cost combination of inputs, and traditional and modern cost theories, including empirical evidence and the derivation of cost functions from production functions.</p> <p>CO3: Examine price and output determination in different market structures, including perfect competition, monopoly, and monopolistic competition, with an emphasis on equilibrium analysis, price determination, and welfare aspects.</p>

	<p>CO4: Explore the behavior of firms and pricing strategies under oligopoly, including non-collusive models (such as Cournot, Bertrand, and Stackelberg) and collusive models (such as cartels and price leadership), as well as the dynamics of price and output determination in monopsony and bilateral monopoly situations.</p> <p>CO5: Apply economic theories to practical scenarios, demonstrating an understanding of how economic theory informs real-world market behavior and decision-making processes.</p>
<p>ECO-412: Macro-Economic Theory I</p>	<p>CO1: Understand the basic theoretical framework</p> <p>CO2: Examine the supply of money through various models, including financial inter mediation, the behavioural model of money supply determination, and the RBI's approach to controlling money supply and understanding the money multiplier.</p> <p>CO3: Analyze the Neo-Classical and Keynesian synthesis, including the IS-LM models and their extensions, to understand the interaction between goods and money markets and the relative effectiveness of monetary and fiscal policies.</p> <p>CO4: Explore extensions of the IS-LM models to incorporate labour markets and flexible prices, and understand the implications of these extensions for macroeconomic policy and analysis.</p> <p>CO5: Relate macroeconomic theories to real-world situations, including the impact of macroeconomic policies on the economy, and apply these theories to analyze economic phenomena such as inflation, business cycles, and policy effects.</p>
<p>ECO-413: Statistical Methods</p>	<p>CO1: Understand and apply fundamental statistical methods, including measures of central tendency, dispersion, skewness, moments, kurtosis, and index numbers, to analyze economic data.</p> <p>CO2: Utilize correlation and regression analysis techniques, including simple correlation, Spearman's rank correlation, and the method of least squares, to analyze relationships between economic</p>

	<p>variables and apply partial and multiple regression methods.</p> <p>CO3: Comprehend and apply the theory of probability, including classical and empirical definitions, laws of addition and multiplication, conditional probability, and mathematical expectation, to solve economic problems.</p> <p>CO4: Analyze theoretical distributions (Binomial, Poisson, and Normal), and understand the concepts of estimation, sampling distribution, and desirable properties of estimators, including hypothesis formulation, Type I and Type II errors, and the use of statistical tests (Z, t, Chi-square, F).</p> <p>CO5: Apply statistical software to perform data analysis, interpret results, and utilize statistical methods effectively in economic research and problem-solving.</p>
<p>ECO-414:</p> <p>Environmental Economics</p>	<p>CO1: Understand key concepts in environmental economics, including natural resources, pollutants, and the inter-linkages between environment and economy, and analyze the management of renewable and non-renewable resources using models like Hotelling's and concepts related to common pool resources.</p> <p>CO2: Examine market failures related to environmental quality, including environmental externalities, and evaluate various policy measures for optimal pollution control such as Pigovian taxes, Coase's bargaining solution, tradable pollution rights, command and control measures, and international treaties.</p> <p>CO3: Apply methods for the valuation of environmental goods and services, including direct and indirect valuation methods, willingness to pay and accept, and various approaches such as the Hedonic Price theory, Averting Expenditure method, Travel Cost method, and Contingent Valuation method.</p> <p>CO4: Analyze the concept of sustainable development, including the limits to growth hypothesis, issues of irreversibility and uncertainty, the trade-offs between environment and development, and the principles and indicators of sustainability.</p>

	<p>CO5: Assess the role of institutions in environmental management and the importance of integrated environmental and economic accounting in the context of sustainable development.</p>
<p>ECO-415: International Trade and Finance</p>	<p>CO1: Understand and apply classical and modern theories of international trade, including opportunity costs, comparative cost, Heckscher-Ohlin theory, and the theorem of factor price equalization, and analyze empirical evidence related to these theories.</p> <p>CO2: Explore trade theories that incorporate economies of scale and imperfect competition, such as the Imitation Gap theory, Technological Gap and Product Cycle theories, Linder-Kravis model, and models of product differentiation and intra-industry trade, including Krugman and Lancaster models.</p> <p>CO3: Analyze the theory and impact of trade interventions and protection measures, including tariffs, quotas, and voluntary export restraints, and understand their welfare implications using concepts like Stolper-Samuelson theorem, Metzler's paradox, and the political economy of non-tariff barriers.</p> <p>CO4: Examine the theory and effects of regional trade blocs and economic cooperation, including the static and dynamic effects of customs unions, the economic progress and rationale behind trading blocs such as the EU, NAFTA, SAARC/SAPTA, and ASEAN.</p> <p>CO5: Assess the impact of globalization and liberalization on trade policies and economies, and critically analyze the effects of trade theories and policies on the global flow of goods, services, and capital.</p>
	<p>Semester II</p>
<p>ECO-421: Micro Economic Theory II</p>	<p>CO1: Critically evaluate alternative theories of the firm, including marginal analysis, Baumol's sales revenue maximization model, Williamson's managerial discretion model, and full cost pricing rules.</p> <p>CO2: Analyze advanced theories of the firm such as Marris's managerial enterprises model, Bain's limit pricing theory with recent</p>

	<p>developments including Sylos-Labinis model, and behavioral and game theoretic models of firm behavior.</p> <p>CO3: Understand and apply distribution theories, including the neo-classical approach of marginal productivity theory, the product exhaustion theorem, and theories of distribution in imperfect markets. Examine the determination of rent, wages, interest, and profit from different theoretical perspectives, including Ricardian, Marxian, Kaleckian, and Kaldorian.</p> <p>CO4: Explore welfare economics concepts such as Pigouvian welfare economics, Pareto optimality, social welfare functions, and the theory of second best. Analyze general equilibrium and the compensation principle, as well as the implications of market imperfections and failures on welfare.</p> <p>CO5: Investigate the economics of information, including its role in economic theory and practice, and analyze how information affects economic behavior and decision-making in both closed and open systems.</p>
<p>ECO-422: Macro Economic Theory II</p>	<p>CO1: Understand and apply Post-Keynesian approaches to the demand for money, including the regressive expectation model, portfolio balance approach, Patinkin's real balance effect, Friedman's modern quantity theory, and the shift from Keynesian economics to monetarism.</p> <p>CO2: Analyze macroeconomic theories in an open economy, focusing on income determination, internal and external equilibrium using the Mundell-Fleming model, and the concept of the foreign trade multiplier.</p> <p>CO3: Examine theories of inflation, including Keynesian and Monetarist approaches, the Structuralists' theory, Phillips curve analysis (short-run and long-run), the Natural Rate of Unemployment hypothesis by Samuelson and Solow, Tobin's modified Phillips curve, and the concepts of adaptive and rational expectations.</p>

	<p>CO4: Explore the nature and features of business cycles, and analyze various theories of business cycles including those by Schumpeter, Kaldor, Samuelson and Hicks, and Goodwin. Evaluate the relative efficiency of monetary and fiscal policies in controlling business cycles.</p> <p>CO5: Critically assess the new classical critique of Keynesian micro foundations, including the new classical approach to business cycles and its policy implications, and understand the new Keynesian counter-critique of the new classical perspective.</p>
<p>ECO-423: Quantative Methods</p>	<p>CO1: Understand and apply fundamental concepts of calculus, including functions, limits, continuity, differentiation (rules, partial derivatives, differentials, and higher-order differentials), and integration in the context of economic analysis.</p> <p>CO2: Analyze and solve problems involving maxima and minima of functions, applying simple integration rules, and understand their economic applications.</p> <p>CO3: Utilize difference and differential equations to model and solve economic problems, including both non-linear and linear differential equations, and first and second-order difference equations.</p> <p>CO4: Master matrix algebra concepts, including types of matrices, operations, determinants, solutions of simultaneous equations using Cramer's rule, matrix inversion, rank of a matrix, vector properties, and quadratic forms, including eigenvalues and eigenvectors.</p> <p>CO5: Apply mathematical and statistical techniques using computer software for economic analysis, research, and forecasting, thereby enhancing practical skills in understanding and addressing economic problems.</p>
<p>ECO-424: Indian Economy</p>	<p>CO1: Understand and evaluate various approaches to economic development in India, including self-reliance strategies, import substitution, protectionist policies, and the impact of globalization and structural adjustment packages post-1991. Analyze the role and</p>

	<p>functions of NITI Aayog in the context of economic planning and development.</p> <p>CO2: Analyze poverty, inequality, and unemployment in India by examining poverty measures, government initiatives, and the Global Hunger Index. Evaluate regional imbalances and disparities, employment issues, underemployment, and the strategies for employment generation, focusing on industrial relations, labor welfare, and informal sector employment.</p> <p>CO3: Explore sectoral growth in India with a focus on agriculture, including the impact of economic liberalization. Assess industrial development strategies, including industrial policy reforms, reservation policies for small-scale industries, competition policy, industrial financing sources, public sector reforms, privatization, and Foreign capital involvement. Analyze the growth and significance of the service sector in India, including its output, employment, and export performance.</p> <p>CO4: Examine current economic issues as presented in the latest Economic Survey and Union Budget. Discuss other contemporary issues impacting the Indian economy and their implications, including infrastructure development in key areas such as energy, transport, health, and education.</p> <p>CO5: Apply empirical analysis to understand and address important economic issues in India, integrating insights from sectoral growth, poverty, inequality, and current economic policies into practical understanding and strategic planning.</p>
<p>ECO-425: International Trade and Finance II</p>	<p>CO1: Analyze the foreign exchange market, including demand and supply, exchange rate theories, and the impact of fixed vs. flexible exchange rates.</p> <p>CO2: Examine balance of payments concepts, adjustment processes, devaluation effectiveness, and policies for equilibrium under different exchange rate regimes.</p>

	<p>CO3: Understand international monetary systems, including the Gold Standard, Bretton Woods System, international reserves, and recent global financial crises.</p> <p>CO4: Evaluate India's trade policies, recent trade reforms, international debt issues, and the role of MNCs, as well as export promotion and import/export policies.</p> <p>CO5: Apply theories to assess the impact of policies and external shocks on the economy, focusing on exchange rates, BOP adjustments, and trade policies.</p>
	COURSE OUTCOME FOR III YEAR
	Semester III
<p>ECO-511: Public Economics I</p>	<p>CO1: Understand the role and functions of government, including allocation, distribution, stabilization, and the provision of public, private, and merit goods.</p> <p>CO2: Analyze public expenditure theories, including Wagner's law, the Wiseman-Peacock hypothesis, and reforms such as programme budgeting and zero-based budgeting.</p> <p>CO3: Examine taxation theories, including benefit and ability-to-pay approaches, optimal taxation, incidence theory, excess burden, and the trade-off between equity and efficiency.</p> <p>CO4: Explore public choice theory and budget determination, including voting systems, the Median Voter model, Arrow's Impossibility theorem, and Down's Theory of Democracy.</p> <p>CO5: Investigate politico-economic factors, such as rent-seeking behavior, bureaucratic inefficiencies, and directly unproductive profit-seeking (DUP) activities.</p>
<p>ECO-512: Growth and Development Theory I</p>	<p>CO1: Understand classical and modern theories of development, including contributions from Adam Smith, Ricardo, Malthus, Karl Marx, and Schumpeter.</p> <p>CO2: Analyze various approaches to development, such as the vicious circle of poverty, big push, balanced and unbalanced growth,</p>

	<p>and the critical minimum effort thesis.</p> <p>CO3: Examine growth models, including Harrod-Domar, Solow, and technological progress theories (embodied vs. disembodied, exogenous vs. endogenous).</p> <p>CO4: Explore the A-K Model of Growth, Cambridge criticism of Neo-classical analysis, and Kaldor’s growth model.</p> <p>CO5: Apply theories of growth and development to real-world contexts, including institutional aspects, international trade, investment criteria, social cost-benefit analysis, and the relevance of planning.</p>
<p>ECO-513: Mathematical Economics I</p>	<p>CO1: Understand and apply mathematical techniques to consumer behavior theories, including utility maximization, elasticity, and utility functions.</p> <p>CO2: Analyze production functions and cost functions using mathematical models, including CES, VEX, and trans-log functions, and understand constrained optimization.</p> <p>CO3: Examine price determination and market structures using mathematical models for perfect competition, monopoly, monopolistic competition, duopoly, oligopoly, and monopsony.</p> <p>CO4: Explore market equilibrium concepts, including Marshallian and Walrasian equilibrium, and analyze multi-market and general equilibrium systems.</p> <p>CO5: Integrate mathematical tools with economic theories to refine and enhance understanding of microeconomic concepts.</p>
<p>ECO-513: Agricultural Economics I</p>	<p>CO1: Analyze the role of agriculture in economic development and understand models like Schultz, Lewis, Fei-Ranis, and Jorgenson’s.</p> <p>CO2: Evaluate agricultural production and productivity, including resource use, production functions, cost and supply curves, and technical change.</p> <p>CO3: Examine land reforms and land policy, including land utilization principles, distribution trends, land tenures, and reform measures.</p> <p>CO4: Study the rural labor market, focusing on labor supply, market</p>

	<p>segmentation, marginalization, unemployment trends, and wage differences.</p> <p>CO5: Understand and analyze policy issues relevant to Indian agricultural economics.</p>
<p>ECO-514: Elementary Econometrics</p>	<p>CO1: Understand the scope and fundamentals of econometrics, including the basics of linear regression models and Gauss-Markov theorem.</p> <p>CO2: Apply of regression models (log-linear, semi-log, reciprocal) to economic data.</p> <p>CO3: Identify and address problems in regression analysis such as heteroscedasticity, multicollinearity, and autocorrelation, including their causes, detection, and remedies.</p> <p>CO4: Utilize techniques for regressions with qualitative independent variables and dummy dependent variables, including dummy variable techniques, structural stability tests, and interaction effects.</p> <p>CO5: Implement and analyze models involving qualitative dependent variables, such as Linear Probability Model (LPM), Logit, and Probit models.</p>
<p>ECO-514: Health Economics</p>	<p>CO1: Understand and evaluate key health metrics, including morbidity, mortality, life expectancy, and their relationship with economic development indicators like infant mortality and malnutrition.</p> <p>CO2: Apply economic evaluation methods to healthcare, including cost analysis (CA), cost-benefit analysis (CBA), cost-effectiveness analysis (CEA), and cost-utility analysis (CUA).</p> <p>CO3: Analyze health care markets, including market structures (monopoly, oligopoly), transaction costs, and issues in provider competition, as well as demand and supply-side considerations.</p> <p>CO4: Assess India's health care system, including public and private health systems, financing trends, health sector reforms, and public policies to improve access and manage costs.</p>

	CO5: Evaluate the role of international organizations, such as the WHO, and understand global and national health policies impacting medical care systems.
ECO-515: Financial Institutions and Markets	CO1: Understand the structure and concepts of the financial system, including money, finance, market types, and security valuation. CO2: Analyze the role and efficiency of banks and non-bank financial intermediaries, including development banks, mutual funds, insurance companies, and venture capital funds. CO3: Examine financial markets in India, including money markets, bond markets, stock markets, derivatives, and foreign exchange markets. CO4: Evaluate regulatory frameworks and institutions, focusing on the need for financial regulation, sources of financial instability, and the roles of RBI, SEBI, and IRDA in maintaining stability and development. CO5: Assess the impact of monetary and financial forces on economic development, policy-making, and international finance.
Semester IV	
ECO-521: Public Economics II	CO1: Understand and recall the basic concepts and principles of Public Economics, including public debt, fiscal policy, and fiscal federalism. CO2: Analyze various concepts through case studies, focusing on public debt, fiscal policy, and the principles of fiscal federalism. CO3: Apply knowledge to practical problems related to public finance, including budgetary deficits, fiscal multipliers, and fiscal federalism. CO4: Execute or create projects or field assignments based on the knowledge gained in the course, covering topics such as public debt management, fiscal policy evaluation, and Indian public finances.
ECO-522: Growth and Development	CO1: Understand the sectoral aspects of development, including the role of agriculture, efficiency, sustainability, and industrialization in developing countries.

<p>TheoryII</p>	<p>CO2: Analyze the impact of international trade on economic development, including theories of trade, export-led growth, and international monetary assistance.</p> <p>CO3: Evaluate resource allocation in developing countries, focusing on investment criteria, cost-benefit analysis, and the choice of appropriate technology.</p> <p>CO4: Assess planning and development in India, including the need for planning and an overview of Indian planning models, such as the Mahalanobis Model.</p>
<p>ECO-523: Mathematical Economics II</p>	<p>CO1: Analyze macro-economic models, including income determination in Classical and Keynesian systems, static and dynamic multipliers, investment determinants, and trade cycle models by Samuelson and Hicks.</p> <p>CO2: Understand and apply growth models such as the Harrod Problem, Neoclassical growth model, Solow and Meade models with technical progress, and concepts of optimal growth and the golden rule of accumulation.</p> <p>CO3: Explore game theory concepts including two-person zero-sum games, payoff matrices, pure and mixed strategies, Maximin and Minimax solutions, saddle point solutions, non-constant sum games, prisoners' dilemma, and linear programming techniques like the simplex method.</p> <p>CO4: Utilize linear programming applications and input-output analysis in economics, including transport and storage problems, open and closed systems, Hawkins-Simon conditions, Leontief's dynamic system, and consistency testing of planning models.</p>
<p>ECO-523: Agricultural EconomicsII</p>	<p>CO1: Analyze the role of capital and rural credit, including institutional and non-institutional sources, reorganization through cooperatives, commercial banks, regional rural banks, and the role of NABARD.</p> <p>CO2: Evaluate agricultural prices and marketing policies, including market efficiency, structure, imperfections, regulated markets, crop</p>

	<p>insurance, terms of trade, and the objectives and instruments of agricultural policy, focusing on food security and the Public Distribution System.</p> <p>CO3: Assess trends in agricultural growth in India, including regional variations, shifts in cropping patterns, supply and pricing of inputs, distribution of gains from technological change, and the role of public investment.</p> <p>CO4: Explore the impact of the external sector on Indian agriculture, including international trade, commodity agreements, the WTO, trade liberalization, agro-industries, the role of MNCs, and globalization effects.</p>
<p>ECO-524: Advanced Econometrics</p>	<p>CO1: Understand simultaneous equation models, including structural and reduced forms, simultaneous equation bias, identification rules, and methods such as Indirect Least Squares (ILS), Two-Stage Least Squares (2SLS), Three-Stage Least Squares (3SLS), and Maximum Likelihood Estimation (ML).</p> <p>CO2: Analyze time series models, covering deterministic and stochastic models, tests of stationarity including Autocorrelation Function (ACF) and Correlogram, and Unit Root Tests such as the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests.</p> <p>CO3: Apply forecasting techniques using single equation regression models, ARIMA modeling (Box-Jenkins methodology), Vector Auto-Regression, and multi-variate analysis methods like Discriminant Analysis and Principal Component Analysis.</p> <p>CO4: Explore dynamic econometric models, including autoregressive and distributed lag models, geometric lag approaches (Koyck model, Adaptive expectations), rational expectations, partial adjustment models, and polynomial lag methods (Almon approach).</p>
<p>ECO-524: Economics of Climate Change</p>	<p>CO1: Understand the climate system, its drivers, natural variability, and the economics and ethics of climate change, including ethical frameworks and inter-temporal equity.</p> <p>CO2: Analyze the impacts of climate change on global growth and</p>

	<p>development, including its effects on people, costs in developed countries, economic modeling, societal impacts, and issues like displacement, migration, health, and marginalized groups.</p> <p>CO3: Evaluate optimal climate policies, focusing on economic efficiency, carbon abatement costs, social cost of carbon, discounting, national climate policy tools (carbon tax, cap-and-trade), equity issues, and the environmental Kuznets curve.</p> <p>CO4: Explore climate change concerns specific to India, including the UNFCCC, Kyoto Protocol, impacts on natural resources, coastal vulnerability, rural livelihoods, food security, India's stance in international negotiations, and the National Action Plan on Climate Change.</p>
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SUBJECT: EDUCATION (M.A.)	
PROGRAMME OUTCOME	<p>PO1:Students will demonstrate a deep understanding of educational theories, philosophies, and research methodologies.</p> <p>PO2: They will possess critical thinking skills to analyze complex educational issues and develop innovative solutions.</p> <p>PO3: Students will exhibit leadership qualities and be able to manage educational institutions and programs effectively. They will possess the skills to plan, organize, and evaluate educational processes to improve learning outcomes.</p> <p>PO4: Studentss will be proficient in designing, developing, and implementing effective curricula and instructional materials. They will be able to align curriculum with learner needs, assessment, and technology integration.</p> <p>PO5: Students will be skilled in conducting educational research to address contemporary challenges. They will demonstrate the ability to contribute to the field of education through innovative practices and scholarly publications.</p> <p>PO6: Students will demonstrate a strong commitment to social justice, equity, and inclusion in education. They will exhibit ethical leadership and professional conduct in various educational settings.</p>
PROGRAMME SPECIFIC OUTCOME	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Demonstrate a deep understanding of indigenous knowledge systems and their integration into contemporary education. • Design and implement educational programs that contribute to rural development and community empowerment. • Possess expertise in creating inclusive learning environments for students with diverse needs and backgrounds. • Proficient in using ICT tools for teaching, learning, assessment, and educational administration. • Demonstrate leadership qualities and be able to effectively manage educational institutions and programs. • Possess skills in designing, developing, and evaluating curricula aligned with learners' needs and national/state standards. • Conduct research to address educational challenges and propose evidence-based solutions. • Equipped to design and implement effective teacher

	<p>training programs.</p> <ul style="list-style-type: none"> • Possess the ability to analyze educational policies, advocate for educational reforms, and participate in policy-making processes. • Demonstrate a commitment to lifelong learning and professional development to stay updated with educational trends. •
COURSEOUTCOMEFORI YEAR	After completion of the course students will be able to:
SEMESTER-I	
EDN-101 Philosophical Foundations of Education	<p>CO1:Critically analyze and compare different philosophical perspectives (Idealism, Realism, Pragmatism, etc.) and their implications for education.</p> <p>CO2:Demonstrate a deep understanding of metaphysical, epistemological, and axiological foundations of education.</p> <p>CO3:Apply philosophical principles to contemporary educational challenges and issues.</p> <p>CO4:Compare and contrast Eastern and Western philosophical perspectives on education.</p> <p>CO5:Demonstrate the ability to justify their position using philosophical arguments and evidence.</p> <p>CO6:Explain philosophical outlook to relate and analyze the context and problems of education.</p>
EDN-102 Sociological Foundations of Education	<p>CO1:Critically analyze different sociological perspectives (symbolic interactionism, structural functionalism, and conflict theory) on education and their implications for understanding educational processes.</p> <p>CO2:Develop a comprehensive understanding of the interconnections between education and social institutions (family, school, society), and their role in shaping individual and societal outcomes.</p> <p>CO3:Analyse the role of education in driving social change and the impact of social change on educational systems and practices.</p> <p>CO4:Develop a critical understanding of social issues (casteism, gender discrimination, etc.) affecting education and their implications for educational equity and access.</p> <p>CO5:Apply sociological research methods to investigate educational problems and contribute to knowledge generation in the field.</p> <p>CO6: Demonstrate a commitment to social justice and equity and be able to develop strategies for addressing educational</p>

	disparities.
EDN-102 Psychological Foundation of Education	<p>CO1: Critically analyze and compare different psychological theories of learning, motivation, intelligence, personality, and adjustment. They will demonstrate an understanding of the strengths and limitations of each theory.</p> <p>CO2: Apply psychological principles to design effective teaching and learning strategies, assess student needs, and create supportive learning environments.</p> <p>CO3: Administer appropriate psychological assessments to identify student strengths, weaknesses, and learning styles. They will also be able to develop and implement interventions to address student needs.</p> <p>CO4: Develop a comprehensive understanding of the role of psychology in education, including its contributions to curriculum development, classroom management, and student counselling.</p>
EDN-104 Recent Trends And Issues In Education	<p>CO1: Identify recent trends and issues in education from global and Indian context.</p> <p>CO2: Explain the constitutional and educational policies for primary, secondary, higher education and inclusive education.</p> <p>CO3: Critically analyze the importance and the functions of different regulatory and statutory bodies of education.</p> <p>CO4: Explain the role of different agencies for quality assessment and assurance in higher education.</p> <p>CO5: Critically analyze educational policies (RCFCE, RPWD Act, etc.) and their impact on educational access, equity, and quality.</p> <p>CO6: Develop a comprehensive understanding of globalization, liberalization, privatization, and their implications for education systems.</p> <p>CO7: Critically evaluate quality assurance frameworks (NAAC, NIRF) and their role in enhancing higher education.</p> <p>CO8: Analyze the effectiveness of government schemes (RUSA, Samagra Shiksha) in achieving educational goals.</p> <p>CO9: Develop the ability to advocate for educational reforms based on a critical analysis of existing policies and practices.</p>
EDN-105 PRACTICUM	<p>CO1: Conduct research on educational issues, collect and analyze data, and draw meaningful conclusions.</p> <p>CO2: Administer and interpret psychological tests to assess individual differences and inform educational practices.</p> <p>CO3: Communicate complex ideas clearly and effectively</p>

	<p>through written and oral presentations.</p> <p>CO4: Identify and analyze educational problems, propose solutions, and implement them in practical settings.</p>
	<p>SEMESTER-II</p>
<p>EDN-201</p> <p>EDUCATIONAL MEASUREMENT AND EVALUATION</p>	<p>CO1: Demonstrate a comprehensive understanding of the fundamental concepts, principles, and processes of test, measurement, assessment, and evaluation in education.</p> <p>CO2: Apply appropriate assessment methods and techniques to gather valid and reliable data for making informed educational decisions.</p> <p>CO3: Critically analyze and interpret assessment data to inform instruction, monitor student progress, and evaluate program effectiveness.</p> <p>CO4: Develop and implement a variety of assessment tools and procedures, including standardized and teacher-made tests, to assess student learning outcomes.</p> <p>CO5: Advocate for fair, equitable, and authentic assessment practices that promote student learning and development.</p> <p>CO6: Calculate the Psychometric properties of the test.</p> <p>CO7: Construct and standardized of an Achievement test and prepare different types of test items and explain the quality of good test.</p> <p>CO8: Critically evaluate the various Models of Evaluation</p>
<p>EDN-202</p> <p>EDUCATIONAL MANAGEMENT</p>	<p>CO1: Demonstrate a comprehensive understanding of the principles, theories, and practices of educational management and administration.</p> <p>CO2: Apply management and leadership concepts to address challenges and opportunities in educational institutions.</p> <p>CO3: Evaluate the effectiveness of educational management systems and propose strategies for improvement.</p> <p>CO4: Analyze the role of quality assurance and accreditation in enhancing institutional performance.</p> <p>CO5: Demonstrate knowledge of contemporary issues in educational management and administration, including change management and technology integration.</p>

	<p>CO6: Illustrate the concept of leadership and different leadership styles in Education.</p> <p>CO7: Compare between the Educational Management and Educational Administration</p> <p>CO8: Describe the concept, principles of Total Quality Management approach in education.</p> <p>CO9: To critically Evaluate the conceptual framework of Educational Management, Administration and Leadership and analyse different models of leadership and their application in the field of Education.</p>
<p>EDN-203 CURRICULUM DEVELOPMENT</p>	<p>CO1: Illustrate the concept of Curriculumtheory, principles, and models; Curriculum Development and various stages of Curriculum Development.</p> <p>CO2: Compare among different types and models of curriculum development and their importance.</p> <p>CO3:Analyze and evaluate different curriculum development approaches and their implications for educational practice.</p> <p>CO4: Design, develop, and implement effective curriculum plans based on learners' needs and national/state standards.tt</p> <p>CO5: Utilize appropriate instructional strategies and assessment methods to enhance curriculum implementation.</p> <p>CO6: Explain the process of curriculum development and curriculum implementations.</p> <p>CO7:Critictally evaluate different Models of curriculum Evaluation</p>
<p>EDN-204 PEDAGOGICAL TRENDS AND ISSUES</p>	<p>CO1: Describe the process and importance of communication in teaching learning process and demonstrate a comprehensive understanding of the theoretical foundations of teaching, learning, and communication processes.</p> <p>CO2: Differentiate the modern pedagogical trends strategies from Traditional pedagogical designs.</p> <p>CO3: Analyze and evaluate different pedagogical approaches and their impact on student learning outcomes.</p> <p>CO4: Identify and address contemporary challenges and issues in teaching and learning and critically analyze the pedagogical issues and challenges from classroom, institutional point of view</p>

	<p>CO5: Reflect critically on teaching practices and engage in continuous professional development to enhance teaching effectiveness.</p>
<p>EDN-205 PRACTICUM</p>	<p>CO1: Develop practical skills in test construction, administration, and interpretation.</p> <p>CO2: Demonstrate the ability to analyze and evaluate educational institutions and their management practices.</p> <p>CO3: Design and implement effective instructional plans based on contemporary pedagogical approaches.</p> <p>CO4: Integrate theoretical knowledge with practical experience to enhance professional competence in education and real class room situation</p> <p>CO5: Apply curriculum development and evaluation principles to real-world contexts..</p>
<p>SEMESTER-III</p>	
<p>EDN-301 RESEARCH METHODOLOGY IN EDUCATION</p>	<p>CO1: Describe about evolutionary prospective of knowledge construction process and describe the nature, scope and needs of Educational Research.</p> <p>CO2: Explain different approaches and designs of educational research and Identify and formulate research problem and state the hypothesis.</p> <p>CO3: Apply appropriate research methods to investigate educational problems and issues.</p> <p>CO4: Select and develop different types of data collection tools.</p> <p>CO5: Prepare the research proposal and report</p> <p>CO6: Adhere to ethical principles and practices in conducting educational research.</p>
<p>EDN-302 ADVANCED EDUCATIONAL STATISTICS</p>	<p>CO1: Describe the concept, importance and use of Descriptive and Inferential statistics in Research.their application in educational research.</p> <p>CO2: Describe the concept, assumptions and use of Parametric and Non parametric statistics.</p> <p>CO3: Compute and use various statistical measures of</p>

	<p>Coefficient of correlation, Variability, Regression and Prediction.</p> <p>CO4: Evaluate the strengths and limitations of different statistical methods and select appropriate techniques for specific research questions.</p> <p>CO5: Utilize statistical software to analyze educational data and generate informative reports.</p>
<p>EDN-303 ADVANCED EDUCATIONAL TECHNOLOGY</p>	<p>CO1: Describe the concept and nature of Educational Technology, ICT in education and Instructional Technology and Demonstrate a comprehensive understanding of the theoretical foundations of educational technology and its role in enhancing teaching and learning.</p> <p>CO2: Apply instructional design models and principles to develop effective learning experiences.</p> <p>CO3: Utilize various educational technologies and media to create engaging and interactive learning environments.</p> <p>CO4: Describe the concept and approaches of e-learning and Social learning.</p> <p>CO5: Apply the knowledge of Educational Technology, ICT and Instructional Technology to search information on different Open Education Resources</p>
<p>EDN-304 DEVELOPMENT OF EDUCATION IN INDIA</p>	<p>CO1: Provide a broad sketch about the development of education in India from the colonial period to the present.</p> <p>CO2: Analyze the impact of significant educational policies and commissions on the Indian education system.</p> <p>CO3: Evaluate the strengths and weaknesses of various educational reforms and their implications for educational development.</p> <p>CO4: Compare and contrast different educational models and ideologies prevalent in India.</p> <p>CO5: Critically evaluate the Background, Objectives and</p>

	recommendations of various Committees, Commissions and policies on Education.
EDN-305 PRACTICAL	<p>CO1: Develop critical thinking and analytical skills to evaluate research studies in the field of education.</p> <p>CO2: Demonstrate the ability to identify research problems, formulate research questions, and develop research proposals.</p> <p>CO3: Apply appropriate research methodologies and data collection techniques to conduct educational research.</p>
SEMESTER-IV	
EDN-401 HIGHER EDUCATION IN INDIA	<p>CO1:Analyze various policies and their recommendations on various aspects of higher education.</p> <p>CO2: Evaluate the functions and importance of different Higher education institutions.</p> <p>CO3: Examine the problems in implementation of the policies of higher education in India.</p> <p>CO4: Explore the problems and reforms in higher education in India.</p> <p>CO5:Analyze role of various agencies of higher education in India.</p>
EDN-402 TEACHER EDUCATION	<p>CO1: Describe the concept, objectives, scope, and importance of teacher education.</p> <p>CO2:Analyze the historical development of teacher education in India and the role of key commissions and policies.</p> <p>CO3: Evaluate the professional attributes, roles, and responsibilities of teachers in contemporary society.</p> <p>CO4: Critically analyze different models of teacher education and their implications for teacher preparation.</p> <p>CO5: Demonstrate knowledge of teacher evaluation methods and their role in professional development and critically evaluate professional ethics, autonomy and accountability of teacher in their profession</p> <p>CO6:Analyse the role and functions of different agencies of teacher education in quality development of teacher</p>

	education..
EDN-403 GUIDANCE AND COUNSELING IN EDUCATION	<p>CO1: Summarize the concepts, principles, and goals of guidance and counselling.</p> <p>CO2: Apply various assessment tools and techniques to gather information for effective guidance and counseling.</p> <p>CO3: Utilize different counselling theories and approaches to address the needs of diverse clients.</p> <p>CO4: Develop skills in providing guidance and counselling services to individuals and groups.</p> <p>CO5: Extract the process, tools and techniques of counselling</p> <p>CO6: Advocate for the importance of guidance and counselling in promoting student success and well-being.</p>
EDN-404 INCLUSIVE EDUCATION	<p>CO1: Summarize concept, nature, and scope of inclusive education; concepts of impairment, disability, and handicap; and the principles of inclusive education.</p> <p>CO2:Analyze the legal framework and policies related to the education of students with disabilities in India and internationally.</p> <p>CO3: Develop strategies for creating inclusive classrooms that meet the diverse needs of all learners.</p> <p>CO4: Evaluate the effectiveness of various support services and interventions for students with disabilities.</p> <p>CO5: Advocate for inclusive education practices and policies to promote social justice and equity.</p> <p>CO6: Categorize and summarize the types, characteristics, etiology and prevention of mentally handicapped.</p>
EDN-405 Dissertation	CO1: Conduct independent research on an educational problem or issue, demonstrating critical thinking and

	<p>analytical skills.</p> <p>CO2: Design and implement appropriate research methodologies to gather and analyze data effectively.</p> <p>CO3: Communicate research findings clearly and effectively through written and oral presentations.</p> <p>CO4: Contribute to the body of knowledge in the field of education through original research.</p>
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SUBJECT: MA-ENGLISH	
PROGRAMME OUTCOME	<p>PO1: Demonstrate expertise in theories and methods of English studies pertinent to the field of further research and teaching.</p> <p>PO2: Choose appropriate methods to formulate critically significant arguments and apply them effectively for writing research papers, conference presentations, etc.</p> <p>PO3: Apply the acquired linguistic and critical skills to better understand the diversity of human experiences</p> <p>PO 4: Conduct theory-based evaluation and analysis of various literary texts</p> <p>PO5: Improve skills to investigate, analyze, and synthesize information, concepts, and theories</p> <p>PO6: Develop openness to new ideas, perspectives, and ways of thinking.</p> <p>PO7: Assess new ideas, perspectives, and ways of thinking from reading texts from different literary genres</p> <p>PO8: Identify, design, and construct an independent approach to analyze and investigate varied social structures and power structures within and beyond the field of English studies</p> <p>PO9: Acquire knowledge skills and inspiration to qualify for higher education programs like Ph. D. or aspire for teaching careers at UG and PG level</p> <p>PO10: Analyze the ways in which ideas and values depicted in literary works with or contrast with those of Indian culture</p>
PROGRAMME SPECIFIC OUT COME For MA ENGLISH	<p>PSO 1: The students will be capable of interpreting and exploring relationships from the points of view of different people</p> <p>PSO 2: The students identify, find, and use information appropriate for discussion of literature.</p> <p>PSO 3: Appreciate Indian Literature in English and explore its uniqueness and its place among literatures in English.</p> <p>PSO 4: Become thorough with readings with theoretical basis.</p>

<p>COURSE OUTCOME FOR M.A. ENGLISH</p>	
<p>Course No: Eng411 Course Title: English Poetry I: Chaucer, Spenser, Milton, Pope</p>	<p>CO1. Analyze Chaucer's portrayal of characters and social commentary in "The Canterbury Tales." CO2. Interpret the allegorical elements and moral lessons in Spenser's "The Faerie Queene." CO3. Evaluate Milton's use of epic conventions and thematic elements in "Paradise Lost" Books I & II. CO4. Identify Pope's satirical techniques and their effects in "The Rape of the Lock." CO5. Compare and contrast the representation of heroism and virtue in Spenser's and Milton's works.</p>
<p>CourseNo:Eng412 Course Title: English Drama I: Marlowe, Shakespeare, Webster</p>	<p>CO1. Explain Marlowe's depiction of ambition and tragedy in "Doctor Faustus." CO2. Analyze the development of characters and themes in Shakespeare's "King Lear." CO3. Assess the use of power and corruption in Webster's "The Duchess of Malfi." CO4. Evaluate the themes of forgiveness and reconciliation in Shakespeare's "The Tempest." CO5. Compare the portrayals of fate and free will in "Doctor Faustus" and "King Lear."</p>
<p>CourseNo:Eng413 Course Title: English Novel I: 18th Century English Novel</p>	<p>CO1. Analyze the themes of isolation and survival in Defoe's "Robinson Crusoe." CO2. Discuss the satirical elements and social commentary in Fielding's "Tom Jones." CO3. Evaluate the depiction of virtue and social class in Richardson's "Pamela." CO4. Interpret Swift's use of satire to critique contemporary society in "Gulliver's Travels." CO5. Compare the narrative techniques and character development in "Tom Jones" and "Pamela."</p>
<p>Course No: Eng414 Course Title: Literary Theory and Criticism up to T.S. Eliot</p>	<p>CO1. Summarize Johnson's views on Shakespeare's dramatic art and its significance in his "Preface to Shakespeare." CO2. Explain Wordsworth's principles of poetic composition and the role of imagination in the "Preface to Lyrical Ballads."</p>

	<p>CO3. Discuss Arnold's criteria for evaluating poetry and the importance of studying poetry in "The Study of Poetry."</p> <p>CO4. Analyze Eliot's concept of tradition and its impact on individual creativity in "Tradition and Individual Talent."</p> <p>CO5. Compare the critical perspectives on poetry and literary tradition in Arnold's and Eliot's works.</p>
<p>Course No: Eng415 Course Title: English Essayists -I</p>	<p>CO1. Analyze Bacon's arguments about the nature and consequences of revenge in "Of Revenge."</p> <p>CO2. Evaluate Bacon's reflections on truth and its value in "Of Truth."</p> <p>CO3. Discuss Wollstonecraft's views on parental responsibilities and affection in chapters 10 and 11 of "A Vindication of the Rights of Woman."</p> <p>CO4. Examine Addison's portrayal of social roles and virtues in "The Fortune Hunter" and "A Friend of Mankind."</p> <p>CO5. Critique Dr. Johnson's perspectives on the relationship between learning and genius in "The Inefficacy of Genius without Learning" and the critique of artificial wants in "The Folly of Creating Artificial Wants."</p>
<p>SEMESTER-II Course No: Eng 421 Course Title: English Poetry II: Wordsworth, Keats, Tennyson, Browning</p>	<p>CO1. Examine the development of Wordsworth's self and artistic vision in "The Prelude" (Books I & II).</p> <p>CO2. Interpret Keats's use of imagery and themes of transience and permanence in "Ode to a Nightingale" and "Ode on a Grecian Urn."</p> <p>CO3. Analyze the exploration of grief and consolation in Tennyson's "In Memoriam" (Prologue, Section I, XXI, XXX).</p> <p>CO4. Discuss the portrayal of power and control in Browning's "My Last Duchess" and the theme of idealism versus reality in "The Last Ride Together."</p> <p>CO5. Compare the treatment of personal and philosophical themes in Wordsworth's and Tennyson's works.</p>
<p>Course No: Eng422 Course Title: English Drama II : Congreve, Shaw, Beckett, Pinter</p>	<p>CO1. Analyze Congreve's use of comedy and social satire in "The Way of the World."</p> <p>CO2. Evaluate Shaw's exploration of social issues and philosophical themes in "Man and Superman."</p> <p>CO3. Discuss Beckett's depiction of existentialism and the absurd in "Waiting for Godot."</p> <p>CO4. Examine Pinter's use of language and ambiguity to create tension in "The Birthday Party."</p> <p>CO5. Compare the thematic treatment of human relationships and societal norms in Congreve's and Shaw's plays.</p> <p>CO1. Analyze the portrayal of social class and personal development in Austen's "Emma."</p> <p>CO2. Discuss** Dickens's exploration of sacrifice and resurrection in "A</p>

<p>CourseNo:Eng423 Course Title: English Novel II: 19th Century English Novel</p>	<p>Tale of Two Cities." CO3. Evaluate** Hardy's treatment of fate and societal constraints in "Tess of the d'Urbervilles." CO4.Examine** Eliot's depiction of redemption and social change in "Silas Marner." CO5.Compare** the representation of social and moral dilemmas in Austen's "Emma" and Dickens's "A Tale of Two Cities."</p>
<p>Course No: Eng424 Course Title: Contemporary Theory</p>	<p>CO1.Explain** Shklovsky's concept of "art as technique" and its role in defamiliarizing everyday experiences in Russian Formalism. CO2.Analyze** Benjamin's argument in "The Author as Producer" regarding the role of the author in shaping political and social contexts. CO3.Discuss** Cixous's ideas on feminist écriture féminine and the significance of female expression in "The Laugh of Medusa." CO4.Evaluate** Barthes's notion of "The Death of the Author" and its implications for interpreting literary texts in Poststructuralist theory. CO5.Compare** the views on authorship and textual interpretation in Barthes's and Benjamin's theories.</p>
<p>Course No: Eng 425 Course Title: English Essayists II</p>	<p>CO1.Analyze** Hazlitt's critique of religious hypocrisy and its impact on moral integrity in "On Religious Hypocrisy." CO2. Discuss** Hazlitt's reflections on the value and enjoyment of life in "On the Love of Life." CO3. Evaluate** Robert Lynd's commentary on materialism and personal values in "The Money Box." CO4.Examine** Lynd's insights on personal resolutions and their effectiveness in "On Good Resolutions." CO5.Compare** the portrayal of personal experiences and social observations in Lamb's and Pristley's essays.</p>

<p>SEMESTER- III CourseNo:Eng431 Course Title: English Poetry III: Yeats, Eliot, Auden, Larkin</p>	<p>CO1. Interpret** Yeats's use of imagery and themes of cultural and personal renewal in "A Prayer for My Daughter" and "Sailing to Byzantium." CO2. Analyze** Eliot's depiction of modernist fragmentation and cultural decay in "The Waste Land." CO3. Discuss** Auden's exploration of social conformity and art's role in "The Unknown Citizen" and "Musee des Beaux Arts." CO4. Evaluate** Larkin's reflections on religious and social change in "Church Going" and "The Whitsun Weddings." CO5. Compare** the treatment of cultural and existential themes in Yeats's and Eliot's works.</p>
<p>Course No: Eng432 Course Title: English Novel III: 20th Century English Novel</p>	<p>CO1. Analyze the development of identity and artistic self-awareness in Joyce's "A Portrait of the Artist as a Young Man." CO2. Discuss Lawrence's exploration of relationships and gender dynamics in "Women in Love." CO3. **Examine** Forster's treatment of cultural conflict and personal connection in "A Passage to India." CO4. **Evaluate** Woolf's use of narrative techniques and themes of time and perception in "To the Lighthouse." CO5. **Compare** the depiction of personal and societal conflicts in Joyce's and Lawrence's novels.</p>
<p>CourseNo:Eng433 CourseTitle: Structure of Modern English - I</p>	<p>CO1. **Define** the basic scientific assumptions underlying the study of linguistics as outlined in Chapter II of John Lyons's "Language and Linguistics: An Introduction." CO2. **Analyze** the articulatory properties and classification of English sounds, including vowels, consonants, diphthongs, and their phonemic and allophonic variations. 3. **Explain** the concepts of morphemes, affixation, inflection, derivation, and morphophonemics in the study of English morphology. 4. **Describe** the principles of sentence structure including basic sentence patterns, immediate constituents, phrase-structure grammar, and transformational generative grammar. 5. **Compare** the methodologies and theoretical frameworks used in phonology and syntax for analyzing language structure.</p>

<p>Course No: Eng 442-IEL Course Title: Indian English Novels</p>	<ol style="list-style-type: none"> 1. Outline the major developments and themes in the history of Indo-Anglian novels. 2. Analyze the theme of escapism and its narrative techniques in Manoj Das's "The Escapist." 3. Discuss the exploration of personal and social conflicts in Shashi Despande's "If I Die Today." 4. Evaluate Khushwant Singh's depiction of communal tensions and historical impact in "Train to Pakistan." 5. Compare the thematic concerns and narrative styles of Das, Despande, and Singh in their respective novels.
<p>Course No: Eng443-IEL Course Title: Indian English Short Stories</p>	<ol style="list-style-type: none"> 1. Outline the development and key features of Indian English short stories throughout their history. 2. Analyze the themes of cultural conflict and human psychology in Tagore's "The Hungry Stones" and "The Kabuliwala." 3. Discuss the exploration of personal experiences and social issues in Manoj Das's "Laxmi's Adventure" and "Letter from the Last Spring." 4. Evaluate Anita Desai's use of symbolism and emotional depth in "Diamond Dust: A Tragedy" and "Games at Twilight." 5. Compare the narrative techniques and thematic concerns of Tagore, Das, and Desai in their respective short stories. <ol style="list-style-type: none"> 1. Summarize the key trends and notable figures in Indo-Anglian non-fictional prose throughout its history. 2. Analyze Swami Vivekananda's key arguments and philosophical perspectives presented in the "Introduction to the Address at the World Parliament of Religions." 3. Discuss Gandhi's reflections on morality and self-discipline in

<p>Course No: Eng444-IEL Course Title: Indian English Prose (Non-fiction)</p>	<p>Chapter 7 ("Stealing and Atonement") and his views on dietetics in "The Story of My Experiments with Truth." 4. Examine Manoj Das's portrayal of cultural and personal insights in "My Little India," focusing on "The Sinister Twilights" and "Midnight Rendezvous." 5. Compare the thematic concerns and narrative styles in Vivekananda's, Gandhi's, and Das's non-fictional prose.</p>
<p>Course No: Eng 445-IEL Course Title: Project and Viva</p>	<ol style="list-style-type: none"> 1. Develop a comprehensive research project that demonstrates a thorough understanding of the chosen topic and integrates relevant theories and methodologies. 2. Present the research findings effectively, utilizing appropriate visual aids and clear, articulate communication during the viva. 3. Critically analyze and discuss the research results, addressing any limitations or challenges encountered and proposing potential solutions or further research directions. 4. Demonstrate the ability to answer questions and engage in scholarly discussion, showcasing a deep understanding of the project topic and related fields. 5. Reflect on the research process, including the formulation of research questions, data collection, analysis, and the impact of the findings on the broader field of study.
<p>Module B: Non-British Novels in English Course No: Eng 441-NBNE Course Title: Theory of the Novel</p>	<ol style="list-style-type: none"> 1. Analyze Henry James's views on the nature of fiction and narrative technique as presented in "The Art of the Fiction." 2. Discuss Lukács's distinctions between epic and novel forms, and the concept of the inner form of the novel in Chapters 3 and 4 of "The Theory of the Novel." 3. Evaluate Jameson's analysis of Third World literature in relation to global capitalism in "Third World Literature in the Era of Multinational Capitalism." 4. Examine Wilson Harris's exploration of the role of imagination and its fabric in shaping narrative and cultural identity in "The Fabric of the Imagination" from "Third World Quarterly". 5. Compare the theoretical perspectives on narrative form and literary representation offered by James, Lukács, Jameson, and Harris.

<p>Course No :Eng 442-NBNE Course Title: Europe, America</p>	<ol style="list-style-type: none"> 1. Analyze Tolstoy's exploration of societal norms and personal conflict in "Anna Karenina." 2. Discuss Kafka's portrayal of bureaucracy and existential angst in "The Trial." 3. Evaluate Hawthorne's examination of sin, guilt, and redemption in "The Scarlet Letter." 4. Examine Ellison's depiction of racial identity and invisibility in "The Invisible Man." 5. Compare the treatment of personal and societal issues in Tolstoy's, Kafka's, Hawthorne's, and Ellison's novels.
<p>Course No :Eng 443- NBNE Course Title: Africa</p>	<ol style="list-style-type: none"> 1. Analyze the depiction of political and social issues in Achebe's "Anthills of the Savannah." 2. Discuss the themes of corruption and disillusionment in Armah's "The Beautiful Ones Are Not Yet Born." 3. Evaluate Salih's exploration of cultural identity and colonialism in "Season of Migration to the North." 4. Examine Coetzee's portrayal of moral and social decay in "Disgrace." 5. Compare the narrative techniques and thematic concerns related to post-colonial identity and societal critique in Achebe's, Armah's, Salih's, and Coetzee's novels.
<p>Course No :Eng 444-NBNE Course Title: Latin America and the Caribbean</p>	<ol style="list-style-type: none"> 1. Analyze Rulfo's use of magical realism and themes of memory and identity in "Pedro Páramo." 2. Discuss García Márquez's narrative techniques and exploration of Latin American history and culture in "One Hundred Years of Solitude." 3. Evaluate Lamming's depiction of colonialism and personal identity in "In the Castle of My Skin." 4. Examine Rhys's portrayal of post-colonial and feminist themes in "Wide Sargasso Sea." 5. Compare the use of magical realism and the representation of colonial and post-colonial themes in the works of Rulfo, García Márquez, Lamming, and Rhys.

<p>Course No: Eng 445-NBNE Course Title: Project and Viva</p>	<ol style="list-style-type: none"> 1. Conduct a Comprehensive Research Project: Develop and execute a research project that addresses a specific topic with thorough investigation and analysis, demonstrating advanced understanding and application of relevant methodologies. 2. Present Findings Clearly: Prepare and deliver a clear, well-organized presentation of the research findings, utilizing appropriate visual aids and demonstrating effective communication skills during the viva. 3. Engage in Scholarly Discussion: Participate in a viva voce by responding thoughtfully to questions and critiques, showing a deep grasp of the research topic and the ability to defend and elaborate on the project. 4. Reflect on Research Process: Critically evaluate the research process, including problem formulation, data collection, analysis, and conclusions, reflecting on any challenges faced and solutions applied. 5. Demonstrate Integration of Knowledge: Apply theoretical and practical knowledge from the course to the project, integrating different perspectives and demonstrating an understanding of how the project contributes to the broader field of study.
<p>Module C : Comparative Literature Course No :Eng441-CLTS Course Title: What is Comparative Literature? What is Translation?</p>	<ol style="list-style-type: none"> 1. Discuss Wellek’s definition and scope of Comparative Literature in “The Name and Nature of Comparative Literature” and its relevance to the field. 2. Analyze Sisir Kumar Das’s arguments for the importance of Comparative Literature in India as presented in “Why Comparative Literature in India?” 3. Evaluate James Holmes’s framework for Translation Studies and its application in “The Name and Nature of Translation Studies.” 4. Examine Walter Benjamin’s views on the role and challenges of translation in “The Task of the Translator.” 5. Compare the perspectives on Comparative Literature and Translation Studies from Indian and Western viewpoints, including contributions from Bharata Muni, Bhartrhari, Anandavardhana, and contemporary scholars like Ganesh Devy, Susann Bassnett, and André Lefevere.
<p>Course No :Eng442-CLTS <i>Course Title: Attitude to Nature in British and Oriya Romantic Poetry</i></p>	<ol style="list-style-type: none"> 1. Analyze the representation of nature in British Romantic poetry (1789-1832), focusing on its philosophical and aesthetic dimensions. 2. Discuss the depiction of nature in 19th and early 20th-century Oriya poetry, examining cultural and historical influences. 3. Evaluate Wordsworth’s depiction of nature and its impact on human emotions in “Tintern Abbey,” Shelley’s portrayal of the skylark as a symbol of inspiration in “To a Skylark,” and Keats’s imagery and themes related to the seasons in “To Autumn.” 4. Examine Radhanath’s portrayal of the Chilika Lake, Baikunthanath’s depiction of local musical traditions in “Nababarasa

	<p>Sangeeta,” and Mayadhar Mansingh’s representation of the Mahanadi River in “Mahanadire Jyotsna Bihar.”</p> <p>5. Compare the treatment of nature and its symbolic meanings in the British Romantic poetry of Wordsworth, Shelley, and Keats with the Oriya poetry of Radhanath, Baikunthanath, and Mansingh.</p>
<p>Course No :Eng443-CLTS</p> <p>Course Title: Attitude to Social Change in British and Oriya Novels</p>	<ol style="list-style-type: none"> 1. Explain the key concepts and factors contributing to social change in 19th-century England, focusing on industrialization, class structure, and social reform. 2. Discuss the nature of social change in 19th-century and early 20th-century Orissa, including colonial impacts, socio-economic transformations, and cultural shifts. 3. Analyze Charles Dickens’s portrayal of industrial society and its impact on individuals and families in "Hard Times," including themes of economic hardship and social critique. 4. Examine Fakir Mohan Senapati’s depiction of rural life and social issues in "Six Acres and a Third," focusing on the implications of landownership and social inequality. 5. Compare the representations of social change and its effects in Dickens’s "Hard Times" and Senapati’s "Six Acres and a Third," highlighting similarities and differences in their critiques of social structures.

<p>Course No : Eng444-CLTS Course Title: Attitude to Human Suffering in Greek and Sanskrit Drama</p>	<ol style="list-style-type: none"> 1. Discuss the concept of human suffering in ancient Greek thought, focusing on philosophical and literary perspectives, such as those found in tragedies and philosophical works. 2. Analyze the understanding of human suffering in ancient Indian philosophy and literature, including key concepts from religious and philosophical texts. 3. Examine Sophocles' exploration of fate, guilt, and personal suffering in "Oedipus the King," including the role of prophecy and tragic flaw. 4. Evaluate Kalidasa's portrayal of human suffering and redemption in "Abhijnanasakuntalam," focusing on themes of love, loss, and reconciliation. 5. Compare the treatment of human suffering in Sophocles' "Oedipus the King" and Kalidasa's "Abhijnanasakuntalam," highlighting cultural differences and similarities in their approaches to tragedy and resolution.
<p>Course No: Eng 445-CLTS Course Title: Project and Viva</p>	<ol style="list-style-type: none"> 1. Develop a comprehensive research project that demonstrates a thorough understanding of the chosen topic and integrates relevant theories and methodologies. 2. Present the research findings effectively, utilizing appropriate visual aids and clear, articulate communication during the viva. 3. Critically analyze and discuss the research results, addressing any limitations or challenges encountered and proposing potential solutions or further research directions. 4. Demonstrate the ability to answer questions and engage in scholarly discussion, showcasing a deep understanding of the project topic and related fields. 5. Reflect on the research process, including the formulation of research questions, data collection, analysis, and the impact of the findings on the broader field of study.

<p>Subject:</p> <p>Geology (M.Sc.)</p>	<p><i>After completion of the course the student will be able to :</i></p>
<p>Programme Outcome</p>	<p>PO1: Identify and understand geological phenomena and concepts, including geotectonics, structural geology, and mineral optics, and apply critical thinking to geologic field mapping, exploration, statistical analysis, and environmental issues.</p> <p>PO2: Demonstrate proficiency in using geoscience technologies and effectively present and document findings in English and an Indian language (e.g., Odia or Hindi).</p> <p>PO3: Develop skills for mediating disagreements, forming liaisons, and working collaboratively in various sectors, including government, public, private, and research institutes.</p> <p>PO4: Cultivate entrepreneurial skills to start and manage geoscience consultancies, mining leases, and industries such as cement and ceramics.</p> <p>PO5: Recognize and adhere to ethical and moral standards in the geoscience profession, taking responsibility in the workplace.</p> <p>PO6: Understand and assess environmental issues related to mining and mineral industries, focusing on sustainable development and natural hazard mitigation.</p> <p>PO7: Engage in independent and lifelong learning to adapt to geotechnological and socio-technological advancements.</p> <p>PO8: Analyze spatial and temporal relationships between Earth processes and products, including the development and evolution of Earth's spheres (lithosphere, hydrosphere, atmosphere, and biosphere).</p> <p>PO9: Assess and manage geo-hazards such as earthquakes, floods, landslides, tsunamis, and volcanic eruptions, and implement damage mitigation strategies.</p> <p>PO10: Employ computer techniques, software, and microscopy for geological research and data analysis, and identify and interpret fossils and groundwater behavior.</p>

<p>Programme Specific Outcome</p>	<p>PSO1: The Master of Science program in Geology offers an interdisciplinary Post-Graduate degree in Geology with the objective of understanding the nature and characteristics of different branches of Geology, thus educating students for success as a geo-scientist in government sector, public sector, private sector, research institutes, or further pursuit of Doctoral studies</p> <p>PSO2: Analyse the relationships among different branches of Geology with a goal to demonstrate content knowledge appropriate to professional career goals.</p> <p>PSO3: Perform procedures to apply theoretical, conceptual and observational knowledge to the analysis and interpretation of geologic data through hands on laboratory practice, field studies, preparation of maps and charts</p> <p>PSO4: Apply the basic concepts learned by the students to execute them by compiling critique geologic literature pertinent to original research; communicating geologic knowledge, findings and interpreting reports in academic, scientific institutions and industrial organizations.</p>
<p>Course Outcome</p>	
<p>Semester-I</p>	
<p>GL. C. 411 Crystallography & General Geology</p>	<p>CO1: Understand the basic concept of crystal structure, its relation to mineral constitution and its role in crystal geometry.</p> <p>CO2: Analyse various concepts of Physical Geology & Crystallography and understand them through case studies</p> <p>CO3: Apply the theoretical knowledge in understanding earth elements through hands-on laboratory practice</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
<p>GL. C. 412 (Meteorology & Environmental Geology and Marine Geology)</p>	<p>CO1: Understand the elements of oceanography, weather and climate, various types of natural hazards (causes, consequences, mitigation measures) and sources of renewable energy.</p> <p>CO2: Analyse various concepts of Oceanography, Meteorology & Environmental Geology and understand them through case studies</p> <p>CO3: Apply the theoretical knowledge in understanding various phenomena through preparation of weather charts and maps.</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
<p>GL. C. 413 (Mineralogy & Optical</p>	<p>CO1: Understand the basic properties (physical, optical and chemical) of minerals, their classification and uses.</p>

mineralogy)	<p>CO2: Analyse various concepts of optical phenomena concerning mineral identification</p> <p>CO3: Apply the theoretical knowledge of mineral structure and properties through hands-on laboratory practice</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course</p>
GL. C. 414 Geomorphology & Geo-statistics and Remote Sensing)	<p>CO1: Understand the basic concepts of Geomorphology and Remote Sensing</p> <p>CO2: Analyse various concepts of remote sensing with reference to management of various Earth resources and understand them through case studies</p> <p>CO3: Apply the theoretical knowledge in understanding various themes and preparing maps through hands on laboratory practice</p> <p>CO4: Execute field studies so as to verify the theoretical knowledge gained in the course.</p>
GL. C. 415 (Practical Corresponding to Course No. GL. C.411 and GL. C.412)	<p>CO1: Understand the various crystal classes and meteorological phenomena.</p> <p>CO2: Analyse various concepts of crystallography about crystal identification</p> <p>CO3: Apply the theoretical knowledge in crystal structure through hands-on laboratory practice and preparation of weather chart.</p> <p>Co4: Apply different statistical tools to solve geological problems</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
GL. C. 416 (Practical Corresponding to Course No. GL. C.413 and GL. C.414)	<p>CO1: Understand various mineral groups and elements of remote sensing.</p> <p>CO2: Analyse various concepts of mineralogy and optical mineralogy in relation to mineral identification</p> <p>CO3: Apply the theoretical knowledge of mineralogy and remote sensing through hands on laboratory practice and preparation of thematic maps</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
Semester-II	
GL. C. 421 (Igneous Petrology - A (Principles of Igneous rock formation) & Igneous Petrology - B (Classification and petro genesis igneous rocks)	<p>CO1: Understand the basic concepts of igneous rocks, their classification, formation and petro genesis.</p> <p>CO2: Analyse various concepts of igneous petrology about their identification</p> <p>CO3: Apply the theoretical knowledge in the process of classification, identification and formation through hands-on laboratory practice</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
GL. C. 422 (Sedimentary Petrology & Metamorphic Petrology)	<p>CO1: Understand the basic concepts of metamorphic and sedimentary rocks, their classification, formation and petro genesis.</p> <p>CO2: Analyse various concepts of metamorphic and</p>

	<p>sedimentary petrology in relation to their identification</p> <p>CO3: Apply the theoretical knowledge in the process of classification, identification, and formation of metamorphic and sedimentary rocks through hands-on laboratory practice</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
GL. C. 423 (Structural Geology & Geotectonics)	<p>CO1: Understand various concepts of Structural Geology.</p> <p>CO2: Analyse various concepts of structures about rock types</p> <p>CO3: Apply the theoretical knowledge of structures through hands-on laboratory practice and preparation of structural and base maps</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
GL. C. 424 (Practical corresponding to Course GL. C. 421 and GL. C. 422)	<p>CO1: Understand various rock types</p> <p>CO2: Analyse various concepts of petrology in relation to rock identification</p> <p>CO3: Apply the theoretical knowledge of petrology through hands on laboratory practice and preparation of various diagrams.</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
GL. C. 425 (Practical Corresponding to Course GL. C. 423 and Report on geological mapping)	<p>CO1: Understand various concepts of Structural Geology.</p> <p>CO2: Analyse various concepts of structures in relation to rock types</p> <p>CO3: Apply the theoretical knowledge of structures through hands on laboratory practice and preparation of structural and base maps</p> <p>CO4: Execute field studies so as to verify the theoretical knowledge gained in the course.</p>
GL. C. 426 Seminar and Field report	CO1: Develop the presentation and investigation skills.
Semester-III	
GL. C. 511 (Hydrology & Engineering Geology)	<p>CO1: Understand the basic concepts of groundwater geology and Engineering Geology</p> <p>CO2: Analyse various aspects of groundwater and engineering structures concerning various rock types and understand them through case studies</p> <p>CO3: Apply the theoretical knowledge in understanding various aspects through physicochemical analysis and preparation of maps through hands-on laboratory practice</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
GL. C. 512 (Geochemistry & Theories of Mineral Formation, Mineral Exploration and Surveying)	<p>CO1: Understand the basic concepts of formation and exploration of mineral deposits and geochemistry.</p> <p>CO2: Analyse various aspects of formation mechanism concerning various ore deposits and understand them through case studies</p>

	<p>CO3: Apply the theoretical knowledge in understanding various economic mineral deposits through phase diagrams and hands-on laboratory practice</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
<p>GL. C. 513 (Metallic Minerals/ Ores & Industrial Minerals)</p>	<p>CO1: Understand the basic concepts of ores and industrial minerals.</p> <p>CO2: Analyse various aspects of ores and industrial mineral deposits such as genesis, distribution, mode of occurrences, and uses and understand them through case studies</p> <p>CO3: Apply the theoretical knowledge in understanding and identifying various ores and industrial mineral deposits through phase diagrams and hands-on laboratory practice</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
<p>GL. C. 514 (Fossil Fuels, Nuclear Minerals and Mineral economics & Environmental Laws and Mining Laws)</p>	<p>CO1: Understand the basic concepts of coal, petroleum, and nuclear minerals. Understand the different provisions of mineral economics, environmental and mining laws.</p> <p>CO2: Analyse various types of coal, petroleum, and nuclear minerals such as genesis, distribution, mode of occurrences, and uses and understand them through case studies.</p> <p>CO3: Apply the theoretical knowledge in understanding and identifying various coal types and nuclear mineral deposits through hands-on laboratory practice</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
<p>GL. C. 515 (Practical Corresponding to Course No. GL. C. 511 and GL. C. 512)</p>	<p>CO1: Understand various rock aquifer properties, engineering properties of soils and rocks and surveying.</p> <p>CO2: Analyse various aquifer parameters in relation to groundwater and engineering structure</p> <p>CO3: Apply the theoretical knowledge of hydrology and engineering geology through hands on laboratory practice, preparation of various diagrams and conducting surveying.</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course. Determination of pH, Temperature, TDS, and other parameters for groundwater quality</p>
<p>GL. C. 516 (Practical Corresponding to Course No. GL. C. 513 and GL. C. 514)</p>	<p>CO1: Understand various ores and industrial minerals.</p> <p>CO2: Analyse various concepts of economic geology concerning their economic properties.</p> <p>CO3: Apply the theoretical knowledge of economic geology through hands-on laboratory practice and preparation of various maps and flow charts.</p> <p>CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
<p>Semester-IV</p>	

<p>GL. C. 521 (Invertebrate Paleontology & Paleobotany, Paleopalynology, Vertebrate Paleontology and Micropaleontology)</p>	<p>CO1: Understand the basic concepts of the evolution of life. CO2: Analyse various aspects of fossil science (vertebrate, invertebrate, plant, spore, pollen, and microfossils) about their identification CO3: Apply the theoretical knowledge of classification, identification, evolution, and morphology through hands-on laboratory practice CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
<p>GL. C. 522 (Precambrian Stratigraphy & Phanerozoic Stratigraphy)</p>	<p>CO1: Understand the basic concepts of principles of stratigraphy. CO2: Analyse various aspects of chronology about their lithology, fossil contents and economic importance. CO3. Apply the theoretical knowledge of stratigraphic correlation through hands-on laboratory practice. CO4: Execute field studies to verify the theoretical knowledge gained in the course.</p>
<p>GL. E. 523 (ORE GENESIS)</p>	<p>CO1: Understand the basic concepts of ores with special emphasis on their genesis. CO2: Analyse various aspects of ore deposits such as genesis, distribution, mode of occurrences, uses and understand them through case studies CO3: Apply the theoretical knowledge in understanding and identifying various ore deposits through phase diagrams and hands-on laboratory practice CO4: Execute field studies to verify the theoretical knowledge gained in the course</p>
<p>GL. C. 524 (Practical Corresponding to Course GL. C. 521 and GL. C. 522)</p>	<p>CO1: Understand the basic concepts of principles of Palaeontology and Stratigraphy. CO2: Analyse various branches of palaeontology chronology about identifications of fossils (vertebrate, invertebrate, plant, spore, pollen and microfossils) CO3: Apply the theoretical knowledge of the morphology of fossils for identification through hands-on laboratory practice. CO4: Execute field studies on fossil sites to verify the theoretical knowledge gained in the course.</p>
<p>GL. E. 525 (Practical Corresponding to Course AG. E. 523 and dissertation/ field Report)</p>	<p>CO1: Understand the basic concepts of ores with special emphasis on their genesis. CO2: Analyse various aspects of ore deposits such as genesis, distribution, mode of occurrences, uses and understand them through case studies CO3: Apply the theoretical knowledge in understanding and identifying various ore deposits through phase diagrams and hands-on laboratory practice CO4: Execute field studies to verify the theoretical knowledge gained in the course</p>
<p>GL. C. 526 (Project)</p>	

SUBJECT: HISTORY(M.A.)	
PROGRAMME OUTCOMES	<p>PO1: Analyse historical events, movements, and figures critically to understand their impact on contemporary society.</p> <p>PO2: Evaluate primary and secondary historical sources to construct evidence-based arguments and narratives.</p> <p>PO3: Interpret the cultural, social, economic, and political developments across different periods and regions.</p> <p>PO4: Synthesize information from various historical periods to identify patterns and trends in human history.</p> <p>PO5: Apply historical methodologies and theoretical frameworks to research and academic writing.</p> <p>PO6: Communicate historical knowledge effectively through written, oral, and digital means.</p> <p>PO7: Engage in historiographical debates and contribute to scholarly discussions with well-founded perspectives.</p> <p>PO8: Assess the ethical implications of historical interpretations and representations.</p> <p>PO9: Collaborate with peers and experts in interdisciplinary research projects related to history.</p> <p>PO10: Demonstrate a comprehensive understanding of local, national, and global histories, emphasizing the interconnectedness of different regions and cultures.</p> <p>PO11: Advocate for the preservation and promotion of historical heritage and its relevance to contemporary issues.</p> <p>PO12: Develop lifelong learning skills and a commitment to ongoing professional development in the field of history.</p>
PROGRAMME SPECIFIC OUTCOMES	<p>PSO1: Analyse the historical development of Odisha, with a focus on its cultural, social, political, and economic transformations.</p> <p>PSO2: Investigate significant historical periods and events in Indian history, emphasizing key figures, movements, and socio-political changes.</p> <p>PSO3: Examine global historical processes, including colonization, industrialization, and globalization, and their impact on various regions.</p> <p>PSO4: Utilize archival materials, oral histories, and archaeological evidence to construct detailed historical accounts.</p> <p>PSO5: Critique historical literature and historiography to understand diverse interpretations and approaches in the</p>

	<p>study of history.</p> <p>PSO6: Conduct independent historical research using appropriate methodologies and present findings in a scholarly manner.</p> <p>PSO7: Interpret the role of gender, caste, religion, and ethnicity in shaping historical narratives and contemporary society.</p> <p>PSO8: Engage with contemporary debates and discussions on historical topics, contributing original insights and perspectives.</p> <p>PSO9: Apply digital tools and technologies in the research, analysis, and dissemination of historical knowledge.</p> <p>PSO10: Advocate for the preservation of historical sites, artifacts, and documents, highlighting their importance for cultural heritage and education.</p> <p>PSO11: Collaborate with local communities and organizations to promote public history initiatives and historical awareness</p>
	COURSE OUTCOMES
SEMESTER-1	<i>After the completion of course, the student will able to:</i>
<p style="text-align: center;">H4.1.1 Indian civilization (from third millennium BCE to 1526 AD)</p>	<p>CO1: Analyze archaeological, literary, epigraphic, and numismatic sources to understand the extent, date, and characteristics of the Harappan Civilization and the Vedic age.</p> <p>CO2: Evaluate the political, social, and economic developments during the rise of the Janapadas and Mahajanapadas, the emergence of republican states in the 6th century BC, and the establishment and administration of the Mauryan Empire.</p> <p>CO3: Assess the contributions and impacts of the Indo-Greeks, Shunga, Kushanas, Northern and Western Kshatrapas, and Satavahanas on the socio-political landscape of ancient India, along with the administration and decline of the Gupta Empire.</p> <p>CO4: Examine the advent of Islam in India, the Arab invasion of Sind, and the consolidation and administration of the Delhi Sultanate under Iltutmish and Balban, as well as Alauddin Khalji's territorial expansion and market reforms.</p>

<p>H4.1.2 Indian civilization (A.D 1526-1950)</p>	<p>CO1:Analyze the social conditions of India during the Mughal rule, including the status of nobility, peasants, artisans, women, and slaves, as well as the religious policies of Akbar and Aurangzeb and the administrative practices of Sher Shah and Shivaji.</p> <p>CO2: Evaluate the advent of European powers in India, focusing on the foundation of the British Empire through the Battles of Plassey and Buxar, and the impact of social reforms under Bentinck and Dalhousie, along with the growth of press and journalism in British India.</p> <p>CO3: Assess the causes, nature, and consequences of the First War of Independence, the British economic impact on agriculture and industry, and the significance of socio-religious movements such as BrahmoSamaj, AryaSamaj, and the Aligarh Movement.</p> <p>CO4: Examine the rise of Indian nationalism, the formation and role of the Indian National Congress from 1885 to 1920, the emergence of Gandhi and his methods, and the major movements such as Non-Cooperation, Civil Disobedience, and Quit India, leading to the partition and independence of India</p> <p>CO5: Investigate the origins of Odisha and the historical geography of Utkala, Kalinga, Tosala, Odra, and South Kosala, highlighting the evolution of these regions.</p> <p>CO6: Analyse the causes and effects of the Kalinga War, the expansion of Kalinga under Kharavela, the invasion of Samudragupta, and the rise of the Matharas and the Nalas.</p>
<p>H4.1.3 Landmarks in Odishan history (4TH BC – 1568 AD)</p>	<p>CO1: Investigate the origins of Odisha and the historical geography of Utkala, Kalinga, Tosala, Odra, and South Kosala, highlighting the evolution and significance of these regions.</p> <p>CO2:Analyze the causes and effects of the Kalinga War, the expansion of Kalinga under Kharavela, the invasion of Samudragupta, and the rise of the Matharas and the Nalas.</p>

	<p>CO3: Evaluate the formation and development of sub-regional kingdoms under the Sarabhapuriyas and Sailodbhavas, including their origins and historical context, as well as the establishment of regional kingdoms under the Bhauma-Karas and Somavamsis.</p> <p>CO4: Examine the achievements and administration of the Imperial Gangas, focusing on rulers such as Chodagangadeva, Narsimhadeva I, and AnangaBhimadeva III, and explore the search for identity and statecraft under the SuryavansiGajapatis, including Kapilendradeva, Purusottamadeva, and Prataparudradeva, leading to the fall of the Odisha Kingdom in 1568 A.D.</p>
<p>H4.1.4 Landmarks in Odishan history (A.D. 1568 TO 1950)</p>	<p>CO1: Analyse the impact of the advent of Afghans and the Afghan-Mughal conflict on Odisha, as well as the implications of Mughal rule and Chauhan rule in the region.</p> <p>CO2: Evaluate the significance of the Bhois of Khurda under Ramchandra Deva-I, the resistance movements such as the Paik Rebellion and Surendra Sai's involvement in the Revolt of 1857.</p> <p>CO3: Examine the creation of Odisha Province, the role of the freedom movement within Odisha, and the regional contributions to the Non-Cooperation, Civil Disobedience, and Quit India movements.</p> <p>CO4: Assess the process and implications of the merger of princely states in Odisha, the role of H.K. Mahatab, the development of press and journalism, and the growth of education during the post-colonial period.</p>
<p>SECOND SEMESTER</p>	
<p>H4.2.1 World in 20th Century. (1914 – 1950)</p>	<p>CO1: Analyse the causes and consequences of the First World War, the implications of the Paris Peace Settlement and Treaty of Versailles, the causes and outcomes of the Russian Revolution of 1917, and the achievements and failures of the League of Nations.</p> <p>CO2: Evaluate the efforts for disarmament through the Washington Conference and Kellogg-Briand Pact, the rise of Fascism and Nazism, the policy of appeasement,</p>

	<p>and the causes and consequences of the Spanish Civil War.</p> <p>CO3: Examine the foreign policies of France and the USA, the rise of modern Turkey under Mustafa Kemal Pasha, including his domestic and foreign policies, and the rise of Japan as a world power with its corresponding domestic and foreign policies.</p> <p>CO4: Assess the causes and results of the Second World War, the origin, organization, and functions of the United Nations, the background, causes, and results of the Chinese Revolution of 1949, and the background and dynamics of the Cold War and the superpower rivalry.</p>
<p>H4.2.2 World in 20th Century (1950-1995)</p>	<p>CO1:Analyze the Cold War military alliances such as NATO, Warsaw Pact, SEATO, and CENTO, the superpower rivalry highlighted by the Berlin Crisis and Cuban Crisis, the Vietnamese Conflict (1945-1975), and the West Asian conflicts including the Palestine problem and the Arab-Israel Wars of 1948, 1956, 1967, and 1973.</p> <p>CO2: Evaluate the efforts towards disarmament and arms control, including the Disarmament Conferences from 1946 to 1972, SALT I and SALT II agreements, the impact of American occupation on Japan (1945-1951), and developments in the Far East and South-East Asia.</p> <p>CO3: Assess the process of détente and the end of the Cold War, the evolution of Sino-US and US-Soviet relations, the causes and consequences of the disintegration of the Soviet Union, the emergence of a new world order transitioning from a bipolar to a unipolar system, and the impact of globalization on Third World countries.</p> <p>CO4: Examine the salient features of India's foreign policy, the role and significance of India in the Non-Aligned Movement, India's bilateral relations with the USA, USSR, China, and Pakistan, and India's engagement with regional organizations such as SAARC and ASEAN, including the Act East Policy.</p>
<p>H4.2.3 Concept of History and Historiography.</p>	<p>CO1:Analyze the definition, different views, and scope of history, and its relationship with social and natural sciences to understand the interdisciplinary nature of</p>

	<p>historical study.</p> <p>CO2: Evaluate the sources and significance of ancient Indian historiography, including the Vedas, Puranas, Buddhist and Jaina writings, the Harshcharita of Banabhatta, and the Rajtarangini of Kalhana.</p> <p>CO3: Examine the trends in medieval historical writings, focusing on the contributions of historians during the Sultanate and Mughal periods such as Alberuni, Amir Khusrau, ZiauddinBarani, and AbulFazal.</p> <p>CO4: Assess the trends in modern historical writing, including the Colonial, National, Marxist, and Subaltern schools, and explore the impact of post-modernism through the works of historians like D.D. Kosambi, JadunathSarkar, and Bipan Chandra.</p>
<p>H4.2.4 Research Methodology</p>	<p>CO1: Understand and define the meaning, objectives, and motivations of research, identify the general characteristics and criteria of good research, and distinguish between different types of research.</p> <p>CO2:Analyze and select research problems, define research problems clearly, design research studies, and formulate testable hypotheses.</p> <p>CO3: Evaluate various methods of data collection, process collected data effectively, and apply appropriate techniques for data analysis.</p> <p>CO4: Interpret research findings, write comprehensive research reports, understand and avoid plagiarism, correctly use bibliography and reference styles, and arrange a thesis systematically.</p>
<p>H4.2.5 Inter Disciplinary Course(Art and Architecture)</p>	<p>CO1:Analyze the distribution and cultural context of rock art in India, with a particular focus on the sites of Bhimbetka and the Vindhyan Range, and evaluate the features of Harappan art and architecture, including sculptures, terracotta art, jewelry, and town planning.</p> <p>CO2: Evaluate the characteristics and contributions of the Asokan School of Art, including its pillars and terracotta works, and compare the Gandhara, Mathura, and</p>

	<p>Sarnath schools of art, alongside the origin and development of stupa architecture at significant sites such as Sanchi and Bharhut.</p> <p>CO3: Examine the evolution and significance of rock-cut architecture in India, with specific case studies on Nagarjuni and Barabar Hills, Khandagiri and Udayagiri, and Ajanta Cave No. 1.</p> <p>CO4: Interpret the cultural and historical significance of various art and architectural styles in ancient India, understanding their development, regional variations, and the influence of religious and social contexts on their evolution.</p>
THIRD SEMESTER	
<p>H5.1.1 Heritage of Art And Architecture in Indian Context</p>	<p>CO1:Analyze the distribution and cultural context of rock art in India, with a focus on the sites of Bhimbetka and the Vindhyan Range, and evaluate the features of Harappan art and architecture, including sculptures, terracotta art, jewelry, and town planning.</p> <p>CO2: Evaluate the characteristics and contributions of the Asokan School of Art, including its pillars and terracotta works, and compare the Gandhara, Mathura, and Sarnath schools of art. Assess the origin and development of stupa architecture at significant sites such as Sanchi and Bharhut.</p> <p>CO3: Examine the evolution and significance of rock-cut architecture in India, with specific case studies on Nagarjuni and Barabar Hills, Khandagiri and Udayagiri, and Ajanta Caves No. 1 and 10.</p> <p>CO4: Investigate the origin and evolution of temple architecture in India, focusing on the Gupta period and the development of provincial schools at Mahabalipuram (Mandapas and Rathas) and Khajuraho (Kandariya Mahadeva).</p>
<p>H5.1.2 Historical Application in Tourism.</p>	<p>CO1: Define the concept, characteristics, forms, types, and purposes of tourism, and evaluate the role of policy and planning in tourism development.</p>

	<p>CO2: Assess the strategies for tourism promotion, including advertising, publicity, public relations, personal selling, and merchandising, and explore the roles and functions of travel agencies and tourism organizations in both international and national contexts.</p> <p>CO3: Evaluate various sources of tourism information, including government agencies, private agencies, and media, and analyze tour packaging, pricing, travel arrangements, tourist accommodation, catering services, and the role of guides and escorts.</p> <p>CO4: Examine the principles of tourism management and regulation, including inbound and outbound travel regulations such as visas, special permits, customs, and other relevant regulations.</p>
SPECIAL PAPER (A or B or C)	
<p>H5.1.3 A: - Archaeology Archaeological Culture and Sequence in Indian Perspective.</p>	<p>CO1: Define and evaluate the aim and scope of archaeology, trace the history of Indian archaeology, and explore the relationship between archaeology and social and natural sciences. Analyze the developments in New Archaeology, Processual Archaeology, and Post-Processual Archaeology.</p> <p>CO2: Examine the Palaeolithic cultures of India, including the Sohan and Acheulian traditions, Middle Palaeolithic culture, and the Microlithic tradition with a focus on sites like Jwalapuram, Mehtakhei, and West Bengal. Assess the Mesolithic cultures of SaraiNaharRai, Bagor, and Adamgarh.</p> <p>CO3: Investigate the Neolithic cultures of India, particularly in Burzoham, Southern India, Odisha, and Koldihawa. Evaluate the Chalcolithic village communities at Kayatha, Ahar, Malwa, Jorwe, Khameswaripali, and GolbaiSason, and analyze the antecedents, main features, chronology, and factors responsible for the decline of the Ha culture.</p> <p>CO4:Analyze the typology and cultural characteristics of the Megalithic culture of South India, examine the Iron Age cultures of Northern India, including the PGW and</p>

	<p>NBPW cultures, and provide a general outline of early historic urban sites in India, such as Sisupalgarh and Arikamedu.</p>
<p>H5.1.4 Indian Epigraphy</p>	<p>CO1:Analyze the role of epigraphs as historical sources, including the classification of inscriptions, and understand the technology, form, and writing materials used. Evaluate the significance of dates and eras such as the Saka Era and Gupta Era in historical context.</p> <p>CO2: Explore the origins and antiquity of writing in India, including the development of ancient Indian scripts. Assess the origins of the Indus script, as well as the Brahmi and Kharoshthi scripts, and their historical significance.</p> <p>CO3: Examine the Ashokan Rock Edicts, including the Jaugarh and Dhauli inscriptions, and specific edicts such as the XII and XIII Rock Edicts of Ashoka. Analyze the Hathigumpha inscription of Kharavela to understand its historical and cultural impact.</p> <p>CO4: Evaluate the historical significance of major inscriptions such as the Nasik Inscription of VasisthiputraPulumavi, Junagarh Inscription of Rudradaman, Besnagar Inscription of Heliodorus, PrayagaPrashasti of Samudragupta, and Aihole Inscription of Pulakeshin II.</p>
<p>H5.1.3 B:- Museology Introduction to Museology.</p>	<p>CO1: Define and analyze the history, aim, and scope of museums, including the history of museums in India. Classify different types of museums and understand their functions, as well as the aims, methods, and ethics of collection.</p> <p>CO2: Examine the processes of documentation, including identification, classification, and accessing of museum objects. Evaluate museum management practices, including staffing, insurance, security, storage, surroundings, and marketing of museum objects.</p> <p>CO3: Explore the principles of conservation and preservation, focusing on different types of museum materials. Identify and control deteriorating factors affecting both organic materials (manuscripts, wood, paper, ivory, and bone) and inorganic materials (stone, terracotta, glass,</p>

	<p>and metal).</p> <p>CO4: Assess various types of museum exhibitions and the equipment required for them. Understand the principles of labeling and evaluate museum-public relations, including visitor types and behaviors. Analyze the role of publications such as guidebooks, catalogues, monographs, and newsletters in museum communication.</p>
<p>H5.1.3 C:- Cultural History of India Social Structure.</p>	<p>CO1:Analyze the structure and characteristics of Harappan society, Vedic society, and the social organization during the Gupta period, focusing on social hierarchies, roles, and cultural practices.</p> <p>CO2: Evaluate the social structure during the medieval period, including the Sultanate and Mughal periods. Assess Hindu social life and the position of women during these eras, highlighting changes and continuities.</p> <p>CO3: Examine the social dynamics of the 18th century in India, including religious practices, caste structure, and the impact of social reforms during colonial rule on Indian society.</p> <p>CO4: Assess the awakening among Muslims, focusing on the contributions of S.A. Khan and the Aligarh Movement. Analyze the characteristics and salient features of the Indian Renaissance and explore social mobility trends in the 20th century.</p>
<p>H5.1.4 State Economy.</p>	<p>CO1:Analyze the economic structure of the Indus Valley Civilization, the pastoral economy during the Vedic period, and the role of the economy in the rise of urban centers around 600 BC.</p> <p>CO2: Evaluate trade and commerce between the 3rd century BC and the 7th century AD, focusing on the agrarian economy of the Mauryan Empire, trade practices, and revenue extraction methods.</p> <p>CO3: Examine the agrarian system during the Sultanate period, the processes of urbanization and development of urban centers, and the trade and commerce practices</p>

	<p>during the Mughal period.</p> <p>CO4: Assess the condition of the Indian economy on the eve of British conquest, analyze the impact of British rule on Indian agriculture, and explore the development of industrial capitalism in India.</p>
<p>H5.1.3 D:- Cultural History of Odisha State of Economy.</p>	<p>CO1:Analyze the economic life of ancient Odisha under the Nandas, Mauryas, and Mahameghavahanas, and evaluate the economic conditions during the Sailodbhavas, Bhaumakaras, and Somavamsis periods.</p> <p>CO2: Examine the economic life in Odisha under the Ganga and Gajapati dynasties, as well as during the Afghan and Mughal periods, and assess the impact of British rule on Odisha's economy.</p> <p>CO3: Investigate trade routes and highways in Odisha, analyze economic calamities affecting the region, and explore maritime activities that influenced Odisha's economic development.</p> <p>CO4: Assess the impact of British rule on Indian agriculture, explore the development of industrial capitalism, and examine the economic life among the tribals of Odisha.</p>
<p>H5.1.4 D:- Religion</p>	<p>CO1:Analyze the growth and development of Buddhism, Jainism, Saivism, and Vaisnavism in Odisha, including their historical context and influence on local culture.</p> <p>CO2: Examine the significance of various religious cults and movements in Odisha, including the SaptaMatrikas, Yogini cult, Siddha movement, and tribal religious faiths such as the Stambhaswari and Naga cults.</p> <p>CO3: Evaluate the origin and growth of the Jagannath cult, the development of the Mahima cult, and the impact of evangelization, Brahmo movement, and the rise of the Satanami cult on Odisha's religious landscape.</p> <p>CO4: Investigate Odisha's cultural contact with Southeast Asia and explore the role and significance of sun worship in Odisha.</p>

<p style="text-align: center;">H5.1.5 Computer Application in Historical Studies.</p>	<p>CO1: Define and analyse the basic structure of computers, including components such as the CPU, I/O devices, and memory, and classify different types of computers based on their functions and applications.</p> <p>CO2: Compare and contrast various operating systems, including Windows, UNIX, and GNU/Linux, and understand basic concepts of computer languages, distinguishing between low-level and high-level languages.</p> <p>CO3: Evaluate application programs and data representation, including the fundamentals of word processing, spreadsheets, data entry, tabulation, and presentation software. Understand the concept of database management and its applications.</p> <p>CO4: Assess the importance of information technologies and explore the Internet, World Wide Web (www), and their resources. Analyze the application of computer technology in historical research and its impact on the field.</p>
<p>FOURTH SEMESTER</p>	
<p style="text-align: center;">H5.2.1 Heritage of Art and Architecture in Odishan Context.</p>	<p>CO1:Analyze the significance of rock art in Orissa and evaluate the town planning of Sisupalgarh. Explore Buddhist art and architecture, including Ashokan art, and the features of Chaityas and Viharas.</p> <p>CO2: Trace the evolution of temple architecture in Orissa, focusing on decorative elements and specific temples such as Parashurameswara, Mukteswara, Vaital, Lingaraja, Rajarani, and Konarka.</p> <p>CO3: Examine the architectural features of temples in Western Orissa, including the Stellate Temples of Boud, the Twin Temple of Gandharadi, and temples at Ranipur-Jharial, Charda, Suvarnameru, and Rameswara of Subarnapur.</p> <p>CO4: Evaluate the use of symbols and icons in art and religion, and explore various art forms including tribal art, terracotta art, and PattaChitra.</p>

<p>H5.2.2 Historical Application in Tourism (History as Tourism Product)</p>	<p>CO1: Identify and analyze historical sites of national importance, including Dhauri and Ayodhya, and evaluate archaeological sites of national significance such as Dholavira and Sarnath.</p> <p>CO2: Examine and assess monuments of national importance, including the Red Fort and the Taj Mahal. Analyze the architectural significance of national treasures such as Ajanta Paintings and the Sun Temple.</p> <p>CO3: Explore and evaluate religious centers of national importance, including Puri and Badrinath, and assess the significance of museums of national importance, such as the Indian Museum in Kolkata and the National Museum in New Delhi.</p> <p>CO4: Investigate tourist places of national importance, including Amritsar and Kanyakumari, and examine the significance of national fairs and festivals, such as KumbhMela, RathaYatra, and DhanuYatra.</p>
<p>SPECIAL PAPER (A or B or C)</p>	
<p>H5.2.3 (A) Principle and Method of Archaeology</p>	<p>CO1: Describe and apply various methods of archaeology, including exploration techniques such as literary sources, village surveys, toposheet reading, geological mapping, and geophysical methods. Develop problem formulation and design excavation plans, including trench layout, trench types, and different excavation techniques like vertical, horizontal, step excavation, and the quadrant method. Understand and apply stratigraphy and stratification, including the Wheeler and Harris Matrix.</p> <p>CO2: Implement and evaluate methods of recording archaeological data using three-dimensional techniques, photography, and drawing. Apply methods of relative dating, including stratigraphy, typology, and analysis of pollen and faunal remains.</p> <p>CO3: Analyze and apply chronometric dating techniques such as radiocarbon dating, thermoluminescence (TL), potassium-argon dating, and dendrochronology. Understand the stages of ceramic production and classification of pottery, and assess the appearance and</p>

	<p>development of stone tools and technology through main techniques and tools of the Stone Age.</p> <p>CO4: Conduct practical fieldwork training on methods of exploration and excavation over a period of approximately 10 days. Prepare and submit a detailed field report for assessment by external and internal examiners, demonstrating the application of learned methods and techniques in a real-world context.</p>
<p>H5.2.4 Indian Numismatics</p>	<p>CO1:Analyze the role of numismatics as a historical source, including the history of numismatic studies in India, relevant terminology, and the provenance of coins through archaeological excavation, stratigraphic relevance, stray findings, and hoards.</p> <p>CO2: Evaluate the origin and antiquity of coinage in India, discussing various theories such as Greek, Achaemenian, Babylonian, and indigenous origins. Understand and apply techniques of minting coins, including punching, casting, die-striking, and repoussé.</p> <p>CO3: Classify and interpret punch-marked coins and Indo-Greek coins, examining the contributions of rulers such as Diodotus I, Euthydemus I, Demetrius I, Demetrius II, Agathocles, and Menander. Study tribal coins including those of the Yaudheyas and Malavas.</p> <p>CO4: Examine the coinage of the Kushanas, including rulers like KujulaKadphices, VimaKadphices, Kaniska I, and Huviska. Analyze the coins of the Satavahanas, including Simukha, GautamiputraSatakarni, and VasistiputraPulamavi, as well as Gupta coinage and Orissan coinage with a general outline.</p>
<p>H 5.2.3 (B) B: MUSEOLOGY Museums and Application</p>	<p>CO1:Describe the professional organizations related to museums, including the International Council of Museums (ICOM) and the Archaeological Survey of India (ASI), and understand their roles and contributions to museum management and preservation.</p> <p>CO2:Analyze the history, organization, collections, exhibitions, education, and public relations of major national museums, including the National Museum,</p>

	<p>New Delhi, the Indian Museum, Kolkata, and the RastriyaManavaSanghralaya. Understand their impact on cultural heritage and education.</p> <p>CO3: Examine the history, organization, collections, exhibitions, and public relations of regional museums, including the Salarjung Museum, Hyderabad, the Orissa State Museum, Bhubaneswar, and the Dr. N.K. Sahu Museum, Sambalpur University. Assess their contributions to regional and national heritage.</p> <p>CO4: Conduct practical training in a museum setting for approximately 10 days, applying theoretical knowledge to real-world museum practices. Prepare and submit a detailed field report of the training for assessment by both external and internal examiners.</p>
<p>C: CULTURAL HISTORY OF INDIA</p> <p>H 5.2.3 (C)</p> <p>Religion and Philosophy</p>	<p>CO1:Analyze and compare the religious practices and beliefs of the Indus Valley Civilization, Early Vedic and Later Vedic periods, and the philosophies of Jainism and Buddhism.</p> <p>CO2: Examine the development and characteristics of major Indian religious traditions, including Vaishnavism, Shaivism, Shaktism, and other minor sects, and assess their impact on Indian culture and society.</p> <p>CO3: Explain the meaning and classification of Indian philosophy, with a focus on Vedanta, the Bhagavad Gita, and the philosophy of Swami Vivekananda. Assess their contributions to Indian thought and their relevance in contemporary contexts.</p> <p>CO4: Evaluate the Visistadvaita philosophy of Ramanuja, the concept of mother worship, tribal religious systems, and Tantrism. Understand their significance and influence on Indian religious practices and beliefs.</p>
<p>H 5.2.4 (C)</p> <p>Literature</p>	<p>CO1: Classify and analyze the Vedas, including their social context as depicted in the Rig Vedic Aryans. Examine the epic literature of the Ramayana and Mahabharata, and understand the distinctive features and classifications of the Puranas.</p>

	<p>CO2: Interpret and evaluate the significance of the Upanishads, Megasthenes's <i>Indica</i>, Kautilya's <i>Arthashastra</i>, Sangam Literature, and Manusmriti. Assess their contributions to ancient Indian philosophy, governance, and social structure.</p> <p>CO3: Analyze the literary works of Kalidasa, such as <i>Raghuvamsham</i> and <i>AbhijnanShakuntalam</i>, and Banabhatta's <i>Kadambari</i>, focusing on their stylistic elements and impact on classical Indian literature.</p> <p>CO4: Trace the origin and development of modern Indian languages through a general survey, and evaluate the literary contributions of Bankim Chandra Chattopadhyay and Prem Chand to modern Indian literature.</p>
<p>D: CULTURAL HISTORY OF ODISHA</p> <p>H 5.2.3 (D)</p> <p>Social Structure</p>	<p>CO1: Analyze the caste structure in ancient and early medieval Odisha, including the migration of Brahmanas, and examine the position of women with a focus on the Devadasi system and its impact on society.</p> <p>CO2: Describe and interpret social customs in Odisha, such as food and drink, costumes, ornaments, games and pastimes, fairs and festivals, and the development of Odissi as a dance form, highlighting their cultural significance.</p> <p>CO3: Evaluate the social setup of tribal communities in Odisha, including the Kandhas, Binjhals, Oraon, Kisan, Mundas, Sauras, and Santhalas, and understand the social structure under Afghan rule.</p> <p>CO4: Assess the social structure in Odisha during the Mughal period, and analyze the social changes that occurred during British rule and the post-colonial period, examining their impact on the region's societal development.</p>
<p>H 5.2.4 (D)</p> <p>Literature</p>	<p>CO1: Analyze inscriptional literature in Odisha, focusing on the Kalinga Edicts of Ashoka and the Hathigumpha Inscription, and evaluate their historical and cultural</p>

significance.

CO2: Examine Odisha's palm leaf manuscripts, with particular emphasis on the Madalapanji, and assess Odisha's contributions to Sanskrit literature, specifically through works like the *Gita Govindam*.

CO3: Explore Panchasakha literature, including its nature and philosophy, and analyze the *SaralaMahabharat*. Discuss the development of modern Oriya literature, focusing on Radhanath Roy's contributions.

CO4: Evaluate the works of Fakir Mohan Senapati and GangadharMeher, and analyze folk songs of Odisha, with a special focus on Western Odisha. Investigate the history of education and learning in ancient Odisha and the development of the press in the region.

SUBJECT: M.Sc in PHYSICS	After completion for the course student will able to
PROGRAMME OUTCOMES	<p>PO1:Recall and describe fundamental concepts of classical mechanics, electromagnetism, quantum mechanics, and statistical mechanics.</p> <p>PO2:Explain the underlying principles and theories of advanced physics topics such as solid-state physics, nuclear physics, and particle physics.</p> <p>PO3:Apply mathematical techniques and physical principles to solve complex problems in theoretical and experimental physics.</p> <p>PO4:Analyze and interpret experimental data, identifying patterns and deriving conclusions about physical phenomena.</p> <p>PO5:Design and conduct experiments, integrating knowledge from different areas of physics to investigate new phenomena.</p> <p>PO6:Critically evaluate scientific research papers, assess the validity of methodologies, and judge the significance of results within the broader context of the field.</p> <p>PO7:Develop and propose innovative solutions to real-world problems by synthesizing concepts from various domains of physics.</p> <p>PO8:Lead and manage independent research projects, demonstrating advanced skills in project planning, execution, and communication of results.</p> <p>PO9:Demonstrate ethical conduct in scientific research and professional practice, upholding integrity and responsibility.</p> <p>PO10:Recognize the importance of lifelong learning and engage in continuous professional development to stay updated with advancements in the field of physics.</p> <p>PO11:Utilize advanced laboratory equipment and computational tools to conduct sophisticated experiments and simulations.</p>
PROGRAMME SPECIFIC OUTCOMES	<p>SO1:Identify and recall advanced concepts in specialized areas of physics, such as condensed matter physics, astrophysics, and quantum field theory.</p> <p>SO2:Summarize and interpret the latest developments and research findings in various branches of physics.</p> <p>SO3:Apply theoretical knowledge to perform advanced</p>

	<p>simulations and modeling of physical systems using software tools.</p> <p>SO4:Analyze complex physical systems and break down their components to understand their functioning and underlying principle.</p> <p>SO5:Integrate knowledge from various subfields of physics to design innovative experiments and propose new theoretical models.</p> <p>SO6:Evaluate experimental results and compare them with theoretical predictions to validate or refute existing theories.</p> <p>SO7:Formulate new hypotheses based on existing knowledge and design experiments to test these hypotheses.</p> <p>SO8:Collaborate with interdisciplinary teams to address complex scientific problems and contribute to multi-disciplinary research projects.</p>
COURSE OUTCOMES	
SEMESTER-1	
PHY- 411: Classical and Relativistic Mechanics	<p>CO1:Analyze the principles of small oscillations and apply normal coordinates and normal modes to the vibration of linear symmetric molecules.</p> <p>CO2:Explain the concept of generalized coordinates for rotation and describe rotation as an orthogonal transformation.</p> <p>CO3:Derive the equations for the general motion of a rigid body using Euler angles and calculate angular momentum and kinetic energy in terms of Euler angles.</p> <p>CO4:Apply the inertia tensor and moments of inertia to solve problems involving the motion of a heavy symmetrical top.</p> <p>CO5:Examine the motion in a non-inertial frame of reference and calculate the effects of the Coriolis force.</p> <p>CO6:Use Poisson brackets to formulate equations of motion and identify canonical invariants.</p> <p>CO7:Apply Liouville's theorem to analyze the conservation properties in phase space.</p> <p>CO8:Generalize Newton's force equation to covariant form and</p>

	<p>derive the energy-momentum relation in relativistic mechanics.</p>
PHY- 412 : Quantum Mechanics (I)	<p>CO1:Explain the inadequacies of classical mechanics and describe the wave-particle duality and wave-packets.</p> <p>CO2:Apply the uncertainty principle and derive the Schrödinger equation.</p> <p>CO3:Analyze commuting observables and the removal of degeneracy, and evaluate the evolution of systems with time and constants of motion.</p> <p>CO4:Apply quantum mechanics to the rigid rotator and solve the radial equation for hydrogen and hydrogen-like atoms.</p> <p>CO5:Analyze symmetries under rotation, determine the algebra of the generators, and diagonalize the matrix representation of generators.</p>
PHY-413: Mathematical Methods for Physics	<p>CO1:Apply the residue theorem to evaluate integrals by the method of residues.</p> <p>CO2:Analyze multi-valued functions, including branch points and branch cuts, and perform contour integration involving branch points.</p> <p>CO3:Define linear vector spaces, determine linear independence, basis, and dimension, and apply the Cauchy-Schwarz inequality.</p> <p>CO4:Construct orthonormal bases using the Schmidt orthogonalization process and compute dual vectors and scalar products.</p>
PHY- 414: Computer Programming	<p>CO1:Describe the basics of programming languages and explain the components of a computer system.</p> <p>CO2:Identify constants, variables, and data types in C programming and apply operators and expressions in writing simple C programs.</p> <p>CO3:Perform input and output operations in C and write programs involving decision-making and branching.</p> <p>CO4:Implement decision-making and looping constructs in C programs to solve repetitive tasks.</p> <p>CO5:Utilize arrays and strings in C programs to manage collections of data.</p> <p>CO6:Create user-defined functions in C to modularize code</p>

	<p>and enhance reusability.</p> <p>CO7:Explain the concept of pointers and use pointers for dynamic memory allocation and manipulation of data.</p> <p>CO8:Define structures and unions in C and demonstrate their uses in complex data management.</p> <p>CO9:Implement file management operations in C to read from and write to files.</p>
SEMESTER-2	
PHY-421 Electrodynamics	<p>CO1:Explain Maxwell's equations and their significance in describing electromagnetic phenomena.</p> <p>CO2:Analyze the equation of continuity and conservation of charge, and apply the Lorentz force law.</p> <p>CO3:Derive Poynting's theorem and explain the conservation of energy and momentum using Maxwell's stress tensor.</p> <p>CO4:Describe electromagnetic potentials and perform gauge transformations, including Lorentz and Coulomb gauges.</p> <p>CO5:Solve the inhomogeneous wave equation for potentials using the Green function method and explain retarded potentials.</p> <p>CO6:Analyze the propagation of plane electromagnetic waves in free space, dielectrics, and conductors, and describe reflection, refraction, and polarization.</p> <p>CO7:Apply Fresnel's laws and the oscillator model to understand dispersion in various media, including dielectrics, conductors, and plasma.</p> <p>CO8:Explain the concepts of anomalous dispersion, resonant absorption, and the Kramers-Kronig dispersion relations.</p> <p>CO9:Derive retarded potentials and analyze fields and radiation due to an arbitrary system of charges and currents using multipole expansion.</p> <p>CO10:Calculate the emission of radiation in the electric dipole, magnetic dipole, and electric quadrupole approximations, and analyze simple radiating systems such as linear centerfed antennas.</p>
PHY-422: Quantum Mechanics (II)	<p>CO1:Describe the experimental evidence for spin angular momentum and explain Pauli's theory and spin wave functions.</p> <p>CO2:Analyze the properties of Pauli matrices and apply them to</p>

	<p>systems of two spin-$\frac{1}{2}$ particles.</p> <p>CO3:Explain the symmetry and anti-symmetry of wave functions, and apply the spin-statistics relation and Pauli exclusion principle.</p> <p>CO4:Demonstrate the implications of the Pauli principle and calculate the Fermi level in various systems.</p> <p>CO5:Apply time-independent perturbation theory to calculate energy levels and eigenfunctions up to the second order, and analyze the anharmonic oscillator problem.</p> <p>CO6:Differentiate between non-degenerate and degenerate cases in perturbation theory, and explain the removal of degeneracy in the Stark effect and helium atom problem.</p> <p>CO7:Utilize the W.K.B approximation to analyze turning points, bound states, and tunneling phenomena.</p> <p>CO8:Apply the Bohr-Sommerfeld quantization formula and estimate ground state and excited state energy levels using the variational principle.</p> <p>CO9:Explain the optical theorem and analyze low-energy scattering cases ($l=0$), scattering length, and effective range.</p>
<p>PHY-423: Basic Electronics</p>	<p>CO1:Explain the concepts of T and Π/Π networks and convert between these network forms using appropriate methods.</p> <p>CO2:Apply Foster's reactance theorem to analyze and simplify network circuits.</p> <p>CO3:Analyze transistor parameters and construct equivalent circuits for transistors in CE, CB, and CC configurations.</p> <p>CO4:Evaluate the small signal low and high frequency transistor circuits, and analyze the impact of the Miller effect and gain-bandwidth product.</p> <p>CO5:Explain the effect of cascading stages in amplifiers and apply feedback principles to analyze feedback circuits.</p> <p>CO6:Evaluate the advantages of master-slave flip-flop configurations and apply them to design robust sequential logic circuits.</p>
<p>PHY-424: Statistical Mechanics</p>	<p>CO1:Describe the fundamental concepts of kinetic theory, including binary collisions and the Boltzmann transport</p>

	<p>equation.</p> <p>CO2:Explain the H-theorem and derive the Maxwell-Boltzmann distribution law.</p> <p>CO3:Calculate the mean free path of particles in a gas and analyze its implications for kinetic theory.</p> <p>CO4:Explain the elements of ensemble theory, phase space, and the ergodic hypothesis.</p> <p>CO5:Apply Liouville’s theorem to analyze the behavior of dynamical systems in phase space.</p> <p>CO6:Differentiate between micro-canonical, canonical, and grand-canonical ensembles, and calculate thermodynamic functions for each ensemble.</p> <p>CO7:Apply the equipartition theorem to classical ideal gases and explain Gibb’s paradox.</p> <p>CO8:Analyze energy and density fluctuations in the canonical and grand-canonical ensembles, respectively.</p> <p>CO9:Describe the concept of the density matrix and apply Quantum Liouville’s theorem to quantum systems.</p> <p>CO10:Explain the different ensembles in quantum mechanics and calculate equilibrium averages of observables.</p>
<p>IDC- 429: IDC or Open Elective Course (PHYSICS)</p>	<p>CO1: Describe the historical development of modern physics, from Galileo and Newton to Einstein, and explain their contributions to our understanding of the solar system, galaxies, and astrophysical objects, including the Big Bang cosmology.</p> <p>CO2: Analyze the structure and behavior of molecules, atoms, nuclei, and elementary particles, and discuss the methodologies used in their observation and experimentation across various laboratories.</p> <p>CO3: Explain the principles of nuclear physics, including binding energy, nuclear fusion, and fission, and evaluate their applications in nuclear reactors, nuclear medicine, X-rays, MRI, and PET/CT scans.</p> <p>CO4: Distinguish between the solid, liquid, and gaseous states of matter, and compare the properties and uses of metals, insulators, and semiconductors. Investigate the photoelectric effect, superconductivity, and novel materials, as well as the</p>

	<p>principles of light, lasers, and heat engines.</p> <p>CO5: Understand the fundamentals of electronics, including the operation of microphones, speakers, and amplifiers. Analyze the concepts of power generation and transmission, and describe the basics of computer systems and their applications.</p>
SEMESTER-3	
PHY- 511: Solid-State Physics	<p>CO1:Describe crystal structures and bonding in solids, and explain normal modes of mono- and diatomic lattices.</p> <p>CO2:Analyze the salient features of dispersion curves and calculate the phonon density of states.</p> <p>CO3:Apply quantum theory to determine heat capacity of solids and interpret the implications for lattice vibrations.</p> <p>CO4:Explain the Sommerfeld theory of the free electron gas and calculate the density of states and electronic heat capacity.</p> <p>CO5:Analyze the temperature dependence of the Fermi-Dirac distribution function and apply it to problems involving cyclotron resonance and the Hall effect.</p> <p>CO6:Describe the AC conductivity and optical properties of materials, and apply concepts of thermionic emission.</p> <p>CO7:Apply Bloch's theorem to analyze the nearly free electron model (NFEM) and tight-binding models, and solve problems using the Kronig-Penney model and effective mass concept.</p> <p>CO8:Differentiate between intrinsic and extrinsic semiconductors, calculate carrier concentration, and analyze electrical conductivity and magnetic field effects.</p> <p>CO9:Explain the Clausius-Mossotti relation, and analyze sources of polarizability, including dipolar dispersion, piezoelectricity, and ferroelectricity.</p>
PHY- 512: ELECTIVE PAPER – I (Condensed matter Physics-I)	<p>CO1: Lattice Dynamics and Energy Band Theory</p> <p>Analyze Lattice Vibrations: Understand harmonic and anharmonic approximations in lattice dynamics. Apply the Born-Oppenheimer approximation to the Hamiltonian for lattice vibrations, quantization, and phonons.</p> <p>Study Electron Waves: Describe the wave equation for an electron in a periodic potential. Apply the Bloch-Floquet theorem to understand energy bands, Brillouin zones, and effective mass of an electron. Use the tight-binding approximation to model electron behavior in solids.</p>

	<p>CO2: Fermi Surfaces</p> <p>Understand Fermi Surfaces: Characterize and construct Fermi surfaces for metals. Analyze experimental techniques for studying Fermi surfaces, including the De Haas-van Alphen effect and cyclotron resonance.</p> <p>CO3: Beyond the Independent Electron Approximation</p> <p>Explore Advanced Theories: Apply the Hartree and Hartree-Fock equations to describe electron correlation and screening. Use the Thomas-Fermi theory to understand the dielectric function in materials beyond the independent electron approximation.</p> <p>CO4: Wannier Representation</p> <p>Utilize Wannier Functions: Define Wannier functions and their role in describing electronic states. Apply the equation of motion in the Wannier representation to study impurity levels and excitons. Analyze weakly bound and tightly bound excitons and their implications in solid-state physics.</p>
PHY- 513: X-ray and Laser Spectroscopy	<p>CO1:Describe Sommerfeld’s extension of the Bohr theory and explain the vector atom model, including the quantum states of one-electron atoms.</p> <p>CO2:Analyze atomic orbitals and the hydrogen spectrum using Pauli’s principle, and explain the effects of spin-orbit interaction and fine structure in alkali spectra.</p> <p>CO3:Apply intensity rules to determine the behavior of equivalent and non-equivalent electrons and calculate interaction energy in LS and jj coupling.</p> <p>CO4:Explain the Stark effect and analyze the spectral characteristics of two-electron systems.</p> <p>CO5:Analyze vibrational energy levels of diatomic molecules, treating them as simple harmonic oscillators, and explain the effects of anharmonicity and Morse potential on energy levels and spectra.</p> <p>CO6:Explain Raman spectroscopy and analyze its applications in molecular spectroscopy.</p>
PHY-514: RESEARCH METHODOLOGY	<p>CO1:Apply statistical concepts and procedures to analyze data and create diagrammatic representations of data.</p> <p>CO2:Calculate measures of central tendency, dispersion,</p>

	<p>skewness, and kurtosis, and interpret their significance in data analysis.</p> <p>CO3:Analyze normal distribution and apply simple and multiple correlation techniques as well as regression analysis to data sets.</p> <p>CO4:Apply principal component analysis and design experiments using Completely Randomized Block Design, Randomized Block Design, and Latin Square Design.</p> <p>CO5:Apply non-parametric procedures and plot graphs to represent statistical data effectively.</p>
SEMESTER - IV	
PHY- 521: Nuclear Physics	<p>CO1:Describe the fundamental properties of nuclei, including composition, mass, charge, density, radii, spin parity, isospin, and statistical properties.</p> <p>CO2:Apply methods to measure nuclear size using nuclear and electromagnetic techniques, including electron scattering.</p> <p>CO3:Analyze the ground state of the deuteron with central forces and explain low-energy neutron-proton scattering, including concepts like scattering length and spin dependence of nuclear forces.</p> <p>CO4:Evaluate proton-proton and neutron-neutron scattering with elementary concepts and interpret their significance in nuclear interactions.</p> <p>CO5:Explain the exchange nature of nuclear forces and apply phenomenological nucleon-nucleon potentials to describe nuclear interactions.</p> <p>CO6:Apply the Breit-Wigner formula to analyze nuclear reactions and interpret its use in describing resonances.</p>
PHY- 522: Particle Physics	<p>CO1: Identify and classify elementary particles</p> <p>Demonstrate the ability to categorize particles into leptons, baryons, mesons, and gauge fields and trace the history of particle discovery and understand the evolution of particle physics.</p> <p>CO2: Analyze symmetries and conservation laws</p> <p>Apply conservation laws including energy, momentum, angular momentum, electric charge, lepton and baryon number to particle interactions.</p> <p>Interpret the Eight-Fold Way and the Gell-Mann Nishijima</p>

	<p>scheme and their implications for particle classification.</p> <p>CO3: Explain the quark model and its applications</p> <p>Illustrate the SU(3) symmetry group and its role in the classification of hadrons. Define and differentiate between color and flavor in the quark model.</p> <p>CO4: Evaluate methods for particle detection and radiation measurement</p> <p>Demonstrate understanding of radiation passage through matter and derive stopping power (dE/dx) for heavy charged particles.</p> <p>Compare and contrast various detection methods including G.M. counters, semiconductor detectors, bubble chambers, cloud chambers, spark counters, and Cherenkov detectors.</p> <p>CO5: Assess and describe particle accelerators and radiation sources</p> <p>Explain the operation principles of particle accelerators including Van de Graaff generators, cyclotrons, synchrotrons, linear and circular accelerators, and colliders.</p> <p>Discuss the role of these accelerators in particle physics research and their impact on radiation detection and particle studies.</p>
<p>PHY -523: ELECTIVE PAPER-II(Condensed Matter Physics (II))</p>	<p>CO1: Magnetism</p> <ul style="list-style-type: none"> • Understand Magnetic Properties: Describe diamagnetism, paramagnetism, and the related susceptibility concepts. Explain Langevin's equation, the Curie law, and quantum theories like Pauli paramagnetism. Discuss Landau levels and different types of magnetism (ferro, anti-ferro, ferrimagnetism). • Analyze Magnetic Phenomena: Explain the Weiss molecular field, exchange interaction, and the temperature dependence of magnetism. Discuss ferromagnetic phase transitions, spin waves, magnons, and the Bloch $T^{3/2}$ law. Understand antiferromagnetic order and the Neel temperature. • Magnetic Resonances: Provide a basic description of magnetic resonances such as Nuclear Magnetic Resonance (NMR) and Electron Spin Resonance (ESR), and discuss their applications. Explain the Bloch equation. <p>CO2: Superconductivity</p> <ul style="list-style-type: none"> • Characterize Superconductors: Discuss the fundamental

properties of superconductors, including flux exclusion (Meissner effect), London's equation, and the concept of Cooper pairs. Explain the BCS theory and its ground state, and compare theoretical results with experimental observations. Describe supercurrent and coherence length.

CO3: Types of Superconductors

- Different Superconductors: Differentiate between Type-I and Type-II superconductors. Provide an overview of high-temperature superconductors, heavy fermion superconductors, and fullerene superconductors.

CO4: Nanostructured Materials

- Understand Nanostructures: Introduce various types of nanostructured materials and discuss their mechanical, magnetic, and optical properties. Explain the size-dependent effects and derive the energy spectrum and density of states for quantum wells, quantum wires, and quantum dots using quantum mechanical solutions.

PG (POLITICAL SCIENCE)	
PROGRAMME OUTCOMES (POs):	<p>PO1: To develop new knowledge and research training in all the varied sub-disciplines of Political Science including Political Theory, Indian Political Thought, International Relations, Comparative Politics, Indian Government and Politics, Public Administration and Human Rights.</p> <p>PO2: To develop analytical and empirical thinking skills and upraise their interaction and interrogation capabilities through various methods ranging from textual analyses, conducting seminar, group discussion, boosting their reading and learning habits.</p> <p>PO3: To encourage students and research scholars to apply theoretical knowledge to understand variant areas of political science and contribute their values for appropriate engagement in civic, political and international development as a whole.</p> <p>PO4: To facilitate an interdisciplinary approach for better understanding and engagement with India's social problems, inclusions/exclusions, situations and issues regarding development of the society.</p>
Programme Specific Outcomes	<p>PSO 1. The students will be able to understand, articulate and explain their core subjects of political science in a detailed manner.</p> <p>PSO 2. The students would experience a scenario from a social, economic, cultural, political and gender perspective.</p> <p>PSO 3. The students will be competent to conduct research rigorously on relevant issues, and apply the research findings effectively for the requirement of the society.</p> <p>PSO 4. The students will be enlightened about the career opportunities available in the fields of political science and outside it.</p> <p>PSO 5. The students will cultivate the spirit of good citizenship, discipline, tolerance, scientific temper, mutual respect, self-confidence and self-reliance in the minds of the students through various value-based orientation programmes.</p>
COURSE OUTCOME	

PSC- 101
**Modern Political
Theory**

- C1. Define The core principles and scope of Traditional Political Theory.
 - C2. Describe The evolution and key features of Modern Political Theory.
 3. Compare Traditional and Modern Political Theory approaches.
 4. Explain how political theory has developed over time.
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1. Explain Harold D. Laswell's view of politics as a decision-making process.
 2. Classify different societal values according to Laswell's theory.
 3. Identify the role of elites in the decision-making process.
 4. *Assess the impact of political groups on the decision-making process.
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1. **Describe** the key components of David Easton's Systems Theory.
 2. **Illustrate** the Input-Output Apparatus in political systems.
 3. **Compare** the Systemic-Persistence Model with other political system models.
 4. **Explain** Gabriel Almond's Structural-Functional Analysis of political systems.
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1. **Outline** Karl W. Deutsch's Systematic-homeostasis Model of Political Life.
 2. **Discuss** the key concepts of Lucian W. Pye's Political Development Theory.
 3. **Identify** the variables that influence political development.
 4. **Evaluate** the role of political culture in political development.

**PSC-102 INDIAN
POLITICAL
TRADITIONS**

****Module I****

1. ****Explain**** the key themes and nature of Indian Political Thought.
2. ****Compare**** Brahminic and Shamanic traditions in pre-colonial Indian political thought.
3. ****Distinguish**** between Islamic and Syncretic political traditions in pre-colonial India.
4. ****Analyze**** the contributions of Manu, Kautilya, Barani, and Kabir to Indian political thought.

****Module II****

1. ****Discuss**** the concept of Cultural Nationalism as presented by Vivekananda, Tagore, and Sri Aurobindo.
2. ****Explain**** Gandhi's principles of Non-violence and Satyagraha.
3. ****Describe**** the ideas of Swaraj and Sarvodaya in Gandhi's political thought.
4. ****Evaluate**** Gandhi's vision of Rama Rajya and its impact on Indian politics.

****Module III****

1. ****Outline**** the political thought of Pandita Ramabai and Savitribai Phule.
2. ****Describe**** J. Nehru's views on Nationalism and Internationalism.
3. ****Analyze**** Nehru's concept of Democratic Socialism.
4. ****Compare**** the political contributions of Pandita Ramabai and Savitribai Phule with those of Nehru.

****Module IV****

1. ****Discuss**** the principles of Hindutva as articulated by V.D. Savarkar and Deendayal Upadhyaya.
2. ****Explain**** the key aspects of Socialist Political Thought according to Ambedkar and Lohia.
3. ****Compare**** the views of J.P. Narayan and Periyar E.V. Ramasamy on socialism.
4. ****Evaluate**** the impact of Hindutva and Socialist political thought on modern Indian politics.

**PSC-103 WESTERN
POLITICAL THINKERS-I**

****Political Thought of Plato****

1. ****Describe**** Plato's concept of the ideal state as presented in "The Republic."
2. ****Explain**** the role and functions of the Philosopher King in Plato's governmental structure.
3. ****Outline**** Plato's system of Communism and its impact on his ideal state.
4. ****Evaluate**** Plato's concept of justice and provide a critical estimate of his political thought.

****Political Thought of Aristotle****

1. ****Explain**** Aristotle's model state, "the polity," and its evaluation and nature.
2. ****Describe**** the functions and structure of Aristotle's model state and his concept of citizenship.
3. ****Analyze**** Aristotle's views on slavery and revolution within his political theory.
4. ****Assess**** Aristotle's contributions to political science and provide a critical estimate of his political thought.

****Political Ideas of Niccolò Machiavelli****

1. ****Discuss**** Machiavelli's concept of the state and the separation of politics from ethics.
2. ****Analyze**** Machiavelli's views on political craft and governance.
3. ****Evaluate**** Machiavelli's influence as the first modern political thinker.
4. ****Provide**** a critical estimate of Machiavelli's political ideas and their relevance.

****Political Thought of Thomas Hobbes****

1. ****Describe**** Hobbes's concept of the social contract and its implications for state sovereignty.
2. ****Explain**** Hobbes's views on the relationship between the state and the individual.
3. ****Discuss**** Hobbesian individualism and its impact on his political theory.
4. ****Evaluate**** Hobbes's political thought and provide a critical assessment.

****Political Thought of John Locke****

1. ****Outline**** Locke's concept of the social contract and its implications for limited government.
2. ****Explain**** Locke's views on individualism and the role of the state.
3. ****Analyze**** the relationship between the state and the individual in Locke's political theory.
4. ****Provide**** a critical estimate of Locke's political thought and its impact.

****Political Thought of Jacques Rousseau****

1. ****Discuss**** Rousseau's concept of the social contract and the idea of the General Will.
2. ****Explain**** Rousseau's views on the state and its relationship with individuals.
3. ****Analyze**** Rousseau's impact on the concept of state-individual relationships.
4. ****Provide**** a critical estimate of Rousseau's political thought and its significance.

**PSC-104 PUBLIC
ADMINISTRATION:
PRINCIPLES AND
THEORIES**

****Module I****

1. ****Explain**** the nature, scope, and importance of Public Administration and how it differs from Private Administration.
2. ****Describe**** the Comparative, Ecological, and Public Choice approaches to studying Public Administration.
3. ****Identify**** key differences between Public Administration and Private Administration.
4. ****Discuss**** the significance of various approaches in understanding the field of Public Administration.

****Module II****

1. ****Define**** the core principles and theories of organization and management.
2. ****Explain**** the concepts of hierarchy, span of control, and unity of command in organizational structure.
3. ****Discuss**** the roles of delegation, staff, and auxiliary agencies within an organization.
4. ****Analyze**** the nature and functions of management and how they influence organizational effectiveness.

****Module III****

1. ****Describe**** Max Weber's theory of bureaucracy and its application in modern administration.
2. ****Explain**** the processes of recruitment, promotions, and training in bureaucratic organizations.
3. ****Outline**** the budgetary process in India, including preparation, enactment, and execution.
4. ****Discuss**** the role of the Controller and Auditor General in financial administration.

****Module IV****

1. ****Describe**** the instruments of governance and their roles in ensuring democratic governance.
2. ****Explain**** the institutional mechanisms that contribute to good governance.
3. ****Discuss**** the concept of equity and inclusiveness in social justice and its relevance to social welfare.
4. ****Analyze**** the management and administration of social welfare institutions.

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PSC-105 THEORIES OF INTERNATIONAL POLITICS.

Module I

1. **Define** the meaning, evolution, scope, and significance of International Politics as a field of study.
2. **Explain** key concepts in International Politics, including national interest, power, and diplomacy.
3. **Discuss** the importance of conflict resolution in the context of international relations.
4. **Analyze** how the nature and scope of International Politics impact global interactions.

Module II

1. **Describe** the main tenets of Liberal Theories of International Politics.
2. **Compare** and **contrast** Idealist and Realist theories in International Politics.
3. **Explain** Neo-Realist, Systems, Game, and Decision-Making theories and their relevance to international relations.
4. **Assess** the contributions of various Liberal theories to the understanding of international politics.

Module III

1. **Discuss** the principles of Critical Theory in International Politics.
2. **Analyze** the Marxist perspective on international relations and its impact on global politics.
3. **Explain** the key concepts of Post Modernism and Feminism in the context of International Politics.
4. **Evaluate** how alternative approaches provide different insights into international relations.

Module IV

1. **Examine** the continuity and changes in international politics over time.
2. **Discuss** the role of ethics in shaping international political decisions and policies.
3. **Analyze** how ethical considerations influence international relations and diplomacy.
4. **Evaluate** the impact of ethical issues on continuity and changes in international politics.

PSC-201 POLITICAL THEORY: ISSUES, IDEOLOGIES & DEBATES

Module I

1. **Define** the evolution, meaning, nature, and scope of Political Theory.
2. **Discuss** the reasons behind the decline and resurgence of Political Theory over time.
3. **Explain** how the scope and nature of Political Theory have changed throughout its evolution.
4. **Analyze** the factors contributing to the revival of Political Theory in contemporary contexts.

Module II

1. **Describe** the relevance and attributes of Civil Society and how it differs from Political Society and the State.
2. **Compare** and **contrast** Civil Society and the State in terms of their roles and functions.
3. **Outline** the main theories of the State, including Liberal, Neo-Liberal, Marxist, Neo-Marxist, Pluralist, Post-Colonial, and Feminist perspectives.
4. **Analyze** how different theories of the State provide varying insights into political structures and power dynamics.

Module III

1. **Discuss** the debates on rights, including the moral vs legal conception and the relationship between rights and duties.
2. **Explain** the theory of rights and its significance in political discourse.
3. **Compare** different conceptions of freedom, including autonomy, development, Swaraj, negative freedom, and positive freedom.
4. **Evaluate** how different theories of freedom impact political and social policies.

Module IV

1. **Discuss** the values of equality and the concept of "Equality of What?" in the context of political theory.
2. **Compare** formal equality with substantive equality and their implications for social justice.
3. **Analyze** the concept of equality of opportunity and its impact on societal structures.
4. **Evaluate** the debates on justice, including Consequentialist vs Deontological approaches, Justice as Fairness, and the Communitarian vs Feminist perspectives.

**PSC-202 WESTERN
POLITICAL THINKERS-
II**

****Module I****

1. ****Describe**** Jeremy Bentham's concept of Utilitarianism and its implications for political theory.
2. ****Explain**** Bentham's theory of state and government and how it influences political thought.
3. ****Evaluate**** the strengths and weaknesses of Bentham's political thought in a critical context.
4. ****Discuss**** John Stuart Mill's theory of state, his concept of representative government, and his views on liberty.

****Module II****

1. ****Outline**** G.W.F. Hegel's theory of state and the relationship between the state and the individual.
2. ****Provide**** a critical estimate of Hegel's political thought and its impact on political theory.
3. ****Describe**** T.H. Green's theory of state and his views on the relationship between the state and the individual.
4. ****Evaluate**** the contributions and limitations of T.H. Green's political thought.

****Module III****

1. ****Explain**** Karl Marx's concepts of economic determinism, dialectical materialism, and surplus value.
2. ****Discuss**** Marx's theory of class struggle and the dictatorship of the proletariat.
3. ****Analyze**** Marx's vision of the Communist Society and provide a critical estimate of his political thought.
4. ****Describe**** Lenin's theory of the Communist State and evaluate the strengths and weaknesses of Lenin's political thought.

****Module IV****

1. ****Outline**** Harold J. Laski's theory of the state and his views on the relationship between the state and the individual.
2. ****Evaluate**** Laski's contributions to political thought and provide a critical assessment of his theories.
3. ****Describe**** John Rawls's theory of state and government, and his views on the relationship between the state and the individual.
4. ****Discuss**** the strengths and limitations of Rawls's political thought in a critical context.

**PSC -203
ADMINISTRATIVE
THEORY**

****Module I****

1. ****Define**** the nature, scope, and approaches to the study of Public Administration, highlighting differences between Traditional and New Public Administration.
2. ****Discuss**** the Politics-Administration dichotomy and its relevance to Public Administration.
3. ****Explain**** the concept of New Public Management and its role in Public Administration.
4. ****Analyze**** the role of Public Administration in both developed and developing countries.

****Module II****

1. ****Describe**** the Decision-Making Theory of Herbert Simon and its impact on Administrative Behaviour.
2. ****Explain**** the concepts of leadership as proposed by Likert and Peter Drucker.
3. ****Discuss**** Maslow's theory of motivation and its application in administrative management.
4. ****Compare**** different approaches to administrative management and their implications for organizational effectiveness.

****Module III****

1. ****Outline**** the concept, scope, and significance of Development Administration.
2. ****Discuss**** the Liberal-Democratic, Marxian, and Gandhian approaches to Development Administration.
3. ****Analyze**** the features, problems, and prospects of Development Administration in developed states.
4. ****Evaluate**** the challenges and opportunities of Development Administration in developing countries.

****Module IV****

1. ****Describe**** the nature, scope, and significance of Comparative Public Administration.
2. ****Explain**** F.W. Riggs's model for comparing administrative systems.
3. ****Discuss**** the nature and importance of delegated legislation in Administrative Law.
4. ****Outline**** the roles of administrative adjudication and administrative tribunals in ensuring effective governance.

**PSC-204 EMERGING
ISSUES IN
CONTEMPORARY
INDIAN POLITICS**

****Module I****

1. ****Describe**** the major perspectives on Indian politics, including Liberal, Marxist, Subaltern, and Feminist approaches.
2. ****Analyze**** how caste, tribe, religion, region, and language influence the politics of identities in India.
3. ****Discuss**** the implications of these perspectives for understanding Indian political dynamics.
4. ****Evaluate**** the impact of identity politics on Indian political processes and policies.

****Module II****

1. ****Outline**** the nature of the Indian state and its approach to development planning.
2. ****Explain**** the New Economic Policy and its effects on growth and human development in India.
3. ****Discuss**** the role of social movements, such as Dalit, Tribal, Women, Farmer, and Labour movements, in shaping Indian politics.
4. ****Assess**** the impact of development planning and economic policies on social and economic development in India.

****Module III****

1. ****Describe**** the role of civil society groups, including non-party social formations, NGOs, social action groups, and anti-corruption movements.
2. ****Analyze**** the regionalization of Indian politics, focusing on the reorganization of states and the role of sub-state regions.
3. ****Discuss**** the significance of state and regional disparities and the demand for new states in India.
4. ****Evaluate**** how regional and civil society dynamics influence Indian political and economic structures.

****Module IV****

1. ****Discuss**** the ideologies and social bases of political parties in India, including national and state parties.
2. ****Explain**** the processes of electoral politics in India, including participation, contestation, and representation.
3. ****Analyze**** emerging trends in Indian electoral politics and their implications for democracy.
4. ****Evaluate**** the role of political parties and electoral processes in shaping Indian political landscape.

**PSC- 205
CONTEMPORARY
THEMES ON
INTERNATIONAL
RELATIONS**

****Module I****

1. ****Analyze**** the post-Cold War world order and its impact on global politics.
2. ****Compare**** and ****contrast**** unipolar and multipolar world structures in the context of international relations.
3. ****Discuss**** the rise of civil society and diaspora and their influence on global and domestic politics.
4. ****Evaluate**** how shifts in global power dynamics affect international cooperation and conflict.

****Module II****

1. ****Explain**** the role of global economic governance institutions such as the World Bank (W.B.), International Monetary Fund (I.M.F.), and World Trade Organization (W.T.O.).
2. ****Discuss**** the significance of international alignments like G-8, BRICS, and G-77 in global economic and political strategies.
3. ****Analyze**** the impact of these economic organizations and alignments on global trade and economic policies.
4. ****Assess**** how global economic governance structures influence international economic relations.

****Module III****

1. ****Describe**** the arms race and the major efforts toward arms control and disarmament.
2. ****Explain**** the objectives and impact of international non-proliferation efforts, including the NPT, CTBT, MTCR, and treaties on chemical and biological weapons.
3. ****Discuss**** the role of deterrence in international security and its implications for global stability.
4. ****Evaluate**** the effectiveness of various arms control and disarmament agreements in reducing global security threats.

****Module IV****

1. ****Define**** international terrorism, including its meaning, threats, and the global response to terrorism.
2. ****Discuss**** the global war on terrorism and its impact on international relations and security policies.
3. ****Explain**** key human rights issues and the realities and concerns surrounding them in the global context.
4. ****Analyze**** how international terrorism and human rights concerns influence global governance and international cooperation.

**CONTEMPORARY
POLITICAL THOUGHT**

****Module I****

1. ****Discuss**** Hannah Arendt's concepts of Civic Republicanism and Totalitarianism and their implications for political theory.
2. ****Explain**** Frantz Fanon's analysis of colonialism through phenomenology and its impact on post-colonial thought.
3. ****Analyze**** the relationship between Arendt's theories and contemporary political systems.
4. ****Evaluate**** the influence of Fanon's work on discussions of colonialism and identity.

****Module II****

1. ****Describe**** John Rawls's theory of Political Liberalism and its concept of Justice as Fairness.
2. ****Explain**** how Rawls's principles contribute to discussions on political philosophy and justice.
3. ****Discuss**** Michael Sandel's critique of Rawls's Procedural Republic and the idea of The Unencumbered Self.
4. ****Evaluate**** the strengths and weaknesses of Sandel's and Rawls's approaches to justice and political theory.

****Module III****

1. ****Outline**** Charles Taylor's theory of The Politics of Recognition and its relevance to contemporary identity politics.
2. ****Explain**** Ronald Dworkin's argument in *Taking Rights Seriously* and its impact on legal and political philosophy.
3. ****Discuss**** David Held's views on Democracy from the City-State to a Cosmopolitan Order.
4. ****Analyze**** how Taylor's, Dworkin's, and Held's theories contribute to modern debates on democracy, recognition, and rights.

****Module IV****

1. ****Discuss**** Bhiku Parekh's concepts of Equality of Differences and their implications for national culture and multiculturalism.
2. ****Explain**** Parekh's views on the role of national culture in multicultural societies.
3. ****Describe**** Michael Walzer's idea of Civil Society and its impact on political theory and practice.
4. ****Evaluate**** the contributions of Parekh and Walzer to discussions on multiculturalism and civil society.

SOCIOLOGY

****Module I****

1. ****Define**** political sociology, including its origin, development, and scope, and discuss various approaches to studying it.
2. ****Explain**** the concepts of influence, power, and authority, and describe Dahl's measurement scheme of power.
3. ****Discuss**** Weber's typology of authority and its relevance to understanding political structures.
4. ****Analyze**** the impact of influence and power on political dynamics.

****Module II****

1. ****Describe**** Almond's typology of political culture and its implications for political analysis.
2. ****Discuss**** the relationship between political culture and political structures.
3. ****Explain**** the different forms of political socialization and the roles of political socializers.
4. ****Analyze**** the significance of political socialization in shaping political attitudes and behaviors.

****Module III****

1. ****Outline**** the typology of political participation and identify its various forms.
2. ****Discuss**** the determinants of political participation and their impact on democratic engagement.
3. ****Explain**** the classical elitist theory and its views on political power structure.
4. ****Compare**** elitism and pluralism as theories of political power structure.

****Module IV****

1. ****Define**** political communication and analyze Almond's contributions to its study.
2. ****Discuss**** the functions and structures of political communication and their roles within political systems.
3. ****Explain**** the concept of political modernization and its impact on politics.
4. ****Analyze**** Samuel P. Huntington's analysis of political modernization and its relevance to contemporary political systems.

**PSC-303 INDIAN
POLITICAL SYSTEM:
INSTITUTIONAL
DYNAMICS**

****Module I****

1. ****Discuss**** the role of caste, tribe, religion, and language in shaping the social infrastructure of the Indian polity.
2. ****Analyze**** the themes and emerging trends in Indian political culture.
3. ****Explain**** different types of political culture in India and their significance.
4. ****Evaluate**** how social factors influence political behavior and attitudes in India.

****Module II****

1. ****Describe**** the process of interest aggregation in Indian politics and the role of major national political parties like the Indian National Congress, BharatiyaJanata Party, and Communist Party of India.
2. ****Discuss**** the role and significance of regional political parties in the Indian political landscape.
3. ****Identify**** major issues and problems faced by federal parties in India.
4. ****Evaluate**** the prospects and challenges for federal parties in India.

****Module III****

1. ****Explain**** the roles and functions of the President and Prime Minister in the Indian political system.
2. ****Discuss**** the functions and responsibilities of the Indian Parliament as the legislative body.
3. ****Analyze**** the role of the Supreme Court in adjudicating and protecting the Constitution.
4. ****Evaluate**** the judicial culture and its impact on constitutional governance in India.

****Module IV****

1. ****Describe**** the electoral process in India, including voting behavior and the need for electoral reforms.
2. ****Discuss**** the challenges of nation-building in India and the prospects for political development.
3. ****Analyze**** the factors influencing political development and nation-building in India.
4. ****Evaluate**** the effectiveness of electoral reforms in improving the democratic process in India.

**PSC-304 DEMOCRACY
AND HUMAN RIGHTS
IN INDIA**

****Module I****

1. ****Define**** the concept of human rights from both Western and Third World perspectives.
2. ****Discuss**** the national and international dimensions of human rights and their implications for global governance.
3. ****Analyze**** the differences and similarities between human rights frameworks in Western and Third World contexts.
4. ****Evaluate**** the effectiveness of international human rights mechanisms in addressing global issues.

****Module II****

1. ****Explain**** the constitutional and legal framework for human rights in India, including Fundamental Rights, Directive Principles of State Policy (DPSP), and the Protection of Human Rights Act, 1993.
2. ****Discuss**** the key issues and challenges faced by various groups such as disabled persons, castes, tribes, women, minorities, children, and the elderly in the context of human rights in India.
3. ****Analyze**** how India's legal framework addresses human rights issues and its effectiveness in protecting marginalized groups.
4. ****Evaluate**** the impact of constitutional and legal measures on human rights protection in India.

****Module III****

1. ****Describe**** the roles of different state institutions, including the police, administration, army, and paramilitary forces, in responding to human rights issues.
2. ****Discuss**** affirmative action strategies and other developmental policies aimed at supporting weaker sections of society.
3. ****Analyze**** the effectiveness of state responses to human rights concerns and the challenges involved.
4. ****Evaluate**** the role of affirmative action in promoting social justice and human rights.

****Module IV****

1. ****Discuss**** the role of civil society in promoting and protecting human rights, focusing on media, public opinion, new social movements, and non-governmental organizations (NGOs).
2. ****Explain**** the functions and impact of democratic institutions such as the National Human Rights Commission (NHRC) and State Human Rights Commissions (SHRCs) in safeguarding human rights.
3. ****Analyze**** the interaction between civil society and democratic institutions in addressing human rights issues.
4. ****Evaluate**** the effectiveness of civil society and democratic institutions in advancing human rights protections.

PSC-305 INDIA AND

ANDADMINISTRATION

****Module I****

1. ****Explain**** the evolution of global governance and the role of international organizations in shaping global politics.
2. ****Discuss**** the formation, structure, and ultimate failure of the League of Nations and its impact on international relations.
3. ****Analyze**** how the League of Nations' failures influenced the creation and development of future international organizations.
4. ****Evaluate**** the lessons learned from the League of Nations that shaped the establishment of modern international governance structures.

****Module II****

1. ****Describe**** the evolution of the United Nations (UNO), its main organs, and their functions.
2. ****Discuss**** the changing role of the United Nations in the post-Cold War era, including its adaptations and challenges.
3. ****Analyze**** the effectiveness of the UNO in addressing global issues since the end of the Cold War.
4. ****Evaluate**** the impact of recent global changes on the operations and influence of the UNO.

****Module III****

1. ****Explain**** the concept of regionalization in international politics and its significance.
2. ****Discuss**** the roles and functions of regional organizations such as the European Union (EU), Association of Southeast Asian Nations (ASEAN), South Asian Association for Regional Cooperation (SAARC), Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), and the Indian Ocean Rim Association (IOR).
3. ****Analyze**** the impact of regional organizations on global politics and their interactions with international institutions.
4. ****Evaluate**** the successes and challenges faced by these regional organizations in promoting cooperation and addressing regional issues.

****Module IV****

1. ****Discuss**** the challenges and prospects for military alliances in the post-Cold War era, including their relevance and strategic roles.
2. ****Analyze**** the impact of global terrorist actors on international security and military alliances.
3. ****Explain**** the strategies adopted by military alliances to address the evolving threats posed by terrorism.
4. ****Evaluate**** the effectiveness of military alliances in countering global terrorism and maintaining international security.

**PSC-403 RESEARCH
METHODOLOGY IN
POLITICAL SCIENCE**

****Module I****

1. ****Define**** the nature of the scientific method and its application to social research, including the challenges of maintaining objectivity.
2. ****Discuss**** the ethical considerations that must be addressed throughout the research process in social research.
3. ****Analyze**** how the scientific method influences the design and execution of social research studies.
4. ****Evaluate**** the impact of objectivity on the validity and reliability of social research findings.

****Module II****

1. ****Explain**** the process of reviewing literature and its significance in formulating a research problem.
2. ****Discuss**** the role and importance of hypotheses in social research, including different types of hypotheses.
3. ****Analyze**** the process of formulating a research problem based on literature review and hypothesis development.
4. ****Evaluate**** how hypotheses guide the direction and scope of social research.

****Module III****

1. ****Describe**** the methods of data collection including participant and non-participant observation, and case studies.
2. ****Discuss**** the use of content analysis and its application in social research.
3. ****Explain**** the interview method and Participatory Rural Appraisal (PRA) as tools for gathering qualitative data.
4. ****Evaluate**** the strengths and limitations of different data collection methods in social research.

****Module IV****

1. ****Explain**** the process of constructing research tools such as schedules and questionnaires, including the roles of mailed questionnaires.
2. ****Discuss**** the steps involved in pre-testing and pilot studies and their importance in research tool development.
3. ****Analyze**** the methods of quantitative data analysis and how they are applied in social research.
4. ****Evaluate**** the process of preparing and writing a research report, including the key steps and elements involved.

****Module I****

1. ****Describe**** the evolution of Indian administration from the ancient and Mughal periods to the colonial and post-colonial periods, focusing on changes and continuities.
2. ****Explain**** the structure of Indian administration at the Centre, State, and District levels, highlighting key functions and relationships.
3. ****Analyze**** the impact of historical developments on the current administrative structure of India.
4. ****Evaluate**** the effectiveness of the Indian administrative system in managing continuity and change across different historical periods.

****Module II****

1. ****Discuss**** the significance of the 73rd and 74th Constitutional Amendment Acts and the PESA Act, 1996, in enhancing local and urban governance in India.
2. ****Explain**** the challenges faced by local and urban governance in the context of these amendments and acts.
3. ****Analyze**** the impact of globalization, liberalization, and privatization on Indian administration.
4. ****Evaluate**** the role of civil society in shaping and responding to changes in Indian administration due to globalization.

****Module III****

1. ****Describe**** the roles and functions of key commissions in India, including the Union Public Services Commission, Planning Commission, Election Commission, Finance Commission, and National Human Rights Commission.
2. ****Discuss**** the public sector reforms in India, including the evolution, forms, and challenges related to autonomy and accountability.
3. ****Analyze**** the impact of public sector reforms on the efficiency and effectiveness of Indian administration.
4. ****Evaluate**** the effectiveness of various commissions and reforms in addressing administrative challenges in India.

****Module IV****

1. ****Discuss**** key issues in Indian administration, including the roles of political and permanent executives, and the importance of integrity in administration.
2. ****Explain**** the functions and significance of the Lokpal and Lokayukta in promoting accountability and transparency.
3. ****Analyze**** the role of people's participation in administration and its impact on governance.

4. **Evaluate** the policy-making process in public administration, including policy formulation, implementation, and evaluation.

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M A SANSKRIT	
PROGRAMME OUTCOMES	<i>At the completion of the course students will be able to:-</i>
	<p>PO1: Understanding of classical and contemporary Sanskrit literature, including epic, poetic, and philosophical texts, and will be able to analyze and interpret them critically.</p> <p>PO2: Demonstrate proficiency in reading, interpreting, and translating classical Sanskrit texts, including Vedic, Upanishadic, and classical literary works, and will be able to engage with them in a scholarly manner.</p> <p>PO3: Research skills, enabling them to undertake independent research projects, analyze complex Sanskrit texts, and contribute original insights to the field of Sanskrit studies.</p> <p>PO4: Compare Sanskrit literature with other classical and contemporary literatures, identifying cross-cultural influences and literary parallels, thereby broadening their understanding of global literary traditions.</p> <p>PO5: Placing Sanskrit texts within their historical, cultural, and philosophical contexts, demonstrating an understanding of the socio-political and religious milieu of different periods in Indian history.</p> <p>PO6: Teach Sanskrit at various educational levels, communicate complex ideas effectively, and contribute to the dissemination of knowledge through various media.</p> <p>PO7: Ethical and professional standards in their scholarly activities, demonstrating integrity, respect for intellectual property, and commitment to advancing the field of Sanskrit studies.</p> <p>PO8: Prepared for continuous learning and professional development, with the ability to adapt to evolving academic and cultural landscapes, and contribute to ongoing discussions in the field of Sanskrit.</p> <p>PO9: Apply interdisciplinary approaches to their study of</p>

	<p>Sanskrit, integrating insights from fields such as history, philosophy, and anthropology to enrich their understanding of Sanskrit texts and traditions.</p> <p>PO10: Contribute to the preservation, promotion, and revitalization of Sanskrit language and literature, fostering appreciation and understanding of this ancient tradition within contemporary contexts.</p>
<p>PROGRAMME SPECIFIC OUTCOMES</p>	<p>PO1: Analyze and interpret classical Sanskrit texts with a high level of expertise, demonstrating the ability to deconstruct complex literary and philosophical content and provide scholarly interpretations.</p> <p>PO2: Translate classical Sanskrit literature into contemporary languages accurately, and effectively communicate the nuances of Sanskrit texts to diverse audiences through both written and oral presentations.</p> <p>PO3: Conduct independent research in Sanskrit studies, employing advanced research methodologies to contribute original findings to the field and produce scholarly work that advances the understanding of Sanskrit literature and language.</p> <p>PO4: Integrate historical and cultural contexts into their analyses of Sanskrit texts, demonstrating an understanding of how socio-political and religious factors have influenced the development and interpretation of these texts.</p> <p>PO5: Teach Sanskrit at various educational levels, designing and delivering curricula that foster deep engagement with the language and literature, and using pedagogical strategies that enhance student learning and appreciation of Sanskrit.</p> <p>PO6: Apply comparative literary analysis to draw connections between Sanskrit literature and other global literary traditions, identifying and discussing cross-cultural influences and thematic parallels.</p> <p>PO7: Uphold ethical research practices in their scholarly</p>

	<p>activities, ensuring accuracy, proper citation of sources, and respect for intellectual property in all research and publication endeavors.</p> <p>PO8: Engage in lifelong learning and professional development, staying current with advancements in Sanskrit studies and related disciplines, and actively participating in academic and cultural discussions.</p> <p>PO9: Contribute to the preservation and promotion of Sanskrit language and literature, participating in initiatives that promote the study and appreciation of this ancient tradition in contemporary contexts.</p> <p>PO10: Utilize interdisciplinary approaches to enrich their understanding of Sanskrit texts, integrating perspectives from fields such as history, philosophy, and anthropology to provide a holistic view of the material.</p>
COURSE OUTCOMES	
SEMESTER-1	
<p>SAN-101:VEDIC LITERATURE,UPANISAD AND NIRUKTAM</p>	<p>CO1: Analyze the structure, themes, and linguistic features of Vedic texts, demonstrating an understanding of their historical and cultural significance.</p> <p>CO2: Interpret the ritualistic and philosophical content of Vedic literature, explaining the underlying principles and their relevance to ancient Indian practices and beliefs.</p> <p>CO3: Compare Vedic texts with post-Vedic literature, identifying continuities and transformations in religious and philosophical thought.</p> <p>CO4: Apply various methodological approaches to the study of Vedic literature, including philological, historical, and contextual analyses.</p> <hr/> <p>CO1: Interpret the philosophical themes and concepts presented</p>

	<p>in the Upanishads, articulating their implications for understanding Vedantic thought and Indian philosophy.</p> <p>CO2: Analyze key Upanishadic texts, identifying their primary arguments, metaphors, and contributions to the broader corpus of Indian philosophical literature.</p> <p>CO3: Compare Upanishadic thought with other philosophical traditions, both Indian and non-Indian, highlighting similarities and differences in metaphysical and epistemological perspectives.</p> <p>CO4: Discuss the historical context in which the Upanishads were composed, explaining how historical and cultural factors influenced their development and content.</p> <p>CO1: Analyze the etymological explanations provided in Niruktam, demonstrating an understanding of how ancient grammarians interpreted the roots and meanings of Sanskrit words.</p> <p>CO2: Apply Niruktic methodology to elucidate the meanings of complex Sanskrit terms and phrases, explaining their usage in different textual contexts.</p> <p>CO3: Compare Niruktam with other lexicographical and grammatical works, identifying similarities and differences in their approaches to word analysis and interpretation.</p> <p>CO4: Discuss the impact of Niruktam on the development of Sanskrit lexicography and grammar, explaining its significance in the historical evolution of linguistic studies.</p>
<p>SAN-102:SANSKRIT GRAMMAR</p>	<p>CO1: Analyze and apply verb conjugation patterns across different tenses, moods, and voices, demonstrating proficiency in the transformation of verbs according to grammatical rules.</p> <p>CO2: Explain and apply phonological rules governing Sanskrit pronunciation and sound changes, including sandhi (phonetic assimilation) and accentuation, to ensure accurate reading and recitation.</p> <p>CO3: Solve complex grammatical exercises, including parsing,</p>

	<p>sentence analysis, and transformation tasks, demonstrating practical proficiency in applying grammatical principles.</p> <p>CO4: Discuss the historical development of Sanskrit grammar, tracing its evolution from early Vedic to classical Sanskrit and explaining the impact of significant grammarians and grammatical traditions.</p> <p>CO5: Apply grammatical knowledge to translate Sanskrit texts into contemporary languages accurately, maintaining the nuances and integrity of the original language.</p>
<p>SAN-103:CLASSICAL LITERATURE</p>	<p>CO1: Analyze major classical Sanskrit texts, such as the Mahabharata, Ramayana, and works of Kalidasa and Bhasa, demonstrating an understanding of their literary forms, themes, and historical contexts.</p> <p>CO2: Interpret the use of literary devices and techniques in classical Sanskrit literature, including metaphor, simile, allegory, and poetic figures, explaining their effects on narrative and poetic expression.</p> <p>CO3 Compare various literary genres within classical Sanskrit literature, such as epic poetry, drama, and lyric poetry, identifying distinctive features and their contributions to the literary tradition.</p> <p>CO4: Discuss the historical and cultural contexts of classical Sanskrit literature, explaining how these contexts influenced the content, style, and reception of literary works.</p> <p>CO5: Examine philosophical and ethical themes presented in classical Sanskrit literature, such as dharma, karma, and moksha, and analyze their relevance to the cultural and religious life of ancient India.</p> <p>CO6: Analyze the evolution of literary styles and conventions over time in classical Sanskrit literature, tracing changes from early Vedic hymns to classical epics and dramas.</p>

<p>SAN – 104: INDIAN PHILOSOPHY</p>	<p>CO1:Analyze the foundational concepts of Sankhya philosophy as presented in the Sankhyakarika of Isvarakrsna.</p> <p>CO2: Interpret and evaluate the core teachings of Vedanta as outlined in the Vedantasarah of Sadananda.</p> <p>CO3: Compare and contrast the Sankhya and Vedanta philosophies in terms of their metaphysical and epistemological perspectives.</p> <p>CO4: Apply the philosophical insights from Sankhyakarika and Vedantasarah to contemporary issues in philosophy and spirituality.</p>
<p>SAN-105- HISTORY OF VEDIC LITERATURE</p>	<p>CO1: Identify and describe the key components and functions of Samhita and Brahmanam texts in Vedic literature.</p> <p>CO2:Analyze the significance and philosophical insights of Aranyaka and Upanisad texts in the context of Vedic thought and practice.</p> <p>CO3: Explain the role and content of the Vedangas in supporting Vedic scholarship and ritual practice.</p> <p>CO4: Evaluate the contributions of major commentators on the Vedas, understanding their interpretations and impact on Vedic tradition.</p>
<p>SEMESTER- 02</p>	
<p>SAN-201- DRAMA LITERATURE</p>	<p>CO1:Analyze the literary and dramatic elements of the Uttararamacaritam of Bhababhuti, focusing on its thematic concerns and character development.</p> <p>CO2: Evaluate the portrayal of dharma and social values in Uttararamacaritam, and their significance in the context of classical Indian drama.</p> <p>CO3: Examine the structure, themes, and stylistic features of the Ratnavali of Sriharsadeva, and their contribution to the genre of Sanskrit drama.</p> <p>CO4: Compare and contrast the thematic and dramatic aspects of Uttararamacaritam and Ratnavali, assessing their influence on</p>

		subsequent literary and theatrical traditions.
SAN-203- PHILOSOPHY	INDIAN	<p>CO1:Analyze the principles and methodologies of Anumana (inference) as presented in Tarkasangraha, focusing on its role in logical reasoning and the structure of valid arguments.</p> <p>CO2: Evaluate the different types of inference and their applications in Tarkasangraha, understanding their significance in classical Indian logic.</p> <p>CO3: Examine the functions of Vidhi (prescriptive statements) and Arthavada (descriptive statements) in the Arthasamgraha, and their impact on interpretative and exegetical traditions in classical Indian texts.</p> <p>CO4: Compare and contrast the approaches to inference and interpretative strategies in Tarkasangraha and Arthasamgraha, assessing their contributions to the development of Indian philosophy and logic.</p>
SAN-204- DHARMASTRAM & ARTHASASTRAM		<p>CO1:Analyze the social and legal principles outlined in Manusmriti Chapter 7 (verses 1-108), focusing on their implications for ancient Indian law and societal norms.</p> <p>CO2: Evaluate the strategies and methodologies of governance and administration as described in the Addhyanirupanam section of Arthashastra, understanding their relevance to classical political theory.</p> <p>CO3: Examine the legal and administrative provisions in Yajnavalkyasmriti Chapter 2 (verses 65-167), and assess their contributions to the understanding of ancient Hindu legal traditions.</p> <p>CO4: Compare and contrast the legal and administrative perspectives of Manusmriti, Arthashastra, and Yajnavalkyasmriti, evaluating their influence on classical Indian jurisprudence and governance.</p>
SAN-205- MAHAKAVYA & GITIKAVYA		<p>CO1:Analyze the poetic and thematic elements of Uttaramegha in Meghadutam, focusing on its literary style, imagery, and</p>

		<p>narrative techniques.</p> <p>CO2: Evaluate the significance of the Uttaramegha in the broader context of classical Sanskrit literature and its impact on the genre of descriptive poetry.</p> <p>CO3: Examine the narrative structure and key themes of the 14th Canto in Raghuvamsa, assessing its role in the epic's portrayal of royal lineage and moral values.</p> <p>CO4: Compare and contrast the literary styles and thematic concerns of Uttaramegha and the 14th Canto of Raghuvamsa, analyzing their contributions to classical Sanskrit epic and poetic traditions.</p>
SAN-206- IDSE		<p>CO1:Analyze the key principles and ethical teachings of Nitisatakam (slokas 1 to 46), focusing on its guidance for personal and social conduct.</p> <p>CO2: Evaluate the strategies and philosophies of governance and statecraft presented in Chanakyanitidarpana (Chapters 1 to 4), understanding their application in political and administrative contexts.</p> <p>CO3: Explore the concepts of Samkhya, Karma, Gyana, and Bhakti in the Bhagavad Gita, and analyze their contributions to self-management and personal development within the framework of Hindu philosophy.</p> <p>CO4: Compare and integrate the principles of Samkhya, Karma, Gyana, and Bhakti as discussed in the Bhagavad Gita, assessing their practical applications for achieving balance and self-realization</p>
SEMESTER-3		
SAN-301- LITERATURE, PRATISAKHYA NIRUKTAM	VEDIC &	<p>CO1:Analyze the thematic elements and ritualistic significance of the Paryanyasuktam (5.83) and Visvamisra-nadi-Samvada (3.33) from the Rigveda, focusing on their contributions to Vedic</p>

	<p>religious and philosophical thought.</p> <p>CO2: Examine the content and ritual importance of the Prajapatisuktam (1.5) from the SuklaYajurveda, and assess its role in Vedic sacrificial practices and cosmology.</p> <p>CO3: Evaluate the social and cosmic dimensions addressed in the Atharvaveda texts, including Rastrabhivardhanam (1.29), Kalasuktam (10.53), and Prithvisuktam (12.1), understanding their relevance to Vedic views on governance, time, and the earth</p> <p>CO4:Analyze the grammatical and metrical rules presented in Patala-01 of the Rgvedapratisakhyam, focusing on their implications for the correct recitation and interpretation of the Rgveda.</p> <p>CO5: Evaluate the explanations and etymological insights provided in Chapters 1 (Padas 4 to 6) of Nirukatam, and their impact on understanding Vedic terminology and linguistic principles.</p>
<p>SAN-302- GRAMMAR</p> <p>SANSKRIT</p>	<p>CO1:Analyze the grammatical rules and principles outlined in the Bhavadiprakaranam of SiddhantaKaumudi Sutra (Sutras 2151-2229), focusing on their application to verbal forms and their syntactical functions.</p> <p>CO2: Evaluate the impact of Bhavadiprakaranam on understanding and interpreting verbal forms and derivational processes in Sanskrit grammar.</p> <p>CO3: Examine the rules and derivational processes related to feminine affixes presented in the Stripratyayaprakaranam of LaghuSiddhantaKaumudi, and their role in forming feminine nouns.</p> <p>CO4:Analyze the principles and applications of verbal actions and derivations discussed in the Krtyaprakaranam of SiddhantaKaumudi, focusing on how they influence the formation of verbal nouns and actions.</p>

<p>SAN-303- LINGUISTICS (भाषाविज्ञानम्)</p>	<p>CO1:Analyze the different types of linguistic knowledge including ध्वनिनवज्ञा (phonological knowledge), पदानवज्ञा (morphological knowledge), वाक्यनवज्ञा (syntactic knowledge), and अर्थनवज्ञा (semantic knowledge) in the context of Sanskrit grammar.</p> <p>CO2: Evaluate the importance of each type of linguistic knowledge in understanding and interpreting classical Sanskrit texts and their contribution to the overall study of language.</p> <p>CO3: Identify and describe the general characteristics of the Indo-European language family, including its historical development and the key features that define its branches.</p> <p>CO4: Compare and contrast the Indo-Germanic and Indo-Aryan sub-families within the Indo-European family, focusing on their linguistic and historical distinctions.</p> <p>CO5: Elaborate on the three stages of Indo-Aryan phonology, detailing the phonological changes and developments that occurred during these stages.</p> <p>CO6: Discuss the evolution of Indo-Aryan morphology across these three stages, analyzing how morphological structures and systems transformed over time</p> <p>CO7: Examine the elements of historical grammar in Old Indo-Aryan, including important philological terms such as Assimilation, Dissimilation, Anaptyxis, Prothesis, Apocope, Syncope, Haplology, Metathesis, Analogy, Stress, Time, and Accent.</p> <p>CO8:Analyze how these philological processes and terms contribute to understanding the historical development and phonological changes in Old Indo-Aryan languages.</p>
<p>SAN-304 (A)- VEDIC STUDIES</p>	<p>CO1:Analyze the ritualistic and theological aspects of the Darsapournamasa and Van-manasUpakhyanam sections in Satapathabrahmanam, focusing on their role in Vedic sacrificial</p>

	<p>practices and their interpretations.</p> <p>CO2: Examine the philosophical and ritual significance of the Purusabibhuti section in the Aitareyanyakam, and assess its contribution to Vedic cosmology and the understanding of the Purusha concept.</p> <p>CO3: Evaluate the description and importance of the Panmahayajnah (Five Great Sacrifices) in the Taittiriyanakam, and discuss their implications for Vedic ritual practice and societal norms.</p> <p>CO4:Analyze the content and thematic elements of the 1st Chapter of Brhaddevata, focusing on its contributions to Vedic mythology and its impact on the understanding of divine manifestations and rituals.</p>
(B) CLASSICAL DRAMATURGY	<p>O1:Analyze the principles of Sahityadarpana Chapter 03 (Karika 30-88), focusing on the aesthetics and elements of literary composition as outlined by the text.</p> <p>CO2: Evaluate the key concepts and theories presented in Chapters 08 and 09 of Sahityadarpana, understanding their contribution to the theory and practice of Sanskrit poetics and dramaturgy.</p> <p>CO3: Examine the principles of Natyasastram Chapter 06 (verses 1-34) concerning the theory and practice of drama, including stagecraft and performance elements.</p> <p>CO4:Analyze the extended discussion in Chapter 06 (verses 35-89) of Natyasastram on the roles and techniques of actors and the detailed aspects of dramatic performance, and their influence on classical Indian theatre.</p>
(C) SANSKRIT GRAMMAR AND GRAMMAR PHILOSOPHY	<p>CO1:Analyze the grammatical rules and derivational processes detailed in the TaddhiteMatvarthiyaprakaranam (Sutras 1846-1946) of Siddhantakaumudi, focusing on the application of</p>

	<p>taddhita affixes and their semantic implications.</p> <p>CO2: Evaluate the impact of these sutras on the understanding of Sanskrit morphology and the formation of complex word structures through taddhita derivation</p> <p>CO3: Examine the contributions of key figures in the history of Sanskrit grammar, including Yaska, Vyadi, Nagesabhatta, Bhattoji, Bhartrihari, Kaundabhatta, Baradaraja, and Kayata, and assess their influence on the development and evolution of grammatical theories.</p> <p>CO4:Analyze the major traditions and lineages of Sanskrit grammar, such as Paninianismrtacaryah, Trimunivyakaranaparampara, Prakriyaparampara, and Vyakaranadarsanaparampara, focusing on their historical development and impact on the study of Sanskrit grammar.</p>
<p>SAN-305 (A) VEDIC LITERATURE AND STUDIES. (B) CLASSICAL LITERATURE (C) GRAMMAR PHILOSOPHY</p>	<p>CO1:Analyze the exegesis and interpretative frameworks presented in the Rgvedabhasyabhumika, focusing on its commentary and insights into the Rgveda.</p> <p>CO2: Examine the etymological explanations and linguistic analysis in Nirukta Chapter 07, and assess its role in understanding Vedic terminology and ancient Sanskrit semantics.</p> <p>CO3:Analyze the thematic and dramatic elements of Mudrarakshasa, focusing on its portrayal of political intrigue and its impact on classical Sanskrit drama.</p> <p>CO4: Examine the narrative structure, character development, and social commentary in Mrichhakatika, and evaluate its contributions to the genre of Sanskrit theatre.</p> <p>CO5:Analyze the grammatical rules and derivational processes related to Atmanepada and Prasmapada forms as outlined in Siddhantakaumudi (Sutras 2679 to 2755), focusing on their application and significance in Sanskrit morphology.</p> <p>CO6: Evaluate the implications of Atmanepada and</p>

	<p>Prasmapada forms on the broader understanding of Sanskrit syntax and verb conjugation</p> <p>CO7: Examine the key concepts and philosophical arguments presented in the Brahmakanda of Vakyapadiyam, focusing on its contribution to the understanding of linguistic philosophy and metaphysics.</p> <p>CO8:Analyze the structural and thematic elements of the Brahmakanda section in Vakyapadiyam, and assess its influence on classical Sanskrit linguistic theory.</p>
SEMESTER-04	
SAN-401- SANSKRIT LITERATURE	<p>CO1:Analyze the narrative and dramatic elements of the 5th Uchhvasa in Harsacaritam, focusing on its portrayal of key events, character development, and thematic significance within the context of the epic.</p> <p>CO2: Evaluate the literary style and structural techniques employed in the 5th Uchhvasa of Harsacaritam, and their contribution to the overall impact and coherence of the text.</p> <p>CO3: Examine the introductory themes and narrative techniques in the 1st Canto of Buddhacaritram, focusing on the depiction of the early life of the Buddha and the foundational elements of the epic.</p> <p>CO4:Analyze the literary and philosophical aspects of the 1st Canto of Buddhacaritram, and assess its role in setting the stage for the subsequent narrative and thematic development of the text.</p>
SAN-402- RESEARCH METHODOLOGY	<p>CO1: Define research and identify its core characteristics, including its systematic nature, objective approach, and methodological rigor.</p> <p>CO2: Classify and differentiate various types of research, such as basic vs. applied, qualitative vs. quantitative, and exploratory vs. conclusive, understanding their respective purposes and</p>

	<p>methodologies.</p> <p>CO3: Outline and explain the essential steps involved in conducting research, from problem formulation and literature review to data collection, analysis, and interpretation.</p> <p>CO4: Compare and contrast different research methods, including qualitative, quantitative, experimental, and non-experimental approaches, and evaluate their appropriateness for various research objectives and contexts.</p> <p>CO5: Identify the key characteristics of a well-written thesis, including clarity, coherence, and originality, and understand the essential elements that constitute a comprehensive and academically rigorous thesis.</p> <p>CO6: Describe the standard formatting and structural requirements for thesis writing, including organization, citation styles, and presentation guidelines, ensuring adherence to academic and institutional standards.</p>
<p>SAN-404 (A) VEDIC LITERATURE</p>	<p>CO1:Analyze the thematic and ritualistic significance of the Asvina hymn (1.116) in the Rgveda, focusing on its depiction of the twin deities and their roles.</p> <p>CO2: Examine the narrative and symbolic elements of the Pururava-Urvasi-Samvada (10.95) in the Rgveda, and assess its contribution to Vedic mythology and poetic expression.</p> <p>CO3: Evaluate the ritualistic and theological aspects of the Pusan hymn (6.53) in the Rgveda, understanding its significance in Vedic sacrificial practices.</p> <p>CO4:Analyze the characterization and invocation of Rudra (2.33) in the Rgveda, focusing on the hymn’s portrayal of this deity and its implications for Vedic religious thought.</p> <p>CO5: Examine the ritual and liturgical significance of the Satarudriyasuktam (Ch. 16, mantras 1-20) in the SuklayajurvedaVajasaneyisamhita, focusing on its invocation</p>

	<p>of Rudra and its role in Vedic ceremonies.</p> <p>CO6:Analyze the content and purpose of the Yogaksemaprarthana (Ch. 22, mantras 22-33) in the SuklayajurvedaVajasaneyisamhita, understanding its appeal for spiritual and material well-being.</p> <p>CO7: Evaluate the themes and ritual functions of the Sarvamedhasuktam (Ch. 32, mantras 1-16) in the SuklayajurvedaVajasaneyisamhita, focusing on its role in universal sacrifice and spiritual merit.</p> <p>CO8:Analyze the content and pedagogical aspects of the Siksavalli section of the Taittiriopanisad, focusing on its instructions and guidelines for Vedic recitation and ritual practice.</p> <p>CO9: Examine the grammatical and phonological rules presented in the Vajasaneyapratisakhyam, understanding its role in the correct recitation and interpretation of the Suklayajurveda.</p>
(B)SANSKRIT POETICS	<p>CO1:Analyze the key concepts and critical theories presented in the 1st Udyota of Dhvanyaloka, focusing on the nature of aesthetic experience and the role of suggestion (dhvani) in literary theory.</p> <p>CO2: Examine the arguments and interpretations provided in the 2nd Udyota of Dhvanyaloka, understanding their contributions to the development of Sanskrit poetics and the theory of literary meaning.</p> <p>CO3: Evaluate the interpretative approaches and scholarly insights presented in the 1st Anana of Rsagangadharah, focusing on its contributions to the understanding of Vedic literature and its hermeneutical methods.</p>
(C)GRAMMAR & GRAMMAR PHILOSOPHY	<p>CO1:Analyze the grammatical rules and derivational processes related to masculine nouns (puling) as outlined in the Ajanta-puling-Prakaranam (Sutras 116-215) of LaghuKaumudi Sutra,</p>

	<p>focusing on their application in Sanskrit morphology.</p> <p>CO2: Evaluate the implications of these rules for understanding noun formation and usage in classical Sanskrit, and assess their impact on the overall grammatical framework of the language.</p> <p>CO3: Examine the contributions of historical figures in Sanskrit grammar, including Kasyapa, Apisali, Gargya, Galaba, Chakravarmaha, Bharadvaja, and Katakana, and assess their influence on the development and evolution of grammatical theories.</p> <p>CO4:Analyze the key developments and changes in Sanskrit grammar across different historical periods, understanding how these scholars shaped the study and practice of Sanskrit linguistics.</p> <p>CO5:Analyze the content and key concepts of ParamalaghumanjusaShaktinirupanam, focusing on its explanations of grammatical and linguistic principles and their applications.</p> <p>CO6: Evaluate the significance of Shaktinirupanam in the context of Sanskrit grammar and its contribution to the understanding of linguistic and philosophical concepts.</p>
SAN-405 DISSERTATION	<p>CO1: Formulate a clear and researchable thesis statement or research question, demonstrating the ability to identify and address significant issues or gaps in the chosen field of study.</p> <p>CO2: Conduct a comprehensive literature review, critically analyzing existing research and theoretical frameworks relevant to the dissertation topic.</p> <p>CO3: Design and implement a methodological approach appropriate for the research question, including data collection, analysis, and interpretation.</p>

SUBJECT: ZOOLOGY(M.Sc.)	
PROGRAMME OUTCOME	<p>PO STATEMENTS: On successful completion of this program ,students will be able to -</p> <p>PO–1 This curriculum is a fundamental unit of basic sciences studied at the undergraduate level to learn and understand different biological systems, their coordination and control, as well as the evolution, behavior, and biological roles of animals in the ecosystem.</p> <p>PO–2 This curriculum enables students to qualitatively and quantitatively analyze evolutionary parameters using various methods of bioinformatics and computational tools used in modern sciences, providing opportunities to explore different career avenues.</p> <p>PO–3 Knowledge gained through this curriculum will be helpful in serving industries, establishing industrial units, or designing public health strategies for social welfare.</p> <p>PO–4 This curriculum is designed to provide in-depth knowledge of applied subjects, ensuring the development of employment skills so that students can pursue careers and become entrepreneurs in diverse fields.</p>
PROGRAMME SPECIFIC OUTCOME	<p>PSO–1: Analyze the distribution or inheritance of different traits and diseases among populations and their ethnicity, correlating with contemporary and modern techniques such as genomics, metagenomics, genome editing, and molecular diagnostic tools.</p> <p>PSO–2: Develop practical skills in biotechnology, biostatistics, bioinformatics, and molecular biology to pursue a career as a scientist in the drug development industry in India or abroad.</p> <p>PSO–3: Examine the relationship or synchronization between structure and function at molecular, cellular, and evolutionary levels based on morphological, anatomical, and systemic organization, providing professional advantages in teaching, research, and taxonomist roles in various government organizations.</p> <p>PSO–4: Utilize skills in diagnostic testing, hematology, histopathology, staining procedures, etc., to work in diagnostic or research laboratories, or pursue careers as an Animal Behaviorist, Conservationist, Wildlife Biologist, Wildlife Educator, Zoology faculty, or Forensic expert.</p>
COURSE OUTCOME	
SEMESTER-I	

<p>PAPER: P-101: Animal Diversity (Non Chordate and Chordate)</p>	<p>CO1: Identify and describe the different non-chordate and chordate phyla, including their general and distinguishing characteristics.</p> <p>CO2: Analyze the evolution of various biological systems, examining how their complexity has developed over time.</p> <p>CO3: Compare and contrast the life processes across different phyla to understand their similarities and differences.</p> <p>CO4: Appreciate the evolutionary process from simple unicellular organisms to complex multicellular ones and classify both invertebrates and vertebrates up to the class level.</p>
<p>PAPER: P-102: Cell Biology and Cancer Biology</p>	<p>CO1: Understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, focusing on macromolecules, membranes, and organelles.</p> <p>CO2: Examine how cellular components are utilized to generate and use energy within the cell.</p> <p>CO3: Identify the various genetic and molecular changes that occur in normal cells during malignant transformation.</p> <p>CO4: Analyze the relationship between defects in the cell cycle, apoptosis, signal transduction, and cancer biology, as well as their implications for human diseases.</p>
<p>PAPER: P-103: Inheritance Biology</p>	<p>CO1: Provide fundamental knowledge on genetics, including its laws, genes and chromosomes, inheritance, heredity, causes of genetic disorders, and methods of gene transfer.</p> <p>CO2: Describe how genetic information in DNA is selectively expressed as functional proteins in cells.</p> <p>CO3: Detail the fundamentals of genetics, Mendelian laws, the concept of alleles, linkage, and crossing over of genes.</p> <p>CO4: Familiarize with various types of genetic data (genotyping, expression, sequence data), chromosomal mapping, genetic composition of biological populations, and evolutionary factors that account for variations.</p>
<p>PAPER: P-104: Bioististatcs and Taxonomy</p>	<p>CO1: Learn key biostatistical concepts and efficient tools for summarizing and plotting data, and make decisions in the presence of uncertainty.</p> <p>CO2: Obtain a thorough understanding of the principles and</p>

	<p>practices of systematics, diversity, and relationships in the animal world, and develop a holistic appreciation of the geological time scale, phylogeny, and adaptation.</p> <p>CO3: Acquire knowledge of biostatistical approaches used for analyzing and presenting data in biological research and other fields.</p> <p>CO4: Gain methodological background and quantitative skills in the morphological and molecular phylogeny of taxonomy and systematics.</p>
PAPER: P-104: Practicals	<p>CO1: Gain knowledge to classify various animals based on morphological features, list invertebrate and vertebrate animals within a given class, and recognize various larval stages and development in both invertebrate and vertebrate groups.</p> <p>CO2: Recognize various stages of mitosis and meiosis in cells.</p> <p>CO3: Analyze pedigrees related to traits such as tongue rolling, widow's peak, color blindness, and blood groups.</p> <p>CO4: Provide knowledge of biostatistical approaches used for analyzing and presenting data in biological research and other fields.</p>
SEMESTER-II	
PAPER: P-201: Biophysical Chemistry and Biochemistry	<p>CO1: Understand the biophysical properties and functioning of life processes.</p> <p>CO2: Comprehend the chemical foundation of life processes, structure, and metabolism of biologically significant molecules.</p> <p>CO3: Apply knowledge of fundamental concepts in physical chemistry that underlie biological processes.</p> <p>CO4: Gain insight into fundamental biochemical principles such as biomolecules, metabolic pathways, and the regulation of biological processes.</p>
PAPER: P-202: Enzyme Technology and Microbiology	<p>CO1: Knowledge of enzyme nomenclature, characteristics, mechanisms of action, kinetics, and various applications.</p> <p>CO2: Understanding of microorganisms in soil and water, and their contributions to medicine, industry, and agriculture.</p> <p>CO3: Fundamentals of enzyme properties, nomenclature, characteristics, mechanisms, kinetics, production, purification, and immobilization.</p> <p>CO4: Description of bacterial cell structure, including the form,</p>

	arrangement, and replication of genetic material.
PAPER: P-203: Molecular Biology	<p>CO1: Comprehensive idea about the structure and function of nucleic acids and regulation of gene expression.</p> <p>CO2: Organization, replication, and repair of DNA in the genome, and the selective expression of genetic information as functional proteins.</p> <p>CO3: Familiarity with various types of genetic data (genotyping, expression, and sequence data), chromosomal mapping, genetic composition of biological populations, and evolutionary factors explaining variation.</p> <p>CO4: In-depth knowledge of chemical and molecular processes within cells, including the central dogma.</p>
PAPER: P-204: Animal Physiology and Endocrinology	<p>CO1: Understand fundamental scientific concepts related to animal physiology and endocrinology.</p> <p>CO2: Basic understanding of different physiological systems and their interaction to maintain homeostasis, and the role of chemical messengers or hormones, whether endocrine or neural.</p> <p>CO3: Detailed knowledge of various physiological organ systems and their importance to the integrative functions of the human body.</p> <p>CO4: Distinguish between endocrine and nervous control systems, and identify key events in hormone signaling, infertility, and birth control measures.</p>
PAPER: P-205: Practicals	<p>CO1: Principles involved in the quantitative and qualitative analysis of carbohydrates, proteins, and lipids from biological samples.</p> <p>CO2: Determination of free amino acid content in biological samples using chromatography techniques.</p> <p>CO3: Enzyme activity of salivary amylase and the effects of temperature, pH, and substrate concentration.</p> <p>CO4: Calculation of V_{max} and K_m of enzyme activity using the Lineweaver-Burk plot and supplied data.</p> <p>CO5: Principles of biomolecule isolation from various biological sources, including DNA from plants, microbes, and animals.</p> <p>CO6: RNA isolation from animal tissues/blood and mobility differences of nucleic acids like DNA through agarose gel</p>

	<p>electrophoresis.</p> <p>CO7: DNA quantification by the Diphenylamine method and RNA quantification by the Orcinol method.</p> <p>CO8: Hemoglobin measurement using Sahli's hemoglobinometer, and red and white blood cell enumeration using a hemocytometer.</p> <p>CO9: Microscopic preparation and histological techniques using microtomy, and study of various endocrine glands in animals.</p>
SEMESTER-III	
PAPER: P-301: Immunology	<p>CO1: Explore the immune system, focusing on its origin, development, and structure.</p> <p>CO2: Examine the complexities and mechanisms underlying various immune reactions.</p> <p>CO3: Detail the immune systems of vertebrates and their ability to recognize and respond specifically to foreign substances.</p> <p>CO4: Analyze the roles of antigens, antibodies, and immunocompetent cells in pathogenesis and immunity to infectious diseases.</p>
PAPER: P-302: Developmental biology and Animal Biotechnology	<p>CO1: Explore the basic concepts and experimental aspects of developmental biology.</p> <p>CO2: Gain in-depth knowledge of cell and tissue culture and its applications.</p> <p>CO3: Utilize knowledge of embryonic and postembryonic development.</p> <p>CO4: Learn step-by-step methods of cell culture and their applications in research.</p>

<p>PAPER: P-303: Bioinstrumentation</p>	<p>CO1: Present tools and techniques for studying the biochemical and biophysical nature of life.</p> <p>CO2: Prepare learners to use these tools and techniques for project work and research in biology.</p> <p>CO3: Outline the structural characteristics of nucleic acids and proteins, and examine parameters affecting their stability and functions.</p> <p>CO4: Explain the principles governing biomolecular interactions and recognize how established research methods are used to analyze different aspects of these interactions.</p>
<p>PAPER: P-304: Evolution and Animal Behaviour</p>	<p>CO1: Examine evidence of common ancestry among living species and how this explains traits and evolutionary changes in genetic composition of populations.</p> <p>CO2: Explore animal behavior through ethological, ecological, and evolutionary perspectives, and review basic concepts of behavior as a science.</p> <p>CO3: Present key concepts in evolutionary biology, the history of life on Earth, phylogenetic relationships among organisms, and structure/function relationships.</p> <p>CO4: Explain basic concepts of animal behavior using ethology and behavioral ecology approaches, including biological rhythms and instinctive behavior.</p>
<p>PAPER: P-305: Practical</p>	<p>CO1: Examine lymphoid organs through histological analysis of spleen, thymus, and lymph nodes using slides and photographs.</p> <p>CO2: Identify ABO blood groups through antigen-antibody interactions and prepare blood smears for differential counts and leukocyte types.</p> <p>CO3: Explore the life cycle of frogs and the embryological stages of chick embryos.</p> <p>CO4: Perform sterilization and prepare media (liquid and solid) for microorganism growth. Isolate and maintain organisms using plating, streaking, and serial dilution methods, as well as slants, stab cultures, and storage techniques.</p> <p>CO5: Analyze population genetics and the Hardy-Weinberg Law using traits such as blood groups, ear lobes, and tongue rolling.</p>

	CO6: Investigate circadian functions in humans, including daily eating, sleep, and temperature patterns.
SEMESTER-IV	
PAPER: P-401: Genetic Engineering	<p>CO1: Demonstrate the creative use of modern tools and techniques for manipulating and analyzing genomic sequences, covering versatile tools in genetic engineering and recombinant DNA technology.</p> <p>CO2: Explore the application of recombinant DNA technology in biotechnological research.</p> <p>CO3: Develop research methodologies using genetic engineering techniques.</p> <p>CO4: Utilize these techniques in basic and applied biological research and this course serves as a foundation for introducing advanced cutting-edge technologies that combine basic techniques in diverse modern applications.</p>
PAPER: P-402: Ecology and Conservation Biology	<p>CO1: Explain the structure and function of ecological systems and illustrate how ecological systems operate at different spatial and temporal scales.</p> <p>CO2: Analyze the interaction of organisms with their environment and evaluate conservation strategies for various animals.</p> <p>CO3: Illustrate ecological relationships between organisms and their environment.</p> <p>CO4: Explore key concepts in evolutionary biology, the history of life on Earth, and phylogenetic relationships among organisms, as well as the structure/function relationships in organisms.</p>
PAPER:P-403: Fisheries Science	<p>CO1: Describe the basic classification of fishes and detail the evolution of chondrichthyes, elasmobranchi, and bradyodonti.</p> <p>CO2: Identify the types of electric fishes, locate and explain the function of the electric organ and sound production mechanism, and assess the roles of bioluminescence and poison apparatus in fishes.</p> <p>CO3: Examine the natural breeding processes of Indian major carps, including the factors influencing it, and outline the mechanism of induced breeding in fishes, along with an overview of freshwater fish culture.</p> <p>CO4: Explore different types of sustainable aquaculture and various fish diseases, including their modes of treatment.</p>
PAPER: P-404: Project	CO1: Cultivate research aptitude, scientific temper, and critical

Report	analysis among students. CO2: Acquire basic skills in project handling and report writing to prepare students for independent scientific work.
PAPER: P-405: Practical	CO1: Calculate population density in a natural or hypothetical community using the quadrature method and compute the Shannon-Weiner diversity index for the same community. CO2: Measure free carbon dioxide levels in water samples. CO3: Analyze COD and dissolved oxygen levels in sewage water samples. CO4: Explore different types of crafts and gears used in fisheries. CO5: Examine various types of fish scales through permanent slides and photographs. CO6: Identify various cyclostomes, chondrichthyes, and osteichthyes based on morphological features.
PAPER: ZOOL-IDC 406: Economic Zoology	CO1: Explore honey bee species and their social organization, as well as methods of beekeeping and honey extraction. CO2: Examine modern honey extraction techniques, the chemical composition of honey, and its economic significance. CO3: Identify the differences between exotic and indigenous silkworms, various types of silkworms, and detailed methods for extracting silk from cocoons, along with the nature of employment opportunities in the sericulture industry.