

Department of English

Course Outcome, Programme Outcome and Programme Specific Outcome for the Department of English

The Department of English at present offers the BA Hons course in English along with English as a Generic Elective and MIL subject-option for interested students.

Programme Outcome of BA Honours in English—The Bachelor of Arts in English Programme has been designed by the affiliating University following the guidelines of the UGC regarding the Choice Based Credit System. It is meant to acquaint the students with the past and present of English literature, society and culture and also traces the cultural legacies that this vast and diverse body of literature has both left and imbibed. This course not only familiarizes the students with literary and cultural texts originally written in English, but also includes translated texts from various European and Indian literatures and broadens the scope of the term “English Literature”. The Core Courses are compulsory papers arranged chronologically and/ or according to literary genre and subtypes whereas the Discipline Specific Elective Courses are chosen out of a pool of such courses. The Skill Enhancement Courses focus on various skill sets and attempts to hone them so that it increases the employability of the students once they successfully complete their Graduation. The course specific outcomes are as follows.

Name of the Course with Code	Course Outcomes
British Poetry : Anglo- Saxon to Seventeenth Century BAHENG101	This course is designed to familiarize the students with the beginnings of British Poetry in fifth century AD and takes them up to the Seventeenth Century. The students are introduced to the cultural and historical backgrounds to the texts and are also acquainted with the different forms and types of poetry.
British Prose and Drama: Anglo-Saxon to Seventeenth Century BAHENG102	This paper is similarly structured to the previous one and acquaints the students with the beginning of English prose and drama. They are taught some key Renaissance texts like Christopher Marlowe’s <i>Dr. Faustus</i> and Francis Bacon’s essays to familiarize them with both the language and the ethos of the Renaissance
Shakespeare BAHENG201	This paper is designed to introduce the students to the plays and poetry of William Shakespeare. Through detailed studies of one tragedy, one comedy and, four sonnets students are provided with a suitable point of entry to the great oeuvre of Shakespeare’s works as well as Shakespearean criticism over the ages.
British Literature: Eighteenth Century BAHENG202	This course includes a background to the eighteenth century literature and culture and introduces the students to key texts— from all three major literary kinds, poetry, prose and drama-- for detailed reading like Daniel Defoe’s <i>Robinson Cruose</i> and Alexander Pope’s <i>The Rape of the Lock</i> .

<p>British Romantic Literature BAHENG301</p>	<p>This course introduces the students to the period of British Literature generally referred to as the “Romantic period”, and familiarizes them with the nomenclature, important literary ideas and important texts from the 1780s. It takes the students up to the first decades of the nineteenth century and includes a selection of poetry of the major Romantic poets and novels by contemporary novelists like Jane Austen.</p>
<p>British Victorian Literature BAHENG302</p>	<p>This course familiarizes the students with the history, culture, and politics of the reign of Queen Victoria. It includes poetry and prose works by important Victorian writers and thinkers like Charles Dickens, Emily Bronte, Alfred Tennyson, and Robert Browning.</p>
<p>Classical Literature :Indian and European BAHENG303</p>	<p>This course includes important Classical texts, both Western and Indian, in translation. It acquaints the students with the cultural impact that the Greco-Roman civilization have had on the course of Western literature. It also provides the students with insights into the rich tradition of Indian Classical literature and introduces to them various important Western and Indian epics and plays in translations, and treatises on dramaturgy.</p>
<p>Actual Reporting and Content Writing BAHENGSE301</p>	<p>The first Skill Enhancement Course of the Programme, this particular paper is designed to enhance the skills-set required to write specific types of content like blog entries, minutes and agenda of meetings, and news reports.</p>

Department of Bengali

Programme Outcome	B. A. Bengali Literature
	Developing intellectual, personal and professional abilities through effective communication skills, ensuring high standard of behavioural attitude through literary Subjects and shaping the students as socially responsible citizens with high moral philosophy.

Programme Specific Outcome

On successful completion of the programme, the students will be accurate both in verbal and written communication as they will be strong in usage of appropriate Grammar and their usage to master the art of linguistic proficiency.
They can express a thorough command of Mother Language, Bengali and its wide variety of linguistic structures.
They can apply the critical frameworks to analyse the linguistic, cultural and historical background of texts written in Bengali.
They will be familiar with the connections of diverse textual genres including fiction, non – fiction, poetry, autobiography, biography, journal, film, plays editorials etc.
Students will be able to gain sound socio-economic and cultural knowledge of different periods as depicted in the texts(Old – Modern)
Students will be able to compare and comprehend different processes, modes of thought from different areas within Bengali literature through the different articulations voiced by various contemporaries
Students will be able to recognize and articulate the diversity of human experience, including ethnicity, race, language, gender as well as political, economic, social and cultural structures over time and space.

Course Outcome:

Bengali Literature	To acquire sound comprehension of and be able to dissect and proactively debate the widespread angles of literary, social, cultural, biographical and historical background of greatest writings and scripts in Bengali literature.
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Department of Sanskrit

BA Sanskrit (Honours)

Programme Outcome:

Sanskrit is a very rich language of IE language group. Sanskrit is a medium to know about ancient Indian history, culture, religion, social life through its text. The academic programme of both Honours and General degree courses are designed not only professional skill but also develop a deep understanding of rich heritage and dynamic prevalent scenario of India through various Sanskrit texts.

Programme Specific Outcomes:

Students will gain knowledge of the major traditions of literatures written in Sanskrit Translation of Sanskrit literature into Bengali and vice-versa. Students acquire ability to apply relevant theoretical perspectives to topics within the field of ancient Indian religion, literature and history So it may be summed up the entire course f Sanskrit honours gives the learners ample opportunity to communicate, translate, corelate with other languages in one way and to enjoy the thesplendor of the language and literature through systematic reading of poetry, drama, grammar, methodologies etc.

Course outcomes:

Semester 1

In the first semester two core papers are taught. Core paper 1 deals with Bhattikavyam by Bhartrihari and Kalidas's Raghuvamsham. It may be e said that the learners are expected to learn how to read and enjoy poetry or more specifically Epic poetry. The second paper contains reading of kiratarjuniyam by Bharavi and rhetorical devices of this language called metre.

Semester 2

2nd semester aims at teaching of the richest treasure of Sanskrit literature AbhijñānaSakuntalam by MahakaviKalidasa Another paper teaches the art of writing i.e. what and how an author should write

Semester 3

In Sem 3 students are taught the history of Sanskrit literature, general grammar and Siddhantakaumudi that aims at teaching Karaka, an important component of Sanskrit grammar. SEC-1 paper is very important in the sense that it teaches tradition or communication which is normally considered as basic knowledge of at learners language acquisition

Semester 4

In Sem 4 also one paper is devoted to teach Samasaparakarana and another for linguistic competence which equips learners with ins and outs of a language. Everyone knows the Veda, the earliest text of the world is very important, so Vedic literature is incorporated with a view to making the learners aware of the life style, rituals, social system of the the Aryan or Vedic people. In SEC-2 gives the students glimpses of the Karmayoga-the lesson incorporated in the Bhagavad Gita Needless to say it is one of the most comprehensive tests

of all literature that gives mankind the knowledge of high moral lesson and helps them find out the right path as Arjuna got it.

Semester 5

In Sem 5 two papers named Kavya-prakasha by Mammata and Sahitya-darpan by Viswanatha offer to teach Rhetoric. Other two DSE papers deal with Puranic literature and Patanjala Yoga-darshanam which has recently become part and parcel of many peoples day to day life.

Semester 6

The final semester is almost general one for all categories of avoid readers irrespective of any discipline - History, Philosophy, Economics etc. In this paper Arthashastra by Kautilya and Indian philosophy are taken up. Again in two other DSE papers general discussion follows on Indian Drama and Manusamhita.

Department of History

Name of the Department	Name of the Programme	Programme Outcome	Programme Specific Outcome	Course outcome
HISTORY	History (Hons) History (Prog)	The discipline of History deals with the past in order to understand the meaning and dynamics of the relationship between cause and effect in the overall development of human societies. Its key feature is its broad range of inquiry, as it is as much concerned with wide perspectives, general explanations, and fundamental questions. The fostering of vibrant and healthy critical debate between differing perspectives, interpretations, and representations of aspects of the past is the major concern for the under graduate	The sole aim of the course is to create a good Historian who would describe the human society and its developments through the way of critical thinking. It would also create a historian who on achieving further higher education would be able to lay the foundation for a better future for the human society by taking knowledge from the past and utilizing them appropriately.	<p>[1] The students shall gain knowledge about the Indian History as well as the International Historiography.</p> <p>[2] The UG Students shall be able to establish themselves for further higher education.</p> <p>[3] The students shall build their opportunities towards several jobs.</p> <p>[4] They will develop the ability of critical thinking which will eventually help them in their research work in future.</p>

		<p>students of history. A critical evaluation of sources and evidence of the past, whether written documentation or oral record needs to be taken into account before interpretation of a particular event of history is made. Thus the student should have a clear understanding of the representation of the past through clear narrative, explanation, and analysis. The courses designed by the faculties have the liberty of flexible incorporation and reading materials are available in the college library or are circulated by the respective faculties of the courses.</p>		
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Department of Political Science

Name of the Department	Name of the Programme	Programme Outcome	Programme Specific Outcome	Course outcome
Political Science	B.A (Hons)	<p>Students learn about the Political Science and gain Knowledge about Politics. Students Learn about Constitution, Political parties, pressure group. They also learn what is constitution and the preamble. Students also gain Knowledge about fundamental Rights and Duties as a citizen of India. They also learn What is the Role and Function of Prime Minister, President ,chief Minister and Cabinet</p>	<p>Students gain Knowledge about Politics and Political system of India as well as USA, UK, China, France. Students Learns National and Inter National Affair Students gain Knowledge of Political Laws and legal awareness of Dowry Prohibition Act ,Consumer Protection Act, Gaining Knowledge about cyber crime that is very relevant now a days.</p>	

		Minister. Students also gain knowledge from this course about Judiciary system of India and the composition and Function of Supreme Court and this court is the Protector of the Constitution and Fundamental Rights.	
			Political Theory (C1) Students learn to analysis what is politics and explain method of approach to politics- Normative, Behavioral, and Feminist. They also gain the concept of basic Knowledge of Democracy, Sovereignty, Liberty, equality, Rights and Laws, Nature of state- Idealist, liberal and neo Liberal.
		.	Comparative Politics(C2) Students learn differences between comparative Government and Comparative Politics. They also gain knowledge political system and Dependency theory
			Political Theory-Socialist Perspective(c3) Students get hold of Marxist approach to the study of politics, theory of revolution –Lenin and Mao, Marxian theory of party
			Comparative Constitutional System

			<p>(C4)</p> <p>Students learn to analysis unitary and federal, parliamentary and presidential constitutional system, they also learn executive, judiciary and legislative system of UK,USA and PRC.</p>
			<p>Western Political Thoughts (C5)</p> <p>Students getting Knowledge about the back ground of Western Political Thought. Aware of Roman Political System and Plato's theory of Justice</p>
			<p>Indian Political Thought(C6)</p> <p>Students getting Knowledge of Political Thought of Kautilya's, Raja Ranmohon Ray, Bankim Chandra ,Rabindrananth, Swaraj of Gandhiji and Social Justice of Ambedkar.</p>
			<p>Political Sociology(c7)</p> <p>Students learn from this nature of Political Sociology,, political Culture, Political, Social Mobility, Power, Influence, Political parties and Pressure Group.</p>
			<p>Modern Western Political Thought(C8)</p> <p>Students get Hold of Knowledge of Thomas Hobbes, John Locke, Rousseau,Hegel,Karl Marx,Mill, Bentham</p>
			<p>Indian Government and Politics(c9)</p> <p>Students learn Framing of Indian Constitution .They also learn what is constitution and the preamble. Students also gain Knowledge about fundamental Rights and Duties as a citizen of India. They</p>

				also learn What is the Role and Function of Prime Minister, President ,chief Minister and Cabinet Minister. Students also gain knowledge from this course about Judiciary system of India and the composition and Function of Supreme Court and this court is the Protector of the Constitution and Fundamental Rights
)			Basic Theories of International Relation(C10) Students can learn of basic theories of International Relations, Foreign Policy, Diplomacy
				World Politics (C11) Students gain Knowledge of United Nations, SAARC, ASEAN, Human Rights, Terrorism.
				Basic Theories of Public Administration(C12) Students gain knowledge from this core paper about the nature, scope and scope of Public Administration. They also learn about Bureaucracy, Development Administration and Decision making model.
				Local Governance in West Bengal(C13) Students learn about Rural and Urban local Government of West Bengal. Structure and Function of Panchayati Raj Institution and Municipal Corporation. They learn about empowerment of women .
				Project C14 Student can gain knowledge from this how to write a research Project and what are the various step to write a research Proposal .This will

				<p>help them in near future to write a proper research proposal in Higher studies like M. Phil, Ph.D. or any other research field. It will help them to write a proper bibliography and help them to become a successful researcher.</p>
				<p>Democratic Awareness with Legal Literacy –SEC-1</p> <p>students to gain knowledge about Constitution, Laws relating to dowry, sexual harassment, violence against women, laws relating to consumer Rights, cyber Crime, Anti terrorist laws.</p>
				<p>Legislative Practices and Procedures – SEC2</p> <p>Students gain Knowledge deeply about the Powers and functions of MLA, M.P. They learn about the law making process, Budget Process.</p>
				<p>Human Rights: Theory and Practice- DSE1</p> <p>Students learn about meaning of Human Rights, how to protect human rights in Indian Constitution, Human Rights movements</p>
				<p>Social Movements in Contemporary India DSE-2</p> <p>Students learn about meaning and nature of social movements like- Telengana, Singur, Chipko, Narmada Bachao, Silent Valley.</p>

Department of Botany

Name of the Department	Name of the Programme	Programme Outcome	Programme Specific Outcome	Course outcome
Botany	B.Sc. Program	The LOCF for CBCS is designed by UGC and upon successful completion of the programme, the students are enriched with the concepts of classical botany, including the morphology, taxonomy and anatomy of the plants. Besides these, the students become abreast with the latest concepts of plant physiology, biochemistry, ecology, cell biology, molecular biology and genetics. The students also acquire skills in both the theoretical and practical aspects. Field studies are the concepts of teamwork that always complementary the classroom studies. Along these,	The specific outcomes of the programme are on several dimensions. This type of syllabus enhances the chances for students to progress for higher education like M.Sc., B.Ed. and Ph.D. They have the options to get selected in different courses of Master degree in Biotechnology, Conservation Biology and also in Hospital management. The programme is versatile enough to ensure that students be successful in different competitive examinations.	Semester I: Phycology and Microbiology (Develop the understanding on the concept of microbes; Develop critical understanding of viruses; Increase the awareness of human friendly viruses, bacteria, algae and their economic importance.) Semester II: Mycology and Phytopathology (Develop the concept to identify true fungi and application of plant pathology in the control of plant diseases; Develop skills in laboratory and field work related to mycology and plant pathology; Identify the common plant diseases according to geographical locations and devise control measures.) Semester III: Archegoniatae: Bryophytes, Pteridophytes, Gymnosperms (Develop the understanding on the concept of Archegoniatae: Bryophytes, Pteridophytes and Gymnosperms; Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms; Understanding of plant evolution and their transition to land habitat.) SEC 1: Nursery and Gardening (Understand the process of sowing seeds in nursery; Analyse the process of Vegetative propagation; Examine the cultivation of different vegetables and growth of plants in nursery and gardening.) Semester IV: Plant Systematics (Develop the concept of classification of Plants systematics and recognize the importance of herbarium; Evaluate the importance of herbaria and botanical gardens.) SEC 2: Biofertilizers (Develop their understanding on the concept of bio-fertilizer; Develop the concept of integrated management for better crop production by using both nitrogenous and phosphate bio fertilizers and vesicular arbuscular mycorrhizal (VAM).) Semester V: Anatomy of Angiosperms (Develop an understanding of concepts and fundamentals of plant anatomy; Develop critical

		<p>skill enhancement courses train the students to become self-sufficient for starting any project combined with floriculture and gardening, mushroom cultivation, cultivation of medicinal plants etc.</p>		<p>understanding on the evolution of concept of organization of shoot and root apex; Evaluate the adaptive and protective systems of plants.) Plant Physiology (Develop an understanding of concepts of water relation of plants with respect to various physiological processes; Understanding of Photosynthesis, respiration, dormancy and germination in plants; To acquire adequate knowledge about translocation in plants, carbon dioxide concentrating mechanisms, growth regulators and flowering of plants.) SEC 3: Mushroom culture technology (Develop the concept of various types and categories of mushrooms; demonstrate various types of mushroom cultivating technologies; develop various types of food technologies associated with mushroom industry.) Semester VI: Cytogenetics (Have conceptual understanding of laws of inheritance, genetic basis of loci, alleles and their linkage; Understanding the effect of chromosomal abnormalities in numerical and structural changes leading to genetic disorders; Analyze the effect of mutations on gene functions and dosage; Examine the structure, function and replication of DNA.) Plant Ecology and Phytogeography: (Develop the concept to understand classification of the soils on the basis of physical, chemical and biological components; Evaluate energy sources of ecological system; Assess the adaptation of plants in relation to light, temperature, water, wind and fire.) SEC 4: Floriculture (Develop conceptual understanding of gardening from historical perspective; Distinguish among the various ornamental plants and their cultivation; Develop the concept of landscaping of public and commercial places for floriculture; Diagnoses the various diseases and uses of pests for ornamental plants.)</p>
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Department of Chemistry

Course Outcome **(Honours/Programme/Generic)**

Durgapur Women's College

Kazi Nazrul University

Mahatma Gandhi Road Durgapur – 713209

Name of the Department	Name of the Programme	Semester	Paper	Subject	Topics	Outcome
Chemistry	B.Sc (Hons)	I	BSCHCEMC 101	Inorganic- I (Th)	<ol style="list-style-type: none"> 1. Atomic Structure and Nuclear Chemistry 2. Periodic Table and Periodic Properties 3. Chemical Bonding 4. Metallic bonding and Weak chemical forces 	Gives comprehensive ideas about the basics of inorganic chemistry, particularly atomic theory of matter, composition of atom and basic idea of chemical bonding which are interesting for the beginners.
			BSCHCEMC 102	Organic -I (Th)	<ol style="list-style-type: none"> 1. Basics of Organic Chemistry 2. Chemistry of Aliphatic Hydrocarbons 3. Chemistry of Aromatic Hydrocarbons 4. Stereochemistry 	Gives comprehensive ideas about the basics of organic chemistry, the areas- mechanism and stereochemistry help in developing a sound knowledge about organic chemistry.
Chemistry	B.Sc (GE)	I	BSCHCEMGE101	Basics in Organic and Inorganic Chemistry	<ol style="list-style-type: none"> 1 Atomic Structure 2. Radioactivity 3. Periodic Table and Periodic Properties 4. Functional Nature of Organic Compounds 5. Electron Displacement in Molecules 6. Introduction to Organic Reaction Mechanism 	Gives preliminary ideas about the basics of organic and inorganic chemistry. Scientific theory of atoms, concept of wave function, physical and chemical characteristics of elements periodic table and mechanism of organic reactions motivates the enthusiasm of beginners
	B.Sc (Prog.)	I	BSCPCEMC101	Basics in Organic and	1 Atomic Structure	Gives preliminary ideas about the

				Inorganic Chemistry	<ul style="list-style-type: none"> 2. Radioactivity 3. Periodic Table and Periodic Properties 4. Functional Nature of Organic Compounds 5. Electron Displacement in Molecules 6. Introduction to Organic Reaction Mechanism 	basics of organic and inorganic chemistry. Scientific theory of atoms, concept of wave function, physical and chemical characteristics of elements periodic table and mechanism of organic reactions motivates the enthusiasm of beginners
Chemistry	B.Sc (Hons)	II	BSCHCEMC201	Physical Chemistry I(Th)	<ul style="list-style-type: none"> 1. Properties of gasI 2. Properties of fluids 3. Properties of Solid 4. Ionic Equilibria 	Familiarization with various states of matter which help in developing a sound knowledge about physical chemistry
				Physical Chemistry I(Lab)	<ul style="list-style-type: none"> 1. Surface Tension 2. Viscosity 3. p^H measurement 	
			BSCHCEMC202	Organic Chemistry II(Th)	<ul style="list-style-type: none"> 1. Chemistry of Halogenated Hydrocarbons 2. Alcohols, Phenols, Ethers and Epoxides 3. Carbonyl Compounds 4 Carboxylic Acids and their Derivatives 	Familiarization about classes of various name reactions, uses of various reagents and the mechanism.
				Organic Chemistry II(Lab)	Qualitative analysis and derivative preparation of organic compounds	
Chemistry	B.Sc (Prog.)	II	BSCPCEMC201	Elementary Physical	1. Kinetic Theory of Gases	Helps to understand kinetic model of

				Chemistry & Organic Chemistry	2. Thermodynamics 3. Stereochemistry	gas and Maxwell distribution, laws of thermodynamics, concepts of calculations of bond energy, 3-D structure of organic molecules
				Organic Qualitative Practical (Lab)	Detection of elements and functional groups	
Chemistry	B.Sc (GE)	II	BSCHCEMGE201	Elementary Physical Chemistry & Organic Chemistry	1. Kinetic Theory of Gases 2. Thermodynamics 3. Stereochemistry	Helps to understand kinetic model of gas and Maxwell distribution, laws of thermodynamics, concepts of calculations of bond energy, 3-D structure of organic molecules
				Organic Qualitative Practical (Lab)	Detection of elements and functional groups	
Chemistry	B.Sc (Hons)	III	BSCHCEMC301	Inorganic Chemistry – II	1. Coordination Chemistry-I 2. Acids and Bases 3. Chemistry of s and p Block Elements	Concept of coordination compounds, valence bond theory. Basic idea of acid-base strength and properties of s- and p-block elements.
				Inorganic Chemistry – II Lab	Qualitative analysis of acid and basic radicals	
			BSCHCEMC302	Organic Chemistry – III	1. Nitrogen Compounds 2. Heterocyclic Compounds 3. Polynuclear Hydrocarbons 4. Rearrangements, Name Reactions & Organometallics	Knowledge about nitrogen containing functional groups and their reactions in various aspects. Concept of polynuclear hydrocarbons, heterocyclic compounds and organometallic

						compounds.
				Organic Chemistry – III Lab	Identification with general reaction and tests of some selected organic compounds	
			BSCHCEMC303	Physical Chemistry – II	<ol style="list-style-type: none"> 1. Thermodynamics I 2. Chemical Kinetics –I 3. Electrochemistry 4. Interface & Dielectrics 	Facilitate the realization of the concept of system, variables, heat, work, and their relations, basic principle of laws of electrochemistry and ion atmosphere, theory and significance of adsorption. Provides practical experience on kinetics and solubility product related experiments
				Physical Chemistry-II Lab	<ol style="list-style-type: none"> 1. Kinetics of decomposition of H₂O₂ by potassium iodide. 2. Solubility/solubility product of Mg-carbonate in presence/absence of common ions and/or neutral electrolytes. 	
			BSCHCEMSE301	Industrial Chemistry	<ol style="list-style-type: none"> 1. Paints 2. Electrochemical and Electro-thermal Industries 3. Ceramics 4. Rusting of Iron and Steel 5. Industrial Safety and Fire Protection 	Preparation and uses of various compounds including KMnO ₄ , CaC ₂ , alloy steels etc. Basic concepts of Paints varnishes, dyes, ceramics fire-extinguishers and their applications.

			BSCHCEMSE302	Pharmaceutical Chemistry	1. Drugs & Pharmaceuticals 2. Fermentation	Establishment of the concept of different drug designing and discoveries, concept of aerobic and anaerobic fermentation chemistry
Chemistry	B.Sc (Prog.)	III	BSCPCEMC301	Physical Chemistry & Inorganic Chemistry	1. Phase Equilibria and Colligative Properties 2. Electrochemistry 3. Chemical Kinetics 4. Chemical and Ionic Equilibrium	Provides basic concept of phase rule in a binary liquid mixture, conductance and ionic equilibria, idea about acid-base chemistry and law kinetics of chemicals reaction
				Inorganic Qualitative Practical (Lab)	Detection of acid and basic radicals by analysis of a mixture.	
			BSCPCEMSE301	Industrial Chemistry	1. Paints 2. Electrochemical and Electro-thermal Industries 3. Ceramics 4. Rusting of Iron and Steel 5. Industrial Safety and Fire Protection	Preparation and uses of various compounds including KMnO_4 , CaC_2 , alloy steels etc. Basic concepts of Paints varnishes, dyes, ceramics fire-extinguishers and their applications.
Chemistry	B.Sc (GE)	III	BSCHCEMGE301	Physical Chemistry & Inorganic Chemistry	1. Phase Equilibria and Colligative Properties 2. Electrochemistry 3. Chemical Kinetics 4. Chemical and Ionic Equilibrium	Provides basic concept of phase rule in a binary liquid mixture, conductance and ionic equilibria, idea about acid-base chemistry and law kinetics of chemicals reaction.
				Inorganic Qualitative Practical	Detection of acid and basic radicals by	

				(Lab)	analysis of a mixture.	
Chemistry	B.Sc (Hons)	IV	BSCHCEMC401	Inorganic Chemistry – III	<ol style="list-style-type: none"> 1. Coordination Chemistry-II 2. Chemistry of d and f Block Elements 3. Inorganic Substitution Reaction Mechanism 	Explanation about the origin of colour of complexes, concepts of d- and f-block elements. Introductory idea about inorganic reaction mechanism, and hands experience on the preparations of some inorganic complexes.
				Inorganic Chemistry – III Lab	<ol style="list-style-type: none"> 1. Preparation of Chrome alum, Mohr's salt, Cuprommonium sulphate, Sodium nitroprusside, hexamine cobalt(III) chloride, tris(ethane 1,2-ammine) nickel(III) chloride 2. Preparation of acetylacetonato complexes of $\text{Cu}^{2+}/\text{Fe}^{3+}$ (calculation of λ_{max} of the prepared complex using instrument). 	
			BSCHCEMC402	Organic Chemistry – IV	<ol style="list-style-type: none"> 1. Alkaloids & Terpenoids 2. Organic Spectroscopy 3. Pericyclic reactions 4. Carbohydrates 	Basic concept about different bioactive organic compounds like carbohydrates, alkaloids, and terpenes. Understanding principle of UV-Vis spectroscopy, IR Spectroscopy, NMR spectroscopy, mass spectrometry and their

						applications. Overall concept pericyclic reactions.
				Organic Chemistry – IV (Lab)	Quantitative analysis of some selected organic compounds	Estimation of: 1. Glucose by Fehling's solution, 2. Acetone, 3. Aniline
			BSCHCEMC403	Physical Chemistry – III	1. : Thermodynamics II & Application 2. Electrochemical Cells 3. Chemical kinetics –II 4. Phase Equilibria & Colligative Properties	Understand the concept of entropy; reversible, irreversible processes, electrodes, EMF measurement, chemical cells and their function. Understand the phase equilibrium, criteria of collision theory and transition state theory. Qualitative idea about potentiometric titrations and their applications.
				Physical Chemistry-III Lab	1. Equilibrium constant of the reaction $KI + I_2 = KI_3$ by partition method. 2. Conductometric titrations of an acid or a base (acid may be monobasic/dibasic, and similarly for the base) 3. Potentiometric titrations of an acid or a base (acid may be monobasic/dibasic, and similarly for the base)	
			BSCHCEMSE401	Mathematics and Statistics for	1. Introduction	To understand different mathematical

				Chemists	2. Differential equations & Probability 3. Vectors, matrices and determinants	functions, probability correlations, sampling, and data analysis.
			BSCHCEMSE402	Fuel Chemistry	1. Energy Sources 2. Petroleum and Petrochemical Industry 3. Lubricants	Concepts of different renewable and non-renewable energy sources and their applications.
Chemistry	B.Sc (Prog.)	IV	: BSCPCEMC401	Inorganic Chemistry & Organic Chemistry	1. Chemical Forces and Molecular Structure 2. Acids, Bases and Buffers 3. Oxidation and Reduction 4. Organic Synthesis	Gives comprehensive ideas about hybridization and shapes of atomic, molecular orbitals, bond parameters, bond- distances. Concepts of acidic and basic nature of different redox active entities along with the preparative methods of few organic compounds.
				Inorganic Quantitative (Lab)	1. Titration of $\text{Na}_2\text{CO}_3 + \text{NaHCO}_3$ mixture vs HCl using phenolphthalein and methyl orange indicators 2. To find the total hardness of water by EDTA titration 3. Titration of ferrous iron by $\text{KMnO}_4/\text{K}_2\text{Cr}_2\text{O}_7$ 4. Titration of ferric iron by $\text{KMnO}_4/\text{K}_2\text{Cr}_2\text{O}_7$ using SnCl_2 reduction	

			BSCPCEMSE401	Chemistry of Cosmetics & Perfumes	1. Preparation and Use of Cosmetics & Perfumes	To understand the basic concepts of cosmetics and perfumes and their preparative methods.
Chemistry	B.Sc (GE)	IV	BSCHCEMGE401	Inorganic Chemistry & Organic Chemistry	<ol style="list-style-type: none"> 1. Chemical Forces and Molecular Structure 2. Acids, Bases and Buffers 3. Oxidation and Reduction 4. Organic Synthesis 	Ideas about bonding interaction and energy of different hybridized molecular orbitals. Understanding the acidic and basic nature of different entities. Understanding the redox reactions and preparation methods of few organic compounds.
	B.Sc (GE)			Inorganic Quantitative (Lab)	<ol style="list-style-type: none"> 1. Titration of $\text{Na}_2\text{CO}_3 + \text{NaHCO}_3$ mixture vs HCl using phenolphthalein and methyl orange indicators 2. To find the total hardness of water by EDTA titration 3. Titration of ferrous iron by $\text{KMnO}_4/\text{K}_2\text{Cr}_2\text{O}_7$ 4. Titration of ferric iron by $\text{KMnO}_4/\text{K}_2\text{Cr}_2\text{O}_7$ using SnCl_2 reduction 	
Chemistry	B.Sc (Hons)	V	BSCHCEMC501	Organic Chemistry – V	<ol style="list-style-type: none"> 1. Biomolecules 2. Bioenergetics 3. Pharmaceutical Compounds 4. Synthetic Methodology 	Understandings different types of pharmaceuticals and bioactive compounds and their synthesis. Gives comprehensive

						ideas about the structure of DNA and of metabolism in human body system.
				Organic Chemistry – V Lab	Preparation of some selected organic compounds	
			BSCHCEMC502	Inorganic Chemistry – IV	<ol style="list-style-type: none"> 1. Redox Potential and Redox Equilibria 2. Nuclear Chemistry 3. Organometallic Compounds 	Gives the concepts of redox potentials and redox titrations. Understandings of radioactivity and organometallic compounds with their preparations.
				Inorganic Chemistry – IV Lab	Volumetric analysis: Redox titrations- permanganometry, dichromatometry, iodometry and iodimetry Volumetric analysis of mixtures involving not more than two different estimations: Fe + Cu, Fe + Cr, Fe + Ca, Ca + Ba, Ca + Mg etc.	
			BSCHCEMDSE501	Green Chemistry	<ol style="list-style-type: none"> 1. Introduction to Green Chemistry 2. Principles of Green Chemistry 3. Examples of Green Synthesis/ Reactions and some real world cases 	The students understand the chemistry of sustainable developments and environmentally friendly procedure for organic synthesis.

			BSCHCEMDSE502	Environmental Chemistry	<ol style="list-style-type: none"> 1. The Atmosphere 2. Aspects of Environmental Inorganic Chemistry 3. The Hydrosphere 4. The Lithosphere and Pollution control 	Understanding the concepts of earth's atmosphere and different toxic elements with their impact on our environment.
			BSCHCEMDSE503	Solid State Chemistry	<ol style="list-style-type: none"> 1. Basic Concepts and selected structure 2. Crystallographic Basics 3. Chemical Bonding in Solids 4. Properties of Solids 	Idea about the structure of solids crystal and laws of crystallography with their different important properties such as superconductor, semiconductors, transistors etc.
Chemistry	B.Sc (Prog.)	V	BSCPCEMDSE501	Applied Chemistry	<ol style="list-style-type: none"> 1. Analytical Chemistry 2. Basic Principles of Green Chemistry 3. Colloidal State 4. Macromolecular Chemistry 	Understanding the basic concepts of analytical chemistry, environmental chemistry and green chemistry with their application in our life.
			BSCPCEMDSE502	Spectroscopy & Quantum Chemistry, Photochemistry	<ol style="list-style-type: none"> 1. Quantum Chemistry 2. Photochemistry 3. Spectroscopy 	Learn about classical mechanics and quantum mechanics for atomic/molecular systems. Knowledge about different spectroscopic technique.
			BSCPCEMSE501	Pharmaceutical Chemistry	<ol style="list-style-type: none"> 1. Drugs & Pharmaceuticals 2. Fermentation 	Knowledge about the synthesis of different pharmaceutically active agents and their applications.

Chemistry	B.Sc (Hons.)	VI	BSCHCEMC601	Inorganic Chemistry – V	<ol style="list-style-type: none"> 1. Bioinorganic Chemistry 2. Introduction to Analytical Chemistry 3. Chromatography 4. Catalytic Inorganic Reaction 5. Polymer 	<p>Students acquire knowledge of role of metal ions in our biological systems and application of polymers.</p> <p>Basic knowledge of analytical chemistry and different chromatography techniques.</p>
				Inorganic Chemistry –V Lab	<ol style="list-style-type: none"> 1. Complexometric Titration 2. Gravimetric Analysis 3. Ion-exchanger: Cation content of a sample by cation exchanger 4. Solvent extraction 	
			BSCHCEMC602	Physical Chemistry – IV	<ol style="list-style-type: none"> 1. Chemical Equilibrium 2. Statistical Thermodynamics & Third Law 3. Symmetry & Group Theory 4. Quantum Chemistry 5. Photochemistry & Spectroscopy 	<p>Understand the equilibrium on the basis of thermodynamic parameters.</p> <p>Calculation of entropy using 3rd law of thermodynamics and basic concept of group theory.</p>
				Physical Chemistry-IV Lab	<ol style="list-style-type: none"> 1. Kinetics of saponification of ester by conductometric method 2. Conductometric verification of Ostwald dilution law 3. Colorimetric determination of pK_{in} of methyl red 	
			BSCHCEMDSE601	Chemistry of Nanomaterials	<ol style="list-style-type: none"> 1. Basic Concepts on Nanomaterials 	Learn about nanomaterials and their

					<ol style="list-style-type: none"> 2. Synthesis and Fabrication of Nanomaterials 3. Special Nanomaterials 4. Characterization, Properties and Applications of Nanomaterials 	<p>synthesis, and characterisations, applications.</p>
			BSCHCEMDSE602	Dynamic Stereochemistry	<ol style="list-style-type: none"> 1. General Introduction 2. Synthetic Approach 3. Stereochemical Aspects of a few Organic Reactions 4. Alicyclic system 	<p>Knowledge of different stereochemical reactions and conformation of different organic compounds.</p>
			BSCHCEMDSE603	Quantum Chemistry & Spectroscopy	<ol style="list-style-type: none"> 1. Quantum Mechanics 2. Atomic structure 3. Molecular Spectroscopy 4. 	<p>Learn about limitations of classical mechanics, quantum mechanical operators, quantization, probability distribution, and uncertainty principle. Some basic concepts of different types of molecular spectra such as vibrational, rotational, Raman, NMR, mossbauer.</p>
Chemistry	B.Sc (Prog.)	VI		Chemistry of Biomolecules & Chemotherapy	<ol style="list-style-type: none"> 1. Carbohydrate Chemistry 2. Amino acids and Protein 3. Heterocyclic Compound and Nucleic acids 4. Enzymes and Biochemical Process 5. Chemotherapy 	<p>Understandings of different types of biomolecules, and their activity in biological systems. Basic concepts of chemotherapy and synthesis of different drug molecules.</p>

			BSCPCEMDSE602	Advanced Inorganic Chemistry	<ol style="list-style-type: none"> 1. Coordination Chemistry 2. Chemistry of Main Group Elements 3. Transition Metals 	Knowledge about coordination compounds and d-block/transition elements.
			BSCPCEMSE601	Fuel Chemistry	<ol style="list-style-type: none"> 1. Energy Sources 2. Petroleum and Petrochemical Industry 3. Lubricants 	Concepts of different renewable and non-renewable energy sources and their applications. Concepts of lubricants and their various properties.

Department of Economics

Course Outcome, Programme Outcome and Programme Specific Outcome for the

The Department of Economics at present offers the BSC Hons course in Economics along with Economics as a Generic Elective and MIL subject-option for interested students.

Programme Outcome of BA Honours in Economics—The Bachelor of Science in Economics Programme has been designed by the affiliating University following the guidelines of the UGC regarding the Choice Based Credit System. It is meant to acquaint the students with the past and present of Economics. The Core Courses are compulsory papers arranged chronologically and/or according to literary genre and subtypes whereas the Discipline Specific Elective Courses are chosen out of a pool of such courses. The Skill Enhancement Courses focus on various skill sets and attempts to hone them so that it increases the employability of the students once they successfully complete their Graduation. The course specific outcomes are as follows.

Name of the Course with Code	Course Outcomes
Semester- I (Honours)	
Microeconomic Theory – I; BSCHECOC101	<ol style="list-style-type: none"> 1. Understand the concept of economics, the distinction between micro economics and macroeconomics, concept of demand and its relevance in a market economy. 2. Learn how the different decision-making units (consumers, firms), with limited resources at their disposal, will chose the best alternative among the available alternatives 3. Realize the operation of the markets, the distinction between real world market and the concept of market in economics. The ideas of perfect market, the nature and causes of market imperfection will help the students to judge the mechanisms of market economy and to take judicious decision.
Macroeconomic Theory – I; BSCHECOC102	<ol style="list-style-type: none"> 1. Be acquainted with the aggregative behaviour of an economic system. The concept of national income, price level, level of employment will guide the learners to judge the situation of an economy in a better manner. 2. Understand the development of the macroeconomic thoughts from the last quarter of the eighteenth century to mid twentieth century, the Classical and the Keynesian theory of income and employment. 3. Know the impacts of great depression on the world economy and the development of different macro theories as a consequence of this event.
Semester- I (Generic)	
Microeconomic	<ol style="list-style-type: none"> 1. Understand the concept of economics, the distinction between micro

Theory – I; BSCHECOGE101	<p>economics and macroeconomics, concept of demand and its relevance in a market economy.</p> <p>2. Learn how the different decision-making units (consumers, firms), with limited resources at their disposal, will chose the best alternative among the available alternatives</p> <p>3. Acquire the concept of different types of costs and the relevance of costs of production in making pricing decision by a producing unit.</p>
Indian Economics: Post Independence; BSCHECOGE102	<p>1. Informed about the situation of the Indian economy in the post-independence regime.</p> <p>2. Acquainted with different policies, relating to agriculture, industry etc. undertaken after independence to build up a self-sufficient economy.</p> <p>3. Updated regarding growth experience of the Indian economy amidst huge population pressure and the ways to move the economy in the growth trajectory.</p>
Semester – I (Program)	
Microeconomic Theory – I; BSCPECOG101	<p>1. Understand the concept of economics, the distinction between micro economics and macroeconomics, concept of demand and its relevance in a market economy.</p> <p>2. Learn how the different decision-making units (consumers, firms), with limited resources at their disposal, will chose the best alternative among the available alternatives.</p> <p>3. Acquire the concept of different types of cost and the relevance of cost of production in making pricing decision by a producing unit.</p>
Semester – II (Honours)	
Microeconomic Theory – II; BSCHECOC201	<p>1. To understand, the decision-making process in different forms of market structure such as monopolistic competition, oligopoly and monopoly markets.</p> <p>2. To deal with the theoretical aspect and issues in the factor pricing theories. 3. To understand the framework of General equilibrium and Pareto criteria of optimality.</p>
Mathematical Economics – I; BSCHECOC202	<p>1. To understand basic concepts, procedures and techniques of mathematical economics.</p> <p>2. To discuss how these tools can be applied in economics. 3. To develop analytical ability to express economic ideas using mathematics techniques.</p>
Semester – II (Generic)	
Money and Banking; BSCHECOGE 201	<p>1. To understand some basic ideas relating to monetary analysis and financial markets with reference to Indian financial markets.</p> <p>2. To gain knowledge about the theories of demand for money and supply of money, measures of money supply in India.</p> <p>3. To develop knowledge of working of banking- commercial banks, central bank, rural banking, non-banking financial intermediaries.</p>
Microeconomic Theory-II; BSCHECOGE 202	<p>1. To understand, the decision-making process in different forms of market structure such as monopolistic competition, oligopoly and monopoly markets. 2. To acquire knowledge about the factor pricing theories.</p>

Semester – II (Program)	
Macroeconomic Theory; BSCPECOC201	<ol style="list-style-type: none"> 1. Be acquainted with the aggregative behaviour of an economic system. The concept of national income, price level, level of employment will guide the learners to judge the situation of an economy in a better manner. 2. Understand the development of the macroeconomic thoughts from the last quarter of the eighteenth century to mid twentieth century, the Classical and the Keynesian theory of income and employment. 3. Know the impacts of great depression on the world economy and the development of different macro theories as a consequence of this event.
Semester – III (honours)	
Statistical Methods-I; BSCHECOC301	<ol style="list-style-type: none"> 1. To understand basic knowledge of data presentation, measures of central tendency, dispersion, skewness and kurtosis. 2. To grasp knowledge of correlation, simple regression analysis and Index numbers. 3. To develop skills in the field of economic analysis and reasoning.
Macroeconomic Theory-II; BSCHECOC302	<ol style="list-style-type: none"> 1. To grasp knowledge of theories of consumption, investment and the importance of these theories in analyzing aggregate behaviour. 2. To understand theoretical aspects of demand for and supply of money. 3. To understand the concepts of and impact of inflation in an economy.
Development Economics; BSCHECOC303	<ol style="list-style-type: none"> 1. To understand the concept of development, distinction between economic growth and economic development and also the concepts sustainable development, inclusive development, human development etc. 2. To understand the reasons behind difference in growth rate between countries and pinpoint the factors responsible for poor economic status of the developing countries. 3. To gain knowledge regarding development strategies needed for a labour surplus economy and also the choice of technique in such an economy.
Semester – III (Generic)	
Introductory Macroeconomics; BSCHECOGE301	<ol style="list-style-type: none"> 1. Realize the aggregative behaviour of an economic system. The concept of national income, price level, level of employment will guide the learners to judge the situation of an economy in a better manner. 2. Understand the development of the two popular macroeconomic thoughts; the Classical and the Keynesian theory of income and employment.
Contemporary Issues of Indian Economy; BSCHECOGE302	<ol style="list-style-type: none"> 1. To understand the situation of the Indian economy in the post-independence regime. 2. To gain understanding regarding planning process in India and its implication for the overall development of the economy. 3. To learn regarding problems related to foreign trade and tax structure.
Semester – III (Honours SEC)	
Data Collection and Data Processing; BSCPECOSE301	<ol style="list-style-type: none"> 1. To understand methods of presentation of data in textual, tabular and diagrammatic form. 2. To understand steps and problems associated with data processing and the analysis of various forms of data (quantitative, qualitative; cross

	<p>section, time series).</p> <p>3. To do Project based on techniques taught in this paper which will be helpful to them in further research.</p>
<p>Semester – III (Program)</p>	
<p>Microeconomic Theory-II; BSCPECOC301</p>	<p>1. To understand, the decision-making process in different forms of market structure such as monopolistic competition, oligopoly and monopoly markets.</p> <p>2. To deal with the theoretical aspect and issues in the factor pricing theories.</p>

Department of Geography

Departmental Program Outcomes

Name of the Department	Name of the Programme	Programme Outcome	Programme Specific Outcome	Course Outcome
Geography	B.Sc. Honours	<p>Geography not only focuses on the physical aspects of the earth systems and processes but also seeks to understand the human societies, social systems and processes. Geography in true sense has emerged as a trans- disciplinary subject integrating the study of nature and society, the regional diversity with the concepts of the space and time. It incorporates dynamic processes including fundamental and modern techniques, contemporary paradigms such as global initiatives like Sustainable Development Goals (SDGs), Disaster Risk Reduction (DRR), Paris Climate Action and national initiatives like smart cities, Securities of food, water, energy, human health and livelihood, biodiversity, and disaster management.</p> <p>The programme learning outcomes relating to B.Sc. (Hons.) Programme in geography:</p> <ul style="list-style-type: none"> • Demonstrating the understanding of basic concepts in geography. • Demonstrating the coherent and systematic 	<p>This CBCS based LOCF syllabus format will help students to move forward in several dimensions. Lots of opportunities will be there in near future. Students can approach towards higher education. First of all they can move towards M.A./M.Sc. Further they can approach to Ph.D. Besides, students now a days can join some modern professional courses after moving through this syllabus. They can join M.Sc. in Geoinformatics, Geographical Information Science. Furthermore they can also approach in Regional Planning, Urban Planning, Rural Development, Rural</p>	<p style="text-align: center;"><u>Semester- I</u></p> <p>Course Name: Geomorphology</p> <p>After the completion of course, the students will have ability to:</p> <ol style="list-style-type: none"> 1. Understand the functioning of landform systems in real time and analyse how the natural and anthropogenic operating factors affects the development of landforms 2. Distinguish between the mechanisms that control these processes 3. Assess the role of structure, stage and time in shaping the landforms, interpret geological maps and apply the knowledge in geographical research. <p>Course Name: Cartographic Techniques</p> <p>After the completion of course, the students will have ability to:</p> <ol style="list-style-type: none"> 1. Understand the importance of scale in geography. 2. Read and prepare maps, comprehend locational and spatial aspects of the earth surface. 3. Use and importance of maps for regional development and decision making.

knowledge in the discipline of geography to deal with current issues and their solution.

- Display an ability to read and understand maps and topographic sheets to look at the various aspects on the space.
- Cultivate ability to evaluate critically the wider chain of network of spatial aspects from global to local level on various time scales as well.
- Recognize the skill development in Geographical studies programme as part of career avenues in various fields like teaching, research and administration.

Management etc.

Semester-II

Course Name: Geography of Human and Cultural landscape

After the completion of course, the students will have ability to:

1. To Know the diversity of changing human and cultural landscape.
2. Understand of population growth and its implications.
3. Understand the diversity of culture.

Course Name: Statistical Method in Geography

After the completion of course, the students will have ability to:

1. Understand the basics of data collection and sampling.
2. Comprehend the representation and interpretation of the results.
3. Practice results in research.

Semester- III

Course Name: Climatology and Oceanography

After the completion of course, the students will have ability to:

1. Understand the elements of weather and climate and its

impacts at different scales.

2. Comprehend the climatic aspects and its bearing on planet earth.

3. Understand the oceanic process and availability of resources.

Course Name: Geography of India

After the completion of course, the students will have ability to:

1. Understand the physical profile of the country

2. Study the resource endowment and its spatial distribution and utilization for sustainable development

3. Synthesise and develop the idea of regional dimensions at present.

Course Name: Fundamentals of Remote Sensing

After the completion of course, the students will have ability to:

1. Appreciate the strength and application of remote sensing

2. Map the resources, their location and availability using GIS software.

3. Apply this knowledge for sustainable development at local to global level.

Course Name: Spatial Statistical Techniques

After the completion of course, the students will have ability to:

1. Understand the basics of data collection and, processing for the meaningful outcomes
2. Understand the selection of proper sampling techniques for the collection of data
3. Put into practice the results obtained for spatial analysis of results and to apply various statistical software for the study

Course Name: Geographical Techniques

After the completion of course, the students will have ability to:

1. Gain knowledge about drawing of longitudinal sections and interpretation of structure of the geological maps.
2. Predict Soil fertility (NPK, pH).
3. Acquire practical knowledge about the application of various metrological instruments.
4. Interpret and predict the climatic condition of an area.

Semester-IV

Course Name: Introduction to Global Economic System

After the completion of course, the students will have ability to:

1. Know different types of economic activities and their utilities.
2. Understand the theories that are relevant to contemporary world.
3. Examine the importance of economic initiatives that are

crucial to development.

Course Name: Environment and Natural Resource Management

After the completion of course, the students will have ability to:

1. Understand the relationship between man and environment.
2. Have good understanding on distribution, utilization and proper management of natural resources.
3. Know about the necessities that are pre-requisite for assessment and review of planning and policies.

Course Name: Digital Remote Sensing

After the completion of course, the students will have ability to:

1. Develop the skill so as to use digital satellite data using software
2. Prepare the maps based with satellite data to compare with the ground realities.
3. Classify digital data for the land use/land cover and urban studies

Course Name: Introduction to GI Science

After the completion of course, the students will have ability to:

1. Have comprehensive understanding of GIS.
2. Have knowledge of using GPS & DGPS for the accurate location
3. Apply the GI Science platform for map making.

Course Name: Thematic Atlas

After the completion of course, the students will have ability to:

1. Have sound knowledge regarding the classification and elements of maps.
2. Have proper utilization of maps for explaining geographical issues.
3. Know the methods of preparation of various thematic maps.

Semester- V

Course Name: Regional Planning and Sustainable Development

After the completion of course, the students will have ability to:

1. Identify notable backward regions and solutions for their overall development
2. Have comprehensive understanding regarding the different regions and application of different models and theories for integrated regional development.
3. Select appropriate indicators for the measurement of socio-economic regional development.

Course Name: Field Techniques, Surveying and Research Methods

After the completion of course, the students will have ability to:

1. Conduct proper field work for the collection of primary data to bring out grassroots realities.
2. Make use of proper tools and surveying methods for measurement in context of collection and processing of data.
3. Prepare a report based on field data.

Course Name: Geography of West Bengal

After the completion of course, the students will have ability to:

1. Understand physical geography of West Bengal and availability of resources
2. Understand the demography, economy and regional issues of West Bengal
3. Assess the developmental problems of West Bengal in the context of future planning

Course Name: Agriculture and Food Security

After the completion of course, the students will have ability to:

1. Conceptualise the agriculture and its determinants.

2. Get the overview of Indian and World agriculture regions and systems.

3. Have sound knowledge of agriculture revolutions and food security

Course Name: Population Geography

After the completion of course, the students will have ability to:

1. Learn the role of demography and population studies as a distinct field of human geography

2. Have sound knowledge of key concept, different components of population along with its drivers

3. Examine population dynamics and characteristic with contemporary issues

Course Name: Hydrology

After the completion of course, the students will have ability to:

1. Understand the basic components of hydrological cycle and comprehend practices of integrated watershed management.

2. Evaluate the water balancing and river basin and water disputes.

3. Study the soil as a basic resource, focusing its distribution, problems and management.

Course Name: Geography of Health

After the completion of course, the students will have ability to:

1. Understand the key concepts related to health.
2. Identify the linkages between the health and environment.
3. Explain the relationships between health and environment with reference to climate change

Semester-VI

Course Name: Evolution of Geographical Thought

After the completion of course, the students will have ability to:

1. Understand paradigms in geography discipline through time
2. Understand the development of geographical thinking.
3. Understand the past and future trends of geography as a discipline.

Course Name: Disaster Management Project Work

After the completion of course, the students will have ability to:

1. Understand processes and impact of disaster on empirical basis.
2. Distinguish both the natural and man-made disaster.
3. Design and prepare project work on disasters.

Course Name: Political Geography

After the completion of course, the students will have ability to:

1. Learn the concept of nation and state and geopolitical theories
2. Understand the different dimensions of resource conflicts on geopolitical base.
3. Acquire sound knowledge on politics of contemporary displacement.

Course Name: Biogeography

After the completion of course, the students will have ability to:

1. Familiarise the dynamics of climate and related theories.
2. Understand of Vegetation as an index of climate.
3. Assess of different aspects of floral and faunal provinces.

Course Name: Geography of Social Wellbeing

After the completion of course, the students will have ability to:

1. Understand the nature, scope and relationships of geography and human wellbeing.
2. Understand the spatial dimensions of social diversity components.
3. Critically analyse the social welfare programs related to inclusive and exclusive policies in India.

Course Name: Urbanization and Urban System

			<p>After the completion of course, the students will have ability to:</p> <ol style="list-style-type: none"> 1. Understand the fundamentals and patterns of urbanization process 2. Learn the functional classification of cities and Central Place Theory 3. Know contemporary problems of Delhi, Mumbai, Kolkata and Chennai <p>Course Name: Soil Geography</p> <p>After the completion of course, the students will have ability to:</p> <ol style="list-style-type: none"> 1. Understand the concepts related to soil. 2. To know the soil diversities and importance of their preservation 3. To know about soil fertility and its significance
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Department of Mathematics

Course learning outcomes

Course Name: Calculus, Geometry & Differential Equations

Course Code: BSCHMTMC101

Course Learning Outcomes:

(After the completion of course, the students will have ability to):

- Understand various kinds of standard functions and graphs, techniques of integrations and limits.
- Learn about real numbers and its basic properties.
- Understand the concepts on three-dimensional geometry.
- Understand the genesis of ordinary differential equations.
- Understand the various techniques of getting exact solutions of solvable first order differential equations and linear differential equations of higher order.

Course Name: Algebra

Course Code: BSCHMTMC102

Course Learning Outcomes: This course will enable the students to

- Understand the importance of roots of real and complex polynomials and learn various methods of obtaining roots.
- Employ DeMoivre's theorem in a number of applications to solve numerical problems.
- Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix, using rank.
- Find eigenvalues and corresponding eigenvectors for a square matrix.

Course Name: Real Analysis

Course Code: BSCHMTMC201

Course Learning Outcomes: This course will enable the students to

- Understand many properties of the real line \mathbb{R} and learn to define sequence in terms of functions from \mathbb{R} to a subset of \mathbb{R} .
- Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.
- Apply the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.
- Understand the theory and concepts of Riemann integration.
- Understand the applications of the fundamental theorems of integration.

Course Name: Differential Equations and Vector Calculus

Course Code: BSCHMTMC202

Course Learning Outcomes: This course will enable the students to

- Learn the Picard's method of obtaining successive approximations of solutions of first order ordinary differential equations.
- Know how to solve linear homogeneous and non-homogeneous equations of higher order with constant coefficients.
- Understand the system of linear differential equations and the solution techniques.
- Learn conceptual differences between usual solution and power series solution of some second order ODEs .
- Understand the theory and applications of vector analysis.

Course Name: Multivariable Calculus

Course Code: BSCHMTMC301

Course Learning Outcomes: This course will enable the students to

- Learn conceptual differences while advancing from one variable to several variables in calculus.
- Apply multivariable calculus in various optimization problems.
- Understand inter-relationship amongst the line integral, double and triple integral formulations.
- Visualise the structure of curves and surfaces in plane and space etc.
- Learn the applications of multivariable calculus in different fields like Physics, Economics, Medical Sciences, Animation & Computer Graphics etc.
- Realize importance of Green, Gauss and Stokes' theorems in other branches of Mathematics.

Course Name: Group Theory

Course Code: BSCHMTMC302

Course Learning Outcomes: The course will enable the students to:

- Realize the basic concept of mathematical composition.
- Link the fundamental concepts of groups and symmetries of geometrical objects.
- Explain the significance of the notions of cosets, normal subgroups, and factor groups.
- Analyze consequences of Lagrange's theorem.
- Learn about structure preserving maps between groups and their consequences.

Course Name: Probability and Statistics

Course Code: BSCHMTMC303

Course Learning Outcomes: The course will enable the students to:

- Establish a formulation helping to predict one variable in terms of the other, i.e., correlation and linear regression.
- Understand central limit theorem, which establish the remarkable fact that the empirical frequencies of so many natural populations, exhibit a bell shaped curve.

Course Name: Mathematical Logic

Course Code: BSCHMTMSE301

Course Learning Outcomes: This course will enable the students to

- Understand the syntax of first-order logic and semantics of first-order languages
- Understand about truth table, different propositions, predicates and quantifiers, basic Theorems like the Compactness Theorem, Meta Theorem and Post Tautology Theorem.
- Grasp the concept of completeness interpretations and their applications with special stress on applications in Algebra.

Course Name: Programming Language in C

Course Code: BSCHMTMSE302

Course Learning Outcomes: This course will enable the students to

- Acquire knowledge about one of the advanced computer language C and its applications.
- Understand basic structure, characters, keywords, identifiers, data types, operators, expressions, etc. in C language.
- Write flow chart and corresponding C-program for solving problems requiring decision making, branching, looping and other control statements.
- Learn to implement arrays and functions in C programming.
- Familiarize with the concepts of structure, union and pointers.

Course Name: Mechanics

Course Code: BSCHMTMC401

Course Learning Outcomes: This course will enable the students to:

- Familiarize with subject matter, which has been the single centre, to which were drawn mathematicians, physicists, astronomers, and engineers together.
- Understand necessary conditions for the equilibrium of particles acted upon by various forces and learn the principle of virtual work for a system of coplanar forces acting on a rigid body.
- Determine the centre of gravity of some materialistic systems and discuss the equilibrium of a uniform cable hanging freely under its own weight.
- Deal with the kinematics and kinetics of the rectilinear and planar motions of a particle including the constrained oscillatory motions of particles.
- Learn that a particle moving under a central force describes a plane curve and know the Kepler's laws of the planetary motions, which were deduced by him long before the mathematical theory given by Newton.

Course Name: Linear Algebra

Course Code: BSCHMTMC402

Course Learning Outcomes: This course will enable the students to:

- Understand the concepts of vector spaces, subspaces, bases, dimension and their properties.
- Relate matrices and linear transformations, compute eigen values and eigen vectors of linear transformations.
- Learn properties of inner product spaces and determine orthogonality in inner product spaces.
- Realise the importance of adjoint of a linear transformation and its canonical form.

Course Name: Partial Differential Equations and Calculus of Variations

Course Code: BSCHMTMC403

Course Learning Outcomes: This course will enable the students to

- Understand the geometric and physical nature of Partial Differential Equations and classify them
- accordingly.
- Apply a range of techniques to solve first and second order partial differential equations.
- Model physical phenomena using partial differential equations such as the heat and wave equations.
- Understand problems, methods and techniques of calculus of variations.

Course Name: Graph Theory

Course Code: BSCHMTMSE401

Course Learning Outcomes: This course will enable the students to

- Appreciate the definition and basics of graphs along with types and their examples.
- Understand the Eulerian circuits, Eulerian graphs, Hamiltonian cycles, representation of a graph by matrix.
- Relate the graph theory to the real-world problems.

Course Name: Object Oriented Programming in C++

Course Code: BSCHMTMSE402

Course Learning Outcomes:

(After the completion of course, the students will have ability to):

- Understand the basic characteristics of object oriented programming languages, different components and structures in C++ programming language.
- Understand and apply the programming concepts of C++ which is important for mathematical investigation and problem solving.
- Use mathematical libraries for computational objectives.
- Represent the outputs of programs visually in terms of well formatted text and plots.

Course Name: Set Theory and Metric Spaces

Course Code: BSCHMTMC501

Course Learning Outcomes: This course will enable the students to:

- Learn basics about the cardinality of a set.
- Learn abstract formulation of the notion “distance” on an arbitrary set and learn how known concepts like continuity, convergence of sequences etc behave in such abstract setting.
- Understand several standard concepts of metric spaces and their properties like openness, closeness, completeness, compactness, Bolzano-Weierstrass property, and connectedness.
- Identify the continuity of a function defined on metric spaces and homeomorphisms.

Course Name: Advanced Algebra

Course Code: BSCHMTMC502

Course Learning Outcomes: This course will enable the students to

- Understand the automorphism, inner automorphism and the fundamental concepts of group actions and their applications
- • Understand the application of Sylow theorems to characterize certain Finite Groups.
- Be acquainted with the basic concepts of Ring Theory such as the concepts of ideals, quotient rings, Integral domains and Fields.
- • Know in detail about polynomial rings, fundamental properties of finite field extensions and classification of Finite Fields.

Course Name: Linear Programming and Game Theory

Course Code: BSCHMTMDSE503

Course Learning Outcomes: This course will enable the students to

- Analyze and solve linear programming models of real life situations.
- • Provide graphical solution of linear programming problems with two variables, and illustrate the concept of convex set and extreme points.
- Solve linear programming problems using simplex method.
- • Learn techniques to solve transportation and assignment problems.
- Solve two-person zero sum game problems.

Course Name: Complex Analysis

Course Code: BSCHMTMC601

Course Learning Outcomes: This course will enable the students to:

- Visualize complex numbers as points of \mathbb{R}^2
- and stereographic projection of complex plane on the Riemann sphere.
- • Understand the significance of differentiability and analyticity of complex functions leading to the Cauchy-Riemann equations.
- Learn the role of Cauchy-Goursat theorem and Cauchy integral formula in evaluation of contour integrals.
- • Apply Liouville's theorem in fundamental theorem of algebra.
- Understand the convergence, term by term integration and differentiation of a power series.
- • Learn Taylor and Laurent series expansions of analytic functions, classify the nature of singularity, poles and residues and application of Cauchy Residue theorem.

Course Name: Numerical Methods & Numerical Lab

Course Code: BSCHMTMC602

Course Learning Outcomes: This course will enable the students to

- Understand the problem solving skills using numerical methods,
- • Handle large system of equations, non-linearity and that are often impossible to

solve analytically,

- Solve differential equations by numerical methods,
- • Develop problem solving skills using computer programming,
- Acquire knowledge of C programming language,
- • Solve different numerical problems using algorithm, flowchart, C language programming.

Course Name: Discrete Mathematics

Course Code: BSCHMTMDSE601

Course Learning Outcomes: This course will enable the students to

- Learn about partially ordered sets, lattices and their types.
- • Understand Boolean algebra and Boolean functions, logic gates, switching circuits and their applications.
- Solve real-life problems using finite-state and Turing machines.
- • Assimilate various graph theoretic concepts and familiarize with their applications.

Course Name: Number Theory

Course Code: BSCHMTMDSE602

Course Learning Outcomes: This course will enable the students to:

- Learn about some important results in the theory of numbers including the prime number theorem, Chinese remainder theorem, Euler's theorem, Wilson's theorem and their consequences.
- • Learn about number theoretic functions, modular arithmetic and their applications.
- Familiarise with modular arithmetic and find primitive roots of prime and composite numbers.
- • Know about open problems in number theory, namely, the Goldbach conjecture and Twin-prime conjecture.
- Apply public crypto systems, in particular, RSA.

Course Name: Advanced Mechanics

Course Code: BSCHMTMDSE603

Course Learning Outcomes: This course will enable the students to

- Understand the reduction of force system in three dimensions to a resultant force acting at a base point and a resultant couple.
- • Learn about a null point, a null line, and a null plane with respect to a system of forces acting on a rigid body together with the idea of central axis.
- Know the inertia constants for a rigid body and the equation of momental ellipsoid together with the idea of principal axes and principal moments of inertia to derive Euler's dynamical equations.
- • Study the kinematics and kinetics of fluid motions to understand the equation of continuity in cartesian, cylindrical polar and spherical polar coordinates which are used to derive Euler's equations and Bernoulli's equation.

- Deal with two-dimensional fluid motion using the complex potential.
- Understand the concepts of sources, sinks, doublets and the image systems of these with regard to a line and a circle.

Course Name: Bio Mathematics

Course Code: BSCHMTMDSE604

Course Learning Outcomes: This course will enable the students to

- Grasp the idea of various bio-mathematical models and techniques which will help them to tackle
- physical world problems.

Department of Physics

B.Sc (Hons) in Physics

Program Outcome (PO):

In BSc Physics program the students learn the cause of different natural phenomena through understanding the core of physics, including substantial experimental physics, enabling them to train in both the theoretical and practical aspects. They are provided with a high quality education in physics within an environment committed to excellence in both teaching and research. The programme is oriented in such a way that it helps students to prepare themselves tackling problems of day to day life by correlating them with appropriate physical principles. The students will also be able to demonstrate their skills in scientific enquiry, problem solving and techniques adopted in the laboratory using experimental, computational, and/or theoretical method based on basic laws of physics.

Program Specific Outcome (PSO)

1. To understand the basic laws and explore the fundamental concepts of physics.
2. To understand the concepts and significance of the various physical phenomena.
3. To carry out experiments to understand the laws and concepts of Physics.
4. To apply the theories learnt and the skills acquired to solve real time problems.
5. To acquire a wide range of problem solving skills, both analytical and technical and to apply them.
6. To enhance the student's academic abilities, personal qualities and transferable skills this will give them an opportunity to develop as responsible citizens.
7. To produce graduates who excel in the competencies and values required for leadership to serve a rapidly evolving global community.
8. To motivate the students to pursue PG courses in reputed institutions.
9. This course introduces students to the methods of experimental physics. Emphasis will be given on laboratory techniques specially the importance of accuracy of measurements.
10. Providing a hands-on learning experience such as in measuring the basic concepts in properties of matter, heat, optics, electricity and electronics.

Course Outcome (CO):

Name of the Course	Course Type	Course Code	Course Outcome (CO)
Mathematical Methods of Physics –I	Core	BSCHPHSC101	After the completion of course, the students will have ability to: 1. Enrich themselves with analytical tools needed for further studies in physics, like basic linear algebra, vector algebra and calculus, solutions

			<p>of ordinary and partial differential equations, probability distributions, determinant and non-singular matrices.</p> <p>2. Apply the techniques for solving different problems related to probability, differential equations, integral transform and linear algebra.</p>
Mechanics	Core	BSCHPHSC102	<p>After the completion of course, the students will have ability to:</p> <p>1. Understand classical mechanics of single as well as system of particles within the scope Newtonian formulation.</p> <p>2. Explain general properties of bulk matter and different types of simple harmonic linear oscillations.</p>
Mathematical Methods of Physics-II	Core	BSCHPHSC201	<p>After the completion of course, the students will have ability to:</p> <p>1. Work with (i) different properties of special functions, useful in other branches of physics; (ii) Fourier expansion of analytic functions; (iii) properties of complex variables and their integrals; (iv) standard integrals.</p> <p>2. Do computer programming using C /C++, aiming for basic mathematical problems as well as on problems based on standard numerical analysis.</p>
Electricity and Magnetism	Core	BSCHPHSC202	<p>After the completion of course, the students will have ability to:</p> <p>1. Discuss the properties of (i) the produced electric field due to charges at rest; (ii) the produced magnetic field due to steady, both in free-space and inside matter.</p> <p>2. Explain the idea of electromagnetism, through Maxwell's equation.</p> <p>3. Analysis of electrical networks and bridges in presence of alternating currents.</p>

Classical Mechanics and Special Theory of Relativity	Core	BSCHPHSC301	After the completion of course, the students will have ability to: 1. Explain the classical mechanics of rotating systems and particle under central force. 2. Understand the Lagrangian and Hamiltonian formulations of classical mechanics. 3. Explain the necessity of replacing Newtonian relativity through Einstein's special relativity, and elaborate on the classical mechanics of fast particles under the special relativity.
Thermal Physics – I	Core	BSCHPHSC302	After the completion of course, the students will have ability to: 1. Demonstrate molecular motion (kinetics) inside an ideal and a real classical gas. 2. Explain how the processes of heat transfer through solid, viz., conduction and radiation
Analog Systems and Applications	Core	BSCHPHSC303	After the completion of course, the students will have ability to: 1. Explain the electronic transport mechanisms through intrinsic and extrinsic semiconductors. 2. Understand the theory of the transport through doped semiconductor junctions in diodes, transistors. 3. Use diode as rectifier and junction transistors as amplifiers.
Electrical Circuit Network Skills	Skill Enhancement Course (SEC) Practical	BSCHPHSSEC 301	After the completion of course, the students will have ability to: 1. Design and trouble shoots the electrical circuits, networks and appliances through hands-on mode. 2. Choose proper devices depending upon application considering economic and technology up-gradation.
Electromagnetic Theory	Core	BSCHPHSC401	After the completion of course, the students will have ability to: 1. Demonstrates the theory behind the generation of the

			<p>electromagnetic (transverse) progressive wave in combination of oscillating electric and magnetic fields.</p> <p>2. Understand the basics of electromagnetic wave and its propagation through conducting and non-conducting medium and their application in modern day communication system.</p> <p>3. Understand the theories of the manifestations by EM wave (viz., dispersion, scattering, polarisation).</p>
Waves and Optics	Core	BSCHPHSC402	<p>After the completion of course, the students will have ability to:</p> <p>1. Explain linear superposition of several collinear and mutually perpendicular SHMs.</p> <p>2. Grow understanding due to manifestations by the optical (light) waves (viz., interference, diffraction and polarisation) can be made.</p> <p>3. Apply knowledge of sound waves, and light waves to explain natural physical processes and related technological advances.</p>
Digital Systems and Applications	Core	BSCHPHSC 403	<p>After the completion of course, the students will have ability to:</p> <p>1. Work with binary logic, and thus know how different kinds of logic gates work.</p> <p>2. Develop a digital logic and apply it to solve real life problems.</p> <p>3. Understand the difference between combinational and sequential logic circuits.</p> <p>4. Analyze, design and implement combinational and sequential logic circuits.</p> <p>5. Gain knowledge how modern day computer works.</p>
Basic Instrumentation Skills	Skill Enhancement Course (SEC) Practical	BSCHPHSSEC401	<p>After the completion of course, the students will have ability to:</p> <p>1. Get exposure with various aspects of instruments and their usage through hands-on mode.</p>

			2. Do experiments listed below in continuation of the topics
Quantum Mechanics	Core	BSCHPHSC501	After the completion of course, the students will have ability to: 1. Explain the failures of classical theory in explaining different experiments of early twentieth century are discussed. 2. Understand ideas of wave-particle duality, matter-wave. 3. Explain how the importance of Schrodinger equation (time-dependent and time-independent) to demonstrate solutions of some systems for different proto-type potentials (1d and 3d) . 4. Understand the concepts of quantum (Hermitian) operators and basis vectors.
Thermal Physics II	Core	BSCHPHSSC502	After the completion of course, the students will have ability to: 1. Demonstrate a mastery of the core knowledge in the areas of Thermal Physics. 2. Explain the concept of thermodynamic as an empirical description for the thermal properties of a macroscopic system. 3. Understand the applications of thermodynamics and the theory of the phase-transitions are discussed
Nuclear and Particle Physics	Discipline Specific Elective	BSCHPHSDSE501	After the completion of course, the students will have ability to: 1. Explain structure and properties of nuclei, the mechanism of different radioactive decays and their applications in peaceful use of nuclear energy. 2. Understand what are the elementary particles that constitute this known universe. 3. Gather capability of elementary problem solving in nuclear and particle physics.
Atomic Physics & Spectroscopy	Discipline Specific	BSCHPHSDSE503	After the completion of course, the students will have ability to:

	Elective		<p>1. Understand the concepts of atomic spectra and its origin using the old quantum theory whose consistency can be later verified by the direct application of the quantum mechanics.</p> <p>2. Account for theoretical models, terminology & working methods used in atomic and molecular physics.</p> <p>3. Carry out experimental and theoretical studies on atomic and molecular physics with focus on structure and dynamics of atoms and molecules.</p>
Statistical Mechanics	Core	BSCHPHSC601	<p>After the completion of course, the students will have ability to:</p> <p>1. Understand how probability theory can be used to derive relations between the microscopic and macroscopic properties of matter.</p> <p>2. Understand classical and quantum statistics and their application in different systems enable students to develop knowledge about how Bosonic and Fermionic systems behave.</p> <p>3. Realize how electrons behave in metals and semiconductors, and photons in blackbody radiations or phonons in solids.</p>
Condensed Matter Physics	Core	BSCHPHSC602	<p>After the completion of course, the students will have ability to:</p> <p>1. Understand the lattice structure in crystalline solids and their different properties (viz., dielectric, magnetic, electrical transport).</p> <p>2. Explain elementary idea on superconductivity.</p>
Applied Optics	Discipline Specific Elective	BSCHPHSDSE601	<p>After the completion of course, the students will have ability to:</p> <p>1. Understand the geometrical / ray optics through transfer matrix-formalism</p> <p>2. Acquire basic knowledge on different types of optical phenomena</p>

			<p>3. Realize the technological applications of optical phenomena as a background of the fiber optics, holography, LASER and photo-detectors.</p> <p>4. Analyze different laser systems and its applications in various fields.</p> <p>5. Conceptualize optical fiber, its construction and importance in communication physics.</p>
Nanomaterials and Applications	Discipline Specific Elective	BSCHPHSDSE604	<p>After the completion of course, the students will have ability to:</p> <p>1. Gain experience in applying unique properties of nanomaterials to solve problems and challenges in our life.</p> <p>2. Demonstrate the ability to develop case studies of nanomaterials with a focus on fundamentals, fabrication, characterization, and applications.</p> <p>3. Gather knowledge about synthesis, characterization and applications of nanomaterials.</p> <p>4. Collect information about optical, electrical and mechanical properties of the nanomaterials.</p>

Department of Zoology

Name of the Department	Department of Zoology
Name of the Programme	B Sc in Zoology
Programme Outcome	After successful completion of the programme, the students will have the concepts of classical Zoology and the different ecological concepts. Apart from developing an appreciation on animals and their behaviour the students become abreast with the modern concepts on genetics, molecular biology, cell biology, biochemistry, immunology, developmental biology and physiology. The students also become skilled in both the theoretical and practical aspects. Field studies and excursion imprint concepts of teamwork as well as life on the outdoors.
Programme Specific Outcome	The specific outcomes of the programme include progression of students for higher education like M Sc and Ph D. This course also trains students in the field of applied zoology like sericulture, apiculture etc. The students also have the opportunity to get engage in different biotechnology and medicine industries. Finally, the programme is versatile enough to ensure that students be successful in different competitive examinations.
Course outcome:	
Course	Outcome
Systematics & Diversity of Life - Protists to Chordates	This classical zoology paper develops concepts of animal classification as well as different features on the diversity of animal life.
Ecology	This course will provide knowledge on different principles of ecology and environment; the interactions between species and their environments.
Comparative Anatomy & Physiology of Nonchordates	The course makes a detailed comparison of the anatomy, physiology of the different taxa of non-chordates.
Cell Biology and Histology	Students will gain detailed insight into basic concepts of cellular structure and function.
Comparative Anatomy & Physiology of Chordates	This paper studies the anatomy and physiology across the entire vertebrate - animal kingdom.
Genetics	Students will gain the basic concepts on genes and heredity.
Biochemistry	The properties of different biomolecules and their metabolic and biochemical activities are studied in this course.

Behaviour and Chronobiology	The paper explains the natural behaviour patterns; function of biological clocks.
Developmental Biology & Evolution	This course studies the process of animal development and the process of evolution.
Molecular Biology	Molecular biological processes are studied in this course.
Biotechniques	The different modern techniques and methodologies used in zoology are studied here.
Microbiology, Parasitology & Immunology	Different aspects of microbiology, parasitology and immunology are studied here.
Biostatistics & Bioinformatics	Application of bioinformatics and statistics in biology are studied here.
Applied Zoology	This course deals with the application of Zoology for commercial purposes.
Genetic Engineering and Biotechnology	A modern field concerned with the modern uses of genetic engineering and biotechnology.
Livestock Management and Animal Husbandry	This paper deals with livestock management and animal husbandry.
Endocrinology	This paper deals with hormones of our body and related issues.
Wild Life Conservation and Management	This paper deals with the conservation and management of wild life.
Mammalian Physiology	The paper deals with various physiological functions in mammals.
Aquatic Biology	The course aims to provide students with a broad-based foundation in science together with extensive subject knowledge in the discipline of aquatic biology.
Beekeeping	The course describes the bee biology and economical aspects of bee keeping.
Sericulture	The course describes the detailed biology and economical aspects of sericulture.
Public Health and Hygiene	The course describes the health and hygiene related issues of human society.
Insect Pest, Vector Biology and Management	The course deals with the study of insect pests, vectors and their management.

Department of Commerce

Name of the Department	Name of the Programme	Programme Outcome	Programme Specific Outcome	Course outcome
Commerce Department	B.Com Programme	<p>Commerce as a subject involves the study of activities related to trade, business, exchange and allied areas like laws, governance and accounting in order to run business enterprises smoothly. The key areas of study within the discipline of commerce comprise: accounting, finance, human resource management, marketing, economics, use of IT etc. The depth of the courses would vary in accordance with the nature of topic in relation to their respective relevance and industry demand in the current</p>	<ul style="list-style-type: none"> • To instil in students the basic knowledge and fundamentals of commerce and business which would be beneficial for them to comprehend, analyse and evaluate the current economic/business scenario of the country and the world at large. • To develop in students the capability to transform theoretical and conceptual knowledge into practical problem-solving approach using critical thinking. • To develop skills which would help them undertake research and 	<p>After completion of this program (under LOCF), the students will be able to acquire the following attributes, qualities and skills:</p> <p>Disciplinary Knowledge The curriculum planning of B.Com.(Program) envisages the students demonstrating fundamental knowledge of the areas related to finance, accounting, human resource management, international business, corporate and business laws, taxation, marketing etc. The students will be made capable of evaluating diverse perspectives provided by the prism of these areas and a comprehensive picture of business situations, using modern ways and means of dealing with issues arising in the dynamic business world.</p> <p>Communication Skills The teaching learning pedagogies used in the programme will make the students capable enough to deliver and communicate information pertaining to business effectively.</p> <p>Problem Solving The programme involves acquainting the students with problem solving techniques by providing them with real life situations through case-studies.</p>

		<p>scenario. Also, in order to enhance the options of employability, experiential and practical approach will be followed in respect of topics which demand hands-on exposure. Focus would be on helping the students simulate themselves in the actual working situations like analysing annual reports and balance sheets, working on live software etc.</p>	<p>innovations in commerce and would enhance their employability</p>	<p>The students shall be able to develop better sense of problem solving after going through the courses.</p> <p>Analytical Reasoning The courses offer opportunity for students to develop analytical reasoning through their active participation and involvement in teaching-learning process as envisioned in the student centric approach.</p> <p>Cooperation/Team Work The curriculum also inculcates in the young minds the qualities of teamwork, cooperation and solidarity which can be seen as a vision of the current business world. They shall be able to gain insight into the need to balance the aspects of collaboration and competition for healthier delivery to society whose hallmark currently is fierce competition. The courses included in the programme teach the students to cultivate such characteristics keeping the larger societal welfare and sustenance in mind.</p> <p>Research-related skills The courses make them understand the need of the current business world and make them capable to view different aspects and dimensions from global perspective. The courses are designed in such a way that the learners are encouraged to seek deeper understanding of issues and develop research abilities.</p>
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				<p>Moral and ethical awareness/reasoning The courses also involve training the students to check unethical behaviour, falsification and manipulation of information in order to avoid debacles which can be seen rising persistently over the period of time.</p> <p>Lifelong Learning The courses are formulated to develop a sense of attitude towards life-long learning as the world of business is constantly in a state of flux. The course content shall help students build on sustaining themselves and being relevant in all times through having such an attitude.</p>
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