

**Programme and Course Outcomes
of
S. B. DEORAH COLLEGE, Guwahati**

Session 2020-21

AECC Courses (Compulsory)			
1st Semester	Ability Enhancement Course (AECC) ENG-AE is compulsory for the Science Stream. Students from Arts stream can opt for either ASM-AE or ENG-AE. BCM-AE is compulsory for all students of commerce.	ASM-AE-1014 (Communicative Assamese)	This paper contains practical knowledge of spoken and writing skills of Assamese language. Student will gain expertise on the language as a mode of communication after going through it.
		ENG-AE-1014 English Communication	This course on English for undergraduate students aims to develop the language skills of students for academic and other purposes.
		BCM-AE-1014 Business Communication	The students will acquire skills in reading, writing, comprehension and communication, as also to use electronic media for business communication
			Students will be sensitized about their environmental

2nd Semester	Ability Enhancement Course (AECC) (Compulsory for all)	ENV-AE-2014 Environmental Studies	surrounding and would be encouraged to take pro-active role in protection of the environment by educating them to various forms of environmental pollution.
--------------------------------	---	--	---

DEPARTMENT OF ASSAMESE

B.A. (Assamese) General and Honours

**Programme
Specific
Outcome**

Assamese, the state language of Assam, is regarded as one of the most important subjects for the students. Students can acquire adequate knowledge about the glorious history of Assamese language, literature and culture after going through the prescribed syllabus. The New Education Policy, 2020 has given very much importance on mother tongue in the process of acquiring knowledge in educational institutions. At present, the Print media industry of Assam is also focussing on publishing various newspaper and magazines in the state language as they are getting massive response from the readers. Hence, the students, having bachelor degree in Assamese, a student will get priority in the recruitment process in these media house also. Moreover, in the modern worlds, electronic media is regarded as one of the strongest mass media. In Assam also there are various news portals and satellite channels, which are using Assamese as their mode of communication or presentation. So, after the successful completion of BA degree in Assamese, students can have plentiful scope to be engaged in this field.

Course Outcomes of B.A. (Assamese) General and Honours

Semester	Course Category	Paper Code and Course Name	Outcomes
1 st	Ability Enhancement Course (AECC)	ASM-AE-1014 (Communicative Assamese)	This paper contains practical knowledge of spoken and writing skills of Assamese language. Student will gain expertise on the language as a mode of communication after going through it.
	Honours	ASM-HC-1016 History of Assamese Literature (Charyapad - Shankari Era)	<ol style="list-style-type: none"> 1. The various opinions of the renowned critics and scholars about the division of the period of Assamese Literature. 2. Concept of the Assamese Literature and its origin with special readings of various periods like 'Charyapad', 'Shrikrishna Kiratan' etc. 3. About the Characteristics of the literary contributions of the prominent writers of the Pre-Shankari Era.

	Honours	ASM-HC-1026 History of Assamese Literature (Post Shankari Era to Arunodoi Era)	<p>This paper aims to study the characteristics and historical background of the Post- shankari Era and Pre-Arunodoi & Arunodoi Era. Charit Xahitya, written during the post-shankari era, is none other than biographies, based on the lives and contributions of twelve Vaishnavite Saints including Shankardeva and Madhabdeva. This paper also emphasizes on various other relevant aspects of Assamese literature including the applied literature and histories written during the Ahom era.</p>
2nd	Honours	ASM-HC-2016 Introduction of Linguistics	<p>This paper aims to study the definition of linguistics and its various branches; various aspects of linguistics like phonology, morphology, semantics and syntax along with the history of the study of linguistics as a subject.</p>
	Honours	ASM-HC- 2026 Literary Criticism	<p>After going through this paper, students can learn the following aspects - 1. Indian and western theories of literature. 2. The definition and the nature of Rasa, Dhvani, Guna and Riti of the Indian Criticism. 3. Definition and characteristics of the trend of Western Drama (special reading - tragedy, absurd etc.). 4. About the literary theory of short story and novel.</p>
	Assamese Core Course (CC)	ASM-CC-3016 Ancient Assamese Literature	<p>With the help of this paper, the students will be able to gain the knowledge of the literatures of the medieval period of Assam.</p>
		ASM-HC- 3016 Assamese Literature: Introduction	<p>After going through this paper, which contains various creative writings and literary critics, a student can acquire the knowledge of the following aspects -</p>

	Honours	<p>ASM-HC- 4026</p> <p>Aryan and Non-Aryan Languages</p>	<p>After going through this paper, which contains various creative writings and literary critics, a student can acquire the knowledge of the following aspects -</p> <ol style="list-style-type: none"> 1. Origin and the evolution of the Assamese language and its relation with the Sanskrit, Prakrit, Bengali and Pali Language. 2. Influence of Non-Aryan Languages like Bodo, Ahom, Rabha, Tai on Assamese language. 3. The relation between the Assamese language and the Indian Aryan Language.
	Honours	<p>ASM-HC- 4036</p> <p>Prose Literature of Assamese - From the beginning to 18th century</p>	<p>This paper will help the students to learn -</p> <ol style="list-style-type: none"> 1. History, characteristics and the trend of Assamese from Shankardeva era to 18th Century. 2. Evolution and development of Assamese prose (through the special readings of some prominent prose)
5th	Honours (Core)	<p>ASM-HC- 5016</p> <p>Assamese Drama and its Performing Style</p>	<p>After completion of the course of this paper students will be able to acquire the knowledge on -</p> <ol style="list-style-type: none"> 1. A brief history of Assamese drama. 2. Ankiya Nat of Shankardeva like 'Rukmini Haran'. 3. Assamese drama and its performing style of pre and post independent time.
		<p>ASM-HC- 5026</p> <p>Assamese Grammar</p>	<p>Students can learn from this paper -</p> <ol style="list-style-type: none"> 1. About the history of Assamese Grammar and its classification and elements. 2. Phonology of Assamese. 3. Analysis of Assamese segmental phoneme like vowel and consonant

5 th			and supra-segmental phoneme like Accent, Tone, Juncture, Nasalization etc. 4. About the syntax of Assamese language. 5. Classification of Assamese sentence and analysis of the structure of Assamese sentence.
	Honours (Discipline Specific Elective (DSE))	ASM-HE-5026 Assamese Romantic Poetry	After going through this paper, students will be able to know the evolution of the Assamese Romantic poetry through the study of some Romantic Assamese Poems of some renowned poems like Lakshminath Bezbaruah, Raghunath Choudhary etc.
		ASM-HE-5036 Shankardeva	This paper will help the students to learn about the literary works of Shankardeva like 'Borgeet', 'Ankiya Nat', 'Parijat Haran'. He was a religious reformer and literature of medieval period of Assam.
5 th	Regular (SEC)	POL-SE-5014 Public Opinion and Survey Research	<ul style="list-style-type: none"> To introduce the students to the debates, principles and practices of public opinion polling. To familiarise the students with how to conceptualise and measure public opinion using quantitative methods.
6 th	Honours	ASM - HC- 6016 Assamese Short Stories and Novels	After going through this paper, students will be able to learn about the evolution and the trend of Assamese short stories and novel. Inclusion of some prominent Assamese short stories and novels like 'Neena', 'Dantal Hatir Uye Khowa Haoda' will help the students to gain in depth knowledge in this sphere.
		ASM - HC- 6026 History of Assamese Script	From this paper the students will be able to learn - 1. The history of Assamese script. 2. Introductory study of various rock

			inscription and copper inscription from 5th century.
	Discipline Specific Elective (DSE)	ASM-HE-6016 Lakshminath Bezbaruah	This special paper on Lakshminath Bezbaruah will help the students to gain knowledge about his vast literary contribution towards the Assamese language and literature.
		ASM-HE-6056 Dissertation Paper	Each student has to prepare a dissertation under the guidance of faculties of the department. The students will conduct field based study on various socio-cultural areas and each student has to submit one dissertation at the end of the semester.

DEPARTMENT OF BOTANY	
B.Sc. (Botany) General and Honours	
Programme Specific Outcome	<p>PO1: Students will learn about different types of micro-organisms, algae etc. and also their importance and applications in different fields.</p> <p>PO2: To comprehend about fungi, Bryophytes, Pteridophytes and Gymnosperms. Students will be benefited on ecological and economic importance of all these group of plants as well as fungi.</p> <p>PO3: Students will learn about angiosperms, different types of tissues, adaptive and protective systems of angiosperms, different economically important plants like cereals, legumes, spices, natural rubber, drug-, timber, fiber yielding plants etc. They will be benefited from the topics like genetics, extrachromosomal inheritance, linkage, crossing over, chromosome mapping, mutations, population, evolutionary genetics etc. which can be applied in research as well as different pharmaceutical industries.</p>

Course Outcomes of B.Sc. (Botany) General and Honours			
Semester	Course Category	Paper Code and Course Name	Outcomes
1st	Generic/Regular	BOT-RC-1016 Biodiversity (Microbes, Algae, Fungi and Archegoniate)	<p>CO1. Understand the origin, structure, reproduction pattern and economic importance of virus and bacteria</p> <p>CO2. Knowledge on characteristics features, classifications, reproductive mechanisms, life cycle pattern and ecology of different genera of algae and fungi</p> <p>CO3. Understand the importance/significance and mechanism of symbiotic associations of algae-fungi and fungi-higher plants</p> <p>CO4. Knowledge on</p>

			<p>archegoniate and alternation of generations</p> <p>CO5. Knowledge on classifications, reproductive mechanisms, ecology, evolution and economic significances of bryophyte, pteridophyte and gymnosperm</p> <p>CO6. Knowledge on T phage and TMV, lytic and lysogenic cycles of viruses</p> <p>CO7. Know about different types of bacteria, their structure and reproduction types, gram staining procedures</p> <p>CO8. Knowledge on morphology, anatomy and reproductive structures of different general of algae, fungi, bryophytes, pteridophyte and gymnosperms</p>
	<p>Honours</p>	<p>BOT-HC-1016</p>	<p>CO1. Detailed knowledge on microbes, viruses and bacteria, and their importance in agriculture and medicine</p> <p>CO2. Knowledge on Algal classification, Economic and ecological importance of Algae</p> <p>CO3. Practical knowledge on structure of T-Phage and TMV, lytic and lysogenic life cycle CO4. Practical knowledge on microscopy of bacteria and algae</p>

	Honours	BOT-HC-1026 Biomolecules and Cell Biology	<p>CO1. Knowledge on structure, classification and physicochemical properties of biomolecules and enzymes</p> <p>CO2. Detailed knowledge on structure, properties and functions of cell and its components</p> <p>CO3. Practical knowledge on properties of cell and cell membrane, DNA staining techniques and microscopy of plant cell</p> <p>CO4. Knowledge on qualitative tests of biomolecules</p>
2nd	Generic/Regular	BOT-RC-2016 Plant Ecology and Taxonomy	<p>CO1. Basic knowledge on Ecology, Know about ecological factors, law of tolerance, Adaptation of hydrophytes and xerophytes</p> <p>CO2. Knowledge on plant communities and its characteristics, processes and types of succession</p> <p>CO3. Understanding concept of ecosystem and its structure, knowledge on production and productivity in ecological pyramids, biogeochemical cycles of Carbon, Nitrogen and Phosphorus</p> <p>CO4. Knowledge on phytogeography and principle of biogeographical zones of India</p>

			<p>CO5. Knowledge on plant taxonomy, its identification, Classification and Nomenclature</p> <p>CO6. Understanding on plant Identification, importance of herbarium and botanical gardens of the world and India, documentation and Keys</p>
	Honours	BOT-HC-2016 Mycology and Phytopathology	<p>CO1. Detailed knowledge on different classes of fungi, their structure, classification, life cycle and reproduction</p> <p>CO2. Knowledge on diseases in plants caused by viruses, bacteria and fungi and biotechnological applications of fungi</p> <p>CO3. Structural analysis of different classes of fungi and their reproductive stages</p> <p>CO4. Knowledge on structures of symbiotic associations (Lichens, Mycorrhiza)</p>
		BOT-HC-2026 Archegoniate	<p>CO1. Detailed knowledge on morphology, anatomy, classification and properties of bryophytes, pteridophytes and gymnosperms</p> <p>CO2. Knowledge on reproduction</p>

	Honours		<p>and economic importance and ecological significance of bryophytes, pteridophytes and gymnosperms</p> <p>CO3. Practical knowledge on morphology and reproductive structures of archegoniates</p> <p>CO4. Spore morphology analysis and detailed knowledge on male and female reproductive structures in gymnosperms</p>
3rd	Generic/Regular	BOT-RC-3016 Plant Physiology and Metabolism	<p>CO1. Knowledge on different types of plant-water relationship, their significance and factors</p> <p>CO2. Knowledge on different mineral nutrients, their roles on plants, different types of transport and their mechanisms, knowledge on different carriers, channels and pumps</p> <p>CO3. Understanding phloem loading and unloading, pressure flow model</p> <p>CO4. Knowledge on different types of photosynthetic pigments, Photosystem I</p>

			<p>and II, electron transport and mechanism of ATP synthesis, different types of pathways of photorespiration and carbon fixation</p> <p>CO5. Basic knowledge on different pathways of respiration</p> <p>CO6. Knowledge on structure and properties of enzyme and their catalysis and inhibition mechanisms</p> <p>CO7. Knowledge on biological nitrogen fixation and metabolism</p> <p>CO8. Knowledge on discovery and physiological roles of different plant growth regulators, Understanding plant responses to light and temperature</p>
	Honours	BOT-HC-3016 Morphology and Anatomy of Angiosperms	<p>CO1. Knowledge on morphology of angiosperms and developmental biology of plant body</p> <p>CO2. Knowledge on structural and anatomical organization of tissue system in plants and their classification</p>

	Honours	BOT-HC-3026 Economic Botany	<p>CO1. Knowledge edge on morphology, uses and economic importance of crop plants</p> <p>CO2. Knowledge on uses of industrially important plants</p> <p>CO3. Practical knowledge on economically important plant parts and their products</p>
	Honours	BOT-HC-3036 Genetics	<p>CO1. Knowledge on Mendelian concepts in genetics; structure, functions and properties of chromosome; chromosomal aberration</p> <p>CO2. Knowledge on gene structures and gene mutations, population genetics</p> <p>CO3. Practical knowledge on chromosomal mapping and gene interaction studies</p> <p>CO4. Practical visualization of chromosomal anomalies</p>
4th	Generic/Regular	BOT-RC-4016 Plant Anatomy and Embryology	<p>CO1. Understand the meristematic and permanent tissue of plants</p> <p>CO2. Knowledge on the structure of monocot and dicot root, stem and leaf</p> <p>CO3. Basic knowledge on vascular cambium, secondary growth in root and stem</p> <p>CO4. Knowledge on epidermis, cuticle, stomata, adaptation in xerophytes and helophytes</p>

		<p>CO5. Knowledge on the structure of anther and pollen, structure and types of ovules, types of embryo sacs, organization and ultrastructure of mature embryo sac</p> <p>CO6. Understand the mechanism of pollination and adaptations, double fertilization, seed structure, and dispersal mechanism</p> <p>CO7. Knowledge on endosperm types, structure, functions, and embryo-endosperm relationship</p> <p>CO8. Basic knowledge on apomixis, polyembryony and their applications</p>
	<p>Honours</p>	<p>BOT-HC-4016</p> <p>Molecular Biology</p> <p>CO1. Detailed knowledge on architecture of nucleic acids, organization of DNA in organisms, models of replication and the factors associated with it</p> <p>CO2. Detailed knowledge on transcriptional and post transcriptional events in a cell, translation of proteins</p> <p>CO3. Practical acquaintance of isolation and quantification of DNA from plants</p> <p>CO4. Knowledge on photographic study of RNA polymerases and RNA modification machinery</p> <p>.</p>
		<p>BOT-HC-4026</p> <p>CO1. Knowledge on origin, formation and properties of abiotic components of the ecosystem, interactions and</p>

	<p style="text-align: center;">Honours</p>	<p>Plant Ecology and Phytogeography</p>	<p>adaptation of plants with biotic and abiotic factors</p> <p>CO2. Knowledge on properties of communities in a population and trophical and habitat organization in an ecosystem</p> <p>CO3. Practical knowledge on property analysis of abiotic components of the ecosystem CO4. Practical knowledge on vegetation study and different ecological sites</p>
	<p style="text-align: center;">Honours</p>	<p style="text-align: center;">BOT-HC-4036 Plant Systematics</p>	<p>CO1. Knowledge on plant identification and classification systems, plant nomenclature CO2. Knowledge on phylogenetic and evolutionary relationships of angiosperms CO3. Practical knowledge on foliar morphology and taxonomical study of angiosperms</p>
	<p style="text-align: center;">Generic/Regular/Honours (SEC)</p>	<p style="text-align: center;">BOT-SE-4014 Nursery and Gardening</p>	<p>CO1. Brief idea about objectives, scope, infrastructure and maintenance of Nursery</p> <p>CO2. Concept on structure, types and dormancy of seeds and brief idea about seed storage including types and process and knowledge on seed production technology</p> <p>CO3. Knowledge on various modes of vegetative propagation and maintenance of plants in green house</p>

			<p>CO4. Brief idea about development and maintenance of gardening including scope and types and understand the various gardening operations including management of pests and diseases</p> <p>CO5. Detail knowledge on managements of seeds and seedlings and concept about cultivation, storage and marketing of important vegetables</p>
5 th	Regular (Elective/ Generic)	<p>BOT-RE-5016</p> <p>Cell and Molecular Biology</p>	<p>CO1. Understand the basic principle, function and working of microscopy used in research CO2. Learn about the basics of cell and cell theory</p> <p>CO3. Learn about the structure, composition and function of different cell organelles</p> <p>CO4. Understand the structure and functions of cell membrane, membrane proteins and carbohydrates, membrane permeability and cell wall</p> <p>CO5. Learn about cell cycle and its regulation at molecular level</p> <p>CO6. Knowledge on history of DNA discovery, experiments related to DNA as the genetic material, structure and types of DNA and different modes of replication</p> <p>CO7. Learn about types and structure of RNA, various</p>

5th			<p>types of RNA polymerases, basic knowledge on prokaryotic and eukaryotic translation and genetic code</p> <p>CO8. Understand about regulation of gene expression in prokaryotes and eukaryotes</p> <p>CO9. Practical knowledge on prokaryotic cells (bacteria), viruses and eukaryotic cells with the help of light and electron micrographs</p>
	Honours	BOT-HC-5016	<p>Reproductive Biology of Angiosperms</p> <p>CO1. Knowledge on detailed morphological and anatomical study of reproductive structures of angiospermic plants</p> <p>CO2. Knowledge on embryology and embryological abnormalities in angiosperms CO3. Structural documentation of reproductive structures of angiosperms</p> <p>CO4. Practical knowledge on developmental biology of embryo and endosperms</p>
		BOT-HC-5026	<p>Plant Physiology</p> <p>CO1. Knowledge on mechanisms of water, minerals and nutrient absorption of plants</p> <p>CO2. Knowledge on roles of plant hormones and mechanism of flowering in plants</p> <p>CO3. Practical knowledge</p>

5 th			<p>on effects of growth regulators on plant parts</p> <p>CO4. Practical knowledge on determination of osmotic and water potential</p>
	<p>Honours (Discipline Specific Elective (DSE))</p>	<p>BOT-HE-5016 Natural Resource Management</p>	<p>CO1. Comprehensive knowledge on different types of natural resources and their ecological, economical and socio-cultural values</p> <p>CO2. Basic understandings of land, water and forest resources</p> <p>CO3. Overall knowledge on resource degradation, their judicious use and management for sustainability</p> <p>CO4. Knowledge on biodiversity - its importance, management and Bioprospecting</p> <p>CO5. Knowledge on IPR, and global arena on resource management, conservation and benefit sharing</p> <p>CO6. Hands on experience on the domestic solid waste estimation and determining its impact on land degradation</p>

			<p>CO7. Hands on experience on forest study using tools like GPS/GIS, and understanding of ecological importance of forest resources</p>
		<p>BOT-HE-5026</p> <p>Horticultural Practices and Post-Harvest Technology</p>	<p>CO1. Basic understandings on Horticultural science and its importance in employment generation and socio-economic development</p> <p>CO2. Classification of horticultural crops, identification of potential horticultural crops – their cultivation, production, management and commercialization</p> <p>CO3. Knowledge on horticultural techniques, landscaping and gardening</p> <p>CO4. Overall knowledge on post-harvest technology, disease management, and germplasm management for horticulture</p> <p>CO5. Field knowledge of gardening, nurseries, standing crops of horticultural importance</p>
	<p>Regular (Elective/ Generic)</p>		<p>CO1. Learn about principle of microscopy, flow cytometry, applications of fluorescence microscopy, chromosome banding, FISH, chromosome painting; transmission and scanning electron</p>

<p>6th</p>		<p>BOT-RE-6016</p> <p>Analytical Techniques in Plant Sciences</p>	<p>microscopy – sample preparation for electron microscopy, cryofixation, negative staining, shadow casting, freeze fracture, freeze etching</p> <p>CO2. Knowledge on different types of centrifugations, marker enzymes</p> <p>CO3. Learn about use of Radioisotopes in biological research, auto-radiography, pulse chase experiment</p> <p>CO4. Learn about principle and application of spectrophotometer in biological research</p> <p>CO5. Knowledge on different chromatographic techniques used in research</p> <p>CO6. Learn about mass spectrometry, X-ray diffraction, X-ray crystallography, characterization of proteins and nucleic acids, electrophoresis</p> <p>CO7. Understand various statistical methods of analysis, measures of central tendency: arithmetic mean, mode, median; measures of dispersion: Range, mean deviation, variation, standard deviation, chi-square test for goodness of fit</p>
-----------------------	--	---	---

6th	Honours	BOT-HC-6016 Plant Metabolism	<p>CO1. Detailed knowledge of metabolic events of photosynthesis and nutrient metabolism</p> <p>CO2. Knowledge of signaling molecules and pathways in the plant cell</p> <p>CO3. Practical knowledge on different types of chromatographic techniques</p> <p>CO4. Estimation of TAN, sugar and protein contents in plant sample</p>
		BOT-HC-6026 Plant Biotechnology	<p>CO1. Knowledge on applications of tissue culture techniques, construction of recombinant DNA and transformation into hosts, construction of DNA libraries</p> <p>CO2. Knowledge on development of transgenic plants for agricultural or industrial use</p> <p>CO3. Practical utility on isolation of plasmid DNA, its digestion and separation of fragments through gel electrophoresis</p> <p>CO4. Preparation of media for tissue culture techniques and photographic study of plant tissue culture</p> <p>CO5. Photographic study of generating transgenic plants for agriculture</p>
		BOT-HE-6016	<p>CO1. Understanding the roles of microbes in industries and environment</p>

	<p style="text-align: center;">Honours (Discipline Specific Elective (DSE))</p>	<p>Industrial and Environmental Microbiology</p>	<p>CO2. Basic knowledge of different kinds of bioreactors and fermentation processes</p> <p>CO3. Knowledge on production processes of some microbial products in industries through site visits</p> <p>CO4. Knowledge on application of enzymes in industries</p> <p>CO5. Diversity and distribution of microbes in air, water and soil</p> <p>CO6. Basic understandings on water microbiology and water analysis methods</p> <p>CO7. Usefulness of microbes in agriculture and bioremediation of contaminated soils</p> <p>CO8. Practical experiences on basic microbiological techniques and handlings</p>
		<p>BOT-HE-6026</p> <p>Analytical Techniques in Plant Sciences</p>	<p>CO1. Knowledge on microscopy and imaging in plant science</p> <p>CO2. Principles and application of centrifuge, spectroscopy and chromatography in biology</p> <p>CO3. Basic knowledge on biostatistics including measures of central tendency and dispersions, statistical data analysis and representations</p> <p>CO4. Practical knowledge on microscopy,</p>

	Honours (Discipline Specific Elective (DSE))		chromatography, centrifugation and spectroscopy
		BOT-HE-6036 Project Work/Dissertation	CO1. Practical knowledge on addressing relevant scientific questions through experimentation
	Regular SEC	BOT-SE-6024 Mushroom Culture Techniques	CO1. Understanding concept of mushroom culture technology, Knowledge on edible and poisonous mushrooms, medicinal values of mushrooms and types of edible mushrooms CO2. Understanding the cultivation techniques of mushrooms and factors associated with their cultivations, Knowledge on low cost technology for mushroom production CO3. Knowledge on storage and nutraceutical values of mushrooms, Understanding on food preparations and marketing of mushrooms

DEPARTMENT OF CHEMISTRY

B.Sc. (Chemistry) General and Honours

Programme Specific Outcome

PO1. Students will have broad and balanced knowledge in chemistry in addition to understanding of key chemical concepts, principles, and theories.
PO2. Students will acquire expertise over solving both theoretical and applied chemistry problems.
PO3. Students will have knowledge, ability, and skill to undertake further studies in chemistry or in related multidisciplinary areas that can be helpful for higher studies. In addition, a chemistry graduate as envisioned in this framework would be sufficiently competent in the field to undertake further discipline-specific studies, as well as to begin domain-related employment.
PO4 Students will be sensitized on problems related environmental issues and will be able to correlate the importance of green chemistry.
PO5 Cognitive development of students in a holistic manner, that provides the latest subject matter (both theoretical as well as practical), in such a way that foster their core competency and discovery learning
PO6. Mould a responsible citizen who is aware of most basic domain-independent knowledge, including critical thinking and communication.
PO7. Enable the graduates to compete in national/international and state level competitive examinations, such as IIT-JAM, CUCET, UPSC Civil Services Examination etc.

Course Outcomes of B.Sc (Chemistry) General and Honours

Semester	Course Category	Paper Code and Course Name	Outcomes
1 st	Generic/Regular	CHE-RC-1016 Chemistry 1	1. The students will learn the atomic structure through the basic concepts of quantum mechanics. 2. They will understand the chemical bonding through VB and MO approaches. 3. The students are expected to learn basic ideas used in organic chemistry, stereochemistry, functional groups, alkanes, alkenes, alkynes etc.

	Honours	CHE-HC-1016 Inorganic chemistry	<p>1. Students will understand the concepts related to atomic and molecular structure, chemical bonding, periodic properties and redox behaviour of chemical species.</p> <p>2. Students will have hands on experience of standard solution preparation in different concentration units and learn volumetric estimation through acid-base and redox reactions.</p>
	Honours	CHE-HC-1026 Physical Chemistry	<p>1. Students will acquire knowledge about the kinetic theory of gases, ideal gas and real gases.</p> <p>2. They will learn the qualitative treatment of the structure of liquid along with the physical properties of liquid, viz, vapour pressure, surface tension and viscosity.</p> <p>3. They will have the knowledge about molecular and crystal symmetry which will be useful in understanding in solid state chemistry and group theory in some higher courses.</p> <p>4. Students will learn the basic solid state chemistry application of x-ray crystallography for the determination of some very simple crystal structures. Moreover, they will also learn about “ionic equilibria” in this course and a hand on knowledge about the properties of liquid.</p>

2nd	Generic/Regular	CHE-RC-2016 Chemistry 2	<ol style="list-style-type: none"> 1. Students will learn periodic properties in main group elements, transition metals (3d series). 2. They will also learn the crystal field theory in coordination chemistry unit. 3. Students are expected to learn kinetic theory of gases, ideal gas and real gases, surface tension, viscosity, basic solid state chemistry and chemical kinetics.
	Honours	CHE-HC-2016 Organic Chemistry	<ol style="list-style-type: none"> 1. Students will be able to identify different classes of organic compounds, describe their reactivity and explain/analyze their chemical and stereo chemical aspects. 2. They will have knowledge on characterization, properties and separation of unknown organic compounds.
	Honours	CHE-HC-2026 Physical Chemistry	<ol style="list-style-type: none"> 1. Students will have knowledge about the laws of thermodynamics, thermochemistry, thermodynamic functions, relations between thermodynamic properties, Gibbs Helmholtz equation, Maxwell relations etc. 2. Besides these, students will learn partial molar quantities, chemical equilibrium, solutions and colligative properties. 3. After completion of this course, the students will be able to understand the chemical systems from

			thermodynamic point of view
3 rd	Generic/Regular	CHE-RC-3016 Chemistry 3	<p>1. After completion of this course, students will be able to understand the chemical system from thermodynamic points of view.</p> <p>2. They will also learn two important topics in chemistry- chemical equilibrium and ionic equilibrium.</p> <p>3. In organic chemistry part, the students are expected to learn various classes of organic molecules-alkyl halides, aryl halides, alcohols, phenols, ethers, aldehydes and ketones.</p>
	Honours	CHE-HC-3016 Inorganic Chemistry	<p>1. On successful completion of this course students would be able to apply theoretical principles of redox chemistry in the understanding of metallurgical processes.</p> <p>2. Students will be able to identify the variety of s and p block compounds and comprehend their preparation, structure, bonding, properties and uses.</p> <p>3. Experiments in this course will boost their quantitative estimation skills and introduce the students to preparative methods in inorganic chemistry.</p>
	Honours	CHE-HC-3026 Organic Chemistry	Students will be able to describe and classify organic compounds in terms of their functional groups and reactivity.

3rd	Honours	CHE-HC-3036 Physical Chemistry	<p>1. Students are expected to learn phase rule and its application in some specific systems. They will also learn rate laws of chemical transformation, experimental methods of rate law determination, steady state approximation etc. in chemical kinetics unit.</p> <p>2. Students will be able to understand different types of surface adsorption processes and basics of catalysis including enzyme catalysis, acid base catalysis and particle size effect on catalysis.</p>
	Generic/Regular/Honours (Skill Enhancement Course (SEC))	CHE-SE-3074 Intellectual Property Rights	<p>1. After completing this course, students will have in-depth understanding about the importance and types of intellectual property rights.</p> <p>2. This course will also provide the clarity on the legal and economic aspects of the IP system.</p>
		CHE-SE-3024 IT Skills for Chemists	<p>1. Course learning outcomes focus on skill development related to basic computer operations and information technology.</p> <p>2. After completing the course students will be able to use the computer for basic purposes of preparing his personnel/business letters, viewing information on Internet (the web), sending mails, using internet banking services etc.</p> <p>3. Students will accumulate the skills in writing activities and handling numeric data.</p>
		CHE-SE-3034 Basic Analytical Chemistry	<p>1. Upon completion of this course, students shall be able to explain the basic principles of chemical analysis.</p>

			2. They will be able to design microscale and semimicro experiments, record, interpret and analyze data following scientific methodology.
4 th	Generic/Regular	CHE-RC-4016 Chemistry 4	CO1. After completion of this course the students learn solutions, phase rule and its application in specific cases, basics of conductance and electrochemistry. CO2. Students will also learn some important topics of organic and biochemistry- carboxylic acids, amines, amino acids, peptides, proteins and carbohydrates.
	Honours	CHE-HC-4016 Inorganic Chemistry	1. On successful completion, students will be able name coordination compounds according to IUPAC, explain bonding in this class of compounds, understand their various properties in terms of CFSE and predict reactivity. 2. Students will be able to appreciate the general trends in the properties of transition elements in the periodic table and identify differences among the rows. 3. Through the experiments students not only will be able to prepare, estimate or separate metal complexes/compounds but also will be able to design experiments independently which they should be able to apply if and when required.
4 th	Honours	CHE-HC-4026 Organic Chemistry	Students shall demonstrate the ability to identify and classify different types of N-based derivatives, alkaloids and heterocyclic compounds.

			They will be able to explain their structure, reactivity and critically examine their synthesis and reactions mechanism.
	Honours	CHE-HC-4036 Physical Chemistry	<p>1. In this course the students will learn theories of conductance and electrochemistry.</p> <p>2. Students will also understand some particularly important topics such as solubility and solubility products, ionic products of water, conductometric titrations, various parts of electrochemical cells along with Faraday's Laws of electrolysis.</p> <p>3. Students are also expected to understand the</p> <p>4. The students will also gain basic theoretical idea of electrical & magnetic properties of atoms and molecules.</p>
	Generic/Regular/Honours (SEC)	CHE-SE-4014: Analytical Clinical Biochemistry	Students will be able to identify various molecules relevant to a particular pathological condition and their estimation protocols.
CHE-SE-4024: Green Methods in Chemistry		Students shall be able to describe and evaluate chemical products and processes from environmental perspective, define and propose sustainable solutions and critically assess the methods for waste reduction and recycling.	
CHE-SE-4034 Pharmaceutical Chemistry		Students will be able to appreciate the drug development process, identify various small molecules used for treatments different ailments and other physiological processes.	

5th	Honours	CHE-HC-5016 Organic Chemistry	Students will be able to explain/describe the important features of nucleic acids, amino acids and enzymes and develop their ability to examine their properties and applications.
	Honours	CHE-HC-5026 Physical Chemistry	<ol style="list-style-type: none"> 1. After completion of this course the students are expected to understand the application of quantum mechanics in some simple chemical systems such as hydrogen atom or hydrogen like ions. 2. Students will also learn chemical bonding in some simple molecular systems. 3. They will be able to understand the basics of various kinds of spectroscopic techniques and photochemistry.
	Generic/Regular / Honours	CHE-RE-5016 CHE-HE-5016 Applications of Computers in Chemistry	After the completion of this course, it will help the student to interpret laboratory data, curve fitting of experimental work, also perform quantum mechanical calculations for various molecular models.
		CHE-RE-5026 CHE-HE-5026 Analytical Methods in Chemistry	<ol style="list-style-type: none"> 1. On successful completion students will have theoretical understanding about choice of various analytical techniques used for qualitative and quantitative characterization of samples. 2. Through the experiments, students will gain hands on experience of the discussed techniques. This will enable students to take judicious decisions while analyzing different samples.

5 th	(Discipline Specific Elective (DSE))	CHE-RE-5036 CHE-HE-5036 Molecular Modelling & Drug Design	Students will be able to identify basic components of computer and programming as applied to computer assisted design and modelling of molecules.
		CHE-RE-5046 CHE-HE-5046 Novel Inorganic Solids	After the completion of this course, it will also be possible for the students to opt for studying an interdisciplinary master's programme with an emphasis on the synthesis and applications of various materials or take up a job in the materials production and/or processing industry.
		CHE-RE-5056 CHE-HE-5056 Polymer Chemistry	<p>1. After completion of this course the students will learn the definition and classifications of polymers, kinetics of polymerization, molecular weight of polymers, glass transition temperature, and polymer solutions etc.</p> <p>2. They also learn the brief introduction of preparation, structure and properties of some industrially important and technologically promising polymers.</p>
		CHE-RE-5066 CHE-HE-5066 Instrumental Methods of Chemical Analysis	Students shall be able to explain the theoretical basis of different analytical techniques, identify the experimental requirements and compare/analyze the data/results thereof.
5 th		CHE-SE-5014: Chemical Technology & Society	<p>1. Students shall be familiarized with processes and terminologies in chemical industry, like mass balance, energy balance etc.</p> <p>2. Learners will be able to use chemical and scientific literacy as a mean to better</p>

	Regular (SEC)		understand the topics related to the society.
		CHE-SE-5024: Cheminformatics	1. On the successful completion of the course, the students should be able to explain, interpret and critically examine the utility of computers and software tools to solving chemistry related problems. 2. Recognize, apply, compare, and predict chemical structures, properties, and reactivity and solve chemistry related problems. 3. Employ critical thinking and scientific reasoning to design and safely implement laboratory experiments and keep the records of the same. 4. Compile, interpret and analyze the qualitative/quantitative data and communicate the same in a scientific literature
		CHE-SE-5034: Business Skills for Chemists	Students shall be able to explain and/or analyze the important steps of business operations, finance, and intellectual property as applied to chemical industry.
		CHE-SE-5044 Intellectual Property Rights	1. After completing this course, students will have in-depth understanding about the importance and types of intellectual property rights. 2. This course will also provide the clarity on the legal and economic aspects of the IP system.
		CHE-HC-6016 Inorganic Chemistry	1. Students will be expected to learn about how ligand substitution and redox reactions take place in coordination complexes.

6th	Honours		<p>2. Students will also learn about organometallic compounds, comprehend their bonding, stability, reactivity and uses.</p> <p>3. They will be familiar with the variety of catalysts based on transition metals and their application in industry.</p> <p>4. Students in general will be able to appreciate the use of concepts like solubility product, common ion effect, pH etc. in analysis of ions and how a clever design of reactions, it is possible to identify the components in a mixture.</p> <p>5. With the experiments related to coordination compound synthesis, calculation of $10Dq$, controlling factors etc. will make the students appreciate the concepts of theory in experiments.</p>
	Honours	CHE-HC-6026 Organic Chemistry	<p>1. Students will be able to explain/describe basic principles of different spectroscopic techniques and their importance in chemical/organic analysis.</p> <p>2. Students shall be able to classify/identify/critically examine carbohydrates, polymers and dye materials.</p>
		CHE-RE-6016 CHE-HE-6016 Green Chemistry	<p>1. Apart from introducing learners to the principles of green chemistry, this course will make them conversant with applications of green chemistry to organic synthesis.</p> <p>2. Students will be prepared for taking up entry level jobs in the chemical industry. They also will have the option of studying further in the area.</p>

6th	Generic/Regular / Honours (DSE)	CHE-RE-6026 CHE-HE-6026 Industrial Chemicals and Environment	<p>1. After successful completion of the course, students would have learnt about the manufacture, applications and safe ways of storage and handling gaseous and inorganic industrial chemicals. Students will get to know about industrial metallurgy and the energy generation industry.</p> <p>2. Students will also learn about environmental pollution by various gaseous, liquid wastes and nuclear wastes and their effects on living beings.</p> <p>3. Finally, the students will learn about industrial waste management, their safe disposal and the importance of environment friendly “green chemistry” in chemical industry.</p>
		CHE-RE-6036 CHE-HE-6036 Inorganic Materials of Industrial Importance	<p>1. This course will establish the foundation of industrial inorganic chemistry among the students. This will be helpful for pursuing further studies of industrial chemistry in future.</p> <p>2. Experiments will help the students to gather the experience of qualitative and quantitative chemical analysis.</p> <p>3. Students will be capable of doing analysis of the inorganic materials which are used in our daily life. They will have insight of the industrial processes.</p>
		CHE-RE-6046 CHE-HE-6046	<p>After completing this course, students should be able to construct a rational research</p>

6 th		Research Methodology for Chemistry	proposal to generate fruitful output in terms of publications and patents in the field of chemical sciences.
		CHE-RE-6056 CHE-HE-6056 Dissertation	This course is a project related work. Students will carry out experimental or theoretical project, analyse the results and write a project report. This course will train students to conduct research in scientific manner.
6 th	Regular	CHE-SE-6014 Chemistry of Cosmetics & Perfumes	1. Students will learn about the preparation and chemistry involved with the production different cosmetic. 2. This may encourage students to take up entry level jobs at cosmetics industry or venture into commercial production of cosmetics as an entrepreneur.
		CHE-SE-6024 Pesticide Chemistry	Students will be able to explain or describe and critically examine different types of pesticides, their activity/toxicity and their applications and the need for the search of an alternative based on natural products.
		CHE-SE-6034 Fuel Chemistry	1. At the end of this course students will learn about the classes of renewable and non-renewable energy sources. 2. Students will learn about the composition of coal and crude petroleum, their classification, isolation of coal and petroleum products and their usage in various industries. 3. They will also learn to determine industrially significant physical

			parameters for fuels and lubricants.
--	--	--	--------------------------------------

DEPARTMENT OF COMMERCE

B.Com. (Commerce) General and Honours

Programme Specific Outcome

The purpose of B.Com. course is to attain a thorough knowledge about the various aspects in the field of Commerce. Commerce is a broad and dynamic field comprising a vast number of subjects that are interrelated. This course is hence helpful for building a foundation for a student's eventual profession and to ensure that students develop fundamental skills and lifelong commitment to learning. Some points are highlighted below-

PO1. To understand the needs, objectives and learn the uses of various types of accounting and auditing functions in various fields.

PO2. To learn about the financial system and various financial institutions as well as the various laws governing the commerce and business in the country.

PO3. To develop an understanding about concept, nature, types and need of management in organisations and learn about the significant role it plays in marketing, business and entrepreneurship.

PO4. To enable the students to acquire skills required in the job sector as well as to pursue entrepreneurship.

PO5. To enable a student to pursue higher studies as well as appear for competitive exams in this field.

Course Outcomes of B.Com. General and Honours

Semester	Course Category	Paper Code and Course Name	Outcomes
1 st	Generic/Regular	COM-GE-1026 Investing in stock markets	CO1. This paper intends to provide basic skills to operate in stock markets and the ways of investing in different types of investment avenues such as shares, IPO/FPO, Bonds, etc. CO2. It will enable the student to take up investment in stock markets independently

	Honours	COM-HC-1016 Financial Accounting	CO1. The objective of this paper is to help students to acquire conceptual knowledge of the Financial Accounting and to impart skills for recording various kinds of business transactions
		COM-HC-1026 Business Law	The objective of the course is to impart basic knowledge of the important business legislation along with relevant case law.
2nd	Generic/Regular	COM-GE-2026 Insurance & Risk Management	CO1. To develop on understanding among students about identifying analyzing and managing various types of risk. CO2. Besides, the students will be in a position to understand principles of insurance and its usefulness in business along with its regulatory framework
	Honours	COM-HC-2016 CORPORATE ACCOUNTING	CO1. This course provides knowledge on the various accounting procedures followed by the Companies Act, 2013. A student learns about issue and redemption of shares, preparation of final accounts etc
	Honours	COM-HC-2026 CORPORATE LAWS	CO1. The objective of the course is to impart basic knowledge of the provisions of the Companies Act 2013 and the Depositories Act, 1996. Case studies involving issues in corporate laws are required to be discussed

3rd	Generic/Regular	COM-GE-3046(A) BUSINESS STATISTICS	CO1. The objective of this course is to familiarise students with the basic statistical tools used for managerial decision-making
	Honours	COM-HC-3016 COMPUTER APPLICATIONS IN BUSINESS	CO1. To provide computer skills and knowledge for commerce students and to enhance the student understands of usefulness of information technology tools for business operations
		COM-HC-3026 INCOME TAX LAW AND PRACTICE	CO1. To provide basic knowledge and equip students with application of principles and provisions of Income-tax Act, 1961 and the relevant Rules
		COM-HC-3036 MANAGEMENT PRINCIPLES AND APPLICATION	CO1. The objective of the course is to provide the student with an understanding of basic management concepts, principles and practices.
	Honours/ Generic/ Regular SEC	COM-SEC-HC-3054 (A) Entrepreneurship	CO1. The purpose of the paper is to orient the learner toward entrepreneurship as a career option and creative thinking and behavior.
	Generic/Regular	COM-GE-4046(A) INDIAN ECONOMY	CO1. This course seeks to enable the student to grasp the major economic problems in India and their solution.
	Generic/Regular	COM-GE-4046 (B) MICRO FINANCE	CO1. The course aims to make the students understand the basic concepts of micro-finance and its importance, institution structure, management of micro-finance institutions and microfinance in Indian context.

4 th	Honours	COM-HC-4016 COST ACCOUNTING	CO1. To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment and cost accounting book keeping systems
		COM-HC-4026 BUSINESS MATHEMATICS	CO1. The objective of this course is to familiarize the students with the basic Financial mathematics tools, with an emphasis on applications to business and economic situations.
		COM-HC-4036 HUMAN RESOURCE MANAGEMENT	CO1. The objective of the course is to acquaint students with the techniques and principles to manage human resource of an organisation
5 th	Regular (Elective) 1	COM-DSE-RC-5016(B) PRINCIPLES OF MARKETING	CO1. The objective of this course is to provide basic knowledge of concepts, principles, tools and techniques of marketing
		COM-DSE-RC-5016(D) Indian Financial System	CO1. To provide students the basic knowledge of Indian Financial System and its components, institutions and their functions
	Regular (Elective) 2	COM-DSE-RC-5026(A) Fundamentals of Financial Management	CO1. To familiarize the students with the principles and practices of financial management
	Regular (Generic)	COM-GE-RC-5036(B) Business Economics	CO1. This paper deals with the basic economic problems, the issue of scarcity, the basic market model of demand and related issues, various market structure, the input market and remuneration of production factors' etc.

			CO2. Students will be acquainted with the basics of economics and make them prepare for various competitive examinations where candidates' knowledge regarding the basic economic phenomenon are tested.
Honours	COM-HC-5016 PRINCIPLES OF MARKETING		The objective of this course is to provide basic knowledge of concepts, principles, tools and techniques of marketing.
	COM-HC-5026 FUNDAMENTALS OF FINANCIAL MANAGEMENT		. CO1. To familiarize the students with the principles and practices of financial management
Honours (Discipline Specific Elective (DSE))	COM-DSE-HC-5036 (A) MANAGEMENT ACCOUNTING		CO1. To impart the students, knowledge about the use of financial, cost and other data for the purpose of managerial planning, control and decision making.
	COM-DSE- HC-5036 (C) Advertising		CO1. The objective of this course is to familiarize the students with the basic concepts, tools and techniques of advertising used in marketing.

		<p>COM-DSE- HC-5036 (F)</p> <p>Indian Financial System</p>	<p>CO1. This paper gives an overall idea about the financial system and structure in our country. The students learn about the various investment avenues such as shares, debentures, mutual funds etc.</p> <p>CO2. They become aware of the investment process and other concepts associated with it. They get an idea about stock exchange and its functioning</p>
6 th	Regular (Elective)1	<p>COM-DSE-RC-6016(A)</p> <p>ADVERTISING</p>	<p>CO1. The objective of this course is to familiarize the students with the basic concepts, tools and techniques of advertising used in marketing</p>
		<p>COM-DSE-RC-6016(B)</p> <p>Banking</p>	
		<p>COM-DSE-RC-6026(A)</p> <p>INTERNATIONAL BUSINESS</p>	<p>CO1. The objective of the course is to familiarise the students with the concepts, importance and dynamics of international business and India's involvement with global business.</p> <p>CO2. The course also seeks to provide theoretical foundations of international business to the extent these are relevant to the global business operations and developments.</p>
		<p>COM-DSE-RC-6026 (C)</p> <p>FUNDAMENTALS OF INVESTMENT</p>	<p>CO1. To familiarize the students with different investment alternatives, introduce them to the framework of their analysis and valuation and highlight the role of investor protection</p>
	Regular (Generic)	<p>COM-GE-RC-6046(A)</p> <p>INDIAN ECONOMY</p>	<p>CO1. This course seeks to enable the student to grasp the major economic problems in India and their solution</p>

			students will be able to understand the basics of public administration.
	Honours	COM-HC-6016 AUDITING AND CORPORATE GOVERNANCE	CO1. To provide knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards CO2 To give an overview of the principles of Corporate Governance and Corporate Social Responsibility
		COM-HC-6026 INDIRECT TAX LAWS	CO1. To provide basic knowledge and equip students with application of principles and provisions of Service Tax, VAT, Central Excise, and Customs Laws.
	Honours DSE	COM-DSE-HC-6036(A) FUNDAMENTALS OF INVESTMENT	CO1. To familiarize the students with different investment alternatives, introduce them to the framework of their analysis and valuation and highlight the role of investor protection
		COM-DSE-HC-6036(D) INTERNATIONAL BUSINESS	CO1. The objective of the course is to familiarise the students with the concepts, importance and dynamics of international business and India's involvement with global business. CO2. The course also seeks to provide theoretical foundations of international business to the extent these are relevant to the global business operations and developments

		COM-DSE-HC-6036(E) INDUSTRIAL RELATIONS AND LABOUR LAWS	CO1. To enable the students to learn the concepts of industrial relations including trade unions, collective bargaining, discipline and various labour enactments
--	--	--	---

DEPARTMENT OF COMPUTER SCIENCE**B.Sc. (Computer Science) Honours****Programme
Specific Outcome**

PO1: To communicate technical information both orally and in writing.
PO2: Apply the knowledge gained in core courses to a broad range of advanced topics in Computer Science, to learn and develop sophisticated technical products independently.
PO3: To design, implement and evaluate computer-based system, process, component, program to meet desired needs by critical understanding, analysis and synthesis .
PO4: Identify applications of Computer Science in other fields in the real world to enhance career prospects.
PO5: Realize the requirement of lifelong learning through continued education and research.
PO6: Use the concepts of best practices and standards to develop user interactive and abstract application.
PO7: Understand the professional, ethical, legal, security, social issues and responsibilities.

Course Outcomes of B.Sc (Computer Science) Honours

Semester	Course Category	Paper Code and Course Name	Outcomes
1st	Honours	CSC-HC-1016 Programming Fundamentals using C/C++	CO1: Explore algorithmic approaches to problem solving. CO2: Ability to analyse a problem and devise an algorithm to solve it. CO3: Able to formulate algorithms, pseudo codes and flowcharts for arithmetic and logical problems. CO4: Ability to implement algorithms in the 'C' language. CO5: Develop modular programs using control structures and arrays in 'C'. CO6: Able to understand the concept of object-oriented programming. CO7: Use the benefits of object-oriented design

	Honours		and understand when it is an appropriate methodology to use. CO8: Design object-oriented solutions for small systems involving multiple objects
		CSC-HC-1026 Computer System Architecture	CO1: To get familiar with concepts of digital electronics. CO2: To study arithmetic circuits, combinational circuits and sequential circuits. CO3: To study and design different counters. CO4: To study basics of computer system. CO5: To study Memory Organization
2nd	Honours	CSC-HC-2016 Programming in JAVA	CO1: Understand to implement object-oriented programming concepts. CO2: Understand how to design graphical user interface in Java programs. CO3: Understand how to design and develop applets. CO3: Able to design User Interface using Swing and AWT. CO4: Understand concept of packages and study how to implement them
		CSC-HC-2026 Discrete Structures	CO1: To develop understanding of Logic Sets and Functions. CO2: To use mathematical reasoning

2 nd			<p>techniques including induction and recursion</p> <p>CO3: To understand and apply counting techniques to the representation and characterization of relational concepts.</p> <p>CO4: To develop an understanding of how graph and tree concepts are used to solve problems arising in the computer science.</p> <p>CO4: To communicate the solutions of technical problems to other professionals.</p> <p>CO5: To develop improved collaborative skills</p>
3 rd	Honours	<p>CSC-HC-3016</p> <p>Data Structures</p>	<p>CO1: Understand different methods of organizing large amount of data using data structure.</p> <p>CO2: Able to choose appropriate data structure as applied to specified problem definition.</p> <p>CO3: Understand various techniques for representation of the data in the real world.</p> <p>CO4: Able to compute the complexity of various algorithms.</p> <p>CO5: Able to understand internal structure of compiler and interpreter.</p> <p>.</p>
		<p>CSC-HC-3026</p> <p>Operating System</p>	<p>CO1: Understand the role of operating system as System software.</p> <p>CO2: Able to compare the various algorithms and comment about</p>

3rd	Honours		<p>performance of various algorithms used for management of memory, CPU scheduling, File handling and I/O operations.</p> <p>CO3: Understand various concept related with Deadlock to solve problems related with Resources allocation, after checking system in Safe state or not.</p> <p>CO4: To understand role of Process synchronization towards increasing throughput of system.</p>
		CSC-HC-3036	<p>Computer Networks</p> <p>CO1: Understand basic computer network technology.</p> <p>CO2: Understand and explain Data Communications System and its components.</p> <p>CO3: Able to identify the different types of network topologies and protocols.</p> <p>CO4: Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.</p> <p>CO5: Identify the different types of network devices and their functions within a network.</p> <p>CO6: Understand the basic protocols of computer networks, and how they can be used to assist in network design and implementation.</p>
		CSC-HC-4016	<p>Design and Analysis of Algorithms</p> <p>CO1: To develop proficiency in problem solving and programming.</p>

4th	Honours		<p>CO2: To be able to carry out the Analysis of various Algorithms for mainly Time and Space Complexity.</p> <p>CO3: To get a good understanding of applications of Data Structures.</p> <p>CO4: To develop a base for advanced study in Computer Science.</p>
	Honours	CSC-HC-4026 Software Engineering	<p>CO1: Able to design and conduct experiments, as well as to analyse and interpret data.</p> <p>CO2: Able to identify, formulate, and solve engineering problems.</p> <p>CO3: Able to analyse, design, verify, validate, implement, apply, and maintain software systems.</p> <p>CO4: Able to understand different phases of SDLC</p>
		CSC-HC-4036 Database Management Systems	<p>CO1: Understand fundamental concepts of database.</p> <p>CO2: Understand user requirements and frame it in data model.</p> <p>CO3: Ability in creations, manipulation and querying of data in databases.</p> <p>CO4: Ability to solve real world problems using appropriate set, function, and relational models.</p> <p>CO4: Ability to design E-R Model for given requirements and convert the same into database tables.</p>

5 th	Honours	CSC-HC-5016 Internet Technologies	<p>CO1: To understand client server architecture. CO2: Implement PHP, Server Side Scripting Language. CO3: To know how to implement socket programming CO4: Understand working of XML, CSS and XML parsers. CO5: Will learn to implement PHP framework for effective design of web application. CO6: Will use JavaScript to program the behavior of web pages. CO7: Will use AJAX to make our application more dynamic.</p>
	Honours	CSC-HC-5026 Theory of Computation	<p>CO1: Understand the fundamental mathematical, regular languages and finite automata CO2: Able to describe and transform regular expressions and grammars. CO3: Able to design different types of Finite Automata and Machine as Acceptor, verifier And translators. CO4: Able to understand the concept and design of push-down automata. CO5: Able to understand the design and different types of Turing machine . CO6: Understand the relation between context free languages, PDA and TM .</p>

			CO7:Able to understand recursive enumerable languages, recursive function theory and Problems on recursive function
5 th	Honours (Discipline Specific Elective (DSE))	CSC-HE-5016 Microprocessor	CO1: To study the basics of 8051 microcontroller, Programming and its Interfacing techniques. CO2: To apply knowledge of 8051 to design different application circuits. CO3: To introduce the basic concepts of advanced Microcontrollers
		CSC-HE-5036 Project Work/Dissertation	CO1: Each student will now implement all the things they have done in previous semester and they will be assigned a project individually.
6 th	Honours	CSC-HC-6016 Artificial Intelligence	CO1: Solve basic AI based problems. CO2: Define the concept of Artificial Intelligence. CO3: Apply AI techniques to real-world problems to develop intelligent systems. CO4: Select appropriately from a range of techniques when implementing intelligent systems.
		CSC-HC-6026 Computer Graphics	CO1: Understand how to use graphics objects represented in computer. CO2: Will able to correlate between user

			<p>and computer through graphics.</p> <p>CO3:Able to increase the productivity through graphics.</p> <p>CO4:Understand programmer's perspective of working of computer graphics.</p>
--	--	--	--

DEPARTMENT OF ECONOMICS	
B.A. (Economics) General and Honours	
Programme Specific Outcome	<p>PO1: Basic understanding of various economic theories and models which have applicability in practice.</p> <p>PO2: Students will get to know about the market structure which is the core of microeconomics</p> <p>PO3: Students can acquire knowledge regarding the macroeconomics variables which play an important role in shaping the economy</p> <p>PO4: students can apply the various economic theories in real life situation using the devices of econometrics and mathematics</p> <p>PO5: They can also infer broad conclusion from the various economics models which are extensively used in policy formulation</p> <p>PO6: The programme will make the students prepare for various competitive examinations</p> <p>PO7: After completion of the programme ,there is scope for the students to make it to the IES</p> <p>PO8: The programme will also prepare students for the banking sector, financial sector, stock market etc.</p>

Course Outcomes of B.A. (Economics) General and Honours			
Semester	Course Category	Paper Code and Course Name	Outcomes
1st	Generic/Regular	ECO-RC-1016 Principles of Microeconomics-I	This course will help the student to learn microeconomic theory and how microeconomics concepts can be applied in real life situations.
	Honours	ECO-HC-1016 Introductory Microeconomics	This course will help the student to learn microeconomic theory and how microeconomics concepts can be applied in real life situations.
	Honours	ECO-HC-1026 Mathematical Methods in Economics –I	This will help the student to know the basic mathematics that enables the study of economic theory.

2 nd	Generic/Regular	ECO-RC-2016 Principles of Microeconomics-II	This course will assist the student to learn how equilibrium is determined in factor market and what are the sources of market failure.
	Honours	ECO-HC-2016 Introductory Macroeconomics	This will help the student to learn the basic concepts of Macroeconomics such as savings, investment, GDP, money, inflation and balance of payments.
	Honours	ECO-HC-2026 Mathematical Methods in Economics –II	This course will help the student to know how to applying mathematical techniques to economic theory.
3 rd	Generic/Regular	ECO-RC-3016 Principles of Macroeconomics I	This course will help the student to learn the basic concepts of Macro - economics like national income accounting, determination of GDP, national income determination with government intervention and foreign trade.
	Honours	ECO-HC-3016 Intermediate Microeconomics-I	This particular course is designed to provide basic understanding of theory of consumer and production and cost. Apart from these, it also Incorporates the idea of perfect competition market. This paper would help students to understand how preference, utility, and budget affects demand, how an individual would react and work under the risk factors and their inter-temporal choice. They

			would also get the required idea about production, the relation between production and cost.
	Honours	ECO-HC-3026 Intermediate Macroeconomics-II	This paper provides the important understanding of the economy as a whole. It gives exposures to the students of formal modeling of the macro-economy. Theories of output, aggregate demand & aggregate supply, inflation, unemployment are incorporated which are the backbone of macroeconomic modeling.
	Honours	ECO-HC-3036 Statistical Methods for Economics	This is a course on statistical methods for Economics. It provides the basic understanding of statistical tools which are extensively used in economics. The various economic models and projection are based on such statistical tools. The policy makers infer from ongoing economic condition to predict the future trend in various fields in economics using such statistical tools.
	Generic/Regular	ECO-RC-4016 Principles of Macroeconomics-II	This will help the student to know various theories of determination of national income, concept of inflation its relationship with unemployment.
		ECO-HC-4016 Intermediate Microeconomics-II	This course is intended to provide understanding of general equilibrium and welfare economics. Apart from this, the efficiency

4th	Honours		aspect is also included. The various imperfect market structure and game theory provides adequate knowledge of how the market system actually works. Asymmetry information provides the basic understanding of insurance market.
	Honours	ECO-HC-4026 Intermediate Macroeconomics-II	This is a sequel to intermediate macroeconomics included in third semester. It provides ideas related to long run dynamic issues like growth and technical progress. Gives adequate idea about various policies concerning the economy adopted by state.
	Honours	ECO-HC-4036 Introductory Econometrics	This course provides comprehensive introduction to basic econometrics. This includes the various testing hypothesis, linear regression model, multiple regression model, the classical assumptions and their violations. This course is highly & extensively used in analyzing economic models and making prediction. This also would provide the ideas of how research in economics are carried out with using these tools.
	Generic/Regular/Honours	POL-SE-4024 Citizens and Rights	CO1: To analyse the linkages between citizenship, law, rights and equality. CO2: To understand the measures of discrimination, justice and empowerment and the ways to protect the

	(SEC)		same.
5 th	Regular (Elective)	ECO-RE-5016 Economic Development and Policy in India –I	This will help the student to know the major trends in aggregate economic indicators in India and major policy debates in India in the post-independence period.
	Regular (Generic)	ECO-RG-5016 Economic Development and Policy in India –I	This will help the student to know the major trends in aggregate economic indicators in India and major policy debates in India in the post-independence period.
	Honours	ECO-HC-5016 Indian Economy I	This will help the student to learn the major trends in economic indicators and policy debates in India in the post-independence period and also international comparisons.
		ECO-HC-5026 Development Economics –I	This will assist the student to know alternative measure of development and comparing development across nations. It also help to know the famous Harrod – Domar model which is the backbone of growth theory. This course will discuss the concepts and measurement of poverty and inequality.

	Honours (Discipline Specific Elective (DSE))	ECO-HE-5026 Money and Financial Markets	This will help the student to know how the monetary and financial sectors of the economy functioning as well reform of financial and banking sector.
		ECO-HE-5036 Public Finance	This will help the student to learn about the role of government in the economy in respect to efficient allocation.
6 th	Regular (Elective)	ECO-RE-6016 Economic Development and policy in India –II	This will help the student to learn the policies and performance of agriculture and industry as well foreign trade trends policies
	Regular (Generic)	ECO-RG-6016 Economic Development and policy in India –II	This will help the student to learn the policies and performance of agriculture and industry as well foreign trade trends policies.
	Honours	ECO-HC-6016 Indian Economy- II	This course will help the student to know about the sector specific policies as well policies and performance of agriculture of agriculture, industry, services.
6 th		ECO-HC-6026 Development Economics-II	This will help the student to learn the demographic concepts and their evolution during the process of development, sustainability and the role of globalization in the historical perspective.
		ECO-HE-6016 Environmental Economics	Students will know about the concept of natural resources, pollution control

	<p style="text-align: center;">(Honours) Discipline Specific Elective</p>		<p>measures and its impact, sustainable development.</p>
		<p style="text-align: center;">ECO-HE-6026 International Economics</p>	<p>This will help the students to know about the trade theories, trade policy and international macroeconomics policy.</p>

DEPARTMENT OF EDUCATION

B.A. (Education) General and Honours

Programme Specific Outcome

PO1: To inculcate the knowledge of education and to get acquainted with the instructional techniques and different models of teaching.

PO2: To acquaint the students with various issues in education that are emerging in the recent years in higher education system

PO3: To be acquainted with the cognitive approach of development and thus to understand the process and factors of cognition.

PO4: To acquaint different statistical procedures used in education.

PO5: To develop an understanding of ICT and e-learning.

PO6: To create awareness in application-oriented research.

PO7: To accustom with the recent education development in India
Skill on curriculum construction and preparation of co-curricular activities.

PO8: Skill on maintenance of school discipline and problems.
Skill on data collection, statistical application, analysis and interpretation of data.

PO9: Application of educational psychology in teaching and learning process.

Course Outcomes of B.A. (Education) General and Honours

Semester	Course Category	Paper Code and Course Name	Outcomes
1 st	Generic/Regular	EDU-HG-1016 Foundation of Education	CO1: The principles of education CO2: Different forms and aims of education CO3: The concept and importance of discipline and freedom

1st	Honours	EDU-HC-1016 Principles Of Education	<p>CO1: understand the sound principles of education.</p> <p>CO2: develop Knowledge about the important concepts of education, different aims of education, curriculum, discipline and freedom, democracy and co-relation of studies.</p> <p>CO3: develop an understanding about the democratic idea of modern education</p>
	Honours	EDU-HC-1026 Psychological Foundation of Education	<p>CO1: understand the relationship between education and psychology</p> <p>CO2: learn about the significance of education psychology in teaching-learning process.</p> <p>CO3: understand the nature and theories of learning, the role of motivation in learning and types of personality.</p> <p>CO4: acquaint themselves with the concept of memory, forgetting, intelligence, attention and interest</p> <p>CO5: develop an effective problem-</p>

			solving skill with the ability to analyse different perspectives.
2 nd	Generic/Regular	EDU-HG-2016 Psychology of Adolescents	CO1: Understand the period of adolescents and its significance in human life CO2: Understand the various problems associated with this stage CO3: Learn about the developmental aspects of adolescents
		EDU-HC-2016 Philosophical and Sociological Foundations of Education	CO1: Know the concept of philosophy and its relationship CO2: Understand the educational implications of different Indian and western philosophy CO3: Learn the concept of sociology and its relationship with education
	Honours	EDU-HC-2026 Development of Education in India-I	CO1: Recount the concept of ancient Indian Education System CO2: Examine the education system in medieval India CO3: Analyze the education system during British Period
		EDU-HG-3016 Guidance and Counseling	CO1: understand the concept, need and importance

3rd	Generic/Regular		<p>of guidance and counselling</p> <p>CO2: learn about the different types and approaches to guidance and counselling</p> <p>CO3: understand the challenges faced by the teacher as guidance worker</p>
	Honours	<p>EDU-HC-3016</p> <p>Development of Education in India-II</p>	<p>CO1: Understand the educational situation during the time of independence</p> <p>CO2: Learn about the recommendations and educational importance of different education commission and committees in post independent India</p> <p>CO3: Accustom with the recent educational development in India</p>
		<p>EDU-HC-3026</p> <p>Educational Technology and Teaching Methods</p>	<p>CO1: understand the objectives of educational technology in teaching learning process</p> <p>CO2: learn about the innovations in the field of education through technology</p> <p>CO3: familiarize</p>

	Honours		<p>themselves about various methods and devices of teaching</p> <p>CO4: understand the strategies of effective teaching as a profession</p>
		<p>EDU-HC-3036</p> <p>Value and Peace Education</p>	<p>CO1: learn the concept and meaning of value</p> <p>CO2: become aware about the role of educational institutions in building a value-based society</p> <p>CO3: understand the meaning and concept of peace and its importance in human life</p> <p>CO4: understand the meaning and importance of peace education and its relevance at national and international level</p>
3rd	<p>Honours/ Generic/Regular</p> <p>Skill Enhancement Course (SEC)</p>	<p>EDU-SEC-3014</p> <p>Public Speaking Skill</p>	<p>After completing this course, the students will be able to acquire the capacities of public speaking skill</p>
		<p>EDU-HG-4016</p> <p>History of Education in India</p>	<p>CO1: Analyze the education system during British Period</p> <p>CO2: Understand the educational</p>

4th	Generic/Regular		<p>situation during the time of independence</p> <p>CO3: Learn about the recommendations and educational importance of different education commission and committees in post independent period</p> <p>CO4: Accustom with the recent educational development in India</p>
	Honours	EDU-HC-4016 Great Educational Thinkers	<p>CO1: learn about the philosophy of life of different educational thinkers and their works</p> <p>CO2: understand about the views of the thinkers in educational contexts</p> <p>CO3: learn about the relevance of their thoughts at present day context</p>
	Honours	EDU-HC-4026 Educational Statistics and Practical	<p>CO1: develop the basic concept of Statistics</p> <p>CO2: understand different statistical procedures used in education</p> <p>CO3: develop the ability to represent educational data through graphs</p>

	Honours	EDU-HC-4036 Emerging Issues in Education	CO1: acquaint with major emerging issues –national state and local CO2: understand the issues in education that are emerging in the recent years in the higher education system CO3: address the various problems and challenges of education in India
	Generic/Regular/Honours (SEC)	EDU-SE-4014 Writing Bio-data and Facing an Interview	After completing the course, the students will be able to write a bio data scientifically and will develop confidence to face different types of interview.
5th	Regular (Elective)	EDU-RE-5026 Developmental Psychology	CO1: acquaint students about hereditary and environmental factors affecting pre-natal development. CO2: enable students to understand the development aspects of adolescence, importance of adolescence period and problems associated with this stage.
			CO1: to acquaint the students with growing need and importance of distance education.

	<p align="center">Regular (Generic)</p>	<p align="center">EDU-RG-5016 Distance Education</p>	<p>CO2: acquaint students with the different forms and methodologies applied in distance education. CO2: acquaint the students with different instructional strategies of distance education.</p>
	<p align="center">Honours</p>	<p align="center">EDU-HC-5016 Measurement and Evaluation in Education and Practical</p>	<p>CO1: Understand the concept of measurement and evaluation in Education CO2: Acquaint themselves with the general procedure of test construction and characteristics of a good test CO3: Learn about different educational tests and their uses</p>
		<p align="center">EDU-HC 5026 Guidance and Counselling</p>	<p>CO1: Understand the concept, need and importance of guidance and counselling CO2: Know about the different types and approaches to guidance and counselling CO3: Acquaint themselves with the organization of guidance service and school guidance clinic.</p>

	Honours (Discipline Specific Elective (DSE))	EDU-HE-5026 Developmental Psychology	<p>CO1: acquaint students about hereditary and environmental factors affecting pre-natal development. CO2: enable students to understand the development aspects of adolescence, importance of adolescence period and problems associated with this stage.</p>
		EDU- HE-5046 Teacher Education in India	<p>CO1: Acquaint with the development of Teacher Education in India. CO2: Acquaint with the innovative trends and recent issues in teachers' education, and be able to critically analyse the status of teacher education in India. CO3: Understand and conceive the qualities, responsibilities and professional ethics of teachers.</p>
6th	Regular (Generic/ Elective)	EDU-RE-6016/ EDU-RG-6016 Mental Health and Hygiene	<p>CO1: Acquaint with the fundamentals and development of mental health and the characteristics of a mentally healthy person. CO2: Acquire knowledge about the principles, factors promoting mental health and the role of home, school and society in</p>

			<p>maintaining proper mental health.</p> <p>CO3: Familiarise with the concept and issues of positive psychology, mental health of women, role of WHO and stress management.</p>
	Honours	<p>EDU-HC-6016</p> <p>Education and Development</p>	<p>CO1: Understand the relation between education and development</p> <p>CO2: Know about the educational development in the post globalization era</p> <p>CO3: Learn about the role of education in community development, education for human resource development.</p> <p>CO4: Understand about economic and political awareness through education</p>
		<p>EDU-HC-6026</p> <p>Project</p>	<p>CO1: Know about the process of conducting a project</p> <p>CO2: Prepare a project report</p>
		<p>EDU-DSC-6016</p> <p>Mental Health and Hygiene</p>	<p>CO1: Acquaint with the fundamentals and development of mental health and the characteristics of a mentally healthy person.</p> <p>CO2: Acquire knowledge about the</p>

	<p align="center">Discipline Specific Elective (DSE)</p>		<p>principles, factors promoting mental health and the role of home, school and society in maintaining proper mental health.</p> <p>CO3: Familiarise with the concept and issues of positive psychology, mental health of women, role of WHO and stress management</p>
<p align="center">EDU-DSC-6036</p> <p align="center">Educational management</p>		<p>CO1: Develop and understanding of the basic concepts of educational management.</p> <p>CO2: Enable student to know about the various resources in education.</p> <p>CO3: Enable the students to know about the financial resources and financial management.</p>	

DEPARTMENT OF ENGLISH

B.A. (English) General and Honours

**Programme
Specific
Outcome**

- (i) Students will have broad and balanced knowledge in English Literature in addition to understanding of key concepts, principles, and theories.
- (ii) Students will acquire expertise over English poetry, fiction, drama among others.
- (iii). Students will have knowledge, ability, and skill to undertake further studies in English literature or in related multidisciplinary areas that can be helpful for higher studies. In addition, a English graduate as envisioned in this framework would be sufficiently competent in the field to undertake further discipline-specific studies, as well as to begin domain-related employment.
- (iv) Cognitive development of students in a holistic manner, that provides the latest subject matter in such a way that foster their core competency and discovery learning
- (vi). Mould a responsible citizen who is aware of most basic domain-independent knowledge, including critical thinking and communication.
- (vii). Enable the graduates to compete in national/international and state level competitive examinations, such as UGC-NET, State level TET, UPSC Civil Services Examination, APSC etc.

Course Outcomes of B.A. (English) General and Honours

Semester	Course Category	Paper Code and Course Name	Outcomes
1st	Generic/Regular	ENG-CC-1016 English 1	The paper seeks to provide the students an opportunity to read and respond to representations of issues in contemporary life and culture in the English language
		AECC ENG-AE-1014 English Communication	This course on English for undergraduate students aims to develop the language skills of students for academic and other purposes as .
	Honours	ENG-HC-1016 Indian Classical Literature	This paper encourage s students to think laterally about literature s of the world and the possibility of cultural exchange.
	Honours	ENG-HC-1026 European Classical Literature	This paper seeks to familiarise students with the enriching literary tradition of European classical literature through the study of representative texts.

2 nd	Generic/Regular	ENG-CC-2016 English 2	The paper seeks to provide the students an opportunity to read and respond to representations of issues in contemporary life and culture in the English language
	Honours	ENG-HC-2016 Indian Writing in English	This paper on Indian Writing in English introduces students to the historical development of this body of writing-the challenges faced by early writers and the interpretation of individual and collective experience in colonial and post colonial India
	Honours	ENG-HC-2026 British Poetry and Drama: 14th to 17th centuries	This paper aims to familiarise the students with two major forms in British literature from the 14th to the 17th centuries, apart from acquainting them with the contexts that generated such literatures.
	Generic/Regular	ALT-CC-3016 Alternative English	This paper aims to familiarise the students with various literary works from poetry to drama with special emphasis on the thematic concerns and critical perspectives.

3 rd	Honours	ENG -HC-3016 History of English literature and forms	This paper introduces students to the history of English literature and the major literary forms like poetry, drama, fiction and non fictional prose. The paper helps acquire a sense of historical development of each literary form and gain understanding of the contexts in which literary forms and individual texts emerge.
	Honours	ENG-HC-3026- American Literature	This paper seeks to acquaint the students with the main currents of American literature in its social and cultural contexts.
3 rd	Honours	ENG-HC-3036 British Poetry and Drama:17th and 18th Centuries	This paper aims to familiarise the students with British literature in the 17th and 18th centuries and encourage the students to look at the economic, political and social changes in Britain during this period.

	Honours	ENG-HC-5016 British Literature: The 20th Century	<p>The objective of this paper is to introduce the students with the spirit of modernism and the ethos of post modernism through the texts of different European writers of the 20th century by transcending the codes and conventions of the past. The paper also aims to make the students learn about new forms and idioms through the reading of the recent poetical and fictional works.</p>
5 th	Honours	ENG-HC-5026 Women's Writing	<p>The objective of this paper is to introduce the students with the nineteenth and twentieth century women writers from different geographical and socio-cultural settings with reference to relevant notions like gender, feminism, identity, body and space and so on. Through this paper, the students will get acquainted with the women writers who have represented their lived experiences in a variety of genres; poetry, novels, short stories and autobiography.</p>

5th	Generic/Regular / Honours (Discipline Specific Elective (DSE))	DSE1 Paper 1: ENG-HE-5016 Popular Literature	<p>The objective of this paper is to enlighten the students with the nature of popular literature as a genre through a practical engagement with certain texts within the arena of popular literature. Through these fictional texts prescribed in this paper, the students will receive a critical idea underpinning the theorization of popular literature.</p>
		DSE2 Paper 3: ENG-HE-5036 Literature of the Indian Diaspora	<p>This paper aims to acquaint the students with the experiences of the diasporic writers by focusing extensively on ideas of transnationalism, exile, nostalgia, migration, alienation, displacement and so on with particular reference to Indian diasporic writers. The selected texts in this paper aims to make the students aware about the strong presence of ‘the literature of the diaspora’ in the global scene.</p>

6th	Honours	ENG-HC-6016 Modern European Drama	<p>This paper aims to introduce the students to modern European drama by introducing selected plays of writers from different places of Europe. Through these selected plays, the students will be provided with an understanding of the emergence of avant garde movements and trends, dramatic devices and techniques during the period of modernism.</p>
	Honours	ENG-HC-6026 Postcolonial Literature	<p>The objective of this paper is to acquaint the students with the emerging study of postcolonial literature through the reading of certain novels, short stories and poems from across the world. The texts prescribed in this paper will make the students familiar with the many regional differences and cultural peculiarities as well as common and shared experiences of postcolonialism.</p>

6 th	<p style="text-align: center;">Generic/Regular / Honours (DSE)</p>	<p>DSE1: ENG-HE-6056 Life Writing</p>	<p>This paper aims to enlighten the students with the field of life writing by introducing texts from various genres across the world, such as autobiographies, confessions, diaries, memoirs and so on. This paper further aims to highlight the influence of the self and the other in an individual; the role of memory in life writing and the way autobiographies are used as a tool of resistance and rewriting history.</p>
		<p>DSE2 Paper 12: ENG-HE-6066 Writing from the Northeast India</p>	<p>The objective of this paper is to acquaint the students with the literature of Northeast India through the reading of oral narratives, poetry, fiction and drama. The paper provides the students with an understanding of ideas like folk narrative, myths and legends and the relevance of memory and telling through selected texts taken from the writers of Northeast India.</p>

DEPARTMENT OF HISTORY	
B.A. (History) General and Honours	
Programme Specific Outcome	<p>PO1. Students will have broad and balanced knowledge in chemistry in addition to understanding of key chemical concepts, principles, and theories.</p> <p>PO2. Students will acquire expertise over solving both theoretical and applied chemistry problems.</p> <p>PO3. Students will have knowledge, ability, and skill to undertake further studies in chemistry or in related multidisciplinary areas that can be helpful for higher studies. In addition, a chemistry graduate as envisioned in this framework would be sufficiently competent in the field to undertake further discipline-specific studies, as well as to begin domain-related employment.</p> <p>PO4. Students will be sensitized on problems related environmental issues and will be able to correlate the importance of green chemistry.</p> <p>PO5. Cognitive development of students in a holistic manner, that provides the latest subject matter (both theoretical as well as practical), in such a way that foster their core competency and discovery learning</p> <p>PO6. Mould a responsible citizen who is aware of most basic domain-independent knowledge, including critical thinking and communication.</p> <p>PO7. Enable the graduates to compete in national/international and state level competitive examinations, such as IIT-JAM, CUCET, UPSC Civil Services Examination etc.</p>

Course Outcomes of B.A. (History) General and Honours			
Semester	Course Category	Paper Code and Course Name	Outcomes
1st	Generic/Regular	HIS –HG/RC-1016 HISTORY OF INDIA (FROM THE EARLIEST TIMES UPTO c. 1206)	<p>CO1. students will be able to explain the emergence of state system in North India, development of imperial state structure and state formation in South India in the early period.</p> <p>CO2. They will be able to understand the changes and</p>

			transformations in polity, economy and society in early India and the linkages developed through contacts with the outside world.
	Honours	HIS-HC-1016 HISTORY OF INDIA- I	CO1. After the completion of this paper, the students will be able to explore and effectively use historical tools in reconstructing the remote past of ancient Indian pre and proto history. CO2. The course will also train the students to analyse the various stages of evolution of human cultures and the belief systems in the proto- history period.
	Honours	HIS-HC-1026 SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD	CO1. the students will be able to explain the processes and stages of the evolution of the variety of cultural pattern throughout antiquarian periods in History. CO2. They will be able to relate the connections between the various Bronze Age civilizations in the ancient world as well as development of slave and polis societies in ancient Greece.
2nd	Generic/Regular	HIS –HG/RC- 2016	CO1. students will be able to analyse the political and social developments in India between 1206-1757. CO2. Students will be able to explain the formation of different States during this period along with their administrative apparatuses, and the society, economy and culture of India in the 13th to mid-18th century period.

	Honours	HIS-HC-2016 HISTORY OF INDIA- II	CO1. the students will be able to explain the economic and socio-cultural connections, transitions and stratifications during the ruling houses, empires and the politico-administrative nuances of early Indian History from 300 BCE to 300 CE.
	Honours	HIS-HC-2026 SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE MEDIEVAL WORLD	CO1. students will be able to analyse and explain the historical socio-political, administrative and economic patterns of the medieval world. CO2. They will be able to describe the emergence, growth and decline of various politico-administrative and economic patterns and the resultant changes therein.
3rd	Generic/Regular	HIS –HG/RC-3016 HISTORY OF INDIA (c. 1757 to 1947	CO1. students will be able to understand the major factors that led to the establishment and consolidation of British rule in India. CO2. They will also be able to identify the process of growth of resistance against British colonial rule and the eventual growth of Indian nationalist movement, which ultimately led to the end of the British rule in the country.
	Honours	HIS-HC-3016 HISTORY OF INDIA III (c. 750 -1206)	CO1. The completion of this paper will enable the students to relate and explain the developments in India in its political and economic fields and its relation to the social and cultural patterns therein in the historical time period between c.700 to 1206

3rd			CO2. They will also be able to analyse India's interaction with another wave of foreign influence and the changes brought in its wake in the period.
	Honours	HIS-HC-3026 RISE OF THE MODERN WEST – I	CO1. students will be able to explain the major trends and developments in the Western world between the 14 th to the 16 th century CE. CO2. They will be able to explore and analyse the significant historical shifts and events and the resultant effects on the civilizations of Europe in the period.
	Honours	HIS-HC-3036 HISTORY OF INDIA IV (c.1206 – 1550)	CO1. students will be able to explain the political and administrative history of medieval period of India from 1206 to 1550 AD CO2. They will also be able to analyse the sources of history, regional variations, social, cultural and economic set up of the period.
	Generic/Regular	HIS –HG/RC-4016 SOCIAL AND ECONOMIC HISTORY OF ASSAM	CO1. students will be able to analyse and explain the socio-economic history of Assam including among others the development of caste system, religious beliefs, agriculture and land system, the social organization, trade and commerce, various agricultural regulations, plantation economy, development of modern industries, transport system, education, the emergence of middle class, development of

4 th			literature and press, and growth of public associations.
	Honours	HIS-HC-4016 RISE OF THE MODERN WEST – II	CO1. student will be able to explain the political and intellectual currents in Europe in the Modern Age CO2. They will also be able to relate the circumstances and causal factors of the intellectual and revolutionary currents of both Europe and America at the beginning of the Modern age
	Honours	HIS-HC-4026 HISTORY OF INDIA V (c. 1550 - 1605)	CO1. students will be able to analyse the circumstances and historical shifts and foundations of a variety of administrative and political setup in India between c.1550-1605 CO2. They will also be able to describe the inter relationships between the economy, culture and religious practices of the period.
	4 th	Honours	HIS-HC-4036 HISTORY OF INDIA VI (c. 1605 - 1750)
		HIS –SE-4014 Oral Culture and Oral History	CO1. students will be able to explain complex interrelationships of structures or events in the context of broader social and cultural framework of societies through ‘public memory’ and use oral history to

	Honours/ Regular		<p>preserve oral culture and local history</p> <p>CO2. The students will be able to use ‘Public memory’ as a tool and a source not only to write public history but also to explore new knowledge in the humanities, social sciences and even in disciplines like architecture, communication studies, gender studies, English, history, philosophy, political science, religion, and sociology</p>
5 th	Regular	<p>HIS –RE-5016</p> <p>HISTORY OF ASSAM (From earliest times upto 1826 CE</p>	<p>CO1. This paper will give a general outline of the history of Assam from the earliest times to the advent of the British</p> <p>CO2. students will be able to identify major stages of developments in the political history of Assam from the earliest times to the occupation of Assam by the English East India Company in the first quarter of the 19th century.</p>
		<p>HIS –RG-5016</p> <p>HISTORY OF EUROPE (c. 1648-1870</p>	<p>CO1. students will be able to explain the emergence of state system in Europe and the rise of modernity</p> <p>CO2. They will also be able to analyse the revolutionary upheaval of Europe that finally shaped the world</p>
		<p>HIS-HC-5016</p> <p>History of Modern Europe- I (c. 1780-1939</p>	<p>CO1. After the completion of this course the students will be able to evaluate the historical evolution and political developments that occurred in Europe in the period between 1780 to 1939.</p> <p>CO2. They will also be also to</p>

	Honours		<p>critically analyse the evolution of social classes, nation states, evolution of capitalism and nationalist sentiment in Europe</p> <p>CO3. They will also be able to relate to the variety of causes that dragged the world into devastating wars in the intervening period.</p>
	Honours	<p>HIS-HC-5026</p> <p>HISTORY OF INDIA VII (c. 1780 - 1857</p>	<p>CO1. students will be able to relate the circumstances leading to the consolidation of colonial rule over India and their consequences</p> <p>CO2. They will also be able to explain the orientation of the indigenous population and the masses towards resistance to the colonial exploitation.</p> <p>CO3. The course will also enable the students to analyse popular uprisings among the tribal, peasant and common people against the British policies.</p>
		<p>HIS –HE-5016</p> <p>HISTORY OF ASSAM (UPTO c. 1228)</p>	<p>CO1. This paper will give a general outline of the history of Assam from the earliest times to the advent of the Ahoms in the 13th century.</p> <p>CO2. students will be acquainted with major stages of developments in the political, social and cultural history of Assam during the early times.</p>

	Honours (Discipline Specific Elective (DSE))	HIS –HE-5026 HISTORY OF ASSAM (c. 1228 – 1826)	<p>CO1. students will be able to identify major stages of developments in the political, social and cultural history of Assam during the medieval times.</p> <p>CO2. This paper will enable the student to explain the history of Assam from the 13th century to the occupation of Assam by the English East India Company in the first quarter of the 19th century.</p>
6th	Regular	HIS –RE-6016 HISTORY OF ASSAM (c. 1826 – 1947)	<p>CO1. students will be able to describe the period of British rule in Assam after its annexation by the imperialist forces.</p> <p>CO2. They will also be able to situate the development of nationalism in Assam and its role in India’s freedom struggle</p> <p>CO3. The course would enable the students to analyse the main currents of the political and socio- economic developments in Assam during the colonial period.</p>
		HIS –RG-6016 HISTORY OF EUROPE (c. 1870 – 1939)	<p>CO1. students will be able to explain the major political developments in Europe from 1870 to 1939.</p> <p>CO2. The students will be able to delineate how the rise of two unified nations of Germany and Italy gave rise of intense imperialist contest the world over.</p> <p>CO3. The course would also enable the students to analyse the causes and consequences of World War I and the developments leading to World War II.</p>

6th	Honours	HIS-HC-6016 HISTORY OF INDIA VIII (c. 1857 - 1950	<p>CO1. Students will be able to analyse the course of British colonial exploitation, the social mobilizations during the period between c.1857 to 1950 and also the techniques of Indian resistance to British policies</p> <p>CO2. It will also enable the students to explain the circumstances leading to de-colonization and also the initial period of nation building in India.</p>
	Honours	HIS-HC-6026 HISTORY OF MODERN EUROPE II (c. 1780 -1939	<p>CO1. students will be able to analyse the historical developments in Europe between c.1780 to 1939.</p> <p>CO2. students will be able to situate the historical development of working class movements, socialist upsurge and the economic forces of the two wars and the other ideological shifts of Europe in the period</p>
	Honours (DSE)	HIS –HE-6016 HISTORY OF ASSAM (c. 1826 – 1947)	<p>CO1. students will be able to describe the period of British rule in Assam after its annexation by the imperialist forces.</p> <p>CO2. They will also be able to situate the development of nationalism in Assam and its role in India’s freedom struggle.</p> <p>CO3. It would also enable the students to analyse the main currents of the political and socio-economic developments in Assam during the colonial period.</p>
		HIS –HE-6026	<p>CO1. Students will be able to assess the aftermath of Partition and other socio- economic</p>

		ASSAM SINCE INDEPENDENCE	developments in post-independence Assam CO2. They will also be able to identify the main currents of political and socio-economic development in Assam after India's independence and the causes and impact of various struggles and movements in contemporary Assam.
--	--	---------------------------------	--

DEPARTMENT OF MATHEMATICS

B.Sc (Mathematics) General and Honours

Programme Specific Outcome

The completion of the Programme shall enable a student to:

PO1. Communicate mathematics effectively by oral, written, computational and graphic means.

PO2. Create mathematical ideas from basic axioms.

PO3. Gauge the hypothesis, theories, techniques and proofs provisionally.

PO4. Utilize mathematics to solve theoretical and applied problems by critical understanding, analysis and synthesis.

PO5. Identify applications of mathematics in other disciplines and in the real world, leading to enhancement of career prospects in a plethora of fields.

PO6. Appreciate the requirement of lifelong learning through continued education and research.

Course Outcomes of B.Sc (Mathematics) General and Honours

Semester	Course Category	Paper Code and Course Name	Outcomes
1st	Honours	MAT-HC-1016 Calculus	<p>This course will enable the students to:</p> <p>i) Learn first and second derivative tests for relative extremum and apply the knowledge in problems in business, economics and life sciences.</p> <p>ii) Sketch curves in a plane using its mathematical properties in different coordinate systems.</p> <p>iii) Compute area of surfaces of revolution and the volume of solids by integrating over cross-sectional areas.</p> <p>iv) Understand the calculus of vector functions and its use to develop the basic principles of planetary motion.</p>

	Honours	MAT-HC-1026 Algebra	<p>This course will enable the students to:</p> <ul style="list-style-type: none"> i) Employ De Moivre's theorem in a number of applications to solve numerical problems. ii) Learn about equivalent classes and cardinality of a set. iii) Use modular arithmetic and basic properties of congruences. iv) Recognize consistent and inconsistent systems of linear equations by the row eMATIon form of the augmented matrix. v) Learn about the solution sets of linear systems using matrix method and Cramer's rule.
	Generic/Regular	MAT-HG/RC-1016 Calculus	<p>The students who take this course will be able to:</p> <ul style="list-style-type: none"> i) Understand continuity and differentiability in terms of limits. ii) Describe asymptotic behavior in terms of limits involving infinity. iii) Use derivatives to explore the behavior of a given function, locating and classifying its extrema, and graphing the function. iv) Understand the importance of mean value theorems.
2nd Sem	Honours	MAT-HC-2016: Real Analysis	<ul style="list-style-type: none"> i) Understand many properties of the real line \mathbb{R}, including completeness and Archimedean properties. ii) Learn to define sequences in terms of functions from \mathbb{N} to a subset of \mathbb{R}. iii) Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence. iv) Apply the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.

	Honours	MAT-HC-2026: Differential Equations	<p>i) Learn basics of differential equations and mathematical modeling.</p> <p>ii) Formulate differential equations for various mathematical models.</p> <p>iii) Solve first order non-linear differential equations and linear differential equations of higher order using various techniques.</p> <p>iv) Apply these techniques to solve and analyze various mathematical models.</p>
	Generic/Regular	MAT-HG- 2016/MAT-RC- 2016 Algebra	<p>i) Learn how to solve the cubic and biquadratic equations, also learn about symmetric functions of the roots for cubic and biquadratic</p> <p>ii) Employ De Moivre's theorem in a number of applications to solve numerical problems.</p> <p>iii) Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix. Finding inverse of a matrix with the help of Cayley-Hamilton theorem</p> <p>iv) Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, ring etc.</p> <p>v) Learn about the concept of linear independence of vectors over a field, and the dimension of a vector space.</p>

3rd Sem	Honours	MAT-HC-3016: Theory of Real Functions	<p>This course will enable the students to:</p> <ul style="list-style-type: none"> i) Have a rigorous understanding of the concept of limit of a function. ii) Learn about continuity and uniform continuity of functions defined on intervals. iii) Understand geometrical properties of continuous functions on closed and bounded intervals. iv) Learn extensively about the concept of differentiability using limits, leading to a better understanding for applications. v) Know about applications of mean value theorems and Taylor's theorem.
	Honours	MAT-HC-3026: Group Theory - I	<p>The course will enable the students to:</p> <ul style="list-style-type: none"> i) Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc. ii) Link the fundamental concepts of groups and symmetrical figures. iii) Analyze the subgroups of cyclic groups and classify subgroups of cyclic groups. iv) Explain the significance of the notion of cosets, normal subgroups and factor groups. v) Learn about Lagrange's theorem and Fermat's Little theorem. vi) Know about group homomorphisms and group isomorphisms.
	Honours	MAT-HC-3036: Analytical Geometry	<p>This course will enable the students to:</p> <ul style="list-style-type: none"> i) Learn conic sections and transform co-ordinate systems. ii) Learn polar equation of a conic, tangent, normal and properties. iii) Have a rigorous understanding of the concept of three dimensional coordinates systems.

	Generic/Regular	MAT-HG-3016/MAT-RC-3016 Differential Equations	The course will enable the students to: i) Learn basics of differential equations and mathematical modelling. ii) Solve first order non-linear differential equations and linear differential equations of higher order using various techniques..
	Skill Enhancement Course	MAT-SE-3024: Combinatorics and Graph Theory	This course will enable the students to: i) Learn about the counting principles, permutations and combinations, Pigeonhole principle. ii) Understand the basics of graph theory and learn about social networks, Eulerian and Hamiltonian graphs, diagram tracing puzzles and Knight's tour problem.
4th	Honours	MAT-HC-4016: Multivariate Calculus	This course will enable the students to: i) Learn the conceptual variations when advancing in calculus from one variable to multivariable discussion. ii) Understand the maximization and minimization of multivariable functions subject to the given constraints. iii) Learn about inter-relationship amongst the line integral, double and triple integral formulations. iv) Familiarize with Green's, Stokes' and Gauss divergence theorems.
	Honours	MAT-HC-4026: Numerical Methods	The course will enable the students to: i) Learn some numerical methods to find the zeroes of nonlinear functions of a single variable and solution of a system of linear equations, up to a certain given level of precision. ii) Know about methods to solve system of linear equations, such as False position method, Fixed point

			<p>iteration method, Newton's method, Secant method and LU decomposition.</p> <p>iii) Interpolation techniques to compute the values for a tabulated function at points not in the table.</p> <p>iv) Applications of numerical differentiation and integration to convert differential equations into difference equations for numerical solutions.</p>
	Honours	MAT-HC-4036: Ring Theory	<p>On completion of this course, the student will be able to:</p> <p>i) Appreciate the significance of unique factorization in rings and integral domains.</p> <p>ii) Learn about the fundamental concept of rings, integral domains and fields.</p> <p>iii) Know about ring homomorphism and isomorphism theorems of rings.</p> <p>iv) Learn about the polynomial rings over commutative rings, integral domains, Euclidean domains, and UFD.</p>
	Generic/Regular	MAT-HG-4016/ MAT-RC-4016: Real Analysis	<p>This course will enable the students to:</p> <p>i) Understand many properties of the real line \mathbb{R}, including completeness and Archimedean properties.</p> <p>ii) Learn to define sequences in terms of functions from \mathbb{R} to a subset of \mathbb{R}.</p> <p>iii) Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.</p> <p>iv) Apply the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.</p>

	Skill Enhancement Course	MAT-SE-4024: LaTeX and HTML	<p>After studying this course the student will be able to:</p> <ul style="list-style-type: none"> i) Create and typeset a LaTeX document. ii) Typeset a mathematical document using LaTeX. iii) Learn about pictures and graphics in LaTeX. iv) Create beamer presentations. v) Create web page using HTML.
5th	Honours	MAT-HC-5016: Riemann Integration and Metric spaces	<p>The course will enable the students to:</p> <ul style="list-style-type: none"> i) Learn about some of the classes and properties of Riemann integrable functions, and the applications of the Fundamental theorems of integration. ii) Know about improper integrals including, beta and gamma functions. iii) Learn various natural and abstract formulations of distance on the sets of usual or unusual entities. Become aware one such formulations leading to metric spaces. iv) Analyse how a theory advances from a particular frame to a general frame. v) Appreciate the mathematical understanding of various geometrical concepts, viz. Balls or connected sets etc. in an abstract setting. vi) Know about Banach fixed point theorem, whose far-reaching consequences have resulted into an independent branch of study in analysis, known as fixed point theory. vii) Learn about the two important topological properties, namely connectedness and compactness of metric spaces.
			<p>The course will enable the students to:</p>

5th	Honours	MAT-HC-5026: Linear Algebra	<p>i) Learn about the concept of linear independence of vectors over a field, and the dimension of a vector space.</p> <p>ii) Basic concepts of linear transformations, dimension theorem, matrix representation of a linear transformation, and the change of coordinate matrix.</p> <p>iii) Compute the characteristic polynomial, eigenvalues, eigenvectors, and eigenspaces, as well as the geometric and the algebraic multiplicities of an eigenvalue and apply the basic diagonalization result.</p> <p>iv) Compute inner products and determine orthogonality on vector spaces, including Gram–Schmidt orthogonalization to obtain orthonormal basis.</p> <p>v) Find the adjoint, normal, unitary and orthogonal operators.</p>
	Honours (Discipline Specific Elective (DSE))	MAT-HE-5016: Number Theory	<p>This course will enable the students to:</p> <p>i) Learn about some fascinating discoveries related to the properties of prime numbers, and some of the open problems in number theory, viz., Goldbach conjecture etc.</p> <p>ii) Know about number theoretic functions and modular arithmetic.</p> <p>iii) Solve linear, quadratic and system of linear congruence equations.</p>

	<p style="text-align: center;">Honours (Discipline Specific Elective (DSE))</p>	<p style="text-align: center;">MAT-HE-5066: Programming in C</p>	<p>After completion of this paper, student will be able to:</p> <ul style="list-style-type: none"> i) Understand and apply the programming concepts of C which is important to mathematical investigation and problem solving. ii) Learn about structured data-types in C and learn about applications in factorization of an integer and understanding Cartesian geometry and Pythagorean triples. iii) Use of containers and templates in various applications in algebra. iv) Use mathematical libraries for computational objectives. v) Represent the outputs of programs visually in terms of well formatted text and plots.
	<p style="text-align: center;">Generic/Regular (Discipline Specific Elective (DSE))</p>	<p style="text-align: center;">MAT-RE-5016: Number Theory</p>	<p>This course will enable the students to:</p> <ul style="list-style-type: none"> i) Learn about some fascinating discoveries related to the properties of prime numbers, and some of the open problems in number theory, viz., Goldbach conjecture etc. ii) Know about number theoretic functions and modular arithmetic. iii) Solve linear, quadratic and system of linear congruence equations.
5 th	<p style="text-align: center;">Regular (SEC)</p>	<p style="text-align: center;">MAT-SE-5014: Combinatorics and Graph Theory</p>	<p>This course will enable the students to:</p> <ul style="list-style-type: none"> i) Learn about the counting principles, permutations and combinations, Pigeonhole principle ii) Understand the basics of graph theory and learn about social networks, Eulerian and Hamiltonian graphs, diagram tracing puzzles and Knight's tour problem.
	<p style="text-align: center;">Honours</p>	<p style="text-align: center;">MAT-HC-6016: Complex Analysis</p>	<p>Completion of the course will enable the students to:</p> <p>CO1. Learn the significance of differentiability of complex functions leading to the understanding of Cauchy–Riemann equations.</p>

6th			<p>CO2. Learn some elementary functions and can evaluate the contour integrals.</p> <p>CO3. Understand the role of Cauchy–Goursat theorem and the Cauchy integral formula.</p> <p>CO4. Expand some simple functions as their Taylor and Laurent series, classify the nature of singularities, find residues and apply Cauchy Residue theorem to evaluate integrals.</p>
	Honours	MAT-HC-6026: Partial Differential Equations	<p>The course will enable the students to:</p> <p>CO1. Formulate, classify and transform first order PDEs into canonical form.</p> <p>CO2. Learn about method of characteristics and separation of variables to solve first order PDE's.</p> <p>CO3. Classify and solve second order linear PDEs.</p> <p>CO4. Learn about Cauchy problem for second order PDE and homogeneous as well as nonhomogeneous wave equations.</p> <p>CO5. Apply the method of separation of variables for solving second order PDEs.</p>
	Honours (DSE)	MAT-HE-6016: Boolean Algebra and Automata Theory	<p>The course will enable the students to:</p> <p>i) Learn about the order isomorphism, Hasse diagrams, building new ordered set.</p> <p>ii) Learn about the algebraic structure lattices, properties of modular and distributive lattices.</p> <p>iii) Get ideas about the Boolean algebra, Switching circuits and applications of switching circuits.</p> <p>iv) Appreciate the theory of automata and its applications.</p>

	Regular (DSE)	MAT-RE-6026: Programming in C	<p>After completion of this paper, student will be able to:</p> <ul style="list-style-type: none"> i) Understand and apply the programming concepts of C which is important to mathematical investigation and problem solving. ii) Learn about structured data-types in C and learn about applications in factorization of an integer and understanding Cartesian geometry and Pythagorean triples. iii) Use of containers and templates in various applications in algebra. iv) Use mathematical libraries for computational objectives. v) Represent the outputs of programs visually in terms of well formatted text and plots.
	Skill Enhancement Course (Regular)	MAT-SE-6014: LaTeX and HTML	<p>After studying this course the student will be able to:</p> <ul style="list-style-type: none"> i) Create and typeset a LaTeX document. ii) Typeset a mathematical document using LaTeX. iii) Learn about pictures and graphics in LaTeX. iv) Create beamer presentations. v) Create web page using HTML.

DEPARTMENT OF PHILOSOPHY	
B.A. (Philosophy) General	
Programme Specific Outcome	<p>The study of philosophy provides students with valuable skills preparing them for their careers:</p> <ol style="list-style-type: none"> a) Generates an understanding about the core areas of philosophical enquiry, including logic, metaphysics, epistemology, ethics etc. existing both in the western and Indian traditions. b) It enhances the student ability to evaluate and resolve problems, c) Exposes students to different ideas and concepts related to the physical and the metaphysical world. d) Enhances student skills like critical thinking, organisation, synthesis, adaptability etc. e) Inculcates moral values and principles among students which are essential for their personal development.

Course Outcomes of B.A. (Philosophy)			
Semester	Course Category	Paper Code and Course Name	Outcomes
1st	Generic/Regular	PH-RC-1016 General Philosophy	CO1. to enable students to gain the general concept of philosophy including its nature, scope, branches etc. and discuss the basic principles of life.
2nd	Generic/Regular	PH-RC-2016 Indian Philosophy	CO1. to introduces the students to the nine different schools of Indian Philosophy and their beliefs in the vedas, brahman, atman, God, world, karma etc.
3rd	Generic/Regular	POL-RC-3016 Ethics	CO1. to gather knowledge about the classification of political systems from a comparative political framework
4th	Generic/ Regular	PH-RC-4016 Logic	CO1. To help students to think coherently and to differentiate between truth and validity.

5 th	Regular (Elective)	PH-RE-5016 Contemporary Indian Philosophy	CO1. Would enable students to comprehend metaphysical debates from an Indian perspective.
	Regular (Generic)	PH-RG-5016 Indian Yogic Tradition	CO1. Would enable students to understand the significance of Yoga in creating physical, mental and emotional harmony.
6 th	Regular (Elective)	PH-RE-6016 Philosophy of Religion	CO1. To analyze religious issues using rational tools and highlights the importance of the theories in God and relation of God and the world.
	Regular (Generic)	PH-RG-6016 Philosophy of Religion	CO1. To analyze the various theories and arguments in relation to religious experience.

DEPARTMENT OF PHYSICS	
B.Sc. (Physics) General and Honours	
Programme Specific Outcome	<p>PO1: Students will gain in depth knowledge of basic Physics both theoretical and practical.</p> <p>PO2: Students will develop computational skill which will help them in all future endeavors especially in higher studies and research.</p> <p>PO3: Students will have knowledge, ability, and skill to undertake further studies in Physics or in related multidisciplinary areas.</p> <p>PO4: Mold a responsible citizen who is aware of most basic domain-independent knowledge, including critical thinking and communication.</p> <p>PO5: Enable the graduates to compete in national/international competitive examinations for higher studies, such as IIT-JAM conducted by IIT's for admission in M.Sc programme, GATE for admission in M.Tech programme, GRE/TOEFL for studying abroad etc.</p> <p>PO6: Along with Civil services Examination a Physics graduate can apply for a scientist position in organization such as BARC, ISRO, DRDO etc.,</p>

Course Outcomes of B.Sc. (Physics) General and Honours			
Semester	Course Category	Paper Code and Course Name	Outcomes
1st	Generic/Regular	PHY-RC-1016 Mechanics and	CO1: On successful completion of the course students should be able understand Inertial and non-inertial reference frames, Newtonian motion, Galilean transformations, projectile motion, work and energy, Elastic and inelastic collisions, motion under central force, simple harmonic oscillations, special theory of relativity.
	Honours	PHY-HC-1016 Mathematical Physics 1	CO1: Will acquire knowledge about vector and its applications in various fields, differential equations and its applications, different coordinate systems, concept of probability and error. CO2: Students will be able to solve differential equation using power series solution method, solve differential equation using separation of variables method, special

			<p>integrals, different properties of matrix, Fourier series.</p> <p>CO3: Skills to solve complex integrals using residue theorem, apply Fourier and Laplace transforms in solving differential equations, understand properties of Tensor like Transformation of coordinates contravariant and co-variant tensors, indices rules for combining tensors.</p> <p>CO4: Use C/ C++/ Scilab/ FORTRAN/ Mathematica/ Python for solving differential equations, graph fitting etc.</p>
	Honours	PHY-HC - 1026 Mechanics and	<p>On successful completion of the course students should be able understand Inertial and non-inertial reference frames, Newtonian motion, Galilean transformations, projectile motion, work and energy, Elastic and inelastic collisions, motion under central force, simple harmonic oscillations, special theory of relativity.</p>
2nd	Generic/Regular	PHY-RC-2016 Electricity and Magnetism	<p>CO1: Upon completion of this course, students are expected to apply Gauss's law of electrostatics to solve a variety of problems, calculate the magnetic forces that act on moving charges and the magnetic fields due to currents, have brief idea of magnetic materials, understand the concepts of induction, and apply them to solve variety of problems.</p> <p>CO2: In the lab course, students will be able to measure resistance (high and low), voltage current, self and mutual inductance, capacitor, strength of magnetic field and its variation, study different circuits RC, LCR etc.</p>
	Honours	PHY-HC-2016	<p>CO1: After successful completion of this course, students will be able to understand electric and magnetic fields in matter, dielectric properties of matter, electromagnetic induction, application of</p>

		Electricity and Magnetism	Kirchhoff's law in different circuits, application of network theorem in circuits.
	Honours	PHY-HC-2026 Wave and Optics	CO1: Understanding on superposition of harmonic oscillations, different types of wave motions, superposition of harmonic waves, interference and interferometer, diffraction, holography.
3rd	Generic/Regular	PHY-RC-3026 Thermal Physics	CO1: Students will have the knowledge and skills to identify and describe the statistical nature of concepts and laws in thermodynamics, in particular: entropy, temperature, Thermodynamics potentials, Free energies, Maxwell's relations in thermodynamics, behavior of real gases.
	Honours	PHY-HC-3016 Mathematical Physics 2	CO1: Will acquire knowledge about vector and its applications in various fields, differential equations and its applications, different coordinate systems, concept of probability and error. CO2: Students will be able to solve differential equation using power series solution method, solve differential equation using separation of variables method, special integrals, different properties of matrix, Fourier series. CO3: Skills to solve complex integrals using residue theorem, apply Fourier and Laplace transforms in solving differential equations, understand properties of Tensor like Transformation of coordinates contravariant and co-variant tensors, indices rules for combining tensors. CO4: Use C/ C++/ Scilab/ FORTRAN/ Mathematica/ Python for solving differential equations, graph fitting etc.
		PHY-HC-3026 Thermal Physics	CO1: Students will have the knowledge and skills to identify and describe the statistical nature of concepts and laws in thermodynamics, in particular: entropy,

	Honours		temperature, Thermodynamics potentials, Free energies, Maxwell's relations in thermodynamics, behavior of real gases.
	Honours	PHY-HC-3036 Digital Systems & Applications	CO1: Understanding on the working principle of CRO, develop a digital logic and apply it to solve real life problems, analyze, design and implement combinational logic circuits CO2: Classify different semiconductor memories, Analyze, design and implement sequential logic circuits, Analyze digital system design using PLD, simulate and implement combinational and sequential circuits
	HONOURS/ GENERIC/ REGULAR SEC	PHY-SE-3014 Physic Workshop Skills	Co1. The aim of this course is to enable the students to be familiar and experience with various mechanical and electrical tool through hands-on mode.
	Generic/Regular	PHY-RC-4016 Wave and Optics	CO1: Understanding on superposition of harmonic oscillations, different types of wave motions, superposition of harmonic waves, interference and interferometer, diffraction, holograph
	Honours	PHY-HC-4016 Mathematical Physics 3	CO1: Will acquire knowledge about vector and its applications in various fields, differential equations and its applications, different coordinate systems, concept of probability and error. CO2: Students will be able to solve differential equation using power series solution method, solve differential equation using separation of variables method, special integrals, different properties of matrix, Fourier series. CO3: Skills to solve complex integrals using residue theorem, apply Fourier and Laplace transforms in solving differential equations, understand properties of Tensor like Transformation of coordinates contravariant

4 th			and co-variant tensors, indices rules for combining tensors. CO4: Use C/ C++/ Scilab/ FORTRAN/ Mathematica/ Python for solving differential equations, graph fitting etc.
	Honours	PHY-HC-4026 Elements of Modern Physics	CO1: Knowledge about modern development in Physics, Starting from Planck's law, it development of the idea of probability interpretation and the formulation of Schrodinger equation. Students will also get preliminary idea of structure of nucleus, radioactivity Fission and Fusion and Laser
		PHY-HC-4036 Analog Systems & Applications	CO1: understanding about the physics of semiconductor p-n junction and devices such as rectifier diodes, zener diode, photodiode etc. and bipolar junction transistors, transistor biasing and stabilization circuits, the concept of feedback in amplifiers and the oscillator circuits, students will also have an understanding of operational amplifiers and their applications.
	Honours/ Generic/ Regular SEC	PHY-SE-4014 Basic Instruments Skills	CO1. This course is tot get exposure with various aspects of instruments and their usage through hands-on mode.
	Regular (Elective)	PHY-RE-5056 Nuclear and Particle Physics	CO1. Students will have the understanding of the sub atomic particles and their properties, the different nuclear techniques and their applications in different branches of Physics and societal application. CO2. Develop the problem-solving skills and the acquired knowledge can be applied in the areas of nuclear, medical, archeology, geology and other interdisciplinary fields of Physics and

5th			Chemistry
	Honours	PHY-HC-5016 Quantum Mechanics & Applications	<p>CO1. Understanding on the principles in quantum mechanics: Schrödinger equation, the wave function, the uncertainty principle, stationary and non-stationary states, time evolution of solutions, and relation between quantum mechanics and linear algebra.</p> <p>CO2. Angular momentum and spin, as well as the rules for quantization and addition of these, spin-orbit coupling and Zeeman Effect.</p> <p>CO3. C/C++/Scilab/FORTRAN/Mathematica/ Python for solving the following problems based on Quantum Mechanics</p>
		PHY-HC 5026 Solid State Physics	<p>CO1. Basic understanding on crystal lattices and phonons, understand the elementary lattice dynamics and its influence on the properties of materials, describe the main features of the physics of electrons in solids; explain the dielectric ferroelectric and magnetic properties of solids and understand the basic concept in superconductivity</p>
	Honours (Discipline Specific Elective (DSE))	PHY-HE-5036 Advanced Mathematical Physics I	<p>CO1. Upon completion of this course, students will be able to solve problems in Physics related to Linear Vector space, Matrix algebra, Tensor</p>

		<p>PHY-HE-5056</p> <p>Nuclear and Particle Physics</p>	<p>CO1. Students will have the understanding of the sub atomic particles and their properties, the different nuclear techniques and their applications in different branches of Physics and societal application.</p> <p>CO2. Develop the problem-solving skills and the acquired knowledge can be applied in the areas of nuclear, medical, archeology, geology and other interdisciplinary fields of Physics and Chemistry</p>
6th	Regular (Elective)	<p>PHY-RE-6056</p> <p>CLASSICAL DYNAMICS</p>	<p>CO1. students will have the overview of Newton's Laws of Motion, Special Theory of Relativity by 4-vector approach and fluids. Students will also have the understanding of the Lagrangian and Hamiltonian of a system..</p> <p>CO2. students will be able to solve the seen or unseen problems/numericals in classical mechanics.</p>
	Honours	<p>PHY-HC-6016</p> <p>Electromagnetic Theory</p>	<p>CO1. Students will acquire the concepts of Maxwell's equations, propagation of electromagnetic (EM) waves in different homogeneous-isotropic as well as anisotropic unbounded and bounded media, production and detection of different types of polarized EM waves, general information as waveguides and fibre optics.</p>
		<p>PHY-HC-6026</p> <p>Statistical Mechanics</p>	<p>CO1. Students will be learn the techniques of Statistical Mechanics to apply in various fields including Astrophysics, Semiconductors, Plasma Physics, Bio-Physics, Chemistry and in many other directions.</p>
	Honours DSE	<p>PHY-HE-6046</p>	<p>CO1. understanding the origin and evolution of the Universe, galaxies and dark matter.</p>

		<p>Astronomy and Astrophysics</p>	<p>CO2. comprehensive introduction on the measurement of basic astronomical parameters such as astronomical scales, luminosity and astronomical quantities.</p> <p>CO3. developments in observational astrophysics and idea of the instruments implemented for astronomical observation, the formation of planetary system and its evolution with time, the physical properties of Sun and the components of the solar system; and stellar and interstellar components of our Milky Way galaxy</p>
		<p>PHY-HE-6056</p> <p>CLASSICAL DYNAMICS</p>	<p>CO1. students will have the overview of Newton's Laws of Motion, Special Theory of Relativity by 4-vector approach and fluids. Students will also have the understanding of the Lagrangian and Hamiltonian of a system..</p> <p>CO2. students will be able to solve the seen or unseen problems/numericals in classical mechanics.</p>

DEPARTMENT OF POLITICAL SCIENCE

B.A. (Political Science) General and Honours

Programme Specific Outcome

- 1) Upon completion of the Programmes, students would have greater understanding of various key concepts, thoughts and thinkers of the discipline, equip them with the tools of state and statecraft, make comparative analysis among them and a broader understanding of politics both at the national and international level.
- 2) The programme facilitates both academic and career growth of the students by equipping them with various foundational concepts related to higher education and various competitive examinations. Better understanding of political science also enable students to pursue careers in law, journalism, psephology, political analysis and civil services.

Course Outcomes of B.A. (Political Science) General and Honours

Semester	Course Category	Paper Code and Course Name	Outcomes
1 st	Generic/Regular	POL-RC-1016 Introduction to Political Theory	to introduce the key concepts of political theory (like liberty, equality, justice, democracy etc.) to the students.
	Honours	POL-HC-1026 Understanding Political theory	To acquaint the students with the idea of political theory, its history and approaches and reconcile them with democracy.
	Honours	POL-HC-1026 Constitutional Government and Democracy in India	To acquaint students with constitutional set up, state structures and institutions.

2 nd	Generic/Regular	POL-RC-2016 Indian Government and Politics	to understand the basic features of Indian Constitution and Indian political system.
	Honours	POL-HC-2016 Political Theory Concepts and Debates	to understand the various concepts of political theory and to appreciate how they enrich political life and issues.
	Honours	POL-HC-2026 Political Process in India	to understand the working of major political institutions with debates and contradictory dynamics of modern state power.
3 rd	Generic/Regular	POL-RC-3016 Comparative Government and Politics	to gather knowledge about the classification of political systems from a comparative political framework .
	Honours	POL-HC-3016 Introduction to Comparative Government and Politics	to help them to understand the basic concepts of comparative politics and enable them to classify political system and to analyze political institutions and behavior of different countries.
	Honours	POL-HC-3026 Perspectives on Public Administration	to enable students to learn the basic concepts of public administration- its major theories- public policies and its formulation and recent debates in public administration.
		POL-HC-3036 (Perspectives on International	to familiarize students with the key theoretical approaches of international

	Honours	Relations and World History)	relations – state system – debates in international relations.
4th	Generic/Regular	POL-RC-4016 Introduction to International Relations	to understand the basic concepts of IR – its theories, and to analyze the current world events and their impact on India's Foreign Policy.
	Honours	POL-HC-4016 Political Process and Institution in Comparative Perspective	to understand, comprehend and analyze the complex nature and functioning of the political systems and processes.
	Honours	POL-HC-4026 Public Policy and Administration in India	<ul style="list-style-type: none"> • to gain knowledge about the processes of public policy making in India • to develop the ability to assess the functioning of the government.
	Honours	POL-HC-4036 Politics of Globalization	to assist the student to understand the importance of global, political and economic policy problem and security relation among nations.
	Generic/Regular/Honours (SEC)	POL-SE-4024 Citizens and Rights	<ul style="list-style-type: none"> • To analyse the linkages between citizenship, law, rights and equality. • To understand the measures of discrimination, justice and empowerment and the ways to protect the same.

5th	Regular (Elective)	POL-RE-5026 Select Constitutions I	students will be introduced to various types of constitutions and the forms of governments from different parts of the world.
	Regular (Generic)	POL-RG-5026 Democracy In India	students be able to learn about the concept, evolution, theoretical basis and election system of Indian democracy.
	Honours	POL-HC-5016 Classical Political Philosophy	assist the students to interpret the ideas underlying the classical political philosophy.
		POL-HC 5026 Indian Political Thought I	to make students understand the political philosophy and tradition of pre-colonial India.
	Honours (Discipline Specific Elective (DSE))	POL-HE-5036 Understanding Global Politics	to describe the key concepts underlying the idea of world order and their historical evolution as well as relevance of international actors in understanding political scenario.
		POL- HE-5046 Select Constitution I	students will be introduced to the various types of constitutions and the forms of government from different parts of the world

5 th	Regular (SEC)	POL-SE-5014 Public Opinion and Survey Research	<ul style="list-style-type: none"> • To introduce the students to the debates, principles and practices of public opinion polling. • To familiarise the students with how to conceptualise and measure public opinion using quantitative methods.
6 th	Regular (Elective)	POL-RE-6026 Select Constitutions II	students will be able to learn about the constitutional and governmental set up of various countries.
	Regular (Generic)	POL-RG-6016 Public Administration II	students will be able to understand the basics of public administration.
	Honours	POL-HC-6016 Modern Political Philosophy	to interpret ideas underlying traditions in modern political philosophy to understand contemporary politics.
POL-HC-6026 (Indian Political Thought II		to evaluate themes and issues of political thought of modern India and to assess their role and relevance in understanding contemporary politics.	

DEPARTMENT OF STATISTICS

B.Sc. (Statistics) Honours and Regular

Programme

Specific

Outcome

The Degree of Bachelor of Science in Statistics aims to train the students both in the theoretical development and in the real-life applications of modern statistical methodology. It will provide a platform for getting exposed to real life data and their statistical analysis using modern statistical software's. It is also aimed to train the students to enable them to find an appropriate place in the modern Information Technology oriented society. This is an introductory three-year course designed to provide students with the basic concepts of data analysis and statistical computing. Topics covered include basic descriptive measures, measures of association, probability theory, confidence intervals, and hypothesis testing. The main objective is to provide students with pragmatic tools for assessing statistical claims and conducting their own statistical analyses. Knowledge of different aspects of Statistics has become crucial in the present scenario. There is a continuous demand for statisticians in fields of education, industry, software and research. The syllabi of three-year B.Sc. (Honours) degree course in Statistics are framed in such a way that the students at the end of the course, can be thorough in statistical techniques for pursuing higher studies and simultaneously can apply statistical tools judiciously to a variety of data sets to arrive at some valid conclusions

PO1. To prepare graduates who are not only statistically sound but also capable of using their appropriate statistical skills in interdisciplinary areas such as finance, health, agriculture, government, business, industry, telecommunication, and bio-statistics. As a result, they can pursue their future career either in the core field or in the applied field of Statistics.

PO2. To familiarize students with computational techniques and software used in the statistical arena.

PO3. To provide a solid ground in the best practices of collating and disseminating information.

PO4. To prepare students for undertaking further study.

	PO5.To teach students to construct practical statistical models for several processes in the real-world
--	---

Course Outcomes of B.Sc. (Statistics) General and Honours

Semester	Course Category	Paper Code and Course Name	Outcomes
1st	Generic/Regular	STA-RC-1016 Statistical Methods	<p>1.Statistical methods are mathematical formulas, models and techniques that are used in statistical analysis of raw research data.</p> <p>2.The students are expected to learn about the application of statistical methods to extract information from research data and provides different ways to assess the robustness of research outputs.</p>
	Honours	STA-HC-1016 Descriptive Statistics	<p>1.Descriptive statistic is a summary statistic that quantitatively describes or summarizes features from a collection of information.</p> <p>2.Going through this topic student will be able to provide basic information about the variables in a dataset and to highlight potential relationships between variables.</p>

	Honours	STA-HC-1026 Calculus	<p>1. Calculus is the mathematical study of continuous change and concerned with the calculation of instantaneous rates of change.</p> <p>2. The vast topic of Calculus will benefit the students to work out important statistical theorems and problems especially probabilities, moments etc.</p>
2nd	Generic/Regular	STA-RC-2016 Introductory Probability	<p>1. Probability is the science of how likely events are to happen.</p> <p>2. Probability topic will be applicable for students who are interested in the Meteorological field to predict the probability of weather forecast and in Epidemiology, it is used to understand the relationship between exposures and the risk of health effects.</p>
	Honours	STA-HC-2016 Probability And Probability Distributions	<p>1. Knowledge to conceptualize the probabilities of events including frequencies and axiomatic approach. Simultaneously, they will learn the notion of conditional probability including the concept of Bayes' Theorem,</p> <p>2. Knowledge related to concept of discrete and continuous random variables and their probability distributions</p>

			<p>including expectation and moments</p> <p>3. Knowledge of important discrete and continuous distributions such as Binomial, Poisson, Geometric, Negative Binomial and Hypergeometric, normal, uniform, exponential, beta and gamma distributions,</p>
	Honours	STA-HC-2026 Algebra	<p>1. Understand the concepts of vector spaces, subspaces, bases, dimension and their properties.</p> <p>2. Relate matrices and linear transformations, compute Eigenvalues and Eigenvectors of linear transformations.</p> <p>3. Realise importance of adjoint of a linear transformation and its canonical forms</p>
	Generic/Regular	STA-RC-3016 Basics Of Statistical Inference	<p>1. Statistical Inference is the study of making inference about the true parameter value based on an estimate.</p> <p>2. The students will be able to analyse the sample data in order to estimate the population parameters.</p> <p>.</p>

3 rd	Honours	STA-HC-3016 Sampling Distributions	<p>1. Basic concepts on sampling distribution like t test, Chi-square test F test and their derivations.</p> <p>2. Students will get an idea about making inferences about the overall population. They will be able to recognize in which situation what sample statistic is to be required to make relevant information from the population.</p>
	Honours	STA-HC-3026 Survey Sampling And Indian Official Statistics	<p>1. Students will learn the basic knowledge of complete enumeration and sample, sampling frame, sampling distribution, sampling and non-sampling errors, principal steps in sample surveys, limitations of sampling etc.,</p> <p>2. Introduced to various statistical sampling schemes such as simple, stratified and systematic sampling.</p> <p>3. Students will get an idea of conducting the sample surveys and selecting appropriate sampling techniques.</p>
3 rd		STA-HC-3036 Mathematical Analysis	<p>1. Students will be introduced to an advance Calculus topic like Limits, Continuity and</p>

	Honours		<p>Differentiability, and some notion of point set topology which are extensively used in Mathematical Statistics.</p> <p>2.This topics will rather build an strong mathematical thinking ability while deriving theorems and their proofs ,solving complex probability problems etc</p>
	Generic/Regular/Honours	<p>STA-SE-3014</p> <p>Statistical Data Analysis Using Software Packages</p>	<p>1.Students will be able to gain knowledge of software packages such as SPSS, Excel, Matlab for doing Practicals, Research oriented problems etc.</p> <p>2.They will learn how to load data, plot a graph viz. histograms (equal class intervals and unequal class intervals), box plot, stem-leaf, frequency polygon, pie chart, ogives with graphical summaries of data.</p>
		<p>STA-SE-3024</p> <p>Data Base Managements Systems</p>	<p>1.Students are expected to learn how to collect programs that enables the user to create and maintain a database.</p>

			<p>2. After going through this, the students will get an idea about management of data that involves both defining structures for storage of information and providing mechanisms for the manipulation of information.</p>
		<p>STA-RC-4016 Applied Statistics</p>	<p>1. Students are expected to gather knowledge about planning for the collection of data, managing data, analyzing, interpreting and drawing conclusions from data.</p> <p>2. The topics included in this paper will build critical thinking and problems solving skills in data analysis and empirical research.</p>
	<p>Honours</p>	<p>STA-HC-4016 Statistical Inference</p>	<p>1. Statistical Inference is the study of making inference about the true parameter value based on an estimate.</p> <p>2. The students will be able to analyse the sample data in order to estimate the population parameters.</p> <p>.</p>
	<p>Honours</p>	<p>STA-HC-4026 Linear Models</p>	<p>1. Students will learn relationships between variables how the change of one variables are interlinked with other variables.</p> <p>2. They will learn how different linear models (ANOVA, Regression model,</p>

			ANOCOVA) are used in specific problems or situations.
	Honours	STA-HC-4036 Statistical Quality Control	<p>1.Students will learn how to measure and inspect the quality of a product, service or process.</p> <p>2.Students will learn how SQC is used to manage tool like cost accounting, time and motion and budget control.</p>
	Generic/Regular/Honours (SEC)	STA-SE-4014: Statistical Data Analysis Using R	<p>1.Students will get an idea about how different statistical problems that is related to data can be solved and analyzed by using R programming .</p> <p>2.It is widely used by researchers from diverse disciplines to estimates and display results and by teachers of Statistics and research methods.</p>
		STA-SE-4024: Statistical Technique For Research Methods	<p>1.Statistical techniques are mathematical formulas, models and techniques that are used in statistical analysis of raw research data.</p> <p>2.The students are expected to learn about the application of statistical methods to extract information from research data and provides different ways to assess the robustness of research outputs.</p>

5th	Honours	STA-HC-5016 Stochastic Processes and Queuing Theory	<p>1.Students will learn how random processes that are functions of time that vary in a randomly manner.</p> <p>2.Students will be able to differentiate between deterministic and probabilistic phenomenon.</p> <p>3.Students will observe how different queueing system can be used to balance the cost of providing a level of service capacity with the cost of customers waiting for services.</p>
	Honours	STA-HC-5026 Statistical Computing Using C/C++ Programming	<p>1.Students will learn Various basic concepts, features and components related to C/C++ programming language, and structure of C/C++ program.</p> <p>2.They are expected to learn various operators used like logical, assignment, conditional, bitwise in C program,</p> <p>3. Control statements, conditional statements, break and continue statements, arrays, etc. in C/C++ program.</p>

5th	Generic/Regular / Honours (Discipline Specific Elective (DSE))	STA-RE-5016 STA-HE-5016 Operation Research	<p>1. Students will learn the Concept of linear programming problem, simplex method and graphical solution of LPP.</p> <p>2. Students will gain the knowledge of optimization problem and it will help them to apply such techniques in different situations.</p>
		STA-RE-5026 STA-HE-5026 Time Series Analysis	<p>1. Students will learn different Time series data, its applications to various fields and components of time series</p> <p>2. They will learn how to Fit and plot of various growth curves such as modified exponential, Gompertz and logistic curve</p>
		STA-RE-5036 STA-HE-5036 Survival Analysis and Biostatistics	<p>1. Students will learn the concepts of survival distribution (e.g. exponential, gamma, Weibull, Rayleigh, lognormal etc.) and their application.</p> <p>2. They will learn Different types of censoring schemes with biological examples</p>

		<p>STA-RE-5046 STA-HE-5046</p> <p>Financial</p> <p>Statistics</p>	<p>1.Students are expected to learn how to deal with a comprehensive set of stock and flow data on the financial assets and liabilities of all sectors of an economy.</p> <p>2.They will get an idea about how at a macro level, statistics helps in understanding a country's financial state and measuring economic growth.</p>
5 th	Regular (SEC)	<p>STA-SE-5014: Statistical Data Analysis Using R</p>	<p>1.Students will get an idea about how different statistical problems that is related to data can be solved and analyzed by using R programming.</p> <p>2.It is widely used by researchers from diverse disciplines to estimates and display results and by teachers of Statistics and research methods.</p>
6 th	Honours	<p>STA-HC-6016</p> <p>Design Of Experiments</p>	<p>1.Students will learn the different types of design such as CRD, RBD, LSD and Factorial experiment</p> <p>2.Concept of confounding and idea of 3^2 experiment.</p> <p>3. Students will get an idea how to apply various designs for agricultural data / agricultural field.</p>

6th	Honours	STA-HC-6026 Multivariate Analysis And Nonparametric Methods	<p>1. Students are expected to learn how set of data's in higher dimensions can be analysed by using Multivariate analysis.</p> <p>2. They will learn new methods that are used in cases such as randomness in a data set, test for locations and test for symmetry etc.</p>
	Generic/Regular / Honours (DSE)	STA-RE-6016 STA-HE-6016 Econometrics	<p>1. Students will learn the concept of different types of econometric models, model building and role of econometrics in practical field.</p> <p>2. They will collect knowledge of linear model with two or more variables.</p> <p>3. Knowledge of least square estimation, test of significance of LS estimators with confidence interval</p>
		STA-RE-6026 STA-HE-6026 Demography And Vital Statistics	<p>1. Students will learn Commonly used measures of demography pertaining to its three basic aspects, viz. The fertility, mortality and migration.</p> <p>2. They will study how Various data collection methods enabling them to have a better insight in policy making.</p>

6th			3.Planning and systematic implementation
		STA-RE-6036 Design Of Experiments	<p>1.Students will learn the different types of design such as CRD, RBD, LSD and Factorial experiment</p> <p>2. Concept of confounding and idea of 3^2 experiment.</p> <p>3. Students will get an idea how to apply various designs for agricultural data / agricultural field.</p>
		STA-HE-6036 Acturial Statistics	<p>1.Students will learn the basic concept of uses of statistics in insurance and utility theory.</p> <p>2.Knowledge of principles of premium calculation with examples</p>
		STA-RE-6046 Acturial Statistics	<p>1.Students will learn the basic concept of uses of statistics in insurance and utility theory.</p> <p>2. Knowledge of principles of premium calculation with examples</p>

		<p style="text-align: center;">STA-HE-6046</p> <p style="text-align: center;">Dissertation/Project work</p>	<p>1.The aim of the project work is to acquire the knowledge of data collection, analysis those data using different statistical tests, conclusion and report writing. At the end of this project, students can analyze and interpret and take appropriate decisions in solving real life problems using statistical tools in the present situations.</p>
	<p style="text-align: center;">Regular</p>	<p style="text-align: center;">STA-SE-6014</p> <p style="text-align: center;">Statistical Technique For Research Methods</p>	<p>1.Statistical techniques are mathematical formulas, models and techniques that are used in statistical analysis of raw research data.</p> <p>2.The students are expected to learn about the application of statistical methods to extract information from research data and provides different ways to assess the robustness of research outputs.</p>

DEPARTMENT OF ZOOLOGY

B.Sc (Zoology) General and Honours

Programme Specific Outcome

The B.Sc. Zoology programme is designed to help the students to:

PO1. To impart basic knowledge of various disciplines of Zoology and General biology meant for a graduate and for higher studies.

PO2. Understanding of relationships between organisms through systematics and cell biology.

PO3. To acquire basic skills in the observation and study of nature, biological techniques, experimental skills and scientific investigation.

PO4. To identify and understand vertebrate as well as invertebrate.

PO5. To explain physiological and biochemical activities and its impact on human bodies.

PO6. To understand basic genetics and Evolution.

PO7. To understand the basic of Human reproduction system and process of development.

Course Outcomes of B.Sc (Zoology) General and Honours

Semester	Course Category	Paper Code and Course Name	Outcomes
1st	Generic/Regular	ZOO-HG/RC-1016 Animal Diversity	<p>CO1.To gain the knowledge about the systematic position of Non-chordates animal in animal kingdom from Protista to Nematelminthes.</p> <p>CO2.To understand the evolution (how complex organism evolve from a simpler organism).</p> <p>CO3.To know the life cycle; pathogenicity and preventive measures of helminthes.</p> <p>CO4.To gain knowledge about the structure and characteristics of the specimen.</p> <p>CO5. To gain knowledge on life cycle stages; host; pathogenicity and preventive</p>
	Honours	ZOO-HC-1016 Non-chordates 1: Protista to Pseudocoelomates	<p>CO1. To gain the knowledge about the systematic position of Non-chordates animal in animal kingdom from Protista to Nematelminthes.</p> <p>CO2. To understand the evolution (how complex organism evolve from a simpler organism).</p> <p>CO3.To know the life cycle; pathogenicity and preventive measures of helminthes.</p> <p>CO4. To gain knowledge about the structure and characteristics of the specimen.</p>

			CO5.To gain knowledge on life cycle stages; host; pathogenicity and preventive
	Honours	ZOO-HC-1026 Principles of Ecology	<p>PO1.To gain the knowledge of Ecology, Population, community, Ecosystem and Applied Ecology (Wildlife conservation and Management).</p> <p>PO2.To gain the knowledge about the method of determination of population density; life of aquatic ecosystem and the physico-chemical determination.</p> <p>PO3.The students can learned about to identify different animals and birds species and their habitat.</p>
2nd	Generic/Regular	ZOO-HG/RC-2016 Comparative Anatomy and Developmental Biology of Vertebrate	<p>CO1. To gain the knowledge about structure and functions of all the system of vertebrates such as Integumentary; Skeletal; Digestive; Respiratory; Circulatory; Urinogenital; Nervous system and Sense organs.</p> <p>CO2. To gain the knowledge about different types of scales of fish through permanent slides; Skeleton of Frog, Fowl and Rabbit; Carapace and plastron of turtle/tortoise; Mammalian skulls: One herbivorous and one carnivorous animal; and structure of any two organs from video recording</p> <p>.</p>

	Honours	ZOO-HC-2016 Non-chordates II: Coelomates	<p>CO1.To understand the evolution (how complex organism evolve from a simpler organism).</p> <p>CO2: To gain the knowledge about true coelomate animals from the phylum Annelida, Arthropoda, Onycophora, Mollusca and Echinodermata.</p> <p>CO3.To gain knowledge about the structure and characteristics of the specimen.</p>
	Honours	ZOO-HC-2026 Cell Biology	<p>CO1.To gain knowledge about cells, its membrane, organelles, cell division and cell signaling.</p> <p>CO2.To gain the knowledge about method to study of mitosis and meiosis practically; Barr body and preparation of permanent slide of DNA, Mucopolysaccharides and Proteins.</p>
	Generic/Regular	ZOO-HG/RC-3016 PHYSIOLOGY AND BIOCHEMISTRY	<p>CO1.To gain the knowledge about Structure, types and functions of tissues, Bone, Cartilage, Muscle, Nervous system, Reproductive System and Endocrine System.</p> <p>CO2.To learn preparation of temporary slide, and permanent slide (Microtomy).</p> <p>CO3.To gain knowledge about tissues and organs</p>

3 rd			<p>from the permanent slide study</p> <p>CO4. To gain the knowledge about structure, classification and functions of Nutrients such as Carbohydrates, Lipids & Proteins.</p> <p>CO5. To understand about the Enzymes: their nomenclature and classification; Factors affecting the enzyme activity; their regulation.</p> <p>CO6. To gain knowledge about Derivation of Michaelis-Menten Equation and Lineweaver-Burk plot.</p>
3 rd	Honours	<p>ZOO-HC-3016</p> <p>DIVERSITY OF CHORDATES</p>	<p>CO1. To gain the knowledge about the systematic position of chordates animals in animal kingdom from Protochordates to Mammals.</p> <p>CO2. To gain the knowledge about loss and gain characteristics; link between one chordate to another; their pattern of migration; Parental care.</p> <p>CO3. To gain the knowledge about distribution of chordates animals in different realms of earth.</p> <p>CO4. To gain knowledge of chordates animal from preserved museum specimen</p>
	Honours	<p>ZOO-HC-3026</p> <p>Physiology: Controlling and Coordinating Systems</p>	<p>CO1. To gain the knowledge about Structure, types and functions of tissues, Bone, Cartilage, Muscle, Nervous system, Reproductive</p>

			System and Endocrine System
	Honours	ZOO-HC-3036 FUNDAMENTALS OF BIOCHEMISTRY	CO1. To gain the knowledge about structure, classification and functions of Nutrients such as Carbohydrates, Lipids & Proteins. CO2. To understand about the Enzymes: their nomenclature and classification; Factors affecting the enzyme activity; their regulation. CO3. To gain knowledge about Derivation of Michaelis-Menten Equation and Lineweaver-Burk plot.
4th	Generic/Regular	ZOO-HG/RC-4016 GENETICS AND EVOLUTIONARY BIOLOGY	CO1. To gain the knowledge of Genetics; Linkage; Mutation; and Sex determination. CO2. To gain the knowledge of Major events in History of life; Lamarckism; Darwinism; Evidences of Evolution and processes of Evolutionary Change. CO3. To gain the knowledge of Species concept, Macro-evolution and Extinction.
		ZOO-HC-4016 COMPARATIVE ANATOMY OF VERTEBRATE	CO1. To gain the knowledge about structure and functions of all the system of vertebrates such as Integumentary; Skeletal; Digestive; Respiratory; Circulatory; Urinogenital;

4th	Honours		Nervous system and Sense organs.
	Honours	ZOO-HC-4026 PHYSIOLOGY: LIFE SUSTAINING	<p>CO1. To understand the process of digestion and absorption of nutrients such as carbohydrates, Proteins, Lipids, water, minerals and vitamins.</p> <p>CO2. To understand the role of hormones and enzymes in digestion.</p> <p>CO3. To know about the structure and function of kidney.</p> <p>CO4. To know about compositions, Groups and functions of blood.</p> <p>CO5. To know the Structure and working of Heart.</p>
		ZOO-HC-4036 BIOCHEMISTRY OF METABOLIC PROCESS	CO1. To understand the metabolic process of nutrients such as Carbohydrate, Protein and Lipid
	Generic/Regular/ Honours (SEC)	ZOO-SE-4014 NON-MULBERRY SERICULTURE	<p>CO1. Students will be able to comprehend the various stages of development of silkworm</p> <p>CO2. They would also be exposed to the processes involved while processing silk.</p> <p>CO3. To gain the knowledge about the host plants of silkworms.</p>

5 th	Regular	ZOO-RE-5016 ANIMAL BIOTECHNOLOGY	CO1. To learn the Molecular Techniques in Gene manipulation, Genetically Modified Organisms. CO2. To gain the knowledge of Animal cell culture techniques and their applications.
	Honours	ZOO-HC-5016 MOLECULAR BIOLOGY	CO1. To gain the knowledge of Nucleic Acids (DNA & RNA); DNA Replication. CO2. To understand the process of protein synthesis (Transcription & Translation). CO3. To understand the process of post transcriptional modifications and processing of Eukaryotic RNA; Gene Regulation, DNA Repair Mechanisms and Regulations of RNA.
	Honours	ZOO-HC-5026 PRINCIPLES OF GENETICS	CO1. To gain the knowledge of Mendelian Genetics; Linkage: Crossing Over; Chromosomal Mapping; Mutations; Sex Determinations; Extra Chromosomal Inheritance; Polygenic Inheritance; Recombination in Bacteria and Viruses; and Transposable Genetic Elements.
5 th	Honours (Discipline Specific Elective (DSE))	ZOO-HE-5016 COMPUTATIONAL BIOLOGY AND BIOSTATISTICS	CO1. The students will be learn about the Bioinformatics; Biological databases; Data Generation and Data Retrieval; Sequence Alignment. CO2. To gain the knowledge of Biostatistical derivations such as Standard Deviation, Standard Error, Coefficient of Variance, Chi square test, Z test and T-test.

		<p style="text-align: center;">ZOO-HE-5026</p> <p style="text-align: center;">ANIMAL BIOTECHNOLOGY</p>	<p>CO1. To learn the Molecular Techniques in Gene manipulation, Genetically Modified Organisms.</p> <p>CO2. To gain the knowledge of Animal cell culture techniques and their applications.</p>
6th	Honours	<p style="text-align: center;">ZOO-HC-6016</p> <p style="text-align: center;">DEVELOPMENTAL BIOLOGY</p>	<p>1. To gain the knowledge about Early Embryonic Development; Late Embryonic Development; Post Embryonic Development and Control of Development.</p> <p>CO2.To gain the knowledge of Implication of Developmental Biology.</p>
		<p style="text-align: center;">ZOO-HC-6026</p> <p style="text-align: center;">EVOLUTIONARY BIOLOGY</p>	<p>CO1. To know about Evolution; Evolutionary theories; Extinction of species; Variation and origin of Man.</p>
	Honours DSE	<p style="text-align: center;">ZOO-HE-6026</p> <p style="text-align: center;">FISH AND FISHERIES</p>	<p>CO1. To study the Morphology; Classification and Physiology of Fishes.</p> <p>CO2. To gain the knowledge about Fisheries and Aquaculture.</p> <p>CO3. To know about the transgenic fishes such as research in Zebra fish.</p>

	/Honours (DSE)	ZOO-HE-6056 DISSERTATION	<p>CO1. The students will get the knowledge about research in their specific field.</p> <p>CO2. To make students familiar with writing of research.</p>
	Regular	ZOO-RE-6016 Aquatic Biology	<p>CO1. To gain the knowledge about Aquatic biomes; Freshwater biology; Marine Biology and Management of Aquatic Resources.</p>
		ZOO-SE-6014 Wildlife Photography and Ecotourism	<p>CO1. Exposes students to various aspects of photography</p> <p>CO2. To exposes students to the methos of documentation</p> <p>CO3. How photography could be used to promote eco-tourism.</p>

