ASUTOSH COLLEGE
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92, S.P. Mukherjee Road
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PROGRAMME /COURSE OUTCOMES

BENGALI (HONS)

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• Primary Teacher'sTraining • Post-Graduation inBengali • Post-Graduation in other subjects like Linguistics, Pali, Buddhist Studies, Library Science	• Teacher • Professor • Researcher • Govt. jobs including WBCS/IASetc • Editing • Journalism • Spoken Bengali • Translator • Script Writing	

COMMUNICATIVE ENGLISH

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.A./M. Phil./Ph.D.in Journalism & Mass Communication, English, Linguistics, Comparative Literature, PublicRelations	• MediaHouse • NGOs • Teaching • Management	

ENGLISH

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.A. • B.Ed. • M.Phil. • Ph.D. • School-level(SSC/Others) • College/University-level (UGC-NET/SET/CSC/PSC/Others • Pursuing higher studies abroad after qualifying GRE – TOEFL and similar examinations	• Research. • Teaching • CivilServices • ProfessionalWriting • Creative/Content Writing/Blogging • Publishing • Journalism (Print/Electronic Media) • Advertising • Filmmaking • NGOs • CallCentres • Airlines/HospitalityIndustry • Non-institutionalTeaching	• Linguistics • Translation Studies • Comparative Literature • Gender/Cultural /Subaltern/ Film Studies • LibraryStudies • Management Studies

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HISTORY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• Masters inHistory • B.Ed. • NET/SET	• Teaching • Media • CivilService	• Media • Analyst in print/electronic media (in the field of politics, sports or culture) • Diplomat/ Bureaucrat

JOURNALISM AND MASS COMMUNICATION

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.A. • M.Phil • Ph.D. • NET/SET • PG Diploma	• Reporting inPrint/Electronic media • **Editing inPrint/Electronic** media • ContentDeveloper • Copywriter inAdvertising Agency • Anchoring inRadio/TV • News presenter onRadio/TV • Public Relations officer in Public & PrivateSectors • Information Service in Central & State Government Organisation • WebJournalism • Different arena ofFilm Making • Jobs in ProductionHouse • Photography • Teaching in Collegeand Universities • Teaching in CBSESchools	

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PHILOSOPHY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities

• M.A.
• B.Ed.
• M.Phil.
• Ph.D.
• Pursuing higher studies abroad after qualifying GRE – TOEFL and such like examinations
• Courses in Law/Journalism/ Management
	• Research
	• Teaching
	  ○ School level(SSC/Others)
	  ○ College/University level (CSC/PSC/Others)
	• Civil/BankingServices
	• NGOs / Institutes ofSocial Sciences
	• Journalism	

POLITICAL SCIENCE

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• B.A with Hons + B.Ed. – SSC (Teaching) • BA with Hons – Civil Service (WBCS, IAS,Others) • BA with Hons – Journalism/ Media • M.A. in Politicalscience • M.Phil • Ph.D. • NET/SET (CSC / PSC)– College Teaching	• Job in Research – Oriented Organisations • Job in Human Rightssector	

SANSKRIT

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.A. • B.Ed. • M.Phil. • Ph.D.	• Research • Teaching • CivilServices • NGOs • CivilServices	

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SOCIOLOGY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.A. • M.Phil. • Ph.D. •	• Research • Teaching • School/College/ University – level after SSC / NET /SET • AdministrativeServices • Public Health and Welfare Organisation • Media andAdvertising • Criminal JusticeSystem • Survey and Polling Organisations • International Agencies (UNICEF) andNGOs	

BIOCHEMISTRY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.Sc. in Biochemistry also in different subjects e.g. ○ Micro Biology ○ Genetics ○ Neuroscience ○ Biotechnology ○ MolecularBiology ○ Bioinformatics ▪ ForensicScience	• Microbiology ○ Job inIndustry ○ Scientist ○ Professor • Bioinformatics ○ ForensicScientist ○ Biotechnologist ○ Nanotechnologist ○ ClinicalBiochemist ○ Pharmacovigilance ○ Intellectualproperty ○ Patentanalyst • ForensicScience ○ Ph. D in specialized field ○ PostDoctorate • Job inIndustry ○ Scientist ○ Professor	• Microbiologist • Labtechnician • MBA • Govt.Job

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BOTANY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.Sc. • Ph D • Research ○ In areas of Botany/ Microbiology / Plant Pathology / Phycology / Mycology / Cell Biology, Genetics & Plant Molecular Biology / Plant Biotechnology / Plant Tissue culture / Agricultural Sciences / Plant Biochemistry & Plant Physiology / Palaeobotany / Environmental Science / Marine Sciences, etc • Pursuing higher studies abroad after qualifying GRE-TOEFL andsimilar examinations	• Teaching (School/College/ University –level) • Career as Scientist: In Research Institutes / BSI/ ICFRE /IARI / FRI, etc. • Teaching • ParamedicalServices • MedicalTranscription • EnvironmentalConsultant • NurseryManager • Horticulturist • GreenhouseManager • Government jobs through BankingServices/PSC/UPSC	

CHEMISTRY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.Sc • Ph.D.	• Scientist R & DSection • Lab Technician • Teaching • Food SafetyOfficer • Scientist inPharmaceutical Companies • Instrument Operator • Research • Forensic Laboratory Technician	

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COMPUTER SCIENCE

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M. Sc. / M.C.A. / M.Tech. • /Ph. D. • Research (UGC-NET / CSIR/ • GATE) • School-level(SSC/Others) • College/University-level (CSC/PSC/Others) • Management Studies • Pursuing higherstudies • abroad after qualifying GRE- • TOEFL	• Teaching • IT Professional • TechnicalConsultancy	

ECONOMICS

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• MA / M. Sc in Economics > M.Phil. >Ph.D. • MA / M. Sc inApplied Economics > M.Phil. > Ph.D. • MBA	• Indian EconomicsService • Teaching • BankingSector • Economics Officers in Ministries andOther Institution • Analytics • Government Sector andNGO • Others	

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ELECTRONICS

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities

• Higher Studies in Indianor abroad (after qualifying relevant examination)
• Post-graduation in
  ○ Electronics
  ○ Radio Physics
  ○ OptoElectronics
  ○ Instrumentation
  ○ MedicalElectronics
  ○ NanoTechnology
  ○ Information Technology
  ○ Management/ Finance
• B.Ed./M.Phil. /Ph.D. (NET/GATE/CSIR)/ Post-doctoralStudies
• Research Scholar
• Scientist
	• Teaching
	  ○ School-level (SSC/Others)
	  ○ College and University-level (CSC/PSC/Others) after Qualifying in NET/SET/GATE
	• CivilServices
	• CivilDefence
	• ITIndustry
	• Telecommunications
	• Aerospace
	• Business	

ENVIRONMENTAL SCIENCE

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities

• M.Sc.
• Ph.D.
• Research
  ○ Environmental Chemistry and Pollution
  ○ Ecology and Biodiversity
  ○ Environmental Microbiology
  ○ Biotechnology
  ○ Others
• Pursuing higher studies abroad after qualifying GRE-TOEFL and such like examinations
	• EnvironmentalOfficer
	• EnvironmentalAnalyst
	• EIAConsultant
	• Teaching (School/College/University-level)
	• Naturalist	

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GEOGRAPHY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• MasterDegree • B.Ed. / M.Ed. • M.Phil. • NET/SET/GATE • M.A inArchaeology • M.A. In South and South East AsianStudies • M.Sc. InGeoinformatics • P.G. Diploma in Applied Remote Sensing andGIS • MSW In National Institute of Technology • SoftwareTrainings	• SchoolTeaching • SSC/PSC • College Teaching • CSC/PSC • CivilServices • WBSC/IAS • GISSpecialist • Cartographer • In Natto &Others • Planner • Scientist • Demographers • Forest Officer • Env.Specialist • Conservation Officer • RecyclingOfficer • LandscapeArchitecture • ExplorationGeologists • DataAnalyst • TourismOfficer • Journalist • TransportPlanner • Ocean -Graper • Meteorologist	

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GEOLOGY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities

• M.Sc. (Applied Geology/ Earth Science/ Geoinformatics / MTech / Ph.D.)
• Research
  ○UGC-NET/CSIR/GATE
• Pursuing higher studies abroad after qualifying GRE-TOEFL and similar examinations
	• Teaching
	  ○ College/University-level (CSC/PSC/Others)
	• Government Sector
	  ○ Geological Survey of India
	  ○ Oil and Natural Gas Corporation(ONGC)
	  ○ Oil IndiaLtd.
	  ○ Coal IndiaLtd.
	  ○ Central Groundwater Board
	  ○ Others
	• PrivateSector
	  ○ MiningIndustry
	  ○ Coal/Mineral Exploration
	  ○ Iron and Steel / MetallurgicalIndustry
	  ○ Cement and Ceramic Industry	

INDUSTRIAL FISH AND FISHERIES

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities

• B.Sc. in Industrial Fish & Fisheries
• AcademicProspects
  ○ M.Sc./MFSC in Industrial Fisheries / Marine Biology/Coastal Aquaculture/Seafood Safety and Trade / Aquaculture
  ○ M.Phil. / Ph.D.
  ○ Research
  ○ NET
	• Teaching (College / University level after NET/SET)
	• Research field andProjects
	• Aquaculture Projects
	• Fish ProcessingIndustry
	• CivilServices
	• Government Sector(Fisheries Field Assistant in the Dept. of Fisheries, Govt. of West Bengal)	

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MATHEMATICS

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.Sc. • B.Ed. • M.C.A. • B.Tech./M.Tech. • Ph.D. • Research (UGC-NET / CSIR/ GATE) • Teaching • School-level(SSC/Others) • College/University-level (CSC/PSC/Others) • Pursuing higherstudies abroad after qualifying GRE-TOEFL	• CivilServices • BankingSector • ITIndustry • MeteorologicalService	

MICROBIOLOGY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.Sc. • Ph.D. (UGC-NET, CSIR,GATE) • Post-Doctorate	• Teaching (School/College/University-level) • ClinicalMicrobiologist • MolecularBiologist • PlantPathologist • AgriculturalMicrobiologist • MedicalPathologist • PharmaceuticalResearcher • GeneticEngineering • Quality ControlManager • Lab Technicianin Microbiology	

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PHYSICS

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities

• Post-graduation in
  ○ Physics
  ○ Electronics
  ○ Radio Physics
  ○ Geophysics
  ○ Geoinformatics
  ○ OptoElectronics
  ○ Instrumentation
  ○ MedicalPhysics
  ○ Astrophysics
  ○ NanoTechnology
  ○ ParticlePhysics
  ○ QuantumPhysics
  ○ Information Technology
  ○ Management/Finance
• B.Ed./M.Phil. /Ph.D. (NET/GATE/CSIR)/ Post-doctoralStudies
• Research Scholar
• Scientist
	• Teaching
	  ○ School-level (SSC/Others)
	  ○ College and University-level (CSC/PSC/Others) after Qualifying inNET/SET/GATE
		• CivilServices
		• CivilDefence
		• ITIndustry
		• Telecommunications
		• Aerospace
		• Business

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PSYCHOLOGY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• B.A./B.Sc. in Psychology • M.A./M.Sc. in Psychology • M.Phil./Ph.D. (Optional • M.Phil./Ph.D. (Optional)	• School Teacher (M.A./M.Sc./B.Ed.) • Assistant Professor (M.A./M.Sc./M.Phil./Ph.D./ NET/SET) • Doctorate • PostDoctorate • Areas of Research (Clinical Industrial/Organizational, Forensic, Military, Health, Social, Sports, Cognitive, Personality, Positive Psychology, Human Resource Management, Psycholinguistics, Indian Psychology, Rehabilitational Psychology, School Psychology, Child Development) ○ After Completion of Postgraduation	• Human Resource Manager (M.A./M.Sc./MBA/Masters in Human ResourceManagement) • Non-Government Organizations and Hospitals • Clinical Psychologists (M.A./M.Sc./M.Phil.) • Counsellors/Therapist (M.A./M.Sc./PG Diploma in Counselling) • Drug AddictionCounsellor • HIV/AIDS AND STDsCounsellor • LifeCoach • Field Officers • Psychometrician • School Psychologist and Academic Mentor (M.A/M.Sc./PG Diploma in Counselling/PG Diploma in SchoolPsychology) • Prison Psychologists/Forensic Psychologist(M.A/M.Sc./Ph.D.) • Sports Psychologist (Masters or Doctorate Degree in Clinical or SPORTS Psychology) • Military/Army Psychologist (Masters and Doctorate Degreein ClinicalPsychology) • Neuropsychologist (Mastersand Doctorate Degree in Neuro Psychology and StateLicensure) • Experimental Psychologist (Masters and Doctorate Degree in Psychology and StateLicensure) • LaboratoryManager • Research Assistant • MarketingResearcher • Public SectorOpening • Administrativeservices • BankingSector • Staff Selection Commission • Defence Service

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STATISTICS

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• Teaching andResearch	• Administrative jobs likeISS • IT sectorjobs • BankingSector	

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ZOOLOGY

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities
• M.Sc • ProfessionalCourse: ○ Paramedical, Biomedical, Forensic Science, R & D Pharmaceuticals, Sales • CSIR-NET, GATE, ICMR-NET, SET, RET etc for pursuing Ph.D. • Integrated Ph.D. program at various institution such as IISc, IITs, IISERs, TIFR, BARC, NCBSetc. • Research Associates at various Research Institutes funded by ZSI, DST, DBT, ICMR, CSIR, DRDO, DAE etc. (AfterPost-Doctoral) • Masters in Forestry or Environment management by cracking entrance ofFRI, Dehradun • Masters in Wildlife Science at WII,Dehradun • Career-oriented Masters such as Forensic Science, Biotechnology, Marine Science, Library Science, Public HealthEntomology, etc.	• Administrative Job: IFS,WBFS	

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BUSINESS ADMINISTRATION (BBA)

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities

• MBA (MAT/GMAT/CAT)
• NTA/NET
• Ph.D.
	• Teaching(NTA/NET)
	  ○ College/ University-level
	  ○ PrivateInstitutions
	• PublicSector
	  ○ Administrative Services
	  ○ Governmental Organisations
	  ○ Defence Services
	  ○ Banking Sector
	  ○ SSC,CGL.
	• PrivateSector
	  ○ Sales
	  ○ Marketing
	  ○ Advertising
	  ○ HRD
	  ○ Operations
	  ○ AuditingResearch
	  ○ Investment Companies
	  ○ ITCompanies	

B.VOC AND COMMUNITY COLLEGE

(Industrial Aquaculture and Fisheries)

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities

• M.Sc. in FisheryScience	• Teaching
	• PublicSector
	  ○ Fisheries Field Assistant in Govt.
	  ○ FisheryProjects
	• PrivateSector
	  ○ Lab Assistant
	  ○ Business
	  ○ Marketing/ Sales	

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B.VOC AND COMMUNITY COLLEGE

(Software Development)

Academic (Higher Education) Prospects	Job Prospects	Other Opportunities

• Higher Studies
  ○ M.C.A.
  ○ M.Sc.
  ○ M.B.A.
	• Public and PrivateSectors
	  ○ SoftwareDeveloper
	  ○ Data EntryOperator
	  ○ Programmer
	  ○ DataAnalyst
	  ○ SoftwareTester	

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DEPARTMENT OF BENGALI
UNDERGRADUATE BA HONOURS MAJOR PROGRAMME
COURSE OUTCOME UNDER CCF
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC1 : HISTORY OF BENGALI LITERATURE (TILL 1800 AD)	To acquaint the students with different genres of Bengali literature from the period of emergence of Bengali language and literature to 1800 AD.
		Students will acquire general knowledge about Bengali Printing and Publishing.
	SEC-1: PRINTING AND PUBLICATION	
II	CC 2 :DESCRIPTIVE LINGUISTIC AND BENGALI LANGUAGE-1	As a student of Bengali Literature, to give an understanding of Bengali Linguistics including Phonetics, Morphology, Vocabulary and Dialects.
	SEC-2: APPLIED BENGALI 1	In addition to essential practical knowledge such as proper letter writing, this course also provides an understanding of professional topics such as translation , book criticism and content writing.

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DEPARTMENT OF BIO-CHEMISTRY
UNDERGRADUATE B.Sc. HONOURS MAJOR PROGRAMME
COURSE OUTCOME UNDER CCF (NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	**BCMM DSCC 1** INTRODUCTION TO BIOCHEMISTRY AND BIOMOLECULES	➢ **STUDENTS SHALL LEARN**; 1. Development of brief ideas about the basic history and future prospects of Biochemistry. 2. Illustrates on different types of organisms and their chemical composition of cells and their respective functions in sustenance of life. 3. Describes the basic units of measurements of diverse chemical parameters used in laboratories. 4. Illustrates the properties and interactions of water in physiological system. 5. Describes the different types, structures and properties of carbohydrates and physiological fates of carbohydrates in humans. 6. Describes the different types, structures and properties and biochemical identification of amino acids. 7. Illuminates on the structure and bonds in present in proteins, and identification of consisting of amino acids in proteins with specific examples of biologically important proteins. 8. Describes the structures, types, functions and occurrence of different physiologically important proteins, and qualitative analyses

		of proteins. 9. Illustrates the functions of different biologically important proteins. 10. Illustrates on structures and types of fatty acids and their functions in human body. 11. Illustrates on structures, types and functions of nucleic acids along with their quantitative estimation. 12. Teaches the qualitative analyses and quantitative estimation of biomolecules.
	BCMM SEC-1 TOOLS AND TECHNIQUES IN BIOCHEMISTRY	➢ **STUDENTS SHALL LEARN**; 1. Elaborates on the preparation of solutions and their properties and teaches the use and principles of different basic laboratory instruments. 2. Elaborates the principle and application of different techniques used in biological laboratories. 3. Gives practical demonstration on use of pipettes and teaches the preparation of solutions of different strengths, developing ideas of pH and other properties of solutions.

SEMESTER	PAPER/ COURSE NAME DESCRIPTION	OUTCOME

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II	**BCMM DSCC 2** GENERAL AND ORGANIC CHEMISTRY	➢ **STUDENTS SHALL LEARN**; 1. Illustrates on the structures of atoms of matters and their energy states. 2. Develops knowledge on different chemical bonding between atoms, their characteristics and theories describing the nature of bonding. 3. Illustrates on different isomeric forms of elements. 4. Emphasizes on the properties and configuration of radioactive elements, their measurements and their application in cancer. 5. Describes the structural configuration of organic compounds. 6. Illustrates the different reactions, the defining rules compounds involved in organic chemistry. 7. Outlines the stereochemical properties and conformational analyses of organic compounds. 8. Describes the mechanism of reaction for different organic compounds. 9. Develops knowledge on organo-metals and reactivity of heterocyclic compounds. 10. The physical characterization of organic compounds and detection of functional groups present in them.
	BCMM SEC – 2 PROTEIN PURIFICATION TECHNIQUES	➢ **STUDENTS SHALL LEARN**; 1. Develops ideas about the different methods of isolation and purification of proteins and study the advantages and disadvantages of the methods used. 2. The hands-on experience of determination of molecular weight of proteins and activity of alkaline phosphatase enzyme.

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DEPARTMENT OF BOTANY
UNDERGRADUATE BSc HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/COURSE NAME & DESCRIPTION	OUTCOME
1	BOT-H-CC1-1-Th PLANT DIVERSITY	Acquiring knowledge of diversity of plants Acquiring knowledge of different plant groups and their special characteristics
II	PLANT SYSTEMATICS (THEORY) BOT-H-CC2-2-Th	Obtaining knowledge of plant systematics Obtaining knowledge of nomenclature, identification, classification of plants

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DEPARTMENT OF CHEMISTRY
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COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/COURSENAME&DESCRIPTION	OUTCOME
I	**Semester 1** **Paper : CHEM-H-SEC1-1-Th** **CHEM-H-SEC1-1-Th**	➢ **STUDENTSSHALL LEARN**; 1. Extra nuclear structure of atoms and Periodicity: 2. Basics of Organic Chemistry Bonding and Physical Properties 3. MO Theory Qualitative idea about molecular orbitals, bonding and antibonding interactions 4. Stereochemistry – I: Bonding geometries of carbon compounds and representation of molecules: tetrahedral nature of carbon and concept of asymmetry; Fischer, sawhorse, flying wedge and Newman projection formulae and their inter translations. Concept of chirality and symmetry. 5. Thermodynamics -I. 6. Chemical Kinetics-I 7. Introduction to Quantitative analysis and its interdisciplinary nature 8. Numerical problems are to be solved wherever applicable 9. Titrimetric analysis: Acid-base titration, redox titration, complexometry, precipitation titration 10. Gravimetric Analysis: 11. Water analysis and Water treatment technologies

		12. Basic laboratory practices and lab safety rules
I	**Semester 1: CHEM-H-CC1-1-Pr**	➢ **STUDENTSSHALL LEARN**; (1) Calibration and use of apparatus. (2) Preparation of primary standard solutions (Oxalic Acid and K2Cr2O7) **Acid-Base Titrations**: (3) Standardization of NaOH standard oxalic acid solution. (4) Estimation of carbonate and bicarbonate present together in a mixture (5) Estimation of acetic acid in commercial Vinegar. **Oxidation-Reduction Titrimetry**: (6) Standardization of KMnO4 standard oxalic acid solution. (7) Estimation of Fe(II) using standardized KMnO4 solution. (8) Estimation of Fe(III) using standard K2Cr2O7 solution. (9) Estimation of Fe(II) and Fe(III) in a given mixture using standard K2Cr2O7 solution **Students will gather information by tutorial classes:** 1. Safety Practices in the Chemistry Laboratory, knowledge about common toxic chemicals and safety measures in their handling, cleaning and drying of glass wares. 2. Calibration of glassware, pipette, burette and volumetric flask. 3. Preparation of TLC plates and separation of amino acids 4. Calibration of instruments like colorimeter, pH-meter, conductivity meter, spectrophotometer using reference standards or reference materials. 5. Conductometric titration between HCl and NaOH 6. Determination of alkali present in soaps/detergents.

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SEMESTER	PAPER/COURSENAMEDESCRIPTION	OUTCOME
II	**PAPER : CHEM-H-CC2-2-Th** **Paper : CHEM-H-SEC2-2-Th**	➢ **STUDENTSSHALL LEARN**; **AI for Everyone** 1. Introduction to Artificial Intelligence, Subfields and Technologies 2. Applications of AI and Ethical and Social Implications of AI 3. Other Important Issues 1. Kinetic Theory and Gaseous state 2. Real gas and Virial equation 3. Chemical Bonding – I: ionic bond and covalent bond 4. Stereochemistry – II 5. General Treatment of Reaction Mechanism –I: Reactive intermediates, Reaction thermodynamics Free energy and equilibrium, enthalpy and entropy factor, calculation of enthalpy change via BDE, intermolecular & intramolecular reactions. Reaction kinetics Rate constant and free energy

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	PAPER: CHEM-H-CC2-2-P	➢ **STUDENTSSHALL LEARN**; (1) Standardization of $Na_2S_2O_3$ solution against standard $K_2Cr_2O_7$ solution. **Iodo-/ Iodimetric Titrations** (2) Estimation of Vitamin C (3) Estimation of (i) arsenite and (ii) antimony iodimetrically (4) Estimation of available chlorine in bleaching powder. Estimation of metal content in some selective samples (5) Estimation of Cu in brass. (6) Estimation of Cr and Mn in Steel. (7) Estimation of Fe in cement.

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DEPARTMENT OF COMMUNICATIVE ENGLISH
UNDERGRADUATE BA HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	DSC1- READING AND WRITING COMPETENCE	The Reading and Writing Competence course offers students an idea of accurate grammatical usage covering common grammatical errors, an idea of correct sentence structure, usage of phrasal verbs and idioms, understanding word class: lexical and functional categories and delving into an understanding of American expressions.
	SEC 1: WRITING FOR BUSINESS COMMUNICATION	The course focuses on different types of writings related to business communication: business letters, memos, minutes, agendas, circulars, notices, CV and E-communication.
	DSC 2: CONTENT WRITING	The course on content writing gives the basic idea on the concept, definition and importance of content writing, types of content writing – copy writing, SEO writing, ghost writing, technical writing, Long-form content writing, E-mail marketing, content scriptwriting, social media marketing. It delves into the skills required for a content writer, explores

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		the several prospects of content writing as a career option. The course also sheds light on plagiarism in content writing and several measures to avoid it.
II	SEC 2: TRAVEL WRITING	The course focuses on diverse range of travel writing: travelogues, travel diaries, blogs on tourist attractions, concept of gender and travel, preparing itineraries, personal narratives, tour plan and advice, travel and tourism advertisement.

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DEPARTMENT OF COMPUTER SCIENCE
UNDERGRADUATE BSc HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	**CMSM** **DSC/CC 1 (Th/P) – Digital Logic**	➢ **STUDENTS SHALL LEARN**; 1. Digital logic, Boolean algebra, logic gates, logical variables, the truth table, number systems, codes, and their conversion from one to others. 2. Minimization techniques to simplify the hardware requirements of digital circuits, implement it, design and apply for real time digital systems. 3. Design and working mechanism of different combinational, sequential circuits and their role in the digital system design. 4. Overall, a solid foundation in digital electronics enhances a student's understanding and opens doors to a wide range of career opportunities in hardware technology-related fields.
	CMSM **SEC-1 (Th/P) – Data visualization using spreadsheet**	**STUDENTS SHALL LEARN**; 1. The need of spreadsheet and its use for problem solving. 2. In-depth understanding of spread sheet concepts and explore the Microsoft Office Excel environment. 3. Creates new workbook, saves, closes, opens saved workbooks.

		4. Enter and edit data. 5. The use of Title bar, Tabs, Address Bar, Formula Bar, Scroll Bars, Gridlines, Status Bar. 6. To use functions and formulas. 7. Create and edit charts and graphics. 8. Filter and sort table data. 9. Work with pivot tables and charts. 10. Data representation formats based on the requirements of the problem.

SEMESTER	PAPER/ COURSE NAME DESCRIPTION	OUTCOME
II	**CMSM** **DSC/CC 2 (Th/P) – Problem Solving using C**	**STUDENTS SHALL LEARN**; 11. The need of programming languages and problem solving techniques. 12. In-depth understanding of functional and logical concepts of C Programming 13. Understand the fundamentals of C programming. 14. Data representation formats based on the requirements of the problem. 15. Implementation using different operations on arrays, functions, pointers, structures, unions and files. 16. To solve different problems with examples.

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	CMSM **SEC-2 (Th/P) – Web Development**	➢ **STUDENTS SHALL LEARN**; 1. Introduction to Web development 2. To learn the basic constructs using HTML. 3. To create a basic website using HTML and CSS. 4. To develop the ability to build efficient web based applications using HTML, CSS using different HTML tags and attributes. 5. To join several static web pages using HTML anchor tag. 6. Design static web pages using HTML and CSS.

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DEPARTMENT OF ECONOMICS
UNDERGRADUATE BSc HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1: MICROECONOMICS (I)	Students build a strong basis for economic analysis by studying this paper, which teaches them the principles of economics, including its scope and methodology. The students are also familiarized with the basic concepts of microeconomics, such as laws of demand and supply, elasticity, etc., so that they can comprehend them and apply them to explain different economic phenomena. The students also acquire an understanding of how various economic agents (individual and firms) make their consumption and production decisions. The students also develop knowledge of economic trade-offs and opportunities. The students are also able to understand basic market mechanisms and the fundamentals behind the price determination and the need for government intervention.

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I	SEC1: INTRODUCTORY STATISTICS AND APPLICATIONS (I)	The students are introduced to the subject matter of statistics. They are acquainted with various methods of collection, presentation, and formulation of the frequency distribution of the data. They are also familiar with different types of data and their analysis. They also learn various tools of descriptive statistics through which they can summarize a large amount of data into several useful bits of information. After studying the paper, they are able to apply the different statistical tools to analyze data not only in economics but also in other social and pure scientific arena. Through this basic course of statistics, the students also build a foundation for econometrics.
II	CC2: MACROECONOMICS (I)	After completing this course on macroeconomics, students learn how an economy as a whole operates. In this regard, students are able to identify the major economic indicators used to assess the state of an economy, e.g., national income, inflation, employment, etc., and also learn how to measure them. The students become familiar with the different schools of macroeconomic thought, one emphasizing short-run, i.e., keynesian, and another long-run, i.e., classical. The underlying principles of the investment decisions of the firms are also learned by the students. Since inflation affects every facet of the economy, whether it is consumption expenditure, business investment, interest rate, and all alike, students are taught about its various causes as well as policies to control inflation.

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II	SEC 2: INTRODUCTORY STATISTICS AND APPLICATIONS (II)	In today's era, data are considered a key input in economic production alongside land, labour, capital etc. (imf, 2019). This course helps the students learn data handling. Thus, students develop knowledge of different types of economic data. They also learn how to collect data from field survey and its importance in economic analysis. In the process, the role of the pilot survey is also taught to them. The students get practical training in data handling using the microsoft excel worksheet program. Starting with data entry and formatting, the students acquire practical knowledge of various modes of data presentation and descriptive analysis of the collected data using different formulas and functions.

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DEPARTMENT OF ELECTRONICS
UNDERGRADUATE BSc HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
1	ELT-H-CC-1-1-TH: FUNDAMENTALS OF CIRCUIT THEORY AND ELECTRONIC DEVICES	Electric Circuit Elements, Circuit Analysis, Dc Analysis, Ac Analysis, Network Theorems, Semiconductor Basics, Junction Diode And Its Applications, Bipolar Junction Transistor, Transistor Biasing, Bjt Amplifiers, Field Effect Transistor
	ELT-H-SEC-1-1-TH: INTRODUCTION TO PROGRAMMING IN PYTHON	Python Installation, Python Syntax, Python Strings, Python Modules
2	ELT-H-CC-2-2-TH: OPERATIONAL AMPLIFIER AND DIGITAL SYSTEMS	Operational Amplifiers, Applications Of Op-Amps, Number System And Codes, Boolean Algebra And Logic Gates, Digital Logic Families, Combinational Logic Analysis, Combinational Circuits Design, D-A And A-D Conversion, Sequential Circuits, Shift Registers, Counters (4 Bits)

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4-YEAR ENGLISH MAJOR/HONOURS COURSE UNDER CCF-NEP

COURSE OUTCOME

DISCIPLINE SPECIFIC COMPULSORY/CORE

SEMESTER – 1

ENG-H-DSC 1-1 INTRODUCTION TO ENGLISH LITERATURE (POETRY)

COURSE OUTCOME: STUDENTS WILL GAIN PRIMARY KNOWLEDGE ABOUTENGLISH POETRY

SEMESTER – 2

ENG-H-DSC 2-2 INTRODUCTION TO ENGLISH LITERATURE (PROSE)

COURSE OUTCOME: STUDENTS WILL GAIN PRIMARY KNOWLEDGE ABOUTENGLISH PROSE

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DEPARTMENT OF ENVIRONMENTAL SCIENCE
UNDERGRADUATE BSc HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	DSCC 1: FUNDAMENTALS OF ENVIRONMENT	**Basic Concepts of Environment:** Students will be able to define key terms such as ecosystem, biodiversity, habitat, and ecological footprint. They will understand the interconnectedness of abiotic and biotic components within an environment. Students will be able to explain the importance of environmental conservation and sustainable development. **Climate Zones:** Students will be able to identify and describe major climate zones, such as tropical, temperate, and polar regions. Students will understand the factors influencing climate patterns, including latitude, altitude, and ocean currents. They will analyse the impact of climate change on different regions and ecosystems.

		Living Matter and Approach to Evolutionary Biology: Students will gain knowledge of basic biological principles, including cellular structure, genetics, and natural selection. They will understand the mechanisms of evolution and adaptation. Students will explore the role of biodiversity in ecosystem resilience and stability. **Global Environmental Issues:** Students will be able to identify major global environmental challenges, such as climate change, deforestation, pollution, and loss of biodiversity. They will analyze the causes and consequences of these environmental issues on both local and global scales. Students will evaluate potential solutions and mitigation strategies for addressing these challenges.
	SEC 1: ENVIRONMENT AND SOCIETY	**Environment Literacy:** Students will develop a deep understanding of environmental concepts, including ecological systems, natural resources, and environmental sustainability. Students will apply environmental literacy to real-world scenarios, considering social, economic, and political factors.

		Societal View of the Environment: Students will explore the cultural, historical, and philosophical perspectives shaping human interactions with the environment. Students will examine the role of media, education, and advocacy in shaping public perceptions of environmental issues. **Environmental Problems: Global Perspectives:** Students will identify and evaluate major environmental problems facing societies globally, such as climate change, biodiversity loss, pollution, and resource depletion. Students will assess the impacts of environmental problems on human health, social equity, and economic development. **Environmental Movements:** Students will study historical and contemporary environmental movements, including grassroots activism, policy advocacy, and international initiatives. Students will analyze the strategies, tactics, and successes/failures of environmental movements in addressing environmental challenges. Students will explore the role of stakeholders, including government agencies, non-governmental organizations, businesses, and communities, in driving

		environmental change.
II	DSCC 2: PRINCIPALS OF ECOLOGY	**Introduction to Ecology:** Students will gain a comprehensive understanding of the scope and importance of ecology as a scientific discipline. Students will be able to define key ecological concepts, including organism, population, community, ecosystem, and biosphere. **Population Ecology:** Students will learn the principles governing population dynamics, including population growth, regulation, and interactions. Students will analyze factors influencing population size, distribution, and structure. They will explore population ecology models and their applications in conservation and management. **Community Ecology:** Students will understand the structure, organization, and dynamics of ecological communities. Students will analyze species interactions, including competition, predation, mutualism, and facilitation. **Ecosystem Ecology:**

		Students will gain knowledge of ecosystem structure and function, including energy flow and nutrient cycling. Students will explore the roles of producers, consumers, and decomposers in ecosystem dynamics. Students will study ecosystem processes, such as primary productivity, decomposition, and nutrient cycling, and their responses to environmental changes. **Biogeochemical Cycles and Nutrient Cycling:** Students will understand the processes and pathways of biogeochemical cycles, including the carbon, nitrogen, phosphorus, and water cycles. Students will examine the interactions between biotic and abiotic components in nutrient cycling. Students will explore human impacts on biogeochemical cycles and potential mitigation strategies.
	SEC 2: URBAN ENVIRONMENT MANAGEMENT	**Environment in an Urban Setting**: Students will gain an understanding of the unique environmental challenges facing urban areas, including pollution, waste management, urban heat islands, and loss of green spaces.

		Students will understand the interactions between built infrastructure, human activities, and environmental quality in urban settings. **Urban Dwelling:** Students will examine the factors influencing urban population growth and patterns of urbanization. Students will understand the environmental impacts of urban dwelling, including land use changes, housing density, and transportation systems. Students will explore sustainable urban design principles and strategies for promoting liveable, resilient cities. **Natural Space in a City:** Students will understand the importance of natural spaces, such as parks, greenways, and urban forests, in enhancing urban environmental quality and human well-being. Students will explore the benefits of urban biodiversity and ecosystem services. Students will study the strategies for preserving and expanding natural spaces within urban environments. **Planning and Environment Management:** Students will learn about urban planning processes and their role in shaping environmental outcomes. Students will explore tools and approaches for integrating environmental considerations into

		urban planning and development, including environmental impact assessment, zoning regulations, and green infrastructure planning. **National and International Efforts in Urban Management**: Students will examine national and international policies, programs, and initiatives aimed at addressing urban environmental challenges. Students will understand the roles of government agencies, non-governmental organizations, and international institutions in urban environmental management. Students will explore best practices and lessons learned from urban management efforts around the world.

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DEPARTMENT OF GEOGRAPHY
UNDERGRADUATE BSc/BA HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEM	PAPER	COURSE NAME AND DESCRIPTION	PROGRAMME OUTCOME
1	CC 1 AND SEC - A	**PHYSICAL GEOGRAPHY AND METHODS IN GEOGRAPHY**	In Semester 1, students will gain foundational knowledge and practical skills in both physical and methodological geography. They will develop expertise in cartography, understanding map- making, scales, and projections, and gain insights into geo- tectonics, geomorphology, and climatology, learning about seismic activity, landform development, and atmospheric patterns. Soil geography and biogeography will cover soil formation and plant distribution across climates, while hazards and disaster geography will focus on natural disaster risks in India. Methodologically, students will master survey design, data collection, and statistical analysis, alongside hands-on training in physical geography techniques using survey instruments. They will also acquire geospatial mapping skills for satellite imagery analysis, and gain proficiency in geographic software, preparing them for advanced studies and practical research.

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2	CC 2	**HUMAN GEOGRAPHY**	In Semester 2, students will acquire a deep understanding of human geography, exploring its nature, 3scope, and contemporary trends, along with the major schools of thought such as resource, locational, landscape, and environmental geography. The course will provide insights into the evolution of human societies, from early hunting and gathering to modern industrial and post-industrial urban societies, using case studies like the Chenchu, Toda, and Gond tribes. Students will also develop a strong foundation in population geography, examining demographic transitions, population distribution, and growth patterns in India. Additionally, they will gain knowledge of settlement geography, focusing on rural and urban settlement characteristics, patterns, and the factors influencing their development. In urban geography, students will study the classification and trends of urban settlements in India, equipping them with the skills to analyze and interpret urbanization processes. This comprehensive program will prepare students for advanced studies and practical applications in human and social geography.

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DEPARTMENT OF GEOLOGY
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COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

Sem	CO	Paper Code (Theory -TH, Practical-P)	Course	Course Outcome
Sem.1	CO1	GELA-DSC-100-Th	Introduction to Earth System Science	Students will learn basics of the earth system, constitution of earth and its internal and external processes
	CO2	GELA-DSC-100-P	Study of hand specimens of minerals and rocks	Practical knowledge of characters of rocks and minerals in hand samples
	CO3	GELA-SEC-100	Field Studies-1	Students will learn about identifications of rocks and minerals on the field. How to do reconnaissance geological survey of an area. They also learn use of topographic map, various geological field instruments.
Sem.2	CO4	GELA-DSC-200-Th	Mineral Science	Students will get detailed knowledge about rock forming minerals and their crytallography, their constitution, paragenesis and origin
	CO5	GELA-DSC-200-P	Crystallography, Study of minerals under microscope	Practical knowledges about crystallographic, physical and optical properties of minerals

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DEPARTMENT OF HISTORY
UNDERGRADUATE BA HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	H CC 1—HISTORY OF INDIA FROM THE EARLIEST TIMES TO C. 300 BCE	Familiarising the students with different tools of reconstructing the past and how to utilise them in the study of history through different phases of early history of india
	HIS-SEC 1—MUSEUM AND ARCHIVES	Mastering knowledge on institutions that house and maintain documentary, visual and material remains of the past. Museums and archives are among the most important such repositories and this course explains their significance and how they work
II	H CC 2—SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD OTHER THAN INDIA	Acquiring knowledge on the significant developments in world history that have shaped the complexities of human existence through studying the history of civilisations other than india like egypt, greece and rome and getting familiar with the evolution of concepts like democracy as also rational thinking and application of reason
	HIS-SEC 2—UNDERSTANDING CULTURAL HERITAGE AND TOURISM	Enabling the students to explore various aspects of cultural Heritage and cultural diversity from a historical perspective that discusses numerous cultural practices that have evolved over centuries.

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DEPARTMENT OF INDUSTRIAL FISH & FISHERIES
UNDERGRADUATE BSc HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/COURSENAME&DESCRIPTION	OUTCOME
I	**DSCC1-FISH TAXONOMY**	➢ **STUDENTSSHALL LEARN**; The entire course of the Industrial Fish and Fisheries is concerned with the scientific management and exploitation of different economically important aquatic animals. So, the detailed information about the diagnosis and description of aquatic animals is important. The paper is deals with the concept of diagnosis, description and classification of fin fish, shellfish like prawns, crabs, mollusca etc. From this paper students will be enriched with the identification and classification of aquatic animals.
	SEC 1-CRAB & PEARL CULTURE	➢ **STUDENTSSHALL LEARN**; Currently, one of the major problems in higher education is the unemployment. The curriculum of the subject Industrial Fish and has been designed in such a way that we can overcome the problem of unemployment. The pearl and crab culture is a skill enhancement course through which students can set up small farm unit after the completion of the course. The knowledge of the paper can helps them to improve the quality of the pearl and crabs. The concept paper can also help them to reduce the production costs and hereby to make the method profitable

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SEMESTER	PAPER/COURSENAMEDESCRIPTION	OUTCOME
II	**DSCC2- FRESHWATER AQUACULTURE**	➢ **STUDENTS SHALL LEARN**; The scientific approach about the cultivation of freshwater fin fish is provided in the paper. From this paper students will be skilled to create a freshwater fish farm and they can rear the fish for considerable period of time.
	SEC 2- ORNAMENTAL FISH PRODUCTION & MANAGEMENT	➢ **STUDENTS SHALL LEARN**; Currently, setting of a home aquarium is the need of the society. The construction of glass aquarium and its beautification is the main objective of the paper. The breeding of the ornamental fishes also an important part of the course. So, from this course students will get in-depth knowledge about the construction of glass aquarium, beautification of the aquarium and the breeding of the ornamental fish. The skilled students having the knowledge of ornamental fish breeding and management, can set up a small scale industry which can generate employment.

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DEPARTMENT OF JOURNALISM & MASSCOMMUNICATION
UNDERGRADUATE BA HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/COURSE NAME AND DESCRIPTION	COURSE OUTCOME
I	JOUR-H-CC-1-1 Basic of Journalism and Mass Communication	This paper deals with News and its different features and aspects. Characteristics of news, its structure, pattern, presentation etc can make the students understand it clearly. The historical perspective and different news presentation make interesting reading
	Tutorial Project and Field work	In the practical portion the students learn how to write and prepare news report, where they can apply the theoretical knowledge of what they are studying in the previous units.
II	JOUR-H-CC-2-2 Basic of Broadcast Journalism	This paper on Radio and Television is mainly meant to give a professional training in the Electronic Media. Besides acquiring the theoretical knowledge in Broadcast media, the students can have a good idea about the functioning of Radio and Television. Also, the audio-visual programme format of news and other entertainment programmes give the students an in-depth knowledge of this media.
	Tutorial Project	In this portion the students learn to make an audiovisual news capsule , where they can apply the theoretical knowledge of what they are studying in the previous units.

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DEPARTMENT OF MATHEMATICS
UNDERGRADUATE BSc HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	(i) DSCC-1 for Major (CALCULUS, GEOMETRY AND VECTOR ANALYSIS) (ii) MN-1 for Minor (CALCULUS, GEOMETRY AND VECTOR ANALYSIS) (iii) CC-1 for MDC (CALCULUS, GEOMETRY AND VECTOR ANALYSIS)	Students acquire basic working knowledge of calculus, geometry and vector analysis which can be applied in future mathematical assignments.
	SEC-1 for Major (C LANGUAGE WITH MATHEMATICAL APPLICATIONS)	The students are introduced to the basic ideas of computer programming with c language. They are expected to use this knowledge in the numerical programming lab later in the curriculum.
		In this course the students are introduced to the basic concepts of higher

II	(i) DSCC-2 for Major (BASIC ALGEBRA) (ii) MN-2 for Minor (BASIC ALGEBRA) (iii) CC-2 for MDC (BASIC ALGEBRA)	level algebra. The course is divided into three parts covering classical algebra, abstract algebra and linear algebra. The students gain knowledge on some basic topics which prepares them to take on the advanced topic of algebra in the following semesters.
	(i) SEC-2 for Major ((a)Python Programming and Introduction to Latex OR (b) Artificial Intelligence) (ii) SEC-2 for MDC ((a)Python Programming and Introduction to Latex OR (b) Artificial Intelligence)	(i) the students are introduced to the basic ideas of computer programming with python. They learn the basics of python language which makes them ready to study advanced level programming later. They are expected to use this knowledge in future either in higher studies/research/profession. (ii) in the course on artificial intelligence the students learn the basics of artificial intelligence (both theory & applications to real life). They get prepared to identify problems where a techniques are applicable. They learn the basic history of and how computers can mimic human cognition. This course provides the first step to develop skills that employers are seeking.

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DEPARTMENT OF MICROBIOLOGY
UNDERGRADUATE BSc HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 101 - INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY	i. Develop knowledge of the expansion of the discipline of microbiology and the contributions of prominent scientists in this field. ii. Develop understanding of the characteristics and classification of different types of microorganisms (prokaryotic and eukryotic). iii. Able to understand basic microbiology laboratory practices and perform basic experiments to grow and study microorganisms in the laboratory.
	SEC-101- FOOD FERMENTATION TECHNIQUES AND PACKAGING	i. Develop concepts on femented foods, their advantages, and health benefits ii. Gain knowledge on milk based, vegetable based, grain based fermented foods. iii. Understand the importance of probiotics. iv. Develop knowledge on controlling the microbiological quality of food and food packaging techniques

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II	CC102: BACTERIOLOGY	i. Able to describe characteristics of bacterial cells, cell organelles, cell wall composition and various Appendages like capsules, flagella, pili. ii. Understand the nutritional requirements and growth Of bacteria; develop knowledge and understanding of Bacterial systematic and important archaeal and Eubacterial groups iii. Perform basic laboratory experiments to study Microorganisms and methods to preserve bacteria in the Laboratory.
	SEC: AI FOR EVERYONE	i. Define and explain the fundamental concepts and subfields of ai. ii. identify real-world applications of ai across various industries. iii. Analyze the ethical, social, and economic implications of ai. iv. Recognize the potential of ai to drive innovation and transformation in different domains

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DEPARTMENT OF PHILOSOPHY
UNDERGRADUATE BA HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER /COURSE NAME & DESCRIPTION	OUTCOME
I	**DSCC-1: FUNDAMENTALS OF PHILSOPHY** **A. INTRODUCTION:** *Nature of Philosophy *Commonsense, Science and Philosophy *Branches of Philosophy- Metaphysics, Epistemology, Ethics, Logic, Social and Political Philosophy, etc. **B. METAPHYSICS:** *Substance: General Introduction, Rationalist View of Substance, Empiricist view of Substance *Causality: Notion of Causal relation, Rationalist View of Causality-Entailment Theory, Empiricist View of Causality-Regularity Theory **C. EPISTEMOLOGY:**	DSCC-1: FUNDAMENTALS OF PHILSOPHY # The course offers an overview of the scope and nature of Philosophy and builds up an idea of the different branches of Philosophy. This is specially informative and helpful for the beginners. # The discussion about Metaphysics, as included in the course, builds up a foundational idea of the western strands of thought on Substance, Self, and Reality. # The discussion on Epistemology, as a part of the course, provides a glimpse into the three prominent trends of thought in the Modern era. # Ethics, as a part of the course, provides a basic idea on the

	*Three principle uses of the verb 'to know', Conditions of propositional knowledge, Strong and weak senses of the "know", Theories of origin of knowledge: Rationalism, Empiricism, Kant's Critical Theory **D. ETHICS:** *Nature and scope of ethics, Branches of ethics: Normative ethics, Meta-ethics, Applied ethics *Moral and non-moral actions, Concepts of good and bad, right and wrong, duty and obligation, Right and Duty, Right and Virtue * Object of Moral Judgement- Motive and Intention	prominent moral perspectives, standards, object, scope of western view.

SEMESTER	PAPER /COURSE NAME & DESCRIPTION	OUTCOME
II	**SEC: MAN AND NATURE** **A. INTRODUCTION:** *The meaning of the word nature;	SEC: MAN AND NATURE

	Narrow and broad sense of nature; Attitude towards nature **B. CLASSICAL INDIAN ATTITUDE TO NATURE:** *The Upanisadic world-view; Tagore's understanding of nature; The Post-Upanisadic view of nature **C. RESPECT FOR NATURE:** *The attitude of respect; Bio-centric outlook to nature; Ethical standards and rules that follow from the attitude of respect to nature; The idea of inherent worth of nature **D. INTRINSIC VALUE OF NATURE:**	# The course offers a comparison and contrast of the Classical and Contemporary Indian views of Nature, on one hand as well as that of the Indian and Western perspectives, on the other. # The Beginners are enlightened by the discussion on the Classical Indian views of Nature and provides a glimpse into the Upanisadic and the Post-Upanisadic views. #The course includes an extensive review of the western perspectives of nature as well as the contemporary development on Bio-centric view of nature, with special reference to Deep Ecology.

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	*Moore's talk of 'intrinsic properties' ; Chisholm's idea of intrinsic value; Attfield on the intrinsic value of nature; Callicott's idea of intrinsic value of nature; Rolston-IIIon intrinsic value of nature; Intrinsic value: subjective and objective value **E. DEEP ECOLOGY AND ITS THIRD WORLD CRITIQUE:** *Arne Naess on Deep Ecology; Ramchandra Guha's critique of Deep Ecology	

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DEPARTMENT OF PHYSICS
UNDERGRADUATE BSc HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/COURSENAME&DESCRIPTION	OUTCOME
I	DSC-1/Minor-1: BASIC PHYSICS-I (Theory)	**STUDENTS SHALL LEARN**; 1. Basic concepts of calculus like limits, functions, differentiation, and convergence of infinite series. 2. Students will be able to solve first and second order differential equations. 3. Calculus of functions of more than one variable, partial derivatives, exact and inexact differentials, maxima minima and Taylor series. 4. Basics of vector algebra, Scalar and vector products and their physical significance, scalar and vector fields. Vector differentiation. Gradient, divergence, curl, del and Laplacian operators and their applications in different areas of Physics. 5. Vector integration, line, surface and volume integration, Gauss's divergence, Stoke's and Green's theorems and their application. 6. Learn about vector operations in cylindrical and spherical coordinates. 7. Newtonian Mechanics and Dynamics of system of particles. Conservation of linear and angular momentum, concept of centre of mass and two body problem. 8. Work-energy theorem, conservative force and conservation of energy 9. Gravitation and central force motion. 10. Centrifugal and coriolis forces in non-inertial frame.

		11. Rotational motion of a rigid body 12. Kinematics of moving fluid, equation of continuity, Euler's equation, Bernoulli's theorem and applications.
	DSC-1/Minor-1: BASIC PHYSICS-I (Practical) **SEC-1: INTRODUCTION TO COMPUTER PROGRAMMING AND GRAPH PLOTTING (PRACTICAL)**	**STUDENTS SHALL LEARN**: 1. Familiar with some basic apparatus used in physics laboratory. 2. Learn how to make systematic experimental observation, data collection, recording of data and other basic laboratory practices. 3. Analysis of data, plotting of graphs and determination of different parameters from the graph. 4. Error estimation of experimental results and exploring the concept of random error by repeated measurements. 5. Perform some experiments to verify different laws and to determine different physical quantities related to mechanics and general properties of matter like moment of inertia, modulus of rigidity, coefficient of viscosity and measurement of high altitude. 1. Plotting of 2D graphs using Gnuplot, an open source graph plotting software. 2. Basics of programming with Python, a universally accepted open source programming language. 3. Variables and data type, basic mathematical operations, compound statements and I/O operations in Python. 4. Iterables data type, string and tuples in Python. 5. Writing scripts in Python to solve some simple problems and Matrix operations.

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SEMESTER	PAPER/COURSE NAME DESCRIPTION	STUDENTS SHALL LEARN
II	**DSC-2/Minor-2: BASIC PHYSICS - II (Theory)**	1. Fundamental properties of charged particles, electrostatic field and potential. 2. Divergence and curl of electrostatic field, and Gauss theorem in electrostatics. 3. Dielectric properties of matter. 4. Laplace and Poisson's equations, and solution of electrostatic problem by the method of images. 5. Electrostatic energy of system of charges. 6. Magnetic properties of matter, magnetic dipole moment, magnetic field, intensity, magnetization and relation between them. 7. Electromagnetic induction, Faraday's and Lenze's law and their various applications. 8. Basics of thermodynamics, zeroth law, concept of thermal equilibrium and temperature. 9. Concept of work, heat, internal energy. First law of thermodynamics, different thermodynamic processes and equivalence of work and heat. 10. Second law of thermodynamics, concept of reversibility, conversion of work into heat and vice-versa, working of heat engines. 11. Important concept of entropy, its applications and entropy principle 12. Different thermodynamic potentials, thermodynamic relations and their applications. Maxwell's relations, T-dS equations and their

		applications. 13. Phase Transition, third law of thermodynamics, liquefaction of gas by Joule-Thomson throttling expansion and unattainability of absolute zero. 14. Kinetic Theory of gas and behaviour of real gas.
	DSC-2/Minor-2: BASIC PHYSICS - II (Practical)	Learn potentiometric measurement techniques of voltage and determination of unknown current by potentiometer 1. Able to determine unknown low resistance by Carey-Foster's bridge 2. Able to convert an ammeter to voltmeter and vice versa 3. Able to determine coefficient of thermal expansion of solid 4. Able to determine pressure coefficient of expansion of air. 5. This laboratory course will further enrich their theoretical concepts and experimental skill learned so far.
	SEC-2 SCIENTIFIC WRITING SKILLS (LATEX) (Theory)	• This course is a technical skill enhancement course. The students will learn how to prepare a scientific article containing figures, tables and mathematical equations in a presentable form through open source scientific writing software LaTex. This course will be beneficial for the students in the job market.
	SEC-2 SCIENTIFIC WRITING SKILLS (LATEX) (Project)	• In this course the students will learn how to prepare different kind of projects in real world using the scientific writing software LaTex and knowledge acquired in the theory portion of this paper. • In this course the students will learn nature of scientific reasoning,

	IDC (INTERDISCIPLINARY): FRONTIERS IN PHYSICS (Theory)	physical laws, a brief history of the Universe, such as Big Bang and their after, Stelar formation, Dark Matter and Dark Energy, Fundamentals of matter and its subatomic structure like protons, neutrons and electrons, various forces in nature and a brief description of quantum mechanics. The course is designed to give the students a brief over view of the physical world around us and its functioning. It avoids any mathematical derivation and mostly based on descriptive arguments to initiate the interest of the students.

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DEPARTMENT OF POLITICAL SCIENCE
UNDERGRADUATE BA HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME AND DESCRIPTION	OUTCOME
I	CC-1: POLITICAL THEORY: FOUNDATIONAL CONCEPTS	**STUDENTS SHALL LEARN:** **1.** The fundamentals of politics, which includes concepts such as state, sovereignty, nation, law, liberty, equality, justice, democracy, authoritarianism and citizenship. **2.** Analytical skills to critically evaluate and interpret various political theories and texts.
	SEC-DEMOCRATIC AWARENESS THROUGH LEGAL LITERACY	**STUDENTS SHALL LEARN:** 1. The basic legal provisions pertaining to first information report (fir), general diary, arrest, bail, seizure, etc. 2. The specific legal provisions that protect vulnerable groups like scheduled caste and scheduled tribe from various forms of discrimination, violence and exploitation. 3. An overview of different personal laws applicable to different religious communities

		in India in addition to contributing to students' general knowledge on labor and environmental laws as well as laws related to consumer protection in India. 4. The Right to Information act and the procedure for accessing information from public authorities in India and be also able to analyze the balance between security concern and human rights protections in the context of anti-terrorist laws thereby becoming more active and aware citizens.
II	CC-2:CONSTITUITIONAL GOVERNMENT IN INDIA	**STUDENTS SHALL LEARN:** 1. To understand the historical context and key debates that shaped the Indian constitution following this course. in addition, they will also become aware of the fundamental rights and duties that they enjoy as citizens of India. 2. To explain the nature of federalism as enshrined in the Indian constitution 3. To take a critical look on the roles and powers of President, Vice-President, Prime Minister, council of ministers, Governor, and Chief Minister in the Indian political system. 4. To explain the composition and function of both the Parliament and the state legislatures as well as the Indian judiciary. 5. To understand the role that these institutions play in protecting and upholding the rights of the citizens. 6. To explain the procedures for amending the constitution and the role of amendment

		in shaping the modern Indian political system.
	SEC:UNDERSTANDING THE LEGAL SYSTEM	**STUDENTS SHALL LEARN:** 1. To trace the development of Indian judiciary, including the establishment of supreme courts and high courts. 2. To differentiate between judicial activism, judicial review and judicial restraint and assess their implications on Indian judiciary 3. To define public interest litigation as an instrument to ensure social justice in India. They will also be able to holistically understand subordinate courts, their structure and their jurisdiction. 4. To look into alternative dispute resolution and Lok Adalat and Mahila Courts in providing a speedy and efficient resolution of disputes. 5. To identity and explain the key provisions of Representation of People Act 1950 and 1951 for conducting free and fair elections in India, the Delimitation Act, 2002, the 91st amendment act 2001 that is the anti-defection laws in India and the 97th amendment Act which introduced a constitutional provision for cooperative societies.

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DEPARTMENT OF PSYCHOLOGY
UNDERGRADUATE BA/BSC HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	DSC – INTRODUCTION TO PSYCHOLOGY	**Students Shall Learn:** 1. Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline. 2. Know the sources and processes of development of modern scientific psychology. 3. Gain knowledge of scientific methodology–the variety of ways in which psychological data are gathered and evaluated / interpreted. 4. Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior. 5. Develop a scientific temperament in studying and understanding human behavior.
	SEC I -STRESS MANAGEMENT	**Students Shall Learn:** 1. Stress reduction: Learning stress-relieving techniques and therapies

		can help you re-examine how you respond to stress. 2. Time management: Learning time management techniques can help you reduce long-term stress by giving you direction when you have too much to do. 3. Resilience: Resilience can be an outcome of stress and burnout modulation. 4. Assertiveness skills: Being assertive can help control stress and anger and improve coping skills for mental illnesses.

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
	DSC– BASIC PSYCHOLOGICAL PROCESSES	**Students Shall Learn:** 1. Understand the mental processes to begin with sensation and perception and how it results in thoughts and communication. 2. Understand the structural and functional dynamics of each of the mental processes and their interconnectedness. 3. Understand the bases sensory actions and the processes of integration

II		of sensory actions in creating and interpreting perceptual events. 4. Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes. 5. Understand the physiological and biochemical links of human behavior. 6. Influence of behaviour, cognition and the environment on bodily system, and developing an appreciation for neurobiological basis of behaviour.
	SEC II- AI / DIGITALMARKETING	**Students Shall Learn:** AI: 1. The fundamental concepts of AI and machine learning, and apply them to various fields. 2. How to design systems that can learn from experience and act intelligently. 3. How to develop AI applications for business, organizational, and technology needs.

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		DIGITAL MARKETING: 1. How to create, manage, and measure the impact of an online brand. 2. How to use content marketing and updated marketing strategies to give clear and detailed information on products and services. **3.** How to use strong verbal and written communication skills to create different types of content to communicate how a certain product or service can change prospective customers' lives.

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DEPARTMENT OF SANSKRIT
UNDERGRADUATE BA HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/COURSENAME&DESCRIPTION	OUTCOME
I	**SANM DSCC- 1 GENERAL GRAMMAR AND METRE**	➢ **STUDENTSSHALL LEARN**; Development Sanskrit Writing School and Language like Case Ending, Samasa, Avaya, Drive and Sandhi
	SANMSEC-1 SKILL OF READING AND WRITING	➢ **STUDENTSSHALL LEARN**; To Develop Sanskrit Writing and Composition like letter , Paragraph,Translation

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SEMESTER	PAPER/COURSENAMEDESCRIPTION	OUTCOME
II	**SANMDSCC2 HISTORY OF SANSKRIT LITERATURE (CLASSICAL AND VEDIC)**	➢ **STUDENTSSHALL LEARN**; For cognitive development on Vedic, Ramayana, Mahabharata, Puranas, Scientific and Technical Sanskrit Literature and Contribution of Scholars in the field of Sanskrit Literature.
	SANMSEC – 2 COMPUTER AWARENESS & COMPUTATIONAL SANSKRIT	➢ **STUDENTSSHALL LEARN**; To Develop Sanskrit Writing and Commuication & Spoken Sanskrit & Computer Awareness For Sanskrit.

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DEPARTMENT OF STATISTICS
UNDERGRADUATE BSC HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
1	CC1 – DESCRIPTIVE STATISTICS I & PROBABILITY I	• Understading the basic concept of collecting, organizing, managing and presenting data. • Acquiring the knowledge to represent and analyze statistical data through graphs and charts. • Acquiring the knowledge to analyze univariate statistical data using mesures of central tendency, dispersion, skewness and kurtosis. • Understanding the basic concepts of probability theory and its applications in real life problems.
	SEC1 – NUMERICAL COMPUTATIONS WITH C	• Understanding the basic concepts of interpolation. • Acquiring the knowledge to compute integrals and solve equations using numerical techniques. • Learning the fundamentals of c programming launguage • Able to write programs in c to solve various statistical problems.
2	CC2 – DESCRIPTIVE STATISTICS II &	• Understanding the concepts of correlation and regression in analysis of bivariate data.

	PROBABILITY II	• Understanding the concepts of categorical data and methods of anaylyzing such data. • Understanding the basic concepts of random variables. • Acquiring the knowledge to use discrete and continuous probability distributins to solve real life problems
	SEC2 – ARTIFICIAL INTELLIGENCE FOR EVERYONE	• Define and explain the fundamental concepts and subfields of ai. • Identify real-world applications of ai across various industries. • Analyze the ethical, social, and economic implications of ai. • Recognize the potential of ai to drive innovation and transformation in different domains

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DEPARTMENT OF ZOOLOGY
UNDERGRADUATE BSC HONOURS (MAJOR) PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	**ZOOM CC 1** **CELL BIOLOGY**	➢ **STUDENTS SHALL LEARN**; 1. Structure and function of cell membrane. Different models of cell membrane structure alongwith functional diversity of cell membranes. 2. Ultrastructure and function of cell organelles such as endoplasmic reticulum, Golgi apparatus and Lysosomes. Protein sorting should also be learned. 3. Ultrastructure of Mitochondria and Chemiosmotic theory for production of ATP in the cells. Centrosome and its organization. 4. Structure and function of different kinds of cytoskeleton 5. Structure of Nucleus with special reference to Nuclear Pore Complex (NPC). Level of organization of chromosome or chromosome packaging. 6. Cell cycle regulation and different aspects of Cancer. Molecular mechanism of cancer development and process of apoptosis or programmed cell death. 7. Modes of cell-cell signaling including types of Signalling molecules, types and example with special reference to regulation of G protein, Adenyl cyclase-

		8. cAMP, Enzyme linked Receptors such as RTK (ras-raf) and JAK/STAT 9. Different tools and techniques related to cell biology such as cell culture techniques, subcellular fractionation, centrifugation, different types of microscope.
	ZOOM SEC-1 **APPLIED ENTOMOLOGY**	➢ **STUDENTS SHALL LEARN**; 1. Morphological and physiological adaptations of insects, general characteristics of some selected orders of insects. 2. Vector borne disease and their transmission like- malaria, dengue, filarial and potentials of ticks and *Phlebotomus* as causative agents and vectors 3. Life cycle, nature of damage and control measures of major pests of paddy, jute, brinjal and stored grain. 4. Integrated pest management strategies with special reference to important crop 5. Biology of silk moth, their rearing, disease and pest management strategies 6. Biology of honey bee, their social organization, beekeeping methods, extraction of honey, disease and their control measures

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		7. Prospects of Sericulture and Apiculture in India.

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
II	**ZOOM CC 2** **BIOCHEMISTRY**	➢ **STUDENTS SHALL LEARN**; 1. Structure, classification and functions of Carbohydrates. 2. Classification and structure of amino acids. Structure, classification and functions of Proteins with different level of complexity. 3. Structure, classification and functions of Lipids. And formation of Triglyceriddes. 4. Nomenclature, classification and properties of Enzymes. Enzyme kinetics and different types of enzyme inhibition. 5. Carbohydrate metabolism pathways and regulations. 6. Protein metabolism pathways and regulations. 7. Lipid Metabolism pathways and regulations. 8. Nucleic acid metabolism pathways and regulations. **9.** Concept of free radicals and antioxidants with examples.
	ZOOM SEC-2	➢ **STUDENTS SHALL LEARN**;

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	AQUACULTURE	1. INTRODUCTION TO AQUARIUM FISH KEEPING 2. BIOLOGY OF AQUARIUM FISHES 3. FOOD AND FEEDING OF AQUARIUM FISHES 4. FISH TRANSPORTATION 5. MAINTENANCE OF AQUARIUM

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DEPARTMENT OF BBA
UNDERGRADUATE PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER I	PAPER / COURSE NAME & DESCRIPTION	OUTCOME
	Principles of Management & Organizational Behaviour (BBAA101CC1)	• To acquaint the students with the fundamentals of managing business and to understand individual and group behavior at work place so as to improve the effectiveness of an organization. • The course will use and focus on Indian experiences, approaches and cases.
	Business Ethics (BBAA102 M1)	• This is to make the students more clear about the importance of ethics in business and practices of good corporate governance. • It also talks about the corporate social responsibility.
	Financial Institutions and Markets (BBAA103MD1)	• The objective of this paper is to introduce students to the different aspects and components of financial Institutions and financial markets. • This will enable them to take the rational decision in financial

		environment.
	Business Communication/ Communicative English (BBAA104 AEC1)	• Developing a confident demeanour and being well-versed in the English language and also being able to use it appropriately with the required appropriateness depending on the occasion and place. • Personality development and becoming assertive.
	Information Technology in Business (BBAA105 SEC1)	• Solve business problems though the use of information systems and technology. • Apply knowledge of business concepts and functions in an integrated manner.

SEMESTER II	PAPER / COURSE NAME & DESCRIPTION	OUTCOME
	Statistics for Business Decisions (BBAA201CC2)	• To familiarize the students with various Statistical Data Analysis tools that can be used for effective decision making. • Emphasis will be on the application of the concepts learnt.
	Macro Economics (BBAA202M2)	• This course deals with the principles of Macroeconomics. • The coverage includes determination of and linkages between major economic variables ; level of output and prices, inflation, interest rates and exchange rates.

		• The course is designed to study the impact of monetary and fiscal policy on the aggregate behavior of individuals.
	ENTREPRENEURSHIP DEVELOPMENT- Concept, Theory & Practice (BBAA203MD2)	• This course provides students with a solid introduction to the entrepreneurial process of creating new businesses. • Role of Creativity and innovation in Entrepreneurial start-ups, manage family-owned companies, context of social innovation and social entrepreneurship and issues and practices of financing entrepreneurial businesses.
	Case Analysis, Copy writing and Content Writing in English (BBAA2 04AEC2)	• The course delves into developing a base of knowledge about cases followed by persuasive case-based essays. • Further the course is intended to develop the knowledge regarding copywriting and content writing)
	AI for Everyone (BBAA 204SEC2)	• This course aims to introduce the fundamental concepts of artificial intelligence (AI) to individuals from all academic backgrounds. • Participants will develop a broad understanding of AI technologies, their implications, and their potential applications in various fields. The course will emphasize practical examples and real-world case studies to facilitate comprehension and inspire innovative thinking.

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DEPARTMENT OF SOFTWARE DEVELOPMENT
UNDERGRADUATE BVOC PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

Semester	Course	Paper Name	Course Out Come
I	DSC-1	Digital Logic	Student will get a knowledge on the followings - 1. Use number systems and complements. 2. Identify the importance of canonical forms in the minimization or other optimization of Boolean formulas in general and digital circuits. 3. Minimize functions using any type of minimizing algorithms (Boolean algebra, Karnaugh map or Tabulation method).
	SEC-1	Fundamentals of Computer	After successfully completing this course, a student will be able to: • Converse in basic computer terminology. • Formulate opinions about the impact of computers on society. • Possess the knowledge of basic hardware peripherals. • Know and use different number systems and the basics of programming.
	IDC-1	Office Automation	Student will get a knowledge on Microsoft Word, Excel, Powerpoint

			Perform basic tasks in Microsoft Word • Create and save files in Microsoft Word. • Format text in Microsoft Word clarity. • Use spell check and find and replace tools. • Create and format numbered and unnumbered lists. **Some of the benefits of learning Excel include:** • Improved data management using Excel. ... • Perform better data analysis with Excel. ... • Share information more clearly with Excel data visualization. ... • Excel makes you more efficient: Excel can save time by streamlining data entry and calculation. **Powerpoint Learning Objectives** • Identify the names and functions of the PowerPoint interface. • Create, edit, save, and print presentations. • Format presentations. • Add a graphic to a presentation. • Create and manipulate simple slide shows with outlines and notes.
	MINOR-1	Physics	• Understand the basic properties of vectors, including magnitude and direction. Identify and represent vectors in various coordinate systems and Perform basic vector operations, including vector addition, subtraction, and vector multiplication.

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			• Understand and apply fundamental concepts of classical mechanics, including Newton's laws of motion, work and energy, and conservation principles. • Understand the basic concepts of gravitation, including Newton's law of universal gravitation, gravitational fields, and potential energy. Explain the relationship between mass, force, and distance in gravitational interactions. • Learn about oscillations, including simple harmonic motion, amplitude, period, frequency, and phase. Understand the principles behind SHM and the forces involved, such as restoring forces and damping.
II	DSC-2	Programming Fundamentals using C	Student will get a knowledge on • Develop a C program. • Control the sequence of the program and give logical outputs. • Implement strings in your C program. • Store different data types in the same memory. • Manage I/O operations in your C program. • Repeat the sequence of instructions and points for a memory location.
	SEC-2	Management Information System	Evaluate the role of information systems in today's competitive business environment. define an information system from both a technical and business perspective and distinguish between computer literacy and information systems literacy.

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	IDC-2	Programming Fundamentals using C	Student will get a knowledge on • Develop a C program. • Control the sequence of the program and give logical outputs. • Implement strings in your C program. • Store different data types in the same memory. • Manage I/O operations in your C program. • Repeat the sequence of instructions and points for a memory location.
	MINOR-2	Physics	• Understand and describe the fundamental properties of matter, including states of matter (solid, liquid, gas), density, pressure, and elasticity. Explain how these properties affect material behaviour under various conditions. • Understand the principles of fluid mechanics, including concepts of fluid pressure, buoyancy, viscosity, and fluid flow. Apply these principles to solve problems involving fluid dynamics and hydrostatics. • Analyze and solve basic electronic circuits using principles of Ohm's Law, Kirchhoff's Laws, and network theorems.

			Demonstrate proficiency in both series and parallel circuit configurations. • Understand the basic principles of magnetism, including magnetic fields, magnetic forces, and the behavior of magnetic materials. Describe the relationship between electric currents and magnetic fields as outlined by Ampère's Law and Biot-Savart Law.

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DEPARTMENT OF INDUSTRIAL AQUACULTURE & FISHERIES
UNDERGRADUATE BVOC PROGRAMME
COURSE OUTCOME UNDER CCF(NEP)
FOR SEMESTER I AND II

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	DSC-1: (Theory and Practical) Taxonomy of Fish and shellfish	Fish and Shellfish systematics is the most unique one in Fisheries Science in view of its importance and implications in diversity. This course deals with the classification and identification of commercially important fish's crustaceans and molluscs occurring in Indian waters. The systematic zoology is the science that discovers names, determines relationships, classifies and studies the evolution of living organisms. It is an important branch in biology and is considered to be one of the major subdivisions of biology having a broader base than genetics, biochemistry and physiology.
	IDC-1: (Theory and Practical) Fisheries Economics and Information Technology	Deliver a well-developed understanding of the economics, science, and fisheries policies associated with fisheries, as well as a broad foundation in environmental and resource economics. The course will help students to understand the fish farmers respond to policies and economic opportunities, to let them know about different agencies servicing fishery and their policies, to acquaint the learner with introductory fisheries Economics, development of fisheries in India, use of yield increasing inputs, marketing, trade, and prices.At the end of this course, each student will be able to: Describe economic opportunities in in the production, use and conservation of seafood resources. Describe ways fishers and aqua culturists may create environmental externalities that lead to

		exploitation of the ecosystem.
	SEC-1: Carp culture	Upon completion of the Carp Culture Practices course, participants will have acquired a comprehensive understanding of the principles, techniques, and best practices involved in carp aquaculture. The course aims to equip students with the knowledge and skills necessary to successfully manage and optimize carp farming operations. By the end of the course, participants should be able to: Demonstrate Knowledge of Carp Biology and Behaviour, Master Carp Farm Design and Infrastructure, Implement Carp Breeding and Genetics, Manage Carp Health and Disease, Optimize Feeding and Nutrition, Execute Efficient Water Management, Implement Harvesting and Post-Harvest Handling, Comprehend Regulations and Compliance.
	Minor Microbiology	The course outcomes for a basic microbiology syllabus may vary depending on the specific objectives and goals of the course. However, here is a general set of course outcomes that could be applicable to a basic microbiology syllabus - Understanding Microbial Diversity, Cellular Structure and Function, Microbial Growth and Reproduction, Microbial Genetics.
II	DSC-2: (Theory and Practical) Aquaculture Techniques	The course will develop the knowledge about Site Selection and Facility Design, Water Quality Management, Aquaculture Systems and Techniques, Feeds and Nutrition, Disease Prevention and Management and Aquatic Species Identification.
	IDC-2: (Theory and Practical) Ecology and Limnology	The course will empower the undergraduate students by: Basic limnology and water quality. Overview of major functional groups of organisms in freshwater, Effects of land use, climate change and other anthropogenic sources of influence on freshwater ecosystems,

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		Effects of abiotic factors on eco-physiology and life history of freshwater organisms, Effects of abiotic factors on trophic interactions, with emphasis on competition, predation and parasitism, Phenotypic responses to trophic interactions, The role of bottom-up vs. top-down regulation in freshwater food webs.
	SEC-2: Shellfish Culture	Expected learning outcome of the course will be Water quality parameters important for fish and shellfish culture, Ranges of water quality parameters tolerable to fish, Optimum water quality requirements for getting good production.
	Minor: Microbiology	In this course, the students will learn microbial growth with details on generation time, growth phases in batch culture and the concept of continuous and synchronous culture. The students shall be introduced to different types of culture media, direct and indirect methods of quantification of microorganisms.

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Principal
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DEPARTMENT OF B. Voc Studies (Software Development)

UNDERGRADUATE PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	**Paper Code - SBVOC-SWD-V-101** **Paper Name - Digital System Design and Computer Architecture**	The working mechanism and design guidelines of different combinational and sequential circuits.
	Paper Code - SBVOC-SWD-V-102 **Paper Name - Introduction To Application Packages (MS-OFFICE)**	After successful completion, students will be able to perform documentation and presenting skills. Proficient in using Windows, Word Processing Applications, Spreadsheet Applications, Database Applications and Presentation Graphics Applications.
	Paper Code - SBVOC-SWD-V-103 **Paper Name - Introduction to C Programming**	Control the sequence of the program and give logical outputs. Implement strings in your C program. Store different data types in the same memory.
	Paper Code - SBVOC-SWD-V-104 **Paper Name - Introduction to Algorithms**	Students can argue the correctness of algorithms using inductive proofs and invariants.
II	**Paper Code - SBVOC-SWD-V 201** **Paper Name - Data Structures**	Ability to devise novel solutions to small scale programming challenges involving data structures and and recursion.
	Paper Code - SBVOC-SWD-V 202 **Paper Name - System Design, Trouble shooting and Operating System**	Students will learn • Know basic components of an operating system. • Comprehend how an operating system virtualizes CPU and memory. • Discuss various scheduling and swapping policies. • Learn basic concurrent programming in C and assembly code. • Explain how a simple file system organizes data in the hard disk.

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	Paper Code - SBVOC-SWD-V 203 **Paper Name - Basic Web Design**	Apply basic design principles to present ideas, information, products, and services on websites.
	Paper Code - SBVOC-SWD-V 204 **Paper Name - Software Engineering**	An ability to identify, formulates, and solves complex engineering problems by applying principles of engineering, science, and mathematics.
III	**Paper Code - SBVOC-SWD-VI-301** **Paper Name - Database Management System (DBMS)**	Understand the basic concepts and the applications of database systems.
	Paper Code - SBVOC-SWD-VI-302 **Paper Name - Object Oriented Programming With C++**	Students will learn • The basic programming and OOPs concepts. • Creating C++ programs. • Tokens, expressions and control structures in C++ • Arranging same data systematically with arrays. • Classes and objects in C++ • Constructors and destructors in C++ • Files management and templates in C++
	Paper Code - SBVOC-SWD-VI-303 **Paper Name - Data Communication and Computer Networking**	Student will be able to understand the concept of flow control, error control and LAN protocols; to explain the design of, and algorithms used in, the physical, data link layers
	Paper Code - SBVOC-SWD-VI-304 **Paper Name - Computer Graphics**	To introduce students with fundamental concepts and theory of computer graphics. It presents the important drawing algorithm, polygon fitting, clipping and 2D transformation curves and an introduction to 3D transformation.
IV	**Paper Code - SBVOC-SWD-VI-401** **Paper Name - Web Application Development Using Asp.Net**	To learn HTML tags and JavaScript Language programming concepts and techniques. To develop the ability to logically plan and develop web pages.
	Paper Code - SBVOC-SWD-VI-402 **Paper Name - Programming With Core Java**	Validate input in a Java program. Identify and fix defects and common security issues in code. Document a Java program using Java doc. Use a version control system to track source code in a project.

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	Paper Code - SBVOC-SWD-VI-403 **Paper Name - Unix/Linux & System Programming**	Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security, and develop shell scripts to perform more complex tasks.
	Paper Code - SBVOC-SWD-VI-404 **Paper Name - Multimedia Technology**	1) To learn the basics of multimedia technologies. 2) To analyze, design and develop videos / movies involving computer graphics and video analytics using advanced techniques and tools.
V	**Paper Code - SBVOC-SWD-VII-501** **Paper Name - Programming With C#.Net**	Students will be able to understand the concept of .Net Framework and C# language fundamentals.
	Paper Code - SBVOC-SWD-VII-502 **Paper Name - Web Development Using Php And Mysql**	To make pages dynamic based upon user interaction, interacting with HTML forms and store and retrieve information from local data sources which include a database.
	Paper Code - SBVOC-SWD-VII-503 **Paper Name - Programming With Advanced Java (Jsp)**	The students should be able to write sophisticated Java applications. Upon completion of the course, the student will be able to use the Java language for writing well-organized, complex computer programs with both command- line and graphical user interfaces.
	Paper Code - SBVOC-SWD-VII-504 **Paper Name - Introduction to Python Programming**	1. Build basic programs using fundamental programming constructs like variables, conditional logic, looping, and functions. 2. Work with user input to create fun and interactive programs.
VI	**Paper Code - SBVOC-SWD-VII-601** **Paper Name - Management Information System (MIS)**	Evaluate the benefits and limitations of enterprise systems and industrial networks explain relationships between concepts of information systems, organization, management and strategy identify the salient characteristics of organizations analyze the relationship between information systems and organizations.
	Paper Code - SBVOC-SWD-VII-602 **Paper Name - Entrepreneurship Development (ED)**	Students will increase their awareness and deliberately practice the skills and disciplines necessary to increase confidence and agency; foster self-efficacy and self-advocacy; improve communication and problem-solving skills manage strong impulses and feelings; and identify personal purpose.
	Paper Code - SBVOC-SWD-VII-603 **Paper Name - Live Industrial Project**	Demonstrate and apply research skills to complete a project.

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DEPARTMENT OF (Industrial Aquaculture and Fisheries)

UNDERGRADUATE (B.Voc.) Skilled PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	Principles of Aquaculture SBVOC-IAF-V-101	Principles of Aquaculture gives outline about the basics and history of aquaculture. A wide range of aspects such as Systems of aquaculture, aquaculture in different types of water bodies, Principles of organic aquaculture, Pond management, study of Monoculture, polyculture and integrated culture systems, Water and soil quality in relation to fish production and estimation of productivity, factors affecting productivity of ponds, Nutrition, health management and economics were portray detailed.
	Taxonomy of Fish and Shell Fish SBVOC-IAF-V-102	Fish and Shellfish systematics is the most unique one in Fisheries Science in view of its importance and implications in diversity. This course deals with the classification and identification of commercially important fish's crustaceans and molluscs occurring in Indian waters. The systematic zoology is the science that discovers names, determines relationships, classifies and studies the evolution of living organisms. It is an important branch in biology and is considered to be one of the major subdivisions of biology having a broader base than genetics, biochemistry and physiology.
	Fish and Shell Fish Biology SBVOC-IAF-V-103	Introduces students to an integrated approach to fish and shellfish biology, including anatomy, morphology, physiology, ecology and behaviour. Students will study how fishes interact with their environment and the wide range of biological adaptations they have evolved to live in a remarkably diverse range of habitats.
	Information & Communication Technology SBVOC-IAF-V-104	Students develop an understanding of the implications of technology in society and the ways Information and Communication Technology (ICT) can help at home, work and the wider world. Through practical and theoretical studies, students solve problems using a variety of common software such as word processors and interactive presentation software.
II	Soil and Water Quality Management SBVOC-IAF-V-201	Students develop effective soil and water quality management practices which are important for any aquaculture endeavours. They may acquire knowledge on soil health, its assessment and maintenance for sustaining soil productivity. They will understand of soil health and soil quality with reference to manage and maintain aquaculture.

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	Capture fisheries resources SBVOC-IAF-V-202	Inland fisheries are "any activity conducted to extract fish and other aquatic organisms from inland waters". Capture fisheries in inland waters have long provided an important source of food for mankind. They are critical for a subset of countries in the world, providing an important source of nutrition, food security as well as micro-nutrients. Inland fisheries are under increasing pressure and threats arising from far reaching changes to the aquatic environment arising from human activities such as damming, navigation, wetland reclamation for agriculture, urbanization, water extraction and transfer, and waste disposal. Ecological and economical value of different inland fishery resources. Crafts and gears in inland waters.
	Fisheries Economics SBVOC-IAF-V-203	At the end of this course, each student will be able to: Describe economic opportunities in in the production, use and conservation of seafood resources. Describe ways fishers and aqua culturists may create environmental externalities that lead to exploitation of the ecosystem.
	Bio Securities	At the end of the course recognize the importance of biosecurity measures for preventing and

	SBVOC-IAF-V-204	controlling diseases in aquaculture. Learn to identify common pathogens affecting aquaculture organisms. Understand the characteristics and life cycles of major aquatic diseases.
III	Fundamentals of Microbiology SBVOC-IAF-VI-301	In this chapter, the students will learn microbial growth with details on generation time, growth phases in batch culture and the concept of continuous and synchronous culture. The students shall be introduced to different types of culture media, direct and indirect methods of quantification of microorganisms.
	Food microbiology SBVOC-IAF-VI-302	The students will understand food microbiology and its importance in food safety and quality. Understand the role of microorganisms in food spoilage and preservation. Explore various methods for preserving food, including heat treatment, refrigeration, fermentation, and others.
	Environmental Microbiology SBVOC-IAF-VI-303	By the end of this course students should be able to: Develop an in-depth comprehension and mastery of the fundamental concepts and methodology of environmental microbiology; Analyse and discuss primary literature articles in the field of environmental microbiology to improve critical thinking and evaluation skills; Write concise critiques of primary literature articles that demonstrate a comprehension of subject matter and ability to provide an argument for their critiques. The students will develop oral communication skills necessary to effectively present information to scientific community.
	Aquatic Animal Health SBVOC-IAF-VI-304	The course will help understand the important environmental variables in the aquatic environment that impact the physiology of aquatic animals understands the fundamentals of bioenergetics as a basis for understanding how animals gain and invest energy in various physiological processes.
IV	Food chemistry and Fish in Nutrition SBVOC-IAF-VI-401	To help students recognize that food is a basic requirement of life. Describe basic food preparation techniques. Identify the physical, chemical, and/or microbiological changes in food caused by heat, enzymes, changes in pH, freezing, incorporation of air, and mechanical manipulation.
	Fish Nutrition SBVOC-IAF-VI-402	To help know about the nutrients, to understand the function and sources of nutrients, to learn about the nutritional value of fishes, to discuss the health benefits of fish.
	Fish Processing Techniques SBVOC-IAF-VI-403	A syllabus for a course on Fish Processing Techniques is to cover a range of topics related to the processing of fish and seafood products. Understand the various stages of fish processing from harvest to final product. Understand the role of product development in meeting consumer demands.
	Fish Products and By-products, Quality Assessment SBVOC-IAF-VI-404	A syllabus for a course on to identify the methods for evaluation of fish quality, to determine their application in fish industry, to know better quality evaluation or assessment techniques in fish.
V	Fundamentals of Genetics SBVOC-IAF-VII-501	To impart knowledge to the students on the ultrastructure of cell and cell organelles, principles of genetics and their applications in plant breeding for improving agricultural productivity. Understand the basic concepts of the ultrastructure of cell, cell organelles, chromosomes and nucleic acids. Apply the principles of inheritance to plant breeding. Acquaint with the fundamentals of chromosomal and cytoplasmic inheritance.

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	Population Genetics SBVOC-IAF-VII-502	Through this course students will: Gain an understanding of different types of genetic variation and how they can be studied. Develop an appreciation of the different evolutionary forces, like mutation, migration, genetic drift, and natural selection and how they affect genetic variation.
	Selection Genetics SBVOC-IAF-VII-503	A course on Selection Genetics typically focuses on the principles and applications of selective breeding in the context of genetics. Explain the basic principles of selective breeding in genetics. Understand the role of selection in shaping the genetic makeup of populations.
	Fish and Non-Fish Breeding SBVOC-IAF-VII-504	To learn the outlines and recent advances in seed production and hatchery management of commercially important cultivable finfishes and shellfishes.
VI	Aquaculture Engineering SBVOC-IAF-VII-601	The course is necessary to understand the impact of aquaculture engineering solutions in a global, economic, environmental, and social context. Recognition of the need for, and an ability to engage in lifelong learning. Ability to learn about contemporary issues.
	Fundamentals of Ornamental Fish Culture SBVOC-IAF-VII-602	By the end of the course, the students will be able to: Prepare and decorate ornamental fish aquarium. Identify the suitable and economically important Ornamental fish species. Initiate entrepreneurship on Aquarium making and Ornamental fish production.
	Ornamental Fish Health Management SBVOC-IAF-VII-603	To make the students aware of the vast potentials and problems involved in ornamental fish farming and trading besides making they learn the diseases in fishes and other constraints in their culturing. The course will help to identify different infections and non-infectious diseases in ornamental fishes and their treatment procedures.
	Ornamental Fish Trade SBVOC-IAF-VII-604	To give students knowledge about various techniques of ornamental fish breeding, rearing and it's marketing to make them self-sustainable after graduation. To teach techniques of construction of glass aquarium and its maintenance. To teach students about fish food production and health related problems with ornamental fish.

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DEPARTMENT OF BUSINESS ADMINISTRATION

UNDERGRADUATE BBA HONOURS PROGRAMME COURSE

OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	BBAA102C1 - Principles of Management & Organisational Behaviour	Upon completion, students will grasp the core principles of business management, gaining insights into individual and group behavior in the workplace. They will apply this understanding to enhance organizational effectiveness, with a specific focus on Indian experiences, approaches, and cases, preparing them for nuanced decision-making in the Indian business context.
	BBAA103C2 - Business Accounting	Upon completion, students will proficiently navigate the mechanics of preparing financial statements and possess a deep understanding of corporate financial statements. They will demonstrate the ability to analyze and interpret financial data, enabling them to make informed financial decisions and communicate effectively within the corporate financial landscape.
II	BBAA202C3- Statistics for Business Decisions	Upon completion, students will be well-versed in a range of Statistical Data Analysis tools, emphasizing practical application for informed decision-making. They will proficiently utilize these tools to extract meaningful insights from data, equipping them with the skills necessary for effective problem-solving and decision support in real-world scenarios.
	BBAA203C4 - Managerial Economics	Upon completion, students will adeptly apply microeconomic concepts and techniques to assess business decisions made by firms. The course will emphasize the utilization of standard price theory tools for formulating decision problems, evaluating alternative courses of action, and making informed choices. Through the integration of simple geometry and fundamental mathematical concepts, students will develop a practical skill set for strategic decision-making in diverse business contexts.
III	BBAA301C5 - Human Resource Management	Upon completion, students will possess a solid understanding of the concepts and techniques essential to human resource management. The course, centered on Indian experiences, approaches, and cases, will equip students with practical skills to navigate various HR functions. They will be prepared to apply this knowledge in real-world scenarios, fostering effective people management within the unique context of the Indian business environment.
	BBAA302C6 - Marketing Management	Upon completion, students will possess a comprehensive understanding of the marketing function within organizations. They will be adept in analyzing and utilizing the Marketing Mix elements while being attuned to emerging issues in marketing. The course, emphasizing Indian experiences, approaches, and cases, will enable students to apply this knowledge effectively, preparing them to address contemporary challenges in the dynamic field of marketing.

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	BBAA303C7 - Management Accounting	Upon completion, students will be well-versed in the role of Management Accounting, gaining insights into its significance in planning, control, and decision-making processes. They will acquire practical skills to apply management accounting tools and techniques, enabling them to contribute effectively to strategic decision-making within organizational contexts.
IV	BBAA401C8 - BUSINESS RESEARCH	Upon completion, students will possess a heightened research orientation essential for industry practitioners. They will gain a comprehensive understanding of the nature and scope of business marketing research, equipped with foundational techniques and tools. This course prepares students to apply research methodologies effectively in practical business scenarios, ensuring a seamless transition into the industry.
	BBAA402C9 - MACRO ECONOMICS	Upon completion, students will demonstrate a solid grasp of the principles of Macroeconomics, understanding the interplay and linkages among major economic variables such as output, prices, inflation, interest rates, and exchange rates. They will analyze the impact of monetary and fiscal policies on aggregate individual behavior, equipping them with the knowledge to comprehend and navigate the broader economic landscape.
	BBAA403C10 - FINANCIAL MANAGEMENT	Upon completion, students will be proficient in the techniques of financial management and adept at applying them to business decision-making. They will possess the skills to analyze financial data, assess investment opportunities, and make informed choices that contribute to the overall financial health and success of an organization.
V	BBAA501C11 - QUANTITATIVE TECHNIQUES FOR MANAGEMENT	Upon completion, students will be equipped with the ability to construct mathematical models for managerial decision situations. They will demonstrate proficiency in using computer software packages to solve complex problems, emphasizing a deep understanding of conceptualization, formulation, and interpretation. This course prepares students to apply quantitative methods effectively, fostering analytical decision-making skills in various business contexts.
	BBAA502C12. LEGAL ASPECTS OF BUSINESS	Upon completion, students will possess a comprehensive understanding of business and corporate laws relevant to corporate bodies and related organizations. They will be able to apply this knowledge to practical situations, demonstrating proficiency in navigating legal frameworks and making informed decisions in the complex landscape of business law.
	BBAA503DSE2A - CONSUMER BEHAVIOR	The course of Consumer behaviour equips students with the basic knowledge about the issues and dimensions of consumer behaviour and with the skill and ability to analyse consumer information and develop consumer behaviour oriented marketing strategies.
	BBAA503DSE3A - HRD: SYSTEMS AND STRATEGIES	Upon completion, students will have a holistic understanding of the necessity for Human Resource Development (HRD) and its practices. They will be equipped to contribute to an organization's systems and strategies, fostering an optimal HRD climate. This course prepares students to integrate HRD principles for organizational enhancement and continuous improvement.

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	BBAA504DSE2B - ADVERTISING AND BRAND MANAGEMENT	Upon completion, students will possess a thorough understanding of the nature, purpose, and intricate elements involved in planning and executing successful advertising programs. They will be exposed to challenges in brand management within competitive markets, gaining practical insights to address these issues. This course prepares students to contribute effectively to the development and execution of impactful advertising strategies in real-world business scenarios.
	BBAA504DSE3B MANAGEMENT OF INDUSTRIAL RELATIONS	Upon completion, students will be familiar with the fundamental concepts of Industrial Relations and the relevant legislations pertaining to Labour Welfare and Industrial Relations. They will gain insights into the dynamics of workplace relations, enabling them to comprehend and navigate the legal frameworks that govern employee-employer interactions. This course prepares students to contribute to the establishment of harmonious and compliant industrial relations within organizational contexts.
VI	BBAA601C13 - BUSINESS POLICY AND STRATEGY	Upon completion, students will be equipped with the essential insights into designing strategies for organizations and aligning them with dynamic environmental changes. The course, emphasizing Indian cases, approaches, and experiences, will enable students to formulate effective strategies that are culturally and contextually relevant. Graduates will be prepared to contribute strategically to organizational success within the dynamic landscape of the Indian business environment.
	BBAA602C14 - FINANCIAL INSTITUTIONS AND MARKETS	Upon completion, students will have a comprehensive understanding of the various aspects and components of financial institutions and markets. This knowledge will empower them to make informed and rational decisions within the complex financial environment. The course aims to equip students with the skills needed to navigate financial institutions and markets, fostering the ability to analyze, strategize, and make sound financial decisions.
	BBAA603DSE2C - MARKETING OF SERVICES	Upon completion, students will possess a comprehensive understanding of marketing principles specific to various service industries. The course is structured to equip students with the knowledge and skills necessary to effectively market services across diverse sectors. Graduates will be well-prepared to address the unique challenges and opportunities associated with marketing services in today's dynamic business landscape.
	BBAA603DSE3C PERFORMANCE AND COMPENSATION MANAGEMENT	Upon completion, students will have a strong familiarity with performance and compensation management concepts. They will be equipped to address challenges related to attracting, retaining, and motivating employees for high performance. The course aims to empower students with practical strategies to optimize organizational performance through effective performance and compensation management practices.
	BBAA604DSE – RESEARCH PROJECT	Overall, successful completion of the research project will demonstrate the student's ability to conduct independent research, contribute to the academic discourse, and apply research skills in a practical context, earning a total of 100 marks.

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DEPARTMENT OF BENGALI

UNDERGRADUATE (BA) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC1 : HISTORY OF BENGALI LITERATURE (TILL 1800 AD)	To acquaint the students with different genres of Bengali literature from the period of emergence of Bengali language and literature to 1800 AD.
	CC 2 : DESCRIPTIVE LINGUISTIC AND BENGALI LANGUAGE	UG Hons. students develop an understanding of Bengali linguistics and phonology.
II	CC 3 : HISTORY OF BENGALI LITERATURE (NINETEENTH CENTURY)	Students are exposed to the influence of modernity in our thought, life style and literature by coming in contact with colonial modernity.
	CC 4 : BENGALI LITERATURE: INTRODUCTORY LESSON	After the basic knowledge about the history of Bengali language and literature, in this phase students get an opportunity to taste literature. Reading literature becomes enjoyable.
III	CC 5 : HISTORY OF BENGALI LITERATURE (TWENTIETH CENTURY)	Through this course, students gain knowledge about the dynamics and nature of Bengali literature in the 20th century.
	CC 6 : HISTORICAL LINGUISTICS	Students gain an understanding of the linguistic characteristics of each stage of the emergence and development of Bengali language from Ancient Indian Aryan language to Modern Indian Aryan language with the help of perticular periodic literature.
	CC 7 : FICTION	Students are introduced to the complexities of modern times, the conflict between individual and collective, the position of women in Bengali family life, the thoughts related to the environment and the various trends of human struggle.
	SEC-A-3 : APPLIED BENGALI-1	Students who wish to take up drama, film or recitation as a career later in life get a basic understanding of those subjects.
IV	CC 8 : MEDIAEVAL LITERATURE	Through this course, students can understand the evolution of Bengali society and culture along with the taste of medieval Bengali literature.
	CC 9 : RHYTHM, RHETORIC AND POETICS	Students of literature develop theoretical ideas about rhythm, rhetoric and poetics.

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	CC 10 : ESSAYS & MISCELLANEOUS WRITINGS	Philosophy or thought in Bengali essays has spread since the middle of the 19th century. It gained momentum in the 20th century. Through this course students are enriched with various topics related to society and literature.
	SEC-B-4 : APPLIED BENGALI-2	Students get a hands-on idea of the craft of literary form. Along with that practical knowledge of Bengali spelling and Roman transcription from Bengali is also developed.
V	CC 11 : LITERARY FORM AND STYLE	Apart from learning about the forms and aspects of different forms of literature, students also get an idea about the evolution of literature.
	CC 12 : DRAMA AND THEATER	The development of theater and drama is relative and complementary to each other. Through this course, students will be able to consider the development of theater as well as the study of drama as a mirror of social reality.
	DSE-A-5-2 : LITERATURE OF BANGLADESH	After partition, a rich genre of Bengali literature developed in East Bengal and Bangladesh. Students get to know him through this course.
	DSE-B-5-1 : BENGALI LITERATURE FOR CHILDREN & TEENAGERS	Bengali children's literature has a deep tradition. From there, students learn to study some selected texts here in academic discipline.
VI	CC 13 : MODERN BENGALI POEMS	Through this course, the students understand the different phases of the new age that came into contact with colonial modernity in our poetry.
	CC 14 : HISTORY OF SANSKRIT, ENGLISH & HINDI LITERATURE	After getting an overall introduction to Bengali literature, students get basic knowledge about the history of Sanskrit, English and neighboring Hindi literature and in that light their appreciation of Bengali literature also becomes more transparent.

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	DSE-A-6-3 : BENGALI DITECTIVE LITERATURE, SCIENCE FICTION & SUPERNATURAL STORIES	Adolescents become accustomed to reading and enjoying literature through detective stories, science fiction stories, or ghost stories. Through this course, students study their familiar subjects in academic disciplines.
	DSE-B-6-3 : BIOGRAPHY, AUTOBIOGRAPHY & TRAVEL LITERATURE	In this course, students master their personal life as well as their time period through Chaitanya's biography, Rabindranath Tagore's autobiography. Students are also introduced to the author's various travel experiences through the reading of Sukh-Pathya 'Desh-Videsh'.

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DEPARTMENT OF BIOCHEMISTRY

UNDERGRADUATE (BSc) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC1(T)- MOLECULES OF LIFE	BASIC INTRODUCTION TO STRUCTURE AND FUNCTIONS OF CARBOHYDRATES, LIPIDS, PROTEINS AND NUCLEIC ACIDS AND THEIR STRUCTURAL AND FUNCTIONAL DISORDERS
	CC1(P) – MOLECULES OF LIFE	GAINS HANDS-ON EXPERIENCE OF QUALITATIVE ANALYSES OF BIOMOLECULES, MEASUREMENT OF CONCENTRATION OF PROTEINS AND SEPERATION OF AMINO ACIDS AND PROTEINS BY CHROMATOGRAPHY TECHNIQUE
	CC2(T)- GENERAL AND ORGANIC CHEMISTRY	DESCRIBES THE ATOMIC STRUCTURE, STEREOCHEMISTRY AND INTERMOLECULAR INTERACTIONS AND MECHANISM OF REACTIONS IN ORGANIC COMPOUNDS AND RADIOACTIVE COMPOUNDS
	CC2(P)- GENERAL AND ORGANIC CHEMISTRY	GAINS HANDS ON EXPERIENCE ON DETECTION OF SPECIAL ELEMENTS AND FUNCTIONAL GROUPS IN ORGANIC COMPOUNDS
II	CC3(T)- GENERAL PHYSICAL CHEMISTRY	GIVES AN OVERVIEW OF THERMODYNAMICS, CHEMIAL EQUILIBRIUM, ELECTROCHEMISTRY AND COLLOIDS
	CC3(P)- GENERAL PHYSICAL CHEMISTRY	GAINS HANDS-ON EXPERIENCE ON PREPARATION OF BUFFERS, FORMOL TITRATION, MEASUREMENT OF pH FOR SOLUTIONS
	CC4(T)- ENZYMES	PROVIDES KNOWLEDGE ON CHARACTERISTICS, CLASSIFICATION, MECHANISM OF ACTIONS, REACTION KINETICS EXTRACTION AND REGULATION OF ACTIVITIES OF ENZYMES IN HUMANS

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	CC4(P)-ENZYMES	GAINS HANDS-ON EXPERIENCE ON DETERMINATION OF TOTAL & SPECIFIC ACTIVITY OF ENZYME, STUDY OF ENZYME KINETICS IN THE PRESENCE OF INHIBITORS, STUDY OF EFFECTS OF TEMPERATURE, pH AND SUBSTARTE CONCENTRATION ON ACTIVITY OF ENZYMES
III	CC5(T)- BIOPHYSICAL CHEMISTRY	DEVELOPS AN UNDERSTANDING ON SPECTROSCOPY TECHNIQUES, THEIR APPLICATIONS, HYDRODYNAMICS AND BIOCALORIMETRY
	CC5(P)-BIOPHYSICAL CHEMISTRY	GAINS HANDS-ON EXPERIENCE ON DETERMINATION OF VISCOSITY, AND EXTINCT COEFFICIENT OF SOLUTIONS AND COLUMN CHROMATOGRAPHY TECHNIQUES
	CC6(T)- METABOLISM OF CARBOHYDRATES AND LIPIDS	DESCRIBES THE SYNTHESIS AND BREAKDOWN OF CARBOHYDRATES AND LIPIDS WITH SPECIAL MENTION TO MEMBRANE LIPIDS
	CC6(P)- METABOLISM OF CARBOHYDRATES AND LIPIDS	GAINS HANDS-ON EXPERIENCE ON ESTIMATION OF CHOLESTEROL AND GLUCOSE FROM SOLUTIONS AND DETERMIANTION OF AMYLASE ACTIVITY AND CONCENTRATION OF LDH IN SERUM
	CC7(T)- CELL BIOLOGY	PROVIDES KNOWLEDGE ON STRUCTURE AND FUNCTIONS OF CELL AND THEIR ORGANELLES, CELL DIVISION AND TECHNIQUES TO STUDY CELLULAR FUNCTIONS
	CC7(P)- CELL BIOLOGY	LEARNS TO VISUALISE PALNT AND ANIMAL CELLS, DIFFERENT STAGES OF CELL DIVISION UNDER MICROSCOPY, GETS A DEMONSTARTION OF WESTERN BLOT AND SDS-PAGE TECHNIQUES OF PROTEIN SEPERATION
	SECA1 – TOOLS AND TECHNIQUES IN BIOCHEMISTRY	GIVES AN IDEA ABOUT BASIC LABORATORY PRACTICES, INSTRUMENTATION AND PREPARATION AND PROPERTIES OF CHEMICAL SOLUTIONS
	SECA2 – PROTEIN PURIFICATION TECHNIQUES	BASIC INTRODUCTION TO PURIFICATION AND CHARACTERIZATION OF PROTEINS
IV	CC8(T)- MEMBRANE BIOLOGY AND BIOENERGETICS	ELUCIDATES ON STRUCTURES AND FUNCTIONS (TRANSPORT) OF CELL MEMBRANES IN PROKARYOTES AND EUKARYOTES AND GIVES AN INTRODUCTORY KNOWLEDGE ON BDIFFERENT PROCESSES OF IOENERGETICS.

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	CC8(P)- MEMBRANE BIOLOGY AND BIOENERGETICS	GAINS HANDS-ON EXPERIENCE ON RBC GHOST PREPARATION, SEPERATION OF PHOTOSYNTHETIC PIGMENTS BY CHROMATOGRAPHY TECHNIQUE AND DETERMINATION OF CMC OF DETERGENTS
	CC9(T)-METABOLISM OF PROTEINS AND NUCLEIC ACIDS	DESCRIBES THE SYNTHESIS AND BREAKDOWN OF PROTEINS AND NUCLEIC ACIDS AND THEIR DISORDERS OF METABOLSIM
	CC9(P)-METABOLISM OF PROTEINS AND NUCLEIC ACIDS	GAINS HANDS-ON EXPERIENCE ON ESTIMATION OF CREATINE, UREA, URIC ACID AND LIVER ENZYMES
	CC10(T)- BASIC MICROBIOLOGY AND MICROBIAL GENETICS	PROVIDES AN OVERVIEW OF MICROBIAL STRUCTURE, GENETICS, NUTRITION, GROWTH AND THEIR REGULATION AND METHODS OF STUDY THE MICROBES
	CC10(P)- BASIC MICROBIOLOGY AND MICROBIAL GENETICS	GAINS HANDS-ON EXPERIENCE OF STAINING AND OBSERVING BACTERIAL CELLS UNDER MICROSCOPY, PREPARATION OF LIQUID AND SOLID BACTERIOLOGICAL GROWTH MEDIA, STERILIZATION TECHNIQUES AND ISOALTION OF SINGLE BACTERIAL CELLS ON SOLID MEDIA
	SECB1- CLINICAL BIOCHEMISTRY	DEVELOPS KNOWLEDGE ON ORGANIZATION OF A CLINICAL LABORATORY AND VARIOUS BIOCHEMICAL PROFILING TESTS DONE FOR DISEASE DIAGNOSIS
	SECB2- RECOMBINANT DNA TECHNOLOGY	GIVES AN OVERVIEW OFWORK FLOW IN-SILICO CLONING, VECTORS USED, METHODS OF CLONING AND THEIR FUNCTIONAL ANALYSES
V	CC11(T)-GENE, GENE EXPRESSION AND REGULATION	PROVIDES AN OVERVIEW ON STRUCTURE, FUNCTIONS, SYNTHESIS, ABNORMALITIES (MUTATIONS) AND REPAIR MECHANISMS OF DNA AND RNA IN PROKARYOTES AND EUKARYOTES
	CC11(P)-GENE, GENE EXPRESSION AND REGULATION	GAINS PARCTICAL EXPERIENCE ON DNA ISOALTION TECHNIQUES, OBSERVATION & MEASUREMENT OF CONCENTRATIONS OF DNA AND GC CONTENT OF DNA
	CC12(T)- PHYSIOLOGY & HORMONES	SUMMARIZES THE PHYSIOLOGICAL SYSTEMS, ENDOCRINOLOGY, REGUALTIONS & DISORDERS IN HUMAN SYSTEMS
	CC12(P)- PHYSIOLOGY & HORMONES	GAINS HANDS-ON EXPERIENCE ON ESTIMATION OF CALCIUM, HEMOGLOBIN AND CHOLESTEROL FROM HUMAN SERUM AND GETS A DEMONSTARTION ON PLASMA PROTEINS SEPERATION

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	DSEA1(T)- NUTRITIONAL BIOCHEMISTRY	ELUCIDATES THE IMPORTANCE, DAILY REQUIREMENTS, PHYSIOLOGICAL ROLES, INTERCATIONS AND THE MEASUREMNTS OF CARBOHYDRATES, FATS, PROTEINS, VITAMINS, MINERALS IN DIETS AND THE EFFECTS OF THEIR DEFICIENCY IN HUMANS
	DSEA1(P)- NUTRITIONAL BIOCHEMISTRY	HANDS-ON EXPERIENCE OF ESTIMATION OF VITAMIN-C, CACIUM, IODINE, PHOSPHORUS AND PHENOL FROM DIFFERENT FOOD ITEMS
	DSEA2(T) – MOLECULAR BASIS OF INFECTIOUS DISEASES	DISCUSSES THE BASIS OF INFECTIONS, THE LIFECYCLE OF INFECTIOUS AGENTS AND MECHANIM OF INFECTION AND INVASION & EVASION OF IMMUNE SYSTEM IN HUMANS
	DSEA2(P) – MOLECULAR BASIS OF INFECTIOUS DISEASES	GAINS HANDS-ON EXPERIENCE ON IDENTIFIACTION OF BACTERIAL CONTAMINATION FROM ENVIRONEMNTAL SAMPLES AND STUDY OF PERMANENT SLIDES OF APTHOGENS AND DEMONSTRATION OF DIFFERENT DIAGNOSTIC TECHNIQUES (PCR, ELISA, DOT-BLOT, WIDAL TEST)
	DSEB1(T) – ADVANCED BIOCHEMISTRY	ENLIGHTENS ON THE PHYSIOLOGICAL PROCESSES INCLUDING PHOTOSYNTHESIS, CARBOHYDRATE BIOSYNTHESIS AND BIOMOLECULAR INTERACYIONS IN PALNTS AND BACTERIA
	DSEB1(P) – ADVANCED BIOCHEMISTRY	GAINS ON HANDS-ON EXPERIENCE ON SEPERATION OF PHOTOSYNTHETIC PIGMENTS BY CHROMATOGRAPHY, DETRMINATION OF CONCENTRATION OF PROTEINS AND STUDY OF ABSORPTION SPECTRUM OF HEMOGLOBIN
	DSEB2(T) – PLANT BIOCHEMISTRY	DEFINES THE CELL STRUCTURE AND PHYSIOLOGICAL PROCESSES INCLUDING PHOTOSYNTHESIS, RESPIRATION, NITROGEN METABOLISM AND SECONDARY METABOLITE SYNTHESIS IN PLANTS
	DSEB2(P) – PLANT BIOCHEMISTRY	GAINS HANDS-ON EXPERIENCE ON SEPERATION OF CAROTENES AND PHOTOSYNTHETIC PIGMENTS BY CHROMATOGRAPHY AND DEMONSTARTION OF PLANT TISSUE CULTURE AND ROLE OF HYDRLYTIC ENZYMES DURING SEED GERMINATION
VI	CC13(T)- RECOMBINANT DNA TECHNOLOGY AND GENETIC ENGINEERING	INTRODUCTION TO CONCEPTS ON DIFFERENT PROCESS USED IN RECOMBINANT DNA TECHNOLOGY AND GENETIC ENGINEERING AND THEIR APLLICATIONS (SEQUENCING, PCR, RT-PCR, CLONING)

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	CC13(P)- RECOMBINANT DNA TECHNOLOGY AND GENETIC ENGINEERING	GAINS HANDS-ON EXPERIENCE ON PALSMID DNA ISOALTION FROM PROKARYOTIC CELLS, DIGESTION OF DNS WITH RESTRICTION ENZYMES, PREPRATION OF COMPETENT CELLS AND TRANSFORMATION OF CELLS WITH PLASMID DNA
	CC14(T)- IMMUNOLOGY	ELUCIDATES ON OVERALL STRUCTURE, COMPONENTS AND FUNCTIONS OF IMMUNE SYSTEM, THE BIOLOGY OF IMMUNE CELLS AND DEVELOPMENT OF AUTOIMMUNITY
	CC14(P)- IMMUNOLOGY	GAINS HANDS-ON EXPERIENCE OF IMMUNOLOGY REACTIONS (AGGLUTINATION & PRECIPITATION OF ANTIGEN-ANTIBODY), IMMUNOELECTROPHORESIS TECHNIQUE AND DEMONSTARTION OF ENZYME-LINKED ABSORBANCE ASSAY
	DSEA3 (T)– ADVANCED CELL BIOLOGY	DETAILED STUDY ON CELLULAR TRANSPORT, INTERACTIONS, CELL CYCLE, CELLULAR DISORDERS (CANCER) AND THE RECENT ADVANCES IN TECHNIQUES TO STUDY CELLULAR PROCESSES
	DSEA3 (P)– ADVANCED CELL BIOLOGY	GAINS HANDS-ON EXPERIENCE ON ISOLATION OF CELL ORGANELLES BY CELL FRACTIONATION, IDENTIFICATION OF CANCER CELLS FROM PERMANENT SLIDES AND STUDY OF APOPTOSIS AND CELL VIABILITY
	DSEA4(T) – THE MOLECULAR BASIS OF NON-INFECTIOUS DISEASES	PROVIDES AN OVERVIEW OF LIFESTYLE DISORDERS, CANCER AND PROTEIN-MISFOLDING DISEASES
	DSEA4(P) – THE MOLECULAR BASIS OF NON-INFECTIOUS DISEASES	GAINS HANDS-ON EXPERIENCE ON ESTIMATION OF HOMOCYSTEINE AND GLYCOSYALTED HEMOGLOBIN FROM HUMAN SERUM AND STUDY OF PERMANENT SLIDES OF CANCER
	DSEB3 (T) – MOLECULAR DIAGNOSTICS	DEVELOPS KNOWLEDGE ON INBORN ERRORS OF METABOLISM AND THE ADVANCED TECHNIQUES OF DIAGNOSIS (ENZYMES, MOLECULAR AND IMMUNODIAGNOSTIC ASSAYS), OTHER TECHNIQUES RELATED TO FORENSIC STUDY AND ARCHAEOLOGICAL STUDY.
	DSEB3 (P) – MOLECULAR DIAGNOSTICS	GAINS HANDS-ON EXPERIENCE OF ESTIMATION OF HEPATITIS SURFACE ANTIGENS, LIPID PROFILE AND PERUM HOSPHATASE ENZYMES, OBSERVATION OF PERMANENT SLIDES OF CANCER AND PATHOGENIC PARASITES
	DSEB4(T) – RESEARCH METHODOLOGY	MASTERING THE CONCEPTS OF DEFINING RESEARCH PROBLEMS, DESIGNING EXPERIMENTS, DATA PROCESSING AND STATISTICAL ANALYSES

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	DSEB4(P) – RESEARCH METHODOLOGY	GETS A GUIDANCE ON PREPARATION OF RESEARCH PROBLEM, SURVEY OF LITERATURE, DEVEVLOPING OF STANDARD OPERATION PROTOCOLS FOR THE DEDICATED TOPIC OF RESAERCH AND FINALLY SUBMITTING A PRESENTATION ON THE TOPIC

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DEPARTMENT OF BOTANY

UNDERGRADUATE BSc HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/COURSE NAME & DESCRIPTION	OUTCOME
1	CC1 PHYCOLOGY AND MICROBIOLOGY	ACQUIRING KNOWLEDGE OF ALGAE AND MICROBES
	CC2 MYCOLOGY AND PHYTOPATHOLOGY	ACQUIRING KNOWLEDGE OF FUNGI AND PLANT DISEASES
II	CC3 PLANT ANATOMY	OBTAINING KNOWLEDGE OF ANATOMY OF PLANTS
	CC4 ARCHEGONIATE	OBTAINING KNOWLEDGE OF BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS
III	CC5 PALAEOBOTANY AND PALYNOLOGY	GAINING KNOWLEDGE OF PRIMITIVE PLANT LIFE AND POLLENS
	CC6 REPRODUCTIVE BIOLOGY OF ANGIOSPERMS	GAINING KNOWLEDGE OF ANGIOSPERM REPRODUCTIVE MECHANISM
	CC7 PLANT SYSTEMATICS	GAINING KNOWLEDGE OF PLANT CLASSIFICATION
IV	CC8 PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION	ATTAINING KNOWLEDGE OF DISTRIBUTION, ECOLOGICAL ASPECTS AND EVOLUTIONARY PROCESSES OF PLANTS
	CC9 ECONOMIC BOTANY	ATTAINING KNOWLEDGE OF ECONOMICALLY IMPORTANT PLANTS
	CC10 GENETICS	ATTAINING KNOWLEDGE OF DETAILED PLANT GENETICS
V	CC11 CELL AND MOLECULAR BIOLOGY	GETTING ACQUAINTED WITH DETAILED MOLECULAR BIOLOGY
	CC12 BIOCHEMISTRY	GETTING ACQUAINTED WITH DIFFERENT PLANT BIOCHEMICAL MECHANISMS
VI	CC13 PLANT PHYSIOLOGY	UNDERSTANDING VARIOUS PHYSIOLOGICAL PROCESSES OF PLANTS
	CC14 PLANT METABOLISM	UNDERSTANDING METABOLIC PATHWAYS OF PLANTS

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DEPARTMENT OF Chemistry

UNDERGRADUATE (BA/BSc) HONOURS PROGRAMME B.Sc

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
1	CC1 and CC2	CC1(Organic + inorganic Chemistry), CC2(Organic + physical chemistry): After completion of syllabus students will be able to understand following outcomes. • Student should learn basic concept of organic chemistry, acid base and redox concept and basic structure of an atom in inorganic chemistry in CC1 • Student should learn basic concept of kinetic theory, chemical kinetics and transport process in physical chemistry and , stereochemistry of an organic compound in CC2
2	CC3 and CC4	CC3(Organic Chemistry), CC2(Inorganic chemistry): After completion of syllabus students will be able to understand following outcomes. • Student should learn a broader aspect of stereochemistry of organic compound, substitution reaction and elimination reaction of organic compounds in CC3 • Student get well acquainted with chemical bonding and basic concept of radioactivity in CC4
3	CC5, CC6, CC7 and SECA	CC5(Physical Chemistry), CC6(Inorganic chemistry), CC7(Organic chemistry) and SEC A: After completion of syllabus students will be able to understand following outcomes.

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		• Student should learn chemical thermodynamics and electrochemistry in CC5 • Student get well acquainted with chemical periodicity and coordination chemistry in CC6 • Student should learn chemistry of different functional groups in CC7 • Student get well acquainted with analytical clinical biochemistry In SEC A
4	CC8, CC9, CC10 and SEC B	CC8(Organic Chemistry), CC9(Physical chemistry), CC10(Inorganic chemistry) and SEC B: After completion of syllabus students will be able to understand following outcomes. • Student should learn application of spectroscopy to identify an organic compound. They learn rearrangement reaction and retrosynthetic approach to synthesis of an organic molecule in CC8 • Student get well acquainted with quantum mechanics, phase equilibrium, crystal structure in CC9 • Student should learn coordination chemistry and periodicity in broader aspects in CC10. • Student get well acquainted with pharmaceutical chemistry or chemistry of pesticides in SEC B
5	CC11, CC12, DSE A, DSE B	CC11(Physical chemistry), CC12(Organic chemistry), DSE A and B: After completion of syllabus students will be able to understand following outcomes. • Student should learn quantum chemistry and statistical thermodynamics and computer programs in CC11

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		• Student should learn cyclic and heterocyclic chemistry, pericyclic reaction, chemistry of carbohydrate and biomolecules in CC12 • Student get well acquainted with application of computers in chemistry in DSE A • Students will learn industrial importance of inorganic molecules in DSE B
6	CC13, CC14, DSE A, DSE B	CC13(Inorganic chemistry), CC12(Physical chemistry), DSE A and B: After completion of syllabus students will be able to understand following outcomes. • Student should learn bioinorganic chemistry and organometallic chemistry in CC13 • Student get well acquainted with molecular spectroscopy, colloids, surface chemistry, photochemistry in CC14 • Student should learn green chemistry in DSE A • a student has to carry out research /review on a topic as assigned by the respective college. A project report and digital presentation will be required for the assessment of the student at the end of the semester

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DEPARTMENT OF COMMUNICATIVE ENGLISH

UNDERGRADUATE (BA) MAJOR PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC1- PHONETICS AND PHONOLOGY	UNDERSTANDING THE BASICS OF SPEECH SOUNDS, AIR STREAM MECHANISM, SPEECH ORGANS, AND PHONOLOGY. UNDERSTANDING ARTICULATION OF SOUNDS AND DOING PHONEMIC TRANSCRIPTION.
	CC2- GRAMMAR AND USAGE	GAINING A COMPREHENSIVE GRASP OF PRECISE GRAMMATICAL USAGE. DIFFERENTIATING BETWEEN COMMONLY CONFUSED WORDS. GAINING BASIC VOCABULARY RELATED TO SYNONYMS, ANTONYMS, AND AMERICAN EXPRESSIONS. IDENTIFYING COMMON GRAMMATICAL ERRORS. BRUSHING UP ON PHRASAL VERBS, IDIOMS, WORD CLASSES, SENTENCE STRUCTURES, VERB CLASSIFICATION, INFINITIVES, GERUNDS, VOICE AND CONCORD.
II	CC3- SOCIOLINGUISTICS	GAINING THEORETICAL KNOWLEDGE ABOUT LANGUAGE APPROPRIATENESS, GRAMMATICALITY, AND ACCEPTABILITY IN ENGLISH. UNDERSTANDING CONCEPTS LIKE REGISTERS, STYLES, SLANG, JARGON, PIDGIN, CREOLE, ACCENT, DIALECTS, BILINGUALISM, AND LINGUISTIC VARIETIES.
	CC4- LISTENING AND SPEAKING COMPETENCE	IMPROVING LISTENING AND SPEAKING SKILLS. READING ALOUD WITH CORRECT STRESS, PRONUNCIATION AND INTONATION. EXTEMPORE SPEAKING AND PARTICIPATING IN ROLE PLAYS. LISTENING TO AUTHENTIC LISTENING MATERIAL TO LOOK FOR SPECIFIC INFORMATION, GIST, MAIN POINTS, INFERENCE AND SO ON.
	CC5- ENGLISH COMPREHENSION & COMPOSITION	IMPROVING READING SKILLS WITH TECHNIQUES LIKE SKIMMING AND SCANNING. IMPROVING WRITING SKILLS THROUGH COMPOSITION WRITING, ARTICLE WRITING, SUMMARISING, PRECIS WRITING AND REPORT WRITING.

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III	CC6- TECHNICAL ENGLISH AND COPY EDITING	UNDERSTANDING THE BASICS OF PROOFREADING, AND COPYEDITING. MASTERING PROOFREADING SYMBOLS AND PROOFREADING A GIVEN PASSAGE WITH ERRORS. WRITING A SURVEY REPORT.

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	CC7- ENGLISH LANGUAGE TEACHING	GAINING A BASIC UNDERSTANDING OF THE FUNDAMENTALS AND OBJECTIVES OF ELT. UNDERSTANDING TECHNIQUES FOR THE TEACHING OF LSRW SKILLS AND LANGUAGE TESTING. LESSON PLANNING FOR STUDENTS FOR DIFFERENT PROFICIENCY LEVELS. GAINING PRACTICAL TEACHING EXPERIENCE FOR A MONTH.
	SEC A1- TRAVEL AND REVIEW WRITING	ACQUIRING BASIC UNDERSTANDING OF TRAVEL WRITING AND REVIEW WRITING. WRITING TRAVEL BLOGS, TRAVEL DIARIES, ITINERARIES AND TOUR PACKAGES. WRITING BOOK REVIEWS, FILM REVIEWS AND MUSIC REVIEWS.
IV	CC 8- PR AND ADVERTISING	ACQUIRING AN UNDERSTANDING OF PR AND ADVERTISING INCUDING PRINCIPLES, METHODS, ETHICS OF PR, FUNCTIONS AND ELEMENTS OF ADVERTISING, SELECTION OF ADVERTISING MEDIA, TYPES OF ADVERTISING.
	CC9 – MASS COMMUNICATION AND MASS MEDIA: PRINT, ELECTRONIC, DIGITALAND NEW MEDIA	RECOGNIZING THE VARIOUS TYPES OF COMMUNICATION, THE BARRIERS TO COMMUNICATION AND THE VARIOUS FORMS AND FUNCTIONS OF MASS MEDIA, VARIOUS FORMS AND SOURCES OF NEWS IN PRINT MEDIA; AND REALIZING THE IMPACT OF MEDIA ON SOCIETY. IDENTIFYING THE TYPES, DESIGN AND LAYOUTS OF RADIO AND TELEVISION PROGRAMME.
	CC10- SOFT SKILL DEVELOPMENT AND POWERPOINT PRESENTATION	ACQUIRING THE BASICS OF SOFT SKILLS INCLUDING: VERBAL AND NON-VERBAL, SELF-MOTIVATION, LEADERSHIP, RESPONSIBILITY, TEAMWORK, PROBLEM SOLVING, DECISION-MAKING, ABILITY, TIME MANAGEMENT, NEGOTIATION AND CONFLICT RESOLUTION, AND PERSUASION. UNDERSTANDING THE TECHNIQUES AND APPLICATIONS OF POWERPOINT PRESENTATION.
	SECB 1- BUSINESS ENGLISH COMMUNICATION	UNDERSTANDING THE ROLES AND PATTERNS OF BUSINESS COMMUNICATION AND BUSINESS CORRESPONDANCE. WRITING PROJECT REPORTS. FACING INTERVIEWS AND PARTICIPATING IN GROUP DISCUSSIONS.
	CC11- INTERVIEWING TECHNIQUES, TALK SHOW, NEWS READING AND WRITING, PUBLIC SERVICE ANNOUNCEMENT, COMMENTARY AND COMPERING	GAINING KNOWLEDGE ABOUT INTERVIEWING TECHNIQUES, TYPES OF TALK SHOWS, HOSTS AND HOSTING OF TALK SHOWS. ACQUIRING PRELIMINARY KNOWLEDGE OF NEWS READING & WRITING. UNDERSTANDING THE BASICS OF NEWS WRITING AND READING FOR RADIO AND TELEVISION; LEARNING THE ART OF PUBLIC SERVICE ANNOUNCEMENTS; MAKING COMMENTARY OR PRODUCT DEMONSTRATION; AND COMPERING.

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V	CC 12- ON JOB TRAINING AND INTERNSHIP REPORT WRITING	UNDERSTANDING THE BASICS OF INTERNSHIP. DEVELOPING EMPLOYABILITY SKILLS THROUGH ADEQUATE EXPOSURE TO THE EMPLOYMENT SECTOR DURING THEIR INTERNSHIP.
	DSEA1- NEWSPAPER REPORT AND FEATURE WRITING	UNDERSTANDING THE ART OF REPORTING DIFFERENT NEWS STORIES. WRITING FEATURE ARTICLES, DIFFERENT TYPES OF HEADLINES, EDITORIAL LETTERS, AND CLASSIFIED ADVERTISEMENTS. UNDERSTANDING THE BASICS OF PHOTOJOURNALISM AND CAPTION WRITING.
	DSEB 1 – TRANSLATION STUDIES	GAINING KNOWLEDGE ABOUT THE HISTORY OF ENGLISH TRANSLATION IN INDIA, TRANSLATION AS A SKILL, AND COMPONENTS OF TRANSLATION. IDENTIFYING COMMON ERRORS IN TRANSLATION AND EDITING THEM. UNDERSTANING THE DIFFERENCE BETWEEN FICTION AND NON-FICTION TRANSLATION.
VI	CC13- ENTREPRENEURSHIP DEVELOPMENT	UNDERSTANDING THE BASICS OF ENTREPRENEURSHIP, HUMAN RESOURCE MANAGEMENT, MARKETING AND FINANCIAL MANAGEMENT. GAINING IDEA ABOUT PROJECT LAYOUT AND FORMULATION. PREPARING PROPOSAL FOR AN ENTREPRENEURIAL VENTURE.
	CC14 - RESEARCH PROJECT	ACQUIRING KNOWLEDGE ABOUT THE FUNDAMENTALS OF RESEARCH AND STRUCTURE OF A RESEARCH PAPER. CONDUCTING INDEPENDENT FIELD SURVEY, PERFORMING DATA ANALYSIS AND PRESENTING FINDINGS USING PIE CHARTS AND GRAPHS.
	DSEA 2- DISCOURSE ANALYSIS	UNDERSTANDING THE RELATIONSHIPS BETWEEN THE SOCIAL CONTEXTS OF USE AND FEATURES OF WRITTEN AND SPOKEN TEXTS. GAINING BASIC UNDERSTANDING OF DISCOURSE ANALYSIS AS A DISCIPLINE, AND ASSOCIATED CONCEPTS.
	DSEB 1- LANGUAGE ONLINE	UNDERSTANDING THE USE OF LANGUAGE ON DIFFERENT ONLINE PLATFORMS, AND THE EFFECTS OF THE INTERNET ON LANGUAGE. GAINING KNOWLEDGE ABOUT THE FEATURES OF TEXTESE AND VARIOUS TYPES OF INTERNET SLANGS.

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DEPARTMENT OF COMPUTER SCIENCE

UNDERGRADUATE (B.Sc.) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

Hons. Courses

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1 (Th/P) – Digital Logic	Digital electronics skills can significantly benefit students in their career paths. Proficiency in digital electronics can lead to opportunities in various fields like Electronics Engineering, Computer Science and Software Development, Embedded Systems, Networking and Communication Robotics: Digital electronics is fundamental to robotics. Students with expertise in this area can contribute to the design and programming of robotic systems used in manufacturing, healthcare, and exploration. IoT (Internet of Things): With the growing prevalence of IoT devices, understanding digital electronics is valuable for creating and maintaining interconnected smart devices. Research and Development: Students with a strong background in digital electronics can engage in research and development activities, contributing to innovations in technology and electronics. Automation and Control Systems: Digital electronics skills are crucial in designing and implementing automation and control systems used in industries such as manufacturing, energy, and transportation. Data Analysis and Signal Processing: Understanding digital signals is essential for students interested in data analysis and signal processing, which are applicable in various fields, including telecommunications, medical imaging and audio processing. Cyber security: In the field of cyber security, knowledge of digital electronics is valuable for understanding and protecting digital systems from potential threats and vulnerabilities. Overall, a solid foundation in digital electronics enhances a student's versatility and opens doors to a wide range of career opportunities in technology-related fields.
	CC 2 (Th/P) – Programming Fundamentals using C	C programming language is a machine-independent programming language that is mainly used to create many types of applications and operating systems such as Windows, and other complicated programs such as the Oracle database, Git, Python interpreter, and games and is considered a programming foundation in the process of learning any other programming language. Operating systems and diverse application software for computer architectures ranging from supercomputers to PLCs and embedded systems are examples of such applications. It is a powerful programming language that offers several benefits over other languages. C is a universal language that can be used for various applications.

II	CC 3 (Th/P) – Data Structure	Data structure has crucial role in designing small program to big software application by leveraging the systematic way of organizing and manipulating data that helps in improving software performance, cost effectiveness w.r.t. design and thus have a greater impact across any study that requires programming or in any Industrial software.
	CC 4 (Th/P) – Basic Electronic Devices and Circuits	Basics of modern electronics and fundamentals of electrical networks which are under this course helps to understand the internals of the Modern computer and communication system.
III	CC5 (Th/P) – Computer Organisation and Architecture	On completion of this course students will be able to understand the basics of Computer Organisation, concept of programs as sequences and operations on computers, different ways of communication with I/O devices and standard I/O interfaces, basics of Memory Systems and Cache memories, design mechanism of Arithmetic and Logical operations with integer operands and fundamentals of basic processing units.
	CC6 (Th/P) – Computational Mathematics	Students are learning here about special mathematical modelling tools known as Discrete Mathematics. In these tools students are learning how to model Combinatorial Problems. Two main Categories are Recurrence Relationship and Graph Theory. A variety of properties of these tools are discussed in this paper.
	CC7 (Th/P) - Operating Systems	Studying OS gives an understanding of how users can interact with hardware for sending instructions to complete their allotted tasks. Operating systems knowledge enhances technical skills, a valuable asset in field of computer science. Students may engage in OS-related projects, contributing to open-source initiatives or developing their own software, showcasing practical skills to potential employers. Proficiency in operating systems can lead to specialization in areas like system administration, cyber security, or software engineering, broadening career options. In summary, a solid foundation in operating systems can significantly contribute to a student's technical competence and can open doors to diverse career opportunities in the ever-evolving Tech. industry.
	SEC A-1 (Th) – Computer Graphics	Learners will be able to transform an image into digital form and perform certain operations on it to obtain enhanced images or extract useful information from the image for analysis. The main objective of computer graphics is to introduce students with fundamental concepts and theory of computer graphics. It presents the important drawing algorithm, polygon fitting, clipping and 2D transformation curves and an introduction to 3D transformation.

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IV	CC8 (Th/P) – Data communication, Networking and Internet Technology.	Knowledge of networking is a demanding area where students can learn and apply their networking knowledge regarding system engineering related work w.r.t. specialized hardware, such as switches, routers, and access points etc. in IT company, Govt. Or non govt. Organization etc. From this course, students gain knowledge in one of the important sector of any business, giving them the specialized job opportunities in present market.
	CC9 (Th/P) - Introduction to Algorithms and its Application	On completion of this course students will be able to 1. Argue the correctness of algorithms, analyse best case, average case and worst case running times of algorithms using asymptotic analysis. 2. Describe the divide and conquer paradigm and explain when an algorithmic design situation calls for it. Derive and solve recurrences describing the performance of divide and conquer algorithms. 3. Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Synthesize greedy algorithms and analyse them. 4. Describe the Dynamic Programming paradigm and explain when an algorithmic design situation calls for it. Synthesize Dynamic Programming algorithms and analyse them. 5. Explain the major graph algorithms and their analyses. 6. Understand the basic concepts of P and NP.
	CC10 (Th/P) - Microprocessor and its Application	Learners will be able to know the internal architecture of an Intel processor along with the instructions used by it. In addition, they can design microcontrollers that can perform different applications adhering to Internet of Things (IoT).
	SEC B- 1 (Th) -Information Security	1. Information security education equips students with essential skills to safeguard sensitive data, fostering a culture of responsible digital citizenship. 2. Students gain a heightened awareness of cyber threats, empowering them to recognize and mitigate risks in both personal and professional settings. 3. Acquiring knowledge in information security enhances students' employability, as organizations prioritize candidates with a strong understanding of data protection. 4. Through practical training, students develop the ability to implement security measures, contributing to a more resilient and secure digital environment. 5. Ultimately, information security education ensures that students play a proactive role in defending against cyber threats, promoting a safer and more secure online landscape.
V	CC11 (Th/P) – Database Management System	Ability to define a problem at the view level & ability to understand the physical structure of the database to handle data. Students would be able to implement the logic by using tools like ERD. Ability to normalize the

		database & understand the internal data structure. Students would clearly understand the transaction system & could extract data efficiently
	CC12 (Th/P) –Object Oriented Programming	Students will be able to understand how to create basic computer programs using the Java programming language, how to use Java to build practical things, from simple programs to interactive applications. They will be able to discover how to make programs talk to databases, a crucial skill in creating applications that store and retrieve information. They will be able to explore creating websites using Java, making them dynamic and engaging. They will get familiar with tools that developers commonly use to make their work easier. They will learn how to test a code to make sure it works as intended and catch mistakes early on. They will develop skills to find and fix errors in their code and troubleshoot common issues also will learn the basics of collaborating with others on coding projects, including code reviews and working together effectively. They will develop the skill of creating clear and understandable documentation for their code and projects and gain insights into what employers are looking for, and be prepared for job interviews and their future career in the tech industry. They will learn how to optimize their code for better performance and follow industry best practices. Students will apply their skills to real-world projects that mimic what you might encounter in a job setting. They will improve their ability to explain their code and ideas clearly, both in writing and verbally. Students will learn the basics of project management and time management, important for meeting deadlines.
	DSE A1 (Th/P) –Digital Image Processing	Learners will be able to transform an image into digital form and perform certain operations on it to obtain enhanced images or extract useful information from the image for analysis. The main objective of computer graphics is to introduce students with fundamental concepts and theory of computer graphics. It presents the important drawing algorithm, polygon fitting, clipping and 2D transformation curves and an introduction to 3D transformation.

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	DSE B2 (Th/P) – Programming using python	Students will understand how to write computer programs using Python. They will be able to build simple and useful programs for everyday tasks using Python. They will explore how Python can be used to work with data, making it easier to analyze and understand information. They will discover how Python can help you automate repetitive tasks, saving time and effort, Learn the basics of creating simple websites with Python, an essential skill in the digital world, get familiar with tools that many programmers use, like Git, to keep track of changes in your code, develop the skill of testing your programs to catch mistakes early and make sure they work correctly. They will understand how to collaborate with others on coding projects, sharing and reviewing code together, dive into the basics of data science with Python, learning how to analyze and visualize data. Students will learn habits that make your code clean and easy to understand, following what's considered good practice in the industry, Learn the basics of writing code that is secure and protects against potential problems, develop the skill of explaining your code clearly, both in writing and when talking to others. Students will gain insights into what employers look for and be prepared for job interviews and future work

		using Python. They will learn techniques to make your Python code run faster and more efficiently. They will Improve their ability to discuss their code and ideas with others in a way that's easy to understand. Students will learn the basics of managing their time effectively, which is important for meeting deadlines and getting work done.
VI	CC13 (Th/P) – Software Engineering	Apply the process to be followed in the software development life-cycle models. Implement communication, modelling, construction & deployment practices in software development. Analyze & design the software models using unified modelling language (UML). Explain the concepts of various software testing methods & be able to apply appropriate testing approaches for development of software. Explain the quality management & different types of metrics used in software development. Apply the concepts of project management & planning.
	CC14 (Th/P) - Theory of Computation	Students are learning here the Mathematical Theory of what is Computing. They are learning here how designing a TURING MACHINE to simulate an algorithm and how to represent a given problem in a language specific to the problem specific TM. Also they are learning here some simpler Computing models.
	DSE A4 (Th/P) – Multimedia and its Application	To introduce various aspects of multimedia components like Images, audio, sound and computer graphics. Provides hands-on training in the use of Image Editing tools with software. motivate them towards developing their career in the area of multimedia and internet applications.
	DSE B 3 (Th/P) – Introduction to Computational Intelligence	Computational Intelligence course in the under graduate level is the foundation course of the Artificial intelligence, modern AI, which is most promising topic for present and future human society. This includes hard algorithmic AI as well as the modern machine learning based AI.

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NEP based B.Sc. Course
DEPARTMENT OF COMPUTER SCIENCE
Major Courses

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	DSC/CC 1 (Th/P) – Digital Logic	Digital electronics skills can significantly benefit students in their career paths. Proficiency in digital electronics can lead to opportunities in various fields like Electronics Engineering, Computer Science and Software Development, Embedded Systems, Networking and Communication Robotics: Digital electronics is fundamental to robotics. Students with expertise in this area can contribute to the design and programming of robotic systems used in manufacturing, healthcare, and exploration. IoT (Internet of Things): With the growing prevalence of IoT devices, understanding digital electronics is valuable for creating and maintaining interconnected smart devices. Research and Development: Students with a strong background in digital electronics can engage in research and development activities, contributing to innovations in technology and electronics. Automation and Control Systems: Digital electronics skills are crucial in designing and implementing automation and control systems used in industries such as manufacturing, energy, and transportation. Data Analysis and Signal Processing: Understanding digital signals is essential for students interested in data analysis and signal processing, which are applicable in various fields, including telecommunications, medical imaging and audio processing. Cyber security: In the field of cyber security, knowledge of digital electronics is valuable for understanding and protecting digital systems from potential threats and vulnerabilities. Overall, a solid foundation in digital electronics enhances a student's versatility and opens doors to a wide range of career opportunities in technology-related fields.
	SEC-1 (Th/P) – Data visualization using spreadsheet	Use spreadsheet software to manage financial data. Work with formulas and functions. Develop professional-looking worksheets. Create charts and graphs. Create and use spreadsheet lists (basic database management). Use spreadsheet's editing and web tools. Develop a spreadsheet application. Use data tables and scenario managers. Use spreadsheet's solver for complex problems. Import data into the spreadsheet from other programs.
	DSC/CC 2 (Th/P) – Problem Solving using C	Next Semester

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II	SEC-2 (Th/P) – Web Development	Next Semester

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DEPARTMENT OF COMPUTER SCIENCE

MASTER DEGREE (M.Sc.)

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CSMC101 (Th) – Mathematics for Computing	In this Paper students are learning about advanced Mathematical tools to model Combinatorial Problems such as Recurrence Relationship Graph Theory etc. Also students are learning Graduate Courses on Linear Algebra. Some methods from Probability Modelling are also taught here.
	CSMC102 (Th) – Data Structures and Algorithm	To understand a few advanced data structures, different algorithm paradigms, complexity class of different problems. To Apply the appropriate data structures in different problems, to apply the algorithm design paradigm for different problems, different techniques to handle NP-Completeness.
	CSMC103 (Th) – Advanced Computer Architecture	On completion of this course students will be able to understand the basics of Computer Organisation, concept of programs as sequences and operations on computers, different ways of communication with I/O devices and standard I/O interfaces, basics of Memory Systems and Cache memories, design mechanism of Arithmetic and Logical operations with integer operands and fundamentals of basic processing units. Students may pursue higher studies and can go for different industry job after pursuing this course.
	CSMC104 (Th) – Object Oriented Analysis and Design	Object Oriented (OOPS) typed languages like C++, JAVA; Python etc. are very popular in IT industry. This course provides scope of learning, understanding different popular OOPS based software designs that the students can use in implementing quality software in industry. This helps in 1. Code reusability 2. Scalability 3. Improved performance 4. Reliable solutions 5. Maintainability etc. w.r.t. any software team/project of which they will be a part in their professional life.

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II	CSMC201 (Th) – Advanced Database Management System	In this Paper students are learning how to design a centralized as also as distributed DBMS. Various features of these tow sorts of DBMS are also taught such as Query Processing and Optimization , Transaction System and concurrency control, Recovery management etc.
	CSMC202 (Th) – Advanced Operating System	Along with the knowledge of basics of Operating System and its functions, students gain the knowledge over how an operating system virtualises CPU and memory over distributed structure than only centralized system. They study the designs of various scheduling and swapping policies. And also come to know about Efficiency, Hardware abstraction, Convenience, and System resource management in distributed system.
	CSMC203 (Th) – Automata & Compiler Design	Students are learning here the Mathematical Theory of what is Computing. They are learning here how designing a TURING MACHINE to simulate an algorithm and how to represent a given problem in a language specific to the problem specific TM. Also they are learning here some simpler Computing models. In Compiler design part Students are learning about how to design a Compiler. Language models from Automata Part are used here.
	CSMC204 (Th) – Cryptography & Network Security	Cryptography & Network Security analyze data encryption standard. Analyze and evaluate the cyber security needs of an organization. Conduct a cyber security risk assessment. Measure the performance and troubleshoot cyber security systems. Implement cyber security solutions.
III	CSME301 (Th)- Image Processing and Pattern Recognition	Image processing is a field that focuses on the manipulation, analysis, and interpretation of digital images using computer algorithms. This is a versatile field with numerous applications that range from improving image quality to enabling advanced automation and analysis in various domains. Its benefits include enhancing image quality, automating tasks, and extracting valuable information for decision-making and research.
	CSME302 (Th)- CBCS-I From Other Department	NA
	CSME303 (Th)- CBCS-II From Other Department	NA
	CSMC304(Th) - Artificial Intelligence (AI)	One of the central aims of Artificial Intelligence paper is to develop systems that can analyze large datasets, identify patterns, and make data-driven decisions. This ability to solve problems and make decisions efficiently is invaluable across various industries, from healthcare and finance to transportation and manufacturing. It also identifies problems where artificial intelligence techniques are applicable. Apply selected basic AI techniques; judge applicability of more advanced techniques. Participate in the design of

		systems that act intelligently and learn from experience.
	CSMP306 (P)- SEMINAR	Describe the specific knowledge, skill, or expertise that a learner may comfortably demonstrate after a course, program, training session, or seminar.
IV	CSMG 401 (G) Elective I Introduction to Data Science	Students will become proficient in the statistical analysis of data and the use of computation tools for data analysis. Students learn to apply different statistical and computational tools to many applied problems, and clearly communicate the results in both written reports and oral presentations. This also helps in their seminar paper in M.Sc. course.
	CSMG 402 (G) Elective II Network and Cyber Security	Analyze and evaluate the cyber security needs of an organization. Conduct a cyber security risk assessment. Measure the performance and troubleshoot cyber security systems. Implement cyber security solutions.
	CSMG 403 (G) Project	From this course, a student learns to apply the knowledge gained from previous courses both from B.Sc. and M.sc. They work in individual or in team for completion of a task and thus gain knowledge out of it. In this paper, they submit their report and also present their work as power point presentation in front of Internal and External examiners. This helps them in improvement of their presentation skills.
	CSMG 404 (G) General Viva Voce	At end semester of M.Sc. course, students face the grand viva paper in front of several Internal and External evaluaters, This paper tests their basic knowledge over the subject since undergraduate times and also evaluate their analytical abilities in the most efficient way.

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DEPARTMENT OF ECONOMICS

UNDERGRADUATE (BSc) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
1	CC1 : INTRODUCTORY MICROECONOMICS	FORMING A BASIC IDEA OF THE SUBJECT MATTER OF ECONOMICS ALONG WITH INTRODUCTORY CONCEPTS OF MICROECONOMICS
1	CC2 : MATHEMATICAL METHODS FOR ECONOMICS-I	ACQUIRING THE KNOWLEDGE OF BASIC MATHEMATICAL TOOLS NECESSARY TO STUDY ECONOMICS.
2	CC3: INTRODUCTORY MACROECONOMICS	ACQUIRING KNOWLEDGE ABOUT MACROECONOMICS AND ITS FUNDAMENTAL CONCEPTS
2	CC4: MATHEMATICAL METHODS FOR ECONOMICS-II	UNDERSTANDING HOW TO SPECIFY AN ECONOMIC PROBLEM MATHEMATICALLY AND USE THE APPROPRIATE MATHEMATICAL TOOLS TO SOLVE THOSE PROBLEMS
3	CC5:INTERMEDIATE MICROECONOMICS I	ACQUIRING THE KNOWLEDGE HOW INDIVIDUALS TAKE DECISIONS UNDER UNCERTAINTY AND HOW PERFECTYLY COMPETITIVE OUTPUT AND INPUT MARKET OPERATE
3	CC6:INTERMEDIATE MACROECONOMICS I	UNDERSTANDING MACROECONOMIC THEORY IN DEPTH WITH KNOWLEDGE OF MONEY SUPPLY AND INFLATION
3	CC7:STATISTICS FOR ECONOMICS	UNDERSTANDING STATISTICAL METHODS FOR ECONOMICS WITH KNOWLEDGE OF DESCRIPTIVE STATISTICS, ELEMENTARY PROBABILITY THEORY, PROBABILITY DISTRIBUTIONS, SAMPLING AND STATISTICAL INFERENCE
4	CC8: INTERMEDIATE MICROECONOMICS II	ACQUIRING THE KNOWLEDGE HOW IMPERFECTYLY COMPETITIVE OUTPUT AND INPUT MARKET OPERATE AND A BRIEF IDEA OF WELFARE ECONOMICS
4	CC9: INTERMEDIATE MACROECONOMICS II	UNDERSTANDING MACROECONOMIC THEORY IN DEPTH WITH KNOWLEDGE OF RATIONAL EXPECTATIONS, CONSUMPTION, MONEY DEMAND AND GROWTH

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4	CC10:INTRODUCTORY ECONOMETRICS	UNDERSTANDING INTRODUCTORY ECONOMETRICS WITH KNOWLEDGE OF SIMPLE AND MULTIPLE LINEAR REGRESSION MODELS, CLASSICAL LINEAR REGREESION AND ITS VIOLATIONS, STATISTICAL INFERENCES WITH VARIOUS TEST STATISTICS
5	CC11:INTERNATIONAL ECONOMICS	UNDERSTANDING INTERNATIONAL TRADE, PURE THEORY OF TRADE ALONG WITH TRADE POLICIES.BALANCE OF PAYMENT IS ALSO TAUGHT TO GIVE AN OVERVIEW OF HOW THE SYSTEM WORKS
5	CC12:INDIAN ECONOMY	ACQUIRING AN OVERVIEW OF INDIAN ECONOMY WITH FOCUS ON FIVE YEAR PLANS; EDUCATION; HEALTH;POVERTY;INEQUALITY;UNEMPLOYMENT AND REFORMS OF BANKING SECTOR,TAX SETOR AND LABOUR MARKET
6	CC13:PUBLIC ECONOMICS	UNDERSTANDING THE ECONOMICS OF THE PUBLIC SECTOR THROUGH THR REVENUE AND EXPENDITURE MEASURES OF THE PUBLIC BUDGET.
6	CC14:DEVELOPMENT ECONOMICS	AWARE OF RELATED THEORIES OF DEVELOPMENT STRATEGIES, HOW THE DIFFERENT INDICES ARE CALCULATED AND THE DIFFERENT DIMENSIONS OF DEVELOPMENT PATHWAY

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DEPARTMENT OF ELECTRONICS

UNDERGRADUATE BSc. HONOURS PROGRAMME

(COURSE OUTCOME UNDER CBCS)

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
1	CC1 BASIC CIRCUIT THEORY AND NETWORK ANALYSIS	BASIC CIRCUIT CONCEPTS, CIRCUIT ANALYSIS, AC CIRCUIT ANALYSIS, NETWORK THEOREM, TWO PORT NETWORKS, NETWORK GRAPH THEORY
	CC2 MATHEMATICS FOUNDATION FOR ELECTRONICS	ORDINARY DIFFERENTIAL EQUATION, SERIES SOLUTION OF DIFFERENTIAL EQUATIONS AND SPECIAL FUNCTIONS, MATRICES, SEQUENCES AND SERIES, COMPLEX VARIABLES AND FUNCTIONS, LAPLACE TRANSFORM
2	CC3 APPLIED PHYSICS	PHYSICS OF CRYSTALLINE SOLIDS, QUANTAM MECHANICS, MECHANICAL PROPERTIES OF MATERIAL, STATISTICAL MECHANICS, ELECTRIC PROPERTIES, MAGNETIC PROPERTIES
	CC4 C PROGRAMMING AND DATA STRUCTURE	INTRODUCTION, IMPORTANCE OF C LANGUAGE, OVERVIEW ON DIFFERENT OPERATORS, CONCEPT OF ARRAY, DATA STRUCTURE, SEARCHING AND SORTING
3	CC5 SEMICONDUCTOR DEVICE	INTRODUCTION AND OVERVIEW CONCEPTS OF SEMICONDUCTOR MATERIAL, PHENOMENA RELATED TO SEMICONDUCTOR DEVICES, CONCEPTS AND OVERVIEW OF DIODE AND DIFFERENT TYPES OF TRANSISTORS.
	CC6 ELECTRONIC CIRCUITS	CIRCUITS RELATED TO SEMI CONDUCTOR DEVIES, CONCEPTS AND OVERVIEW OF DIFFERENT TYPE OF AMPLIFIERS.
	CC7 ELECTROMAGNETICS	VECTOR ANALYSIS, ELECTROSTATICS, MAGNETOSTATICS, CONCEPTS OF ELECTROMAGNETIC WAVE PROPAGATION.

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	SEC 1-A-1 DESIGN AND FABRICATION OF PRINTED CIRCUIT BOARDS	FUNDAMENTALS OF PCB, SCHEMATIC AND LAYOUT DESIGN, TECHNOLOGY OF PCB
4	CC8 OPERATIONAL AMPLIFIER AND APLICATION	CONCEPT OF AMPLIFIERS, OP AMP PARAMETERS – CIRCUITS AND APMLIFICATION, SIGNAL GENERATOR, TIMER CIRCUITS, IC REGULATORS, SIGNAL CONDITIONING CIRCUITS.
	CC9 DIGITAL ELECTRONICS AND VHDL	NUMBER SYSTEMS AND CODES, LOGIC GATES AND BOOLEAN ALGEBRA, DIGITAL LOGIC FAMILIES, COMBINATIONAL LOGIC ANALYSIS AND DESIGN, SEQUENTIAL LOGIC DESIGN, PROGRAMMABLE LOGIC DEVICES, VHDL PROGRAMMING, DATA TYPES.
	CC10 SIGNALS AND SYSTEMS	INTRODUCTION AND OVERVIEW OF DIFFERENT TYPES OF SYSTEM AND RELATED SYSTEMS, FOURIER SERIES AND TRANSFORM.
	SEC 2-B-2 PROGRAMMING WITH MATLAB /SCILAB	BASICS OF MATALAB, PROGRAMMING WITH MATLAB, MATRICES AND VECTOR.
5	CC11 ELECTRONIC INSTRUMENTATION	BASIC MEASURING INSTRUMENT, WORKING PRINCIPLE OF OSCILLOSCOPE AND SIGNAL GENERATORS, CLASSIFICATION OF TRANDUCERS AND SENSORS.
	CC12 MICROPROCESSOR AND MICROCONTROLLER	INTRODUCTION, CONCEPT AND OVERVIEW OF MICROPROCESSOR (8085) AND MICRO CONTROLLERS, ASSEMBLY LANGUAGE PROGRAMMING USING 8085.
	DSE 1-A-2 CONTROL SYSTEMS	INTRODUCTION OF CONTROL SYSTEMS, TIME DOMAIN ANALYSIS, CONCEPT OF STABILITY, FREQUENCY DOMAIN ANALYSIS, STATE SPACE ANALYSIS, DIFFERENT CONTROLLERS AND COMPENSATION TECHNIQUES.
	DSE 2-B-2 POWER ELECTRONICS	NEED FOR SEMICONDCUTOR POWER DEVICES, SILICON CONTROLLED RECTIFIER, DIAC AND TRIAC, POWER MOSFETS, POWER INVERTERS, CHOPPERS, REGULATORS AND CONVERTERS.

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6	CC13 COMMUNICATION ELECTRONICS	ELECTRONIC COMMUNICATION, DIFFERENT MODULATION TECHNIQUES WITH VIVID IDEAS.
	CC14 PHOTONICS	LIGHT AS ELECTROMAGNETIC WAVES, CONSTRUCTION OF LED, LASERS, CONCEPT OF PHOTODETECTORS, TYPES OF LCD DISPLAYS ALONG WITH WORKING PRINCIPLE, OPTICAL FIBRE.
	DSE 3-A-2 DIGITAL SIGNAL PROCESSING	INTRODUCTION, CONCEPT AND PRINCIPLES OF DISCRETE TIME SYSTEMS, DISCRETE FOURIER TRANSFORM AND DIGITAL FILTERS.
	DSE 4-B-2 TRANSMISSION LINES, ANTENNA AND MICROWAVE DEVICES	INTRODUCTION, CONCEPT AND PRINCIPLES OF TRANSMISSION LINES, ANTENNA FUNDAMENTALS AND PARAMETERS, TYPES OF ANTENNA, PROPAGATION OF RADIO WAVES, QUALITATIVE STUDY OF MICROWAVE DEVICES.

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DEPARTMENT OF **ENGLISH**

UNDERGRADUATE (BA) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1 HISTORY OF LITERATURE AND PHILOLOGY	ACQUIRING AN OVERVIEW OF ENGLISH LITERARY HISTORY INCLUDING SOCIO-HISTORICAL BACKGROUND; HISTORY OF THE ENGLISH LANGUAGE
	CC2 – EUROPEAN CLASSICAL LITERATURE	BRIEF INTRODUCTION TO CLASSICAL EUROPEAN INHERITANCE OF ENGLISH LITERATURE: STUDENTS ARE FAMILIARISED WITH HOMER, HORACE, OVID, SOPHOCLES
II	CC3 INDIAN WRITING IN ENGLISH	ACQUIRING PRELIMINARY KNOWLEDGE OF INDIAN LITERATURE IN ENGLISH (POETRY, NOVEL, DRAMA) – FROM THE BEGINNINGS TO THE TWENTIETH CENTURY
	CC4 – BRITISH POETRY AND DRAMA (14^{TH} – 17^{TH} CENTURY)	INTRODUCING THE POETRY OF CHAUCER, SPENSER, SHAKESPEARE, DONNE, MARVELL TO UNDERSTAND THE DEVELOPMENT OF BRITISH POETRY; SIGNIFICANCE OF THE ELIZABETHAN DRAMATIC TRADITION IN THE CONTEXT OF THE RENAISSANCE
III	CC5 – AMERICAN LITERATURE	ACQUIRING PRELIMINARY KNOWLEDGE OF AMERICAN LITERATURE – POETRY (BOTH WHITE MAINSTREAM AND BLACK), FICTION (NOVEL AND SHORT STORY), AND DRAMA THROUGH SELECTED TEXTS
	CC6 – POPULAR LITERATURE	UNDERSTANDING POPULAR LITERATURE AND ITS COMPLEXITIES THROUGH A SELECTION OF TEXTS INCLUDING COMICS AND NONSENSE RHYMES
	CC7 – BRITISH POETRY AND DRAMA (17^{TH} – 18^{TH} CENTURY)	CONTINUING TO ACQUIRE KNOWLEDGE OF BRITISH LITERATURE THROUGH SELECTIONS FROM RESTORATION AND AUGUSTAN LITERATURE; GAINING KNOWLEDGE OF EPIC AND MOCK-EPIC TRADITIONS IN ENGLISH POETRY

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	SEC A2 BUSINESS COMMUNICATION	MASTERING REPORT WRITING, DRAFTING BUSINESS LETTERS, COMPOSING CV, WRITING MINUTES, AND COMPOSING EMAILS: SKILLS WHICH ARE ABSOLUTELY NECESSARY
IV	CC8 – 18TH CENTURY BRITISH LITERATURE	ACQUIRING FURTHER KNOWLEDGE OF BRITISH LITERATURE OF LATE RESTORATION AND AUGUSTAN TIMES THROUGH SELECTED LANDMARK TEXTS
	CC9 – BRITISH ROMANTIC LITERATURE	GAINING FAMILIARITY WITH ONE OF THE CULT MOVEMENTS OF BRITISH LITERARY HISTORY, THE ROMANTIC REVIVAL, THROUGH SELECTIONS OF POEMS BY THE CANONICAL POETS, THE FAMILIAR ESSAYS OF LAMB, AND THE SEMINAL WORK OF SCIENCE FICTION BY MARY SHELLEY
	CC10 – 19TH CENTURY BRITISH LITERATURE	THROUGH A SELECTION OF SOME MAJOR TEXTS, UNDERSTANDING THE CONTINUITY OF THE IMPULSES OF ROMANTICISM IN VICTORIAN LITERATURE AND ALSO HOW IT FOUND ITS DISTINCTIVE VOICE AND ANTICIPATED THE CONCERNS OF EARLY 20TH CENTURY LITERATURE
	SEC B2 – ACADEMIC WRITING AND COMPOSITION	STUDENTS LEARN THE FORMAL REQUIREMENTS OF ACADEMIC WRITING WHICH GIVES THEM A PRELIMINARY IDEA OF HOW TO COMPOSE SCHOLARLY ARTICLES OR CRITICAL ESSAYS, THE STYLES OF CITATION.
V	CC11 – WOMEN'S WRITING	GENERATING AWARENESS ABOUT WOMEN'S WRITING AS A DISTINCTIVE STREAM WITH ITS OWN COMPLEXITIES AND POLITICS THROUH A SELECTION OF 19TH – 20TH CENTURY TEXTS BY WOMEN WRITERS BELONGING TO DIVERSE CULTURAL CONTEXTS INCLUDING INDIAN; FAMILIARISING THEM WITH REPRESENTATION OF GENDER ISSUES IN WOMEN'S WRITINGS.
	CC12 – EARLY TWENTIETH CENTURY BRITISH LITERATURE	INTRODUCING STUDENTS TO MODERNISM AND THE DISTINCTIVE FEATURES OF LITERATURE IN BRITISH LITERATURE TILL THE FIRST WORLD WAR, INCLUDING IMAGISM AND SYMBOLISM THROUGH SELECTIONS FROM YEATS, ELIOT, OWEN, AND CULT TEXTS BY LAWRENCE, CONRAD, SHAW.
	DSE-A1 – MODERN INDIAN WRITING IN ENGLISH TRANSLATION	STUDENTS ARE INTRODUCED TO THE DIVERSITY OF MODERN INDIAN LITERATURE THROUGH A READING OF SELECTED WRITINGS BY TAGORE, PREMCHAND, ISMAT CHUGTAI, F M SENAPATI, MUKTIBODH, AMRITA PRITAM, VIJAY TENDULKAR IN ENGLISH TRANSLATION

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	DSE-B1 – LITERARY TYPES, RHETORIC AND PROSODY	DETAILED KNOWLEDGE OF MAJOR LITERARY TYPES, RHETORICAL DEVICES (FIGURES OF SPEECH), AND THE DIFFERENT METERS OF ENGLISH POETRY, AND HOW TO SCAN LINES OF VERSE.

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VI	CC13 – MODERN EUROPEAN DRAMA	STUDENTS GAIN ACQUAINTANCE WITH THE EUROPEAN DRAMATIC TRADITION (REALISTIC, ABSURD) THROUGH SEMINAL WORKS OF IBSEN, BRECHT, BECKETT.
	CC14 – POSTCOLONIAL LITERATURES	STUDENTS ARE INTRODUCED WITH POSTCOLONIALISM WHICH IS ONE OF THE MOST IMPORTANT AREAS OF LITERARY STUDIES THROUGH SELECTED WORKS OF SOME VERY POWERFUL AUTHORS FROM ERSTWHILE COLONIES OF BRITAIN AND OTHER IMPERIAL POWERS.
	DSE-A3 – PARTITION LITERATURE	FAMILIARISING STUDENTS WITH LITERATURE OF THE STRIFE-TORN YEARS OF THE PARTITION, AND ITS RESONANCES IN SUBSEQUENT INDIAN LITERATURE.
	DSE-B3 – AUTOBIOGRAPHY	STUDENTS ARE INTRODUCED TO A SPECIAL KIND OF WRITING, THAT OF THE LIFE NARRATIVE OR AUTOBIOGRAPHY THROUGH SELECTIONS FROM TAGORE, GANDHI, NIRAD CHAUDHURI, BINODINI DASI.

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DEPARTMENT OF ENVIRONMNETAL SCIENCE

UNDERGRADUATE (BSc.) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1- EARTH AND EARTH SURFACE PROCESSES	STUDENTS GAIN A COMPREHENSIVE UNDERSTANDING OF EARTH AS A SYSTEM, INCLUDING ITS GEOSPHERE, HYDROSPHERE, ATMOSPHERE, AND BIOSPHERE. THIS INVOLVES LEARNING ABOUT THE INTERCONNECTED PROCESSES THAT SHAPE THE EARTH'S SURFACE. STUDENT GET SOLID UNDERSTANDING OF VARIOUS SURFACE PROCESSES SUCH AS WEATHERING, EROSION, DEPOSITION, SEDIMENTATION, AND THE IMPACT OF NATURAL FORCES LIKE WIND, WATER, AND ICE.
	CC2 – PHYSICS & CHEMISTRY OF ENVIRONMENT	THIS PAPER EQUIP STUDENTS WITH A COMPREHENSIVE UNDERSTANDING OF THE FUNDAMENTAL PRINCIPLES OF PHYSICS AND CHEMISTRY AS THEY RELATE TO THE ENVIRONMENT. STUDENTS WILL EXPLORE THE INTERCONNECTIONS BETWEEN DIFFERENT ENVIRONMENTAL SYSTEMS, ANALYZE CHEMICAL PROCESSES IN AIR, WATER, AND SOIL, INVESTIGATE THE IMPACT OF HUMAN ACTIVITIES ON THE ENVIRONMENT, AND DEVELOP PRACTICAL SKILLS IN ENVIRONMENTAL MONITORING AND ANALYSIS. THE COURSE EMPHASIZES CRITICAL THINKING, ETHICAL CONSIDERATIONS, AND EFFECTIVE COMMUNICATION OF SCIENTIFIC FINDINGS RELATED TO ENVIRONMENTAL PHYSICS AND CHEMISTRY.
II	CC3 - WATER AND WATER RESOURCES MANAGEMENT	THIS PAPER SEEKS TO PROVIDE STUDENTS WITH A DEEP UNDERSTANDING OF WATER SYSTEMS, EMPHASIZING PRINCIPLES OF HYDROLOGY, WATER QUALITY, AND SUSTAINABLE MANAGEMENT PRACTICES. STUDENTS WILL LEARN TO ASSESS AND ADDRESS WATER-RELATED CHALLENGES, INCLUDING RESOURCE ALLOCATION, POLLUTION CONTROL, AND CONSERVATION. THE COURSE AIMS TO DEVELOP PRACTICAL SKILLS FOR EFFECTIVE WATER RESOURCE MANAGEMENT, CONSIDERING ENVIRONMENTAL, SOCIAL, AND ECONOMIC FACTORS.
	CC4 –LAND MANAGEMENT AND SOIL CONSERVATION	THE PAPER IS DESIGNED TO IMPART KNOWLEDGE AND SKILLS FOR SUSTAINABLE LAND USE. STUDENTS WILL LEARN PRINCIPLES OF SOIL SCIENCE, EROSION CONTROL, AND CONSERVATION PRACTICES. THE COURSE AIMS TO DEVELOP AN UNDERSTANDING OF LAND MANAGEMENT STRATEGIES, INCLUDING WATERSHED MANAGEMENT AND SUSTAINABLE AGRICULTURAL PRACTICES, FOSTERING AN ABILITY TO ADDRESS SOIL DEGRADATION

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		CHALLENGES AND PROMOTE ENVIRONMENTALLY SOUND LAND USE PRACTICES.
III	CC5 – ECOLOGY AND ECOSYSTEMS	THIS PAPER AIMS TO PROVIDE STUDENTS WITH A FOUNDATIONAL UNDERSTANDING OF ECOLOGICAL PRINCIPLES AND THE DYNAMICS OF ECOSYSTEMS. STUDENTS WILL LEARN ABOUT BIODIVERSITY, ENERGY FLOW, NUTRIENT CYCLING, AND THE INTERRELATIONSHIPS BETWEEN ORGANISMS AND THEIR ENVIRONMENT. THE COURSE EMPHASIZES ECOLOGICAL SUSTAINABILITY, BIODIVERSITY CONSERVATION, AND THE APPLICATION OF ECOLOGICAL PRINCIPLES TO ADDRESS ENVIRONMENTAL CHALLENGES. STUDENTS WILL DEVELOP ANALYTICAL AND CRITICAL THINKING SKILLS FOR ASSESSING AND MANAGING ECOSYSTEMS IN THE CONTEXT OF GLOBAL ENVIRONMENTAL ISSUES.
	CC6 – ENVIRONMENTAL BIOTECHNOLOGY	THE PAPER FOCUSES ON APPLYING BIOTECHNOLOGICAL PRINCIPLES TO ADDRESS ENVIRONMENTAL CHALLENGES.STUDENTS WILL LEARN TECHNIQUES FOR WASTE TREATMENT, POLLUTION CONTROL, AND ENVIRONMENTAL MONITORING USING BIOLOGICAL PROCESSES. THE COURSE AIMS TO DEVELOP SKILLS IN THE DESIGN AND IMPLEMENTATION OF BIOTECHNOLOGICAL SOLUTIONS FOR SUSTAINABLE ENVIRONMENTAL MANAGEMENT. STUDENTS WILL GAIN AN UNDERSTANDING OF THE ROLE OF MICROORGANISMS IN ENVIRONMENTAL PROCESSES AND THE POTENTIAL OF BIOTECHNOLOGY TO CONTRIBUTE TO ECOLOGICAL SUSTAINABILITY AND BIODIVERSITY CONSERVATION.
	CC7 – ATMOSPHERE & GLOBAL CLIMATE CHANGE	THE PAPER AIMS TO PROVIDE STUDENTS WITH A COMPREHENSIVE UNDERSTANDING OF EARTH'S ATMOSPHERE AND THE MECHANISMS DRIVING CLIMATE CHANGE. STUDENTS WILL EXPLORE ATMOSPHERIC PROCESSES, GREENHOUSE GAS DYNAMICS, AND THE IMPACT OF HUMAN ACTIVITIES ON GLOBAL CLIMATE. THE COURSE EMPHASIZES THE SCIENTIFIC BASIS FOR CLIMATE CHANGE, MITIGATION STRATEGIES, AND THE ROLE OF ATMOSPHERIC SCIENCE IN ADDRESSING CONTEMPORARY ENVIRONMENTAL CHALLENGES. STUDENTS WILL DEVELOP ANALYTICAL SKILLS TO ASSESS THE IMPLICATIONS OF CLIMATE CHANGE AND CONTRIBUTE TO INFORMED DECISION-MAKING FOR A SUSTAINABLE FUTURE.
	SEC A2-WILDLIFE MANAGEMENT	THIS PAPER FOCUSES ON THE KNOWLEDGE AND SKILLS NECESSARY FOR THE SUSTAINABLE CONSERVATION AND UTILIZATION OF WILDLIFE. STUDENTS WILL LEARN PRINCIPLES OF ECOLOGY, HABITAT MANAGEMENT, AND CONSERVATION STRATEGIES, AIMING TO BALANCE THE NEEDS OF WILDLIFE

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		POPULATIONS WITH HUMAN ACTIVITIES. THE COURSE EMPHASIZES WILDLIFE CONSERVATION, BIODIVERSITY MONITORING, AND ETHICAL CONSIDERATIONS IN MANAGING NATURAL HABITATS. STUDENTS WILL DEVELOP PRACTICAL SKILLS FOR ASSESSING AND IMPLEMENTING WILDLIFE MANAGEMENT PLANS TO PROMOTE ECOLOGICAL BALANCE AND PRESERVE BIODIVERSITY.
IV	CC8-SYSTEMATICS & BIOGEOGRAPHY	THIS PAPER IMPARTS STUDENTS WITH A DEEP UNDERSTANDING OF THE CLASSIFICATION OF ORGANISMS AND THEIR DISTRIBUTION ACROSS GEOGRAPHICAL REGIONS. STUDENTS WILL LEARN SYSTEMATIC METHODS FOR TAXONOMY AND PHYLOGENETICS, EXPLORING THE EVOLUTIONARY RELATIONSHIPS AMONG SPECIES. THE COURSE EMPHASIZES BIOGEOGRAPHICAL PATTERNS, EXAMINING HOW HISTORICAL AND ECOLOGICAL FACTORS INFLUENCE THE DISTRIBUTION OF ORGANISMS. STUDENTS WILL DEVELOP SKILLS IN SPECIES IDENTIFICATION, PHYLOGENETIC ANALYSIS, AND GAIN INSIGHTS INTO THE ECOLOGICAL AND HISTORICAL PROCESSES SHAPING BIODIVERSITY ACROSS DIFFERENT REGIONS.
	CC9-URBAN ECOSYSTEMS	THE PAPER FOCUSES ON PROVIDING STUDENTS WITH AN UNDERSTANDING OF THE ECOLOGICAL DYNAMICS WITHIN URBAN ENVIRONMENTS. STUDENTS WILL EXPLORE THE INTERACTIONS BETWEEN HUMAN ACTIVITIES, INFRASTRUCTURE, AND THE NATURAL ENVIRONMENT IN URBAN SETTINGS. THE COURSE AIMS TO DEVELOP INSIGHTS INTO THE CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE URBAN DEVELOPMENT, INCLUDING ISSUES RELATED TO BIODIVERSITY, GREEN SPACES, AND THE IMPACT OF URBANIZATION ON ECOSYSTEMS. STUDENTS WILL GAIN PRACTICAL SKILLS FOR ASSESSING AND PROMOTING ECOLOGICAL RESILIENCE IN URBAN LANDSCAPES.
	CC 10-ENVIRONMENTAL LEGISLATION & POLICY	THIS PAPER PROVIDES COMPREHENSIVE UNDERSTANDING OF ENVIRONMENTAL LAWS AND POLICIES. STUDENTS WILL STUDY THE LEGAL FRAMEWORKS GOVERNING ENVIRONMENTAL PROTECTION, RESOURCE MANAGEMENT, AND SUSTAINABLE DEVELOPMENT. THE COURSE EMPHASIZES THE ANALYSIS OF ENVIRONMENTAL POLICIES, THEIR IMPLEMENTATION, AND THE ROLE OF REGULATORY MECHANISMS. STUDENTS WILL DEVELOP SKILLS TO CRITICALLY EVALUATE AND CONTRIBUTE TO THE DEVELOPMENT OF EFFECTIVE ENVIRONMENTAL POLICIES AND COMPLY WITH LEGAL FRAMEWORKS FOR ENVIRONMENTAL STEWARDSHIP.
	SEC B1-ENVIRONMENT IMPACT & RISK ASSESSMENT	THIS PAPER AIMS TO PROVIDE STUDENTS WITH THE KNOWLEDGE AND SKILLS TO ASSESS AND MANAGE POTENTIAL ENVIRONMENTAL IMPACTS OF HUMAN ACTIVITIES. STUDENTS WILL LEARN METHODOLOGIES FOR IDENTIFYING, EVALUATING, AND MITIGATING ENVIRONMENTAL RISKS. THE COURSE

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		EMPHASIZES THE APPLICATION OF RISK ASSESSMENT TOOLS, ENVIRONMENTAL IMPACT STATEMENTS, AND REGULATORY COMPLIANCE. STUDENTS WILL DEVELOP PRACTICAL SKILLS TO ANALYZE AND COMMUNICATE ENVIRONMENTAL RISKS, CONTRIBUTING TO INFORMED DECISION-MAKING FOR SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PROTECTION.
V	CC 11-BIODIVERSITY & CONSERVATION BIOLOGY	THIS PAPER AIMS TO EQUIP STUDENTS WITH A DEEP UNDERSTANDING OF BIODIVERSITY'S IMPORTANCE AND THE PRINCIPLES AND METHODS OF CONSERVATION. STUDENTS WILL LEARN TO ASSESS AND ADDRESS THREATS TO BIODIVERSITY, DEVELOP CONSERVATION PLANS, AND EXPLORE SUSTAINABLE MANAGEMENT PRACTICES. THE COURSE EMPHASIZES PRACTICAL SKILLS IN BIODIVERSITY MONITORING, CONSERVATION PLANNING, AND PROMOTING ECOLOGICAL RESILIENCE. STUDENTS WILL BE PREPARED TO CONTRIBUTE TO GLOBAL EFFORTS IN PRESERVING AND MANAGING BIOLOGICAL DIVERSITY FOR A SUSTAINABLE FUTURE
	CC 12-ORGANISMAL & EVOLUTIONARY BIOLOGY	PROVIDES STUDENTS WITH A PROFOUND UNDERSTANDING OF THE DIVERSITY OF LIFE AT BOTH THE ORGANISMAL AND EVOLUTIONARY LEVELS. STUDENTS WILL LEARN ABOUT THE FORM, FUNCTION, AND ADAPTATIONS OF ORGANISMS, AS WELL AS THE MECHANISMS AND PATTERNS OF EVOLUTION. THE COURSE EMPHASIZES CRITICAL THINKING, OBSERVATIONAL SKILLS, AND THE APPLICATION OF EVOLUTIONARY PRINCIPLES TO UNDERSTAND THE COMPLEXITIES OF LIFE ON EARTH. STUDENTS WILL BE EQUIPPED TO ANALYZE AND APPRECIATE THE INTERCONNECTEDNESS OF ORGANISMS AND THEIR EVOLUTIONARY HISTORIES.
	DSE A1-ENERGY & ENVIRONMENT	THIS PAPER PROVIDES COMPREHENSIVE UNDERSTANDING OF THE INTERPLAY BETWEEN ENERGY PRODUCTION AND ITS ENVIRONMENTAL IMPLICATIONS. STUDENTS WILL LEARN ABOUT VARIOUS ENERGY SOURCES, THEIR ENVIRONMENTAL IMPACTS, AND SUSTAINABLE ENERGY SOLUTIONS. THE COURSE EMPHASIZES THE EVALUATION OF ENVIRONMENTAL CONSEQUENCES, REGULATORY FRAMEWORKS, AND THE DEVELOPMENT OF STRATEGIES FOR A MORE SUSTAINABLE AND ENVIRONMENTALLY RESPONSIBLE ENERGY FUTURE. STUDENTS WILL GAIN PRACTICAL SKILLS IN ASSESSING AND ADDRESSING ENVIRONMENTAL CHALLENGES ASSOCIATED WITH ENERGY PRODUCTION AND CONSUMPTION.
	DSE B2-SOLID WASTE MANAGEMENT	PROVIDE STUDENTS WITH THE KNOWLEDGE AND SKILLS TO EFFECTIVELY MANAGE SOLID WASTE. STUDENTS WILL LEARN ABOUT WASTE GENERATION, COLLECTION, DISPOSAL METHODS, AND RECYCLING STRATEGIES. THE COURSE EMPHASIZES SUSTAINABLE WASTE MANAGEMENT PRACTICES, WASTE

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		REDUCTION, AND THE ENVIRONMENTAL, SOCIAL, AND ECONOMIC IMPACTS OF SOLID WASTE. STUDENTS WILL BE PREPARED TO ANALYZE, PLAN, AND IMPLEMENT WASTE MANAGEMENT SYSTEMS THAT CONTRIBUTE TO ENVIRONMENTAL CONSERVATION AND COMMUNITY WELL-BEING.
VI	CC 13- ENVIRONMENTAL POLLUTION AND HUMAN HEALTH	THIS PAPER FOCUSES ON UNDERSTANDING THE LINKAGES BETWEEN ENVIRONMENTAL POLLUTION AND HUMAN HEALTH. STUDENTS WILL EXPLORE THE IMPACT OF POLLUTANTS ON AIR, WATER, AND SOIL ON HUMAN WELL-BEING. THE COURSE AIMS TO DEVELOP SKILLS IN ASSESSING AND MITIGATING HEALTH RISKS ASSOCIATED WITH ENVIRONMENTAL POLLUTION. STUDENTS WILL BE PREPARED TO CONTRIBUTE TO STRATEGIES THAT PROMOTE A HEALTHIER ENVIRONMENT AND SAFEGUARD PUBLIC HEALTH.
	CC 14- NATURAL RESOURCES MANAGEMENT & SUSTAINABILITY	THE PAPER AIMS TO EQUIP STUDENTS WITH KNOWLEDGE AND SKILLS TO SUSTAINABLY MANAGE NATURAL RESOURCES. STUDENTS WILL LEARN PRINCIPLES OF RESOURCE CONSERVATION, ECOSYSTEM MANAGEMENT, AND SUSTAINABLE UTILIZATION. THE COURSE EMPHASIZES PRACTICAL STRATEGIES FOR BALANCING HUMAN NEEDS WITH ENVIRONMENTAL PRESERVATION. GRADUATES WILL BE PREPARED TO CONTRIBUTE TO SUSTAINABLE DEVELOPMENT, CONSIDERING THE ECOLOGICAL, SOCIAL, AND ECONOMIC DIMENSIONS OF NATURAL RESOURCE MANAGEMENT.
	DSE B1- NATURAL HAZARDS & DISASTER MANAGEMENT	PROVIDE STUDENTS WITH A COMPREHENSIVE UNDERSTANDING OF NATURAL HAZARDS AND THEIR IMPACT ON COMMUNITIES. STUDENTS WILL LEARN RISK ASSESSMENT, DISASTER PREPAREDNESS, AND MITIGATION STRATEGIES. THE COURSE EMPHASIZES THE APPLICATION OF SCIENTIFIC PRINCIPLES TO MANAGE NATURAL DISASTERS EFFECTIVELY, INCLUDING RESPONSE COORDINATION AND COMMUNITY RESILIENCE. STUDENTS WILL BE EQUIPPED TO CONTRIBUTE TO DISASTER MANAGEMENT EFFORTS, REDUCING THE IMPACT OF NATURAL HAZARDS ON HUMAN LIVES AND INFRASTRUCTURE.
	DSE A3- GREEN TECHNOLOGIES	THIS PAPER FOCUSES ON PROVIDING STUDENTS WITH KNOWLEDGE AND SKILLS RELATED TO SUSTAINABLE AND SUSTAINABLE TECHNOLOGIES. STUDENTS WILL LEARN ABOUT RENEWABLE ENERGY, ECO-FRIENDLY MATERIALS, WASTE REDUCTION METHODS, AND RESOURCE-EFFICIENT PRACTICES. THE COURSE AIMS TO DEVELOP THE ABILITY TO DESIGN, IMPLEMENT, AND ASSESS TECHNOLOGIES THAT CONTRIBUTE TO ENVIRONMENTAL CONSERVATION AND PROMOTE A MORE SUSTAINABLE FUTURE. STUDENTS WILL BE PREPARED TO ENGAGE IN THE DEVELOPMENT AND APPLICATION OF INNOVATIVE TECHNOLOGIES ALIGNED WITH ECOLOGICAL PRINCIPLES.

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DEPARTMENT OF GEOGRAPHY UNDERGRATUATE(B.Sc) HONOURS

PROGRAMME COURSE OUTCOME UNDER CBCS

SEM	PAPER	COURSE NAME AND DESCRIPTION	OUTCOME
1	CC 1	GEOTECHTONICS AND GEOMORPHOLOGY	Understanding the actual configuration of the earth surface as well as the effects of different geomorphic agents on landform Development
	CC 2	CARTOGRAPHIC TECHNIQUES	Acquiring in depth knowledge of surveying and levelling using different traditional and modern surveying instruments.
2	CC 3	HUMAN GEOGRAPHY	Major outcome of this course is to clear the nature and principles of human geography and know the man environment relationship with adaptative quality of different tribal groups of the world.
	CC 4	THEMATIC MAPPING AND SURVEYING	Gather some information on thematic mapping and use of different surveying instruments.

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3	**CC 5**	**CLIMATOLOGY**	Understanding the elements of atmosphere as well as to obtain the information on atmospheric phenomena including different hazards and disasters.
	CC 6	**HYDROLOGY AND OCEANOGRAPHY**	To clear concept of drainage basin with hydro morphological attributes and groundwater storage and major relief features of the ocean floor and sea level changes.
	CC 7	**STATISTICAL METHODS IN GEOGRAPHY**	Importance of statistical techniques and application of statistical techniques in geographical research.
	SEC A	**COASTAL MANAGEMENT**	Understanding the nature of coastal morpho dynamics and coastal hazards and their management using structural and non-structural measures.
4	**CC 8**	**ECONOMIC GEOGRAPHY**	Obtain basic nature of economic activities and international trading system with reference to major international economic blocks.

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	CC 9	**REGIONAL PLANNING AND DEVELOPMENT**	Acquiring preliminary knowledge of regional planning and development and brief introduction of different economic and regional models and theories on regional development.
	CC 10	**SOIL AND BIOGEOGRAPHY**	Understanding the concept of soil and bio geography with reference to biome and ecosystem and knowing the biogeochemical cycle with an idea of deforestation and bio diversity.
	SEC B	**RURAL DEVELOPMENT**	Gathering detail information on rural development and implication of different rural planning and programme for the benefit of rural people of India.
5	**CC 11**	**RESEARCH METHODOLOGY AND FIELDWORK**	Acquiring the importance of research methodology and implementation of research techniques in the geographical field studies.
	CC 12	**REMOTE SENSING, GIS AND GNSS**	Understanding the basic concept of remote sensing, geographical information system and global navigation satellite system with their practical knowledge using software and global positioning system.

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	DSE A	**CLIMATE CHANGE: VULNERABILITY AND ADAPTATIONS**	Obtaining the knowledge on climate change and its vulnerability and adaptations with impact of climate change on different different environmental condition and gather some basic concept of different protocol and mechanism as climate change mitigation strategy.
	DSE B	**CULTURAL AND SETTLEMENT GEOGRAPHY**	Introducing the concept of social, cultural and settlement geography with an idea of impact of socio-cultural elements on human habitation.
6	**CC 13**	**EVOLUTION OF GEOGRAPHICAL THOUGHT**	Acquiring knowledge on nature of pre modern geography and understanding the nature of modern geography with critical evaluation of changing concept of location time and space.
	CC 14	**HAZARD MANAGEMENT**	Understanding the basic concept of hazard and disaster management with hazard specific study on different hazards and disaster on West Bengal and India.

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	DSE A	**RESOURCE GEOGRAPHY**	Obtaining the concept of resource and significance of resource as backbone of economic growth and development with resource conflict and management.
	DSE B	**GEOGRAPHY OF INDIA**	Introducing the physiographic divisions of India and West Bengal along with corelation between different physical and socio-cultural elements also getting the idea of different regional issues of West Bengal mainly Sunderban and Darjeeling hills.

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DEPARTMENT OF GEOLOGY

UNDERGRADUATE (B.Sc.) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1- GEL-A-CC-1-1-TH: EARTH SYSTEM SCIENCE GEL-A-CC-1-1-P: EARTH SYSTEM SCIENCE	Students will learn basics of the earth system, constitution of earth and its internal and external processes. Practical knowledge of basics of earth systems (Problem based, maps and samples based-rocks and minerals).
	CC2 – GEL-A-CC-1-2-TH: MINERAL SCIENCE GEL-A-CC-1-2-P: MINERALSCIENCE	Students will get detailed knowledge about rock forming minerals and their crytallography, their constitution, paragenesis and origin. Practical knowledges about crystallographic, physical and optical properties of minerals
II	CC3 - GEL-A-CC-2-3-TH: ELEMENTS OF GEOCHEMISTRY GEL-A-CC-2-3-P: ELEMENTS OF GEOCHEMISTRY	Students acquire basic knowledge of geochemical properties of earth materials and geochemical processes and their principals active in the backdrop of geological evolution of earth Problem based knowledge on geochemical principles.
	CC4 – GEL-A-CC-2-4-TH: STRUCTURALGEOLOGY GEL-A-CC-2-4-P:STRUCTURALGEOLOGY	Students acquire knowledge about geometry and origin of deformation signatures preserved in rock record. Practical problem-solving knowledge through numerical and map based problems on geological structures.
III	CC5 – GEL-A-CC-3-5-TH:IGNEOUS PETROLOGY GEL-A-CC-3-5-P:IGNEOUS PETROLOGY	Students acquire knowledge about the vast variety of igneous rocks, their mineralogy, texture, morphology, origin and emplacement Students acquire knowledge about identification and description and some explanation of origin of igneous rocks through optical petrography and numerical problem solving.

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III	GEL-A-CC-3-6-TH:SEDIMENTARY PETROLOGY	Students acquire knowledge sedimentation process, types of sedimentary rocks, theirs constituents, textures and structures and also their origin.
	GEL-A-CC-3-6-P:SEDIMENTARY PETROLOGY	Students acquire knowledge about identification and description and some explanation of origin of sedimentary rocks through optical petrography and numerical problem solving
	GEL-A-CC-3-7-TH:PALEONTOLOGY	Students acquire knowledge of organic evolution on earth studying the principles of fossilisation, fossil types their spatial and temporal distribution in the rock record.
	GEL-A-CC-3-7-P:PALEONTOLOGY	Students learn to study, describe and interpret fossilization through study of different fossil samples.
	SEC-A GEL-A-SEC-A-(3- 1)/(3-2)-P 7DAY'S FIELD WORK	Students learn about identifications of rocks and minerals on the field. They also learn use of topographic map, various geological field instruments.

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IV	GEL-A-CC-4-8-TH:METAMORPHIC PETROLOGY GEL-A-CC-4-8-P:METAMORPHIC PETROLOGY GEL-A-CC-4-9-TH:STRATIGRAPHIC PRINCIPLESANDINDIANSTRATIGRAPHY GEL-A-CC-4-9-P:STRATIGRAPHIC PRINCIPLESANDINDIANSTRATIGRAPHY GEL-A-CC-4-10-TH:PHANEROZOIC STRATIGRAPHYOFINDIA GEL-A-CC-4-10-P:PHANEROZOIC STRATIGRAPHYOFINDIA GEL-A-SEC-B-(4-1)/(4-2)-P 7 DAY'S FIELDWORK GEL-A-DSE-B-(5-1) FUEL GEOLOGY/(5-	Students acquire knowledge about the vast variety of metamorphic rocks, their mineralogy, texture, morphology, origin and emplacement. Students acquire knowledge about identification and description and some explanation of origin of metamorphic rocks through optical petrography and numerical problem solving. Students learn stratigraphic principles, learn to understand evolution of sequence of rocks and also Precambrian rock records of India to understand early geological evolution of India Understanding stratigraphic principles and Indian Precambian rock sequences through map solving and vertical sequencing of rock. Supercontinent fitting problems are also learned. Students learn about Phanerozoic rock records of India to understand Phanerozoic geological evolution of India including its biological diversity and evolution in Phanerozoic Eon. Students learn about Phanerozoic Geology of India through stratal sequencing and map solving of Phanerozoic basins of India Students' learn about structural mapping of a terrain with deformed rocks and stratigraphic correlation / Stratigraphic and sedimentological fieldwork in a Phanerozoic rock terrain Fuel Geology: Students acquire knowledge about origin, classification and distribution of fossil fuels and nuclear fuels.

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	2)EVOLUTION OF LIFE THROUGH TIME -TH (Any one)	Evolution of Life through Time: Students will learn geobiology and evolution of life from its earliest state to the age of Humans
V	GEL-A-CC-5-11-TH:ECONOMIC GEOLOGY	Students learn about geological processes of ore formations, important Indian deposits of economic minerals and their uses.
	GEL-A-CC-5-11-P:ECONOMIC GEOLOGY	Students learn to identify ore minerals from had sample and microscopic studies and alo to present different economic deposits of India her map.
	GEL-A-CC-5-12-TH:ENGINEERING GEOLOGY	Students learn basic aspects of engineering geology required for constructions and dams, tunnels etc. and mitigation of landlised.
	GEL-A-CC-5-12-P:ENGINEERING GEOLOGY	Students learn to estimate geological merits and demerits of an engineering project sites, to compute reservoir capacity and learn to compute engineering properties of rocks.
	GEL-A-DSE-A-(5-1) TECTONICS /(5-2) EXPLORATION GEOLOGY -TH (Any one)	Tectonics: Students learn about principles and plate tectonics and also eatch tectonics through time. Exporation Geology: Students learn basic principles and basics of methods of geological exploration for natural resources.

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	GEL-A-DSE-A-(5- 1) TECTONICS /(5-2) EXPLORATION GEOLOGY)-P (Any one)	Tectonics: Students learn to solve numerical problems and vector solution for plate tectonics Exploration Geology: Students learn to identify and work with anomalies indicating ore concentration in raw data, draw geological cross-sections and estimation of reserves of natural resources

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	GEL-A-DSE-B-(5-1) FUEL GEOLOGY/(5-2)EVOLUTION OF LIFE THROUGH TIME -TH (Any one)	Fuel Geology: Students acquire knowledge about origin, classification and distribution of fossil fuels and nuclear fuels. Evolution of Life through Time: Students will learn geobiology and evolution of life from its earliest state to the age of Humans
	GEL-A-DSE-B-(5-1) FUEL GEOLOGY/(5-2)EVOLUTION OF LIFE THROUGH TIME -P (Any one	Fuel Geology: Students will learn characterize coal from hand especimens and to estimate coal reserve from given geological data / map. Evolution of Life through Time: Students will learn to describe evolution from specimens of fossils from different stratigraphic levels and also will learn to identify different modes of preservation of fossils.

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VI	GEL-A-CC-6-13-TH:HYDROGEOLOGY	Students will learn about basics of ground water character, quality, flow and management
	GEL-A-CC-6-13-P:HYDROGEOLOGY	Determination of permeability, determination of water quality from chemical data, map study of groundwater provinces of India
	GEL-A-CC-6-14-TH: GEOMORPHOLOGY, REMOTESENSINGANDGIS	Basic ideas on geomorphological features, their origin, basics and uses of photogeology and remote sensing, digital image processing and uses of GIS and GPS
	GEL-A-CC-6-14-P: GEOMORPHOLOGY,REMOTESENSINGAND GIS	Students will learn topographic map reading, different morphometric studies of geomorphological features, identification of types of rocks and landforms from aerial photographs and remote sensed images.
	GEL-A-DSE-A-(6-1) EARTH AND CLIMATE /(6-2) EARTH SURFACE PROCESSES-TH	Earth and climate: To acquire knowledge about climate principles and climatic systems of earth, paleoclimate and temporal changes in climate Earth Surface Processes: To get thorough knowledge of external processes of earth, their causes and effects
	GEL-A-DSE-A-(6-1) EARTH AND CLIMATE /(6-2) EARTH SURFACE PROCESSES –P	Earth and climate: To learn map study of climate zones, wind pattern zones and also to work with paleoclimate numerical-proxies to decipher past climates Earth Surface Processes: Students will learn interpretation of surface processes from map study, morphometric analysis of landforms, computation of rates of surface processes
	GEL-A-DSE-B-(6-1)FIELD GEOLOGY AND GRAND VIVA /(6-2)INTRODUCTION TO GEOPHYSICS –TH	Field Geology And Grand Viva: Viva-voce to examine the knowledge acquired in six semesters Introduction To Geophysics: Students will learn basics of geophysics, its relation to geology, its use in geological explorations for resources and engineering, interpretation of geophysical anomalies.

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	GEL-A-DSE-B-(6-1)FIELD GEOLOGY AND GRAND VIVA /(6-2)INTRODUCTION TO GEOPHYSICS -P	Field Geology And Grand Viva: Students will learn to map a deformed area , learn mining operations by visiting a mine and will learn to write reports Introduction To Geophysics: Students will learn to present geophysical anomalies graphically, interpret seismic reflection profiles, and solve problems on gravity anomaly

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DEPARTMENT OF HISTORY

UNDERGRADUATE (BA) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1—HISTORY OF INDIA FROM THE EARLIEST TIMES TO C. 300 BCE	FAMILIARISING THE STUDENTS WITH THE DIFFERENT TOOLS OF RECONSTRUCTING THE PAST AND HOW TO UTILISE THEM IN THE STUDY OF HISTORY THROUGH DIFFERENT ERAS OF EARLY HISTORY OF INDIA
	CC 2—SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD OTHER THAN INDIA	ACQUIRING KNOWLEDGE ON THE SIGNIFICANT DEVELOPMENTS IN WORLD HISTORY THAT HAVE SHAPED THE COMPLEXITIES OF HUMAN EXISTENCE THROUGH STUDYING THE HISTORY OF CIVILISATIONS OTHER THAN INDIA LIKE EGYPT, GREECE AND ROME AND FAMILIARISING WITH THE EVOLUTION OF CONCEPTS LIKE DEMOCRACY AS ALSO RATIONAL THINKING AND APPLICATION OF REASON
II	CC 3—HISTORY OF INDIA C. 300 BCE—C. 750 CE	CONTINUING WITH KNOWLEDGE FORMATION ON INDIAN HISTORY WITH INTRODUCTION AND IN-DEPTH ANALYSIS OF DYNASTIC HISTORIES FROM THE MAURYAS TO THE GUPTAS WITH THRUST ON REGIONAL KINGDOMS LIKE THE KUSHANAS, SAKAS AS INDIA MOVES TOWARDS A NEW AGE
	CC 4—SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD OTHER THAN INDIA	IMPARTING KNOWLEDGE ON THE TRANSITION FROM ANCIENT TO THE MEDIEVAL WORLD THROUGH HISTORIES OF ROME FROM REPUBLIC TO EMPIRE AS ALSO INTRODUCING TO INSTITUTIONS LIKE CHURCH AND MONASTERY INTERACTION BETWEEN BELIEFS LIKE JUDAISM AND CHRISTIANITY AND THE CRISIS FACED WITH THE ADVENT OF ISLAM
	CC 5—HISTORY OF INDIA (CE 750—1206)	ACQUIRING PRELIMINARY KNOWLEDGE OF POST-GUPTA PERIOD WITH AN EMPHASIS ON CHANGES IN THE SOCIAL, POLITICAL, CULTURAL AND ECONOMIC SPHERES

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III	CC 6—RISE OF THE MODERN WEST—I	UNDERSTANDING THE TRANSITION FROM FEUDALISM TO CAPITALISM, DELVING INTO VARIOUS PROCESSES THAT SAW THE CULMINATION OF THE PROCESS AND THE CHANGES BROUGHT THEREOF IN EUROPE WITH RENAISSANCE, REFORMATION, ECONOMIC DEVELOPMENTS AND FINALLY THE EMERGENCE OF THE NATIONAL MONARCHIES
	CC 7 – HISTORY OF INDIA (C. 1206-1526)	CONTINUING TO ACQUIRE KNOWLEDGE OF INDIAN HISTORY THROUH AN IN-DEPTH STUDY OF THE SOCIETY, POLITY, ECONOMY, CULTURE AND RELIGION OF THE DELHI SULTANATE
	SEC A 1—ARCHIVES AND MUSEUMS	MASTERING KNOWLEDGE ON INSTITUTIONS THAT HOUSE AND MAINTAIN DOCUMENTARY, VISUAL AND MATERIAL REMAINS OF THE PAST

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IV	CC 8—RISE OF MODERN WEST—II	INTERNALISING SOME OF THE MAJOR PATH BREAKING CHANGES THAT TOOK PLACE AROUND THE MID 17TH AND LATE 18TH CENTURY EUROPE SUCH AS THE PRINT REVOLUTION, REVOLUTION IN WAR TECHNIQUES, SCIENTIFIC REVOLUTION, THE GROWTH OF MERCANTILISM AND ITS IMPACT ON THE EUROPEAN ECONOMICS, LEADING TO A PRELUDE TO THE INDUSTRIAL REVOLUTION, THE GROWTH OF PARLIAMENTARY MONARCHY WITH PATTERNS OF ABSOLUTISM THAT USHERED IN DRAMATIC CHANGES IN THE HISTORY OF EUROPE.
	CC 9—HISTORY OF INDIA (C. 1526—1605)	IDENTIFYING THE CHANGES AND CONTINUITIES IN THE FIELD OF AN ECLECTIC POLITICAL AND RELIGIOUS IDEOLOGY IN INDIA BETWEEN THE SIXTEENTH AND THE EARLY SEVENTEENTH CENTURIES WITH THE COMING OF THE MUGHALS
	CC 10—HISTORY OF INDIA (C. 1605-1750s)	ACQUIRING KNOWLEDGE ON VARIOUS ASPECTS OF THE MUGHAL EMPIRE FROM ITS HEYDEY TO ITS DECLINE WITH EMPHASIS ON SYNCRETISM AND ASSIMILATION IN THE FIELDS OF ART, ARCHITECTURE AND LITERATURE
	SEC B 2—ART APPRECIATION	GATHERING KNOWLEDGE ON INDIAN ART FROM ANCIENT TO CONTEMPORARY TIMES IN ORDER TO UNDERSTAND AND APPRECIATE ITS DIVERSITY AND AESTHETICISM
V	CC 11—HISTORY OF MODERN EUROPE (C. 1780-1939)	STUDYING THE VARIOUS WATERSHED EVENTS THAT SHAPED EUROPEAN HISTORY AND THAT OF THE WORLD, BEGINNING WITH THE FRENCH REVOLUTION AND ENDING WITH THE SECOND WORLD WAR
	CC-12—HISTORY OF INDIA (C. 1750S—1857)	ENGAGING WITH THE PROCESS OF TRANSFORMATION FROM INDIGENOUS RULE TO COLONIALISM AND ITS CONSEQUENT IMPACT ON INDIAN SOCIETY, CULTURE, POLITY AND ECONOMY
	DSE A 1—HISTORY OF BENGAL (C.1757—1905)	UNDERSTANDING THE GROWTH OF COLONIAL POWER IN THE SUBCONTINENT WITH BENGAL AS THE BRITISH BRIDGEHEAD
	DSE B 1—HISTORY OF MODERN EAST ASIA—I CHINA (C.1840-1949)	CULTIVATING IN-DEPTH UNDERSTANDING OF CHINA'S TRANSITION FROM FEUDALISTIC SOCIETY TO A COMMUNIST REGIME UNDER MAO TSE TUNG

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		THAT IMPACTED THE TRAJECTORY OF WORLD POLITICS IN THE TWENTY-FIRST CENTURY
VI	CC 13—HISTORY OF INDIA (C. 1857-1964)	KNOWING ABOUT THE RICH TAPESTRY OF INDIAN HISTORY FROM THE HEIGHT OF COLONIAL RULE TO THE SHAPING OF INDEPENDENT INDIA UNDER NEHRUVIAN VISION
	CC 14— HISTORY OF WORLD POLITICS (1945—1994)	SEEKING TO GAIN KNOWLEDGE ON THE NUANCES OF WORLD POLITICS HIGHLIGHTING THE IMPACT OF A SHIFT FROM EUROCENTRIC TO IDEOLOGICALLY POLARIZED SUPER POWER CENTRIC POLITICS, THUS MANIFESTING IN A NEW TYPE OF WAR—THE COLD WAR. ALSO STUDYING OF THE CONCEPT OF NATIONALISM, A CORE ISSUE OF 20TH CENTURY CONTEMPORARY WORLD HISTORY THAT TRIGGERED NATIONAL LIBERATION MOVEMENTS THAT SAW THE EMERGENCE OF THE THIRD WORLD ON THE ONE HAND AS WELL AS THE END OF THE COLD WAR ON THE OTHER- CULMINATING IN THE RISE OF A UNIPOLAR WORLD SYSTEM
	DSE A 3—HISTORY OF BENGAL (c.1905-1947)	GETTING TO KNOW THE INTRICACIES OF TWENTIETH CENTURY BENGAL'S HISTORY FROM A MACRO AS WELL AS A MICRO-POINT OF VIEW WITH EMPHASIS ON WOMEN'S ROLE AT THE REGIONAL AND THE LOCAL LEVEL MOVEMENTS
	DSE B 3— HISTORY OF MODERN EAST ASIA—I JAPAN (C.1868-1945)	INCULCATING KNOWLEDGE OF THE HISTORY OF FAR-EAST BY TAKING JAPAN AS A CASE-STUDY AND UNDERSTANDING HOW THIS ISLAND NATION PLAYED A SIGNIFICANT ROLE IN THE SECOND WORLD WAR AND INFLUENCED THE COURSE OF THE WAR

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DEPARTMENT OF **INDUSTRIAL FISH & FISHERIES**

UNDERGRADUATE (B.Sc.) MAJOR PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1 FISH TAXONOMY	ACQUIRING AN OVERVIEW OF TAXONOMICAL CLASSIFICATION OF FISHES AND IDENTIFICATION.
	CC2 – CAPTURE FISHERIES	UNDERSTANDING THE FISH RESOURCES FROM DIFFERENT TYPE OF WATER BODIES.
II	CC3 FISH BIOLOGY	UNDERSTANDING THE DETAILS ANATOMY, PHYSIOLOGY AND BIOLOGY OF FIN FISHES AND SHELL FISHES.
	CC4 – FRESH WATER AQUACULTURE	UNDERSTANDING THE DIFFERENT FRESH WATER FISH CULTURE TECHNIQUES, METHODS AND PRACTICES.
III	CC5 – FISH GENETIC ENGINEERING & MOLECULAR BIOLOGY	ACQUIRING PRELIMINARY KNOWLEDGE OF FISH GENETIC BIOLOGY AND MOLECULAR TECHNIQUES OF FISH GENETIC STUDIES.
	CC6 – FISH SEED PRODUCTION TECHNOLOGY	UNDERSTANDING THE FISH HACTCHERY AND CAPTIVE BREEDING TECHNIQUES FOR SEED PRODCUTION.
	CC7 – BRACKISH WATER AQUACULTURE & MARICULTURE	UNDERSTANDING THE DIFFERENT MARIBE AND BRACKISH WATER FISH CULTURE TECHNIQUES, METHODS AND PRACTICES.

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	SEC A1 PEARL CULTURE	ACCURING DIIFERENT ASCPECT OF PEARL CULTURE, PEARL PRODUCTION TECHNIQUES THROUGH SKILLED DEVELOPMENT STUDIES.

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IV	CC8- AQUARIUM FISHERIES	STUDIES ABOUT ORNAMENTAL FISH CULTURE, ORNAMENTAL FISH IDENTIFICATION AND AQUARIUM CONSTRUCTUION FOR KEEOING FISHES.
	CC9- FISH PATHOLOGY & IMMUNOLOGY	STUDIES ABOUT FISH DISEASES AND COLTROLLING MEASURE.
	CC10- FISHING CRAFT AND GEARS TECHNOLOGY	AQUIRE KNOWLEDGE REGARDING FISH CATCHING METHODS, EQUIPMENTS USED FOR CAPTURE THE FISHES FROM DIFFERENT WATER BODIES.
	SEC B1- CRAB CULTURE	ACCURING DIIFERENT ASCPECT OF CRAB CULTURE, CRAB PRODUCTION TECHNIQUES THROUGH SKILLED DEVELOPMENT STUDIES.
V	CC11- FISHERIES POST HARVEST TECHNOLOGY	BRIEF DISCUSSION ABOUT FISH PROCESSING, FISH PRODUCT, FISH BY-PRODUCTS AND QUALITY MANAGEMENT
	CC12- FUNDAMENTAL OF BIOCHEMISTRY	BIOCHEMICAL COMPOSITION AND ANALYSIS OF DIFFERENT BIOCHEMICAL COMPOUNDS IN FISHES.
	DSEA1- FISHERY MICROBIOLOGY	BRIEF KNOWLEDGE ABOUT MICROBIOLOGICAL ASPECT OF FISHES
	DSE B1- ENTREPRENEURSHIP DEVELOPMENT	AQUIRE KNOWLEDGE ABOUT MANAGEMENT SKILLS
VI	CC13- AQUATIC ECOLOGY	STUDIES THE ECOLOGY OF DIFFERENT WATER BODIES
	CC14- FISHERIES ECONOMICS, FISHERIES EXTENSION & MARK	ACQUIRE KNOWLEDGE REGARDING FISHERIES ECONOMICS, SOCIO ECONOMICS STUDIES OF FISHERMEN COMMUNITIES AND FISHERIES LEGISLATION
	DSE A2- BIOSTATISTICS, COMPUTER APPLICATION, REMOTE SENSING & GIS	DEVELOPED SKILL FOR STATITICAL ANALYSIS AND DIFFERENT COMPUTUTIONAL TECHNIQUES FOR ANAYLSE DIFFERENT DATAS
	DSE B2- TOOLS & TECHNIQUES IN BIOLOGY	AQUIRING KNOWLEDGE OF DIFFERENT INSTRUMENATION TECNIQUES USED FOR FISH BILOGICAL, BIOCHEMICAL AND PHYSIOLOGICAL ANALYSIS

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DEPARTMENT OF JOURNALISM & MASS COMMUNICATION
UNDERGRADUATE (B.A) HONOURS PROGRAMME
COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/COURSE NAME & DESCRIPTION	COURSE OUTCOME
I	JORA-CC-1-1 INTRODUCTION TO JOURNALISM	THIS PAPER DEALS WITH NEWS AND ITS DIFFERENT FEATURES AND ASPECTS. CHARACTERISTICS OF NEWS, ITS STRUCTURE, PATTERN, PRESENTATION ETC CAN MAKE THE STUDENTS UNDERSTAND IT CLEARLY. THE HISTORICAL PERSPECTIVE AND DIFFERENT NEWS PRESENTATION MAKE INTERESTING READING
	JORA-CC-1-1-P INTRODUCTION TO JOURNALISM - PRACTICAL	IN THE PRACTICAL PORTION THE STUDENTS LEARN HOW TO WRITE AND PREPARE NEWS, WHERE THEY CAN APPLY THE THEORETICAL KNOWLEDGE OF WHAT THEY ARE STUDYING IN THE PREVIOUS UNITS.
	JORA-CC-1-2 HISTORY OF INDIAN JOURNALISM	THIS PAPER DEALS WITH THE HISTORY OF INDIAN JOURNALISM. INDIA HAS A VERY RICH HISTORY OF JOURNALISM. THE STUDENTS CAN COME TO KNOW THE ROOTS OF JOURNALISM IN INDIA AND WHILE STUDYING THIS ALSO MAKES THEM PROUD.THOSE WHO WILL PURSUE WITH ACADEMICS CAN HAVE A THOROUGH KNOWLEDGE IN THIS AREA AND IN THE HIGHER STUDIES SOME MAY GO FOR SOME RESEARCH WORK ON THE HISTORY OF INDIAN JOURNALISM.

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II	JORA-CC-2-3 REPORTING AND EDITING	REPORTING AND EDITING ARE THE TWO PILLARS ON WHICH STANDS JOURNALISM. THIS PAPER GIVING AN OVERALL IDEA ABOUT NEWSPAPER ORGANIZATION, THE JOURNALISTS WORKING IN DIFFERENT DEPARTMENTS AND THEIR DUTIES AND FUNCTIONS CAN HELP THE STUDENTS UNDERSTAND THE SUBJECT WELL, WHEN THEY DON'T HAVE THE CHANCE TO VISIT THE NEWSPAPER ORGANIZATION AND WITNESS EVERYTHING. THE STUDENTS ARE ALSO LEARNING ABOUT SPECIALIZED WRITING WHICH IS THE ORDER OF THE DAY. THIS IS GOING TO HELP THEM IN THEIR PROFESSIONAL LIFE.
	JORA-CC-2-4 MEDIA AND COMMUNICATION	THIS PAPER DEALS IN THE ROLE OF MEDIA AND ITS FUNCTIONS WHICH WILL HELP THE STUDENT TO GET A CLEAR IDEA ABOUT MEDIA AND ITS POSITION IN THE SOCIETY. THIS UNIT ALSO DEALS IN NEW MEDIA WHAT THE STUDENTS HAVE TO STUDY IN THE RECENT TIMES.
	JORA-CC-2-4-P INTRODUCTION TO MEDIA AND COMMUNICATION	THE PRACTICAL PART IN THIS PAPER INCLUDES ALL KINDS OF JOURNALISTIC WRITING. THIS IS POSSIBLY ONE OF THE MOST IMPORTANT PARTS OF THE COURSE, ESPECIALLY FOR THOSE WHO WILL JOIN THE PROFESSION IMMEDIATELY AFTER COMPLETING GRADUATION.

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III	JORA-CC-3-5 COMMUNICATION, MEDIA, SOCIETY	THE STUDENTS NEED TO STUDY COMMUNICATION IN DETAIL AND THIS IS WHAT THEY ARE DOING IN THIS SEMESTER. THE THEORIES AND MODELS OF COMMUNICATION ALONG WITH THE STUDY OF MEDIA AND SOCIETY HELPS THE STUDENTS UNDERSTAND THE SUBJECT THOROUGHLY. THIS THEORETICAL KNOWLEDGE WILL HELP THEM IN FORMING A GROUND TO GET THE PRACTICAL TRAINING AND THOSE WHO WILL BE CONTINUING IN ACADEMICS WILL GET A GREAT HELP IN POST GRADUATION AND ALSO IN THE RESEARCH.
	JORA-CC-3-6 MEDIA AND CULTURAL STUDIES	THE STUDENTS NEED TO STUDY COMMUNICATION IN DETAIL AND THIS IS WHAT THEY ARE DOING IN THIS SEMESTER. THE THEORIES AND MODELS OF COMMUNICATION ALONG WITH THE STUDY OF MEDIA AND SOCIETY HELPS THE STUDENTS UNDERSTAND THE SUBJECT THOROUGHLY. THIS THEORETICAL KNOWLEDGE WILL HELP THEM IN FORMING A GROUND TO GET THE PRACTICAL TRAINING AND THOSE WHO WILL BE CONTINUING IN ACADEMICS WILL GET A GREAT HELP IN POST GRADUATION AND ALSO IN THE RESEARCH

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	JORA-CC-3-7 INTRODUCTION TO RADIO	THIS PAPER ON RADIO IS MAINLY MEANT TO GIVE A PROFESSIONAL TRAINING IN THE ELECTRONIC MEDIA. BESIDES ACQUIRING THE THEORETICAL KNOWLEDGE IN BROADCAST MEDIA, THE STUDENTS CAN HAVE A GOOD IDEA ABOUT THE FUNCTIONING OF RADIO. THE LONG AND RICH HISTORY OF RADIO IN INDIA, THE INFRASTRUCTURE, PRESENT SITUATION, DIFFERENT PROGRAMMES OF AIR AND PRIVATE CHANNELS GIVE THEM A CLEAR IDEA ABOUT THIS MEDIUM.
	JORA-SEC-A-3-1 RADIO WRITING AND PRESENTATION	THE COURSE IN RADIO WRITING AND PRESENTATION HELPS THE STUDENTS IN UNDERSTANDING THE PRODUCTION SIDE OF THE RADIO, WHICH WILL HELP THEM IN THEIR FUTURE IF THEY WANT TO JOIN THE BROADCAST MEDIA.
	JORA-SEC-A-3-2 PHOTO JOURNALISM	THE COURSE IN PHOTO JOURNALISM IS ANOTHER PRACTICAL TRAINING. NOWADAYS PHOTOGRAPHY HAS TAKEN A FRONT SEAT IN THE MEDIA, ESPECIALLY IN JOURNALISM. THOSE WHO HAVE AN INCLINATION TOWARDS PHOTOGRAPHY CAN TAKE UP THE PROFESSION IN PHOTO JOURNALISM AND THIS PAPER CAN HELP THEM IN THIS MATTER.

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IV	JORA-CC-4-8 INTRODUCTION TO TELEVISION	THE PAST AND PRESENT CONDITION OF TELEVISION, ITS INFRASTRUCTURE, ITS FUNCTIONS ETC HELP THE STUDENTS IN UNDERSTANDING THIS ELECTRONIC MEDIA. ALSO, THE TELEVISION PROGRAMME FORMAT OF NEWS AND OTHER ENTERTAINMENT PROGRAMMES GIVE THE STUDENTS AN IN-DEPTH KNOWLEDGE OF THIS MEDIA. THOSE WHO HAVE A DREAM TO JOIN TELEVISION EITHER AS A JOURNALIST OR PRODUCTION PERSON CAN GATHER VERY GOOD KNOWLEDGE FROM THIS PAPER.
	JORA-CC-4-8-P INTRODUCTION TO TELEVISION PRACTICAL	THE PRACTICAL PART MAKES THE STUDENTS WELL INTERESTED IN CREATING THE TELEVISION PROGRAMMES.
	JORA-CC-4-9 FILM THEORIES AND PRODUCTION	THIS PAPER ON FILM THEORIES AND PRODUCTION GIVES AN ALTOGETHER DIFFERENT FLAVOUR. FILM BEING AN IMPORTANT AREA OF MASS COMMUNICATION, THE STUDENTS MUST HAVE A GOOD KNOWLEDGE OF FILM. STUDYING THE FILMS OF THE INDIAN AND INTERNATIONAL MASTERS GIVE THE STUDENTS AN IDEA ABOUT OLD AND CONTEMPORARY FILMS. THE TECHNICAL SIDES LIKE LIGHT, SOUND ETC HELP THEM UNDERSTAND THE PRODUCTION. IN FUTURE IF ANYONE WANTS TO PURSUE WITH FILM AS A CAREER, THIS IS DEFINITELY GOING TO HELP.

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	JORA-CC-4-10 MEDIA MANAGEMENT, PRESS LAWS	THE STUDENTS OF JOURNALISM AND MASS COMMUNICATION ALSO HAVE AN INTEREST IN THE MANAGEMENT OF THE MEDIA. QUITE A FEW OF THEM CAN TRY FOR A CAREER IN THE MANAGEMENT OF ANY MEDIA, WHERE THIS IS GOING TO HELP THEM. BESIDES THIS PAPER HELPS ALL THE STUDENTS UNDERSTAND HOW A MEDIA IS RUN, WHAT KIND OF OWNERSHIPS PREVAIL IN OUR COUNTY, MEDIA AUTONOMY AND A FEW NECESSARY LAWS FOR THE SMOOTH FUNCTIONING OF THE MEDIA.
	JORA-SEC-B-4-1 DOCUMENTARY FILM PRODUCTION	THIS TECHNICAL KNOWLEDGE HELPS STUDENTS GATHER THE CLEAR IDEA ABOUT THE PRACTICAL SIDE OF THE FILMS. SINCE THE PRESENT- DAY STUDENTS ARE TAKING THIS MEDIUM SERIOUSLY AND WANT TO MAKE CAREER OUT OF IT, THIS KIND OF EDUCATION IS HELPFUL FOR THEM.
	JORA-SEC-B-4-2 FEATURE FILM PRODUCTION	THIS TECHNICAL KNOWLEDGE HELPS STUDENTS GATHER THE CLEAR IDEA ABOUT THE PRACTICAL SIDE OF THE FILMS. SINCE THE PRESENT- DAY STUDENTS ARE TAKING THIS MEDIUM SERIOUSLY AND WANT TO MAKE CAREER OUT OF IT, THIS KIND OF EDUCATION IS HELPFUL FOR THEM.

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V	JORA-CC-5-11 INTRODUCTION TO NEW MEDIA	DURING THE RECENT TIME THE PATTERN OF JOURNALISM HAS CHANGED A LOT AFTER THE INTRODUCTION OF INTERNET. THE MODE OF COMMUNICATION HAS ALSO CHANGED A LOT WITH THE INTRODUCTION OF INTERNET AND DEVELOPMENT OF INFORMATION TECHNOLOGY. SO, THIS PAPER IS A VERY RELEVANT ONE THAT DEALS IN NEW MEDIA.
	JORA-CC-5-11-P INTRODUCTION TO NEW MEDIA PRACTICAL	THE PRACTICAL IN THIS PAPER IS ALSO VERY IMPORTANT AS THE STUDENTS NEED TO LEARN THIS MEDIA THOROUGHLY. WRITING, EDITING, AND PRESENTATION EVERYTHING IS DIFFERENT IN NEW MEDIA THAN THAT OF THE PRINT AND ELECTRONIC MEDIA. THIS PRACTICE CAN HELP THE STUDENTS TAKE UP A CAREER IN THIS NEW MEDIA.
	JORA-CC-5-12 DEVELOPMENT COMMUNICATION	THIS PAPER HAS BEEN DESIGNED ON DEVELOPMENT COMMUNICATION. THIS IS COMPARATIVELY A NEW BRANCH OF COMMUNICATION THAT STARTED GAINING IMPORTANCE SINCE THE DECADES OF SEVENTIES IN THE LAST CENTURY. THE KNOWLEDGE OF DEVELOPMENT COMMUNICATION CAN HELP THE STUDENTS IN DOING THE RESEARCH WORK ALSO IN THIS AREA. THE MAIN IDEA IS TO IMPART THE KNOWLEDGE OF THE STRENGTH OF DEVELOPMENT COMMUNICATION IN THE DEVELOPING COUNTRIES WHICH THE INDIAN STUDENTS MUST LEARN.

	JORA-DSE-A-5-1 GLOBAL MEDIA &POLITICS	IN GLOBAL MEDIA AND POLITICS STUDENTS GATHER THE PROFOUND KNOWLEDGE ON THE INFORMATION FLOW OF THE PAST AND PRESENT, INTERNATIONAL MEDIA, GLOBALIZATION – BEFORE AND AFTER, PRESENT INDIAN MARKET AND MEDIA. THIS IS A VERY IMPORTANT AREA IN MEDIA STUDIES AND THE STUDENTS WOULD GATHER KNOWLEDGE ABOUT THE CURRENT AFFAIRS RELATED TO MEDIA
	JORA-DSE-B-5-2 COMMUNICATION RESEARCH	THE IMPORTANCE OF COMMUNICATION RESEARCH CAN BE UNDERSTOOD BY EVERYONE IN THIS FIELD. THOSE WHO WILL GO FOR HIGHER STUDIES NEED TO KNOW THIS SUBJECT IN ORDER TO GO FOR ANY KIND OF RESEARCH. IT WILL NOT ONLY HELP THEM IN PURSUING IN ACADEMICS, BUT ALSO WORKING IN ANY FIELD OF RESEARCH. THE CONCEPT OF RESEARCH, METHODS OF MEDIA RESEARCH, THE STEPS AND PROCESS OF RESEARCH, DATA ANALYSIS – ALL THESE ARE GOING TO HELP THE STUDENTS IN THEIR CAREER.

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VI	JORA-CC-6-13 ADVERTISEMENT	THIS PAPER DISCUSSES ANOTHER PROFESSIONAL SUBJECT-ADVERTISING. THE STUDENTS CAN HAVE A THOROUGH KNOWLEDGE ABOUT THE BASIC CONCEPT OF ADVERTISING, ITS POSITION IN THE SOCIETY AND ITS RELATION TO MASS MEDIA. THEY ARE ALSO STUDYING THE FUNCTIONS OF ADVERTISING, WORKING OF THE AD AGENCIES AND THE LAWS AND REGULATIONS. THIS IS GOING TO HELP THEM THOROUGHLY IN THEIR PROFESSION.
	JORA-CC-6-13-P ADVERTISING PRACTICAL	THOSE WHO HAVE A CREATIVE BENT OF MIND, ADVERTISING IS A FIELD FOR THEM. DESIGNING DIFFERENT TYPES OF ADS, WRITING COPIES, CREATING RADIO AND TV COMMERCIALS, ALL ARE VERY MUCH ENGROSSING AND THE STUDENTS LEARN A LOT OF THINGS
	JORA-CC-6-14 PUBLIC RELATION	IN THIS PAPER THEY GATHER THE CONCEPT OF PUBLIC RELATION, ITS FUNCTIONS AND METHODS OF WORKING, AND THE UTILITY. THE KNOWLEDGE IN PUBLIC RELATION WILL BE GREAT HELP FOR MAKING A GOOD CAREER.

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	JORA-DSE-A-6-3 DISSERTATION WITH PRESENTATION	THOSE WHO WILL CHOOSE DISSERTATION WILL HAVE A CHANCE TO GO FOR AN INDIVIDUAL RESEARCH THAT WOULD HELP THEM TO SHOW THEIR ABILITY IN CONCEIVING A TOPIC, OBSERVING AND ANALYZING IT AND FINALLY WRITING A DETAIL REPORT ON IT. THIS WILL HELP THEM IN HAVING A CONFIDENCE TO PURSUE FOR RESEARCH IN FUTURE. THE PRESENTATION SKILL HELPS THE MASS COMMUNICATION STUDENTS IN EVERY FIELD. FINALLY, THE WHOLE PROCESS OF WORKING ALONE WILL GIVE THEM A FULL CONFIDENCE TO TAKE INDIVIDUAL RESPONSIBILITY.
	JORA-DSE-B-6-3 FOLK AND COMMUNITY MEDIA	FOLK AND COMMUNITY MEDIA ARE THE TRADITIONAL MEDIA WHICH ARE STILL GOING PARALLEL IN OUR COUNTRY. INDIA HAS A VERY RICH CULTURE IN FOLK MEDIA. FOLK TALES, FOLK SONG, FOLK DANCE, FOLK LORE ETC HAVE A DEEP IMPACT NOT ONLY ON THE RURAL BUT ON THE URBAN MASS TOO

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DEPARTMENT OF MATHEMATICS

UNDERGRADUATE (BSc) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1 (CALCULUS, GEOMETRY, & VECTOR ANALYSIS)	STUDENTS ACQUIRE BASIC WORKING KNOWLEDGE OF CALCULUS, GEOMETRY AND VECTOR ANALYSIS WHICH CAN BE APPLIED IN FUTURE MATHEMATICAL ASSIGNMENTS.
	CC 2 (ALGEBRA)	STUDENTS DEVELOP A PRELIMINARY KNOWLEDGE OF CLASSICAL, MODERN AND LINEAR ALGEBRA WHICH HELP THEM TO UNDERTAKE THE STUDIES IN ADVANCED ALGEBRA.
II	CC 3 (REAL ANALYSIS)	STUDENTS ACQUIRE A BASIC KNOWLEDGE OF POINT SET THEORY, REAL SEQUENCE AND SERIES.
	CC 4 (GROUP THEORY-I)	THE STUDENTS ARE INTRODUCED TO THE INTRODUCTORY IDEA OF GROUP THEORY. THE COURSE INCLUDES THE IDEAS OF SUB-GROUPS, CYCLIC GROUPS AND NORMAL SUB-GROUPS.
III	CC 5 (THEORY OF REAL FUNCTIONS)	STUDENTS GET A EXTENSIVE IDEA REGARDING THE LIMIT, CONTINUITY AND DIFFERENTIABILITY OF REAL FUNCTIONS.
	CC 6 (RING THEORY & LINEAR ALGEBRA-I)	IN RING THEORY THE STUDENTS GET A COMPREHENSIVE IDEA OF THE ALGEBRAIC STRUCTURE OF RINGS, SUBRINGS, IDEALS, RING HOMOMORPHISM, ETC. IN LINEAR ALGEBRA THE STUDENTS ARE INTRODUCED TO THE IDEAS OF VECTOR SPACES AND LINEAR TRANSFORMATIONS.

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	CC 7 (ORDINARY DIFFERENTIAL EQUATION & MULTIVARIATE CALCULUS-I)	THE STUDENTS LEARN METHODS TO FORMULATE AND SOLVE FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS. THEY ARE ALSO INTRODUCED TO PLANAR AUTONOMOUS SYSTEMS AND POWER SERIES SOLUTIONS. IN MULTIVARIATE CALCULUS THE STUDENTS LEARN THE CONCEPTS OF LIMIT, CONTINUITY AND DIFFERENTIABILITY OF FUNCTIONS OF TWO OR MORE VARIABLES AND THEIR APPLICATIONS.
	SEC A (C PROGRAMMING LANGUAGE)	THE STUDENTS ARE INTRODUCED TO THE BASIC IDEAS OF COMPUTER PROGRAMMING WITH C LANGUAGE. THEY ARE EXPECTED TO USE THIS KNOWLEDGE IN THE NUMERICAL PROGRAMMING LAB IN SEMESTER VI.
IV	CC 8 (RIEMANN INTEGRATION & SERIES OF FUNCTIONS)	THE COURSE INCLUDES THE DETAILED IDEAS ABOUT RIEMANN INTEGRATION, IMPROPER INTEGRAL AND SERIES OF FUNCTIONS.
	CC 9 (PARTIAL DIFFERENTIAL EQUATION & MULTIVARIATE CALCULUS-II)	DIFFERENT TYPES OF PDEs ARE INTRODUCED AND VARIOUS SOLUTIONS ARE DISCUSSED. THE COURSE ALSO INCLUDES HEAT EQUATION, WAVE EQUATION, CAUCHY PROBLEM AND ITS SOLUTIONS UNDER DIFFERENT INITIAL AND BOUNDARY CONDITIONS. IN MULTIVARIATE CALCULUS THE STUDENTS LEARN HOW TO COMPUTE MYLTIPLE INTEGRALS AND ITS APPLICATIONS IN AREAS AND VOLUMES. THE COURSE ALSO INCLUDES THE IDEAS OF VECTOR DIFFERENTIAL OPERATORS LIKE DIVERGENCE, CURL, AND SOME THEOREMS RELATED TO THEM.
	CC 10 (MECHANICS)	THE STUDENTS GET A COMPREHENSIVE IDEA OF THE BASICS OF ANALYTICAL STATICS AND ANALYTICAL PARTICLE DYNAMICS. THEY GET A CLEAR IDEA OF SOLVING MECHANICAL PROBLEMS USING THE THEORETICAL CONCEPTS.
	SEC B (i. MATHEMATICAL LOGIC ii. SCIENTIFIC COMPUTING WITH SAGEMATH & R)	IN MATHEMATICAL LOGIC THE STUDENTS GET A CLEAR IDEA OF PROPOSITIONS, TRUTH TABLES, PROPOSITIONAL LOGIC, AND PREDICATE LOGIC. IN SCIENTIFIC COMPUTING WITH SAGEMATH & R THE STUDENTS ARE INTRODUCED TO THE FUNDAMENTAL COMMANDS AND STRUCTURE OF SAGEMATH AND R. THE COURSE COVERS THE BASIC SYNTAX AND SEMANTICS OF SAGEMATH AND R INCLUDING BASIC DATA TYPES, VARIABLES, CONTROL STRUCTURES, AND FUNCTIONS.

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V	CC 11 (PROBABILITY & STATISTICS)	THE STUDENTS LEARN THE ADVANCED CONCEPTS OF PROBABILITY WHICH INCLUDES PROBABILITY DISTRIBUTIONS, EXPECTATIONS IN ONE AND MANY VARIABLES AND CONVERGENCE THEOREMS. IN STATISTICS THE STUDENTS ARE INTRODUCED TO THE CONCEPTS OF SAMPLING, ESTIMATION, AND TESTING OF HYPOTHESIS.
	CC 12 (GROUP THEORY-II & LINEAR ALGEBRA-II)	THE COURSE INCLUDES ADVANCED CONCEPTS OF GROUP THEORY WHICH INCLUDES AUTOMORPHISM, DIRECT PRODUCT AND ABELIAN GROUPS. THE COURSE OF LINEAR ALGEBRA INCLUDES INNER PRODUCT SPACES, BILINEAR AND QUADRATIC FORM, AND DUAL SPACES.
	DSE A1 (i. ADVANCED ALGEBRA ii. BIO MATHEMATICS)	THE COURSE ON ADVANCED ALGEBRA INCLUDES FURTHER ADVANCED TOPICS OF GROUP THEORY AND RING THEORY THAT INCLUDES GROUP ACTION, CLASS EQUATION, PRINCIPAL IDEAL DOMAIN, POLYNOMIAL RINGS, ETC. THE COURSE OF BIO MATHEMATICS INCLUDES VARIOUS MATHEMATICAL MODELS OF BIOLOGICAL SYSTEMS AND THEIR SOLUTIONS.
	DSE B1 (LINEAR PROGRAMMING & GAME THEORY)	STUDENTS ARE INTRODUCED TO THE BASIC IDEAS OF THE OPTIMIZATION TECHNIQUES INCLUDING FORMULATION AND SOLUTION OF OPTIMIZATION PROBLEMS. THE TECHNIQUES INCLUDE SIMPLEX METHOD, BIG M METHOD, CONCEPT OF DUALITY, TRANSPORTATION AND ASSIGNMENT PROBLEMS. THE COURSE ALSO INCLUDES A BASIC IDEA OF GAME THEORY.
VI	CC 13 (METRIC SPACE & COMPLEX ANALYSIS)	STUDENTS ACQUIRE THE BASIC CONCEPTS OF METRIC SPACES AND COMPLEX ANALYSIS AND LEARN TO SOLVE PROBLEMS USING SUCH CONCEPTS.
	CC 14 (NUMERICAL METHODS)	SOLUTIONS FOR VARIOUS MATHEMATICAL PROBLEMS, WHOSE ANALYTICAL SOLUTIONS MAY NOT EXIST ARE FOUND USING DIFFERENT NUMERICAL METHODS. STUDENTS ARE INTRODUCED TO SUCH CONCEPTS AND PROBLEM SOLVING TECHNIQUES.

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	CC 14 PRACTICAL (NUMERICAL METHODS LAB.)	PROBLEMS ARE NUMERICALLY SOLVED USING C PROGRAMMING CODES. STUDENTS WRITE CODES IN COMPUTERS AND SOLVE VARIOUS MATHEMATICAL PROBLEMS USING NUMERICAL METHODS.
	DSE A2 (i. DIFFERENTIAL GEOMETRY ii. MATHEMATICAL MODELLING)	IN DIFFERENTIAL GEOMETRY STUDENTS ACQUIRE KNOWLEDGE ON HOW TO DO GEOMETRY ON CURVED SPACES. THEY LEARN TENSOR CALCULUS AND APPLY THE KNOWLEDGE IN LEARNING THE CONCEPTS OF PLANE AND SPACE CURVES, GEODESICS, ETC. IN MATHEMATICAL MODELLING STUDENTS LEARN DIFFERENT MATHEMATICAL TECHNIQUES USED TO MODEL DIFFERENT PHYSICAL SYSTEMS. THE TECHNIQUES INCLUDE POWER SERIES SOLUTIONS TO DIFFERENTIAL EQUATIONS, MONTE CARLO SIMULATION MODELLING, ETC.
	DSE B2 (i. POINT SET TOPOLOGY ii. ADVANCED MECHANICS)	IN POINT SET TOPOLOGY STUDENTS ARE INTRODUCED TO THE IDEAS OF TOPOLOGICAL SPACES, POINT SET, COUNTABILITY, CONNECTED SPACES, ETC. IN ADVANCED MECHANICS STUDENTS GET A DETAILED IDEA OF THE TRANSITION FROM THE NEWTONIAN MECHANICS TO THE MORE REALISTIC LAGRANGIAN AND HAMILTONIAN MECHANICS.

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DEPARTMENT OF MICROBIOLOGY

UNDERGRADUATE (B.Sc) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1 - INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY	i. DEVELOP KNOWLEDGE OF THE EXPANSION OF THE DISCIPLINE OF MICROBIOLOGY AND THE CONTRIBUTIONS OF PROMINENT SCIENTISTS IN THIS FIELD. ii. DEVELOP UNDERSTANDING OF THE CHARACTERISTICS AND CLASSIFICATION OF DIFFERENT TYPES OF MICROORGANISMS (PROKARYOTIC AND EUKRYOTIC). iii. ABLE TO UNDERSTAND BASIC MICROBIOLOGY LABORATORY PRACTICES AND PERFORM BASIC EXPERIMENTS TO GROW AND STUDY MICROORGANISMS IN THE LABORATORY.
	CC2 - BACTERIOLOGY	i. ABLE TO DESCRIBE CHARACTERISTICS OF BACTERIAL CELLS, CELL ORGANELLES, CELL WALL COMPOSITION AND VARIOUS APPENDAGES LIKE CAPSULES, FLAGELLA, PILI. ii. UNDERSTAND THE NUTRITIONAL REQUIREMENTS AND GROWTH OF BACTERIA; DEVELOP KNOWLEDGE AND UNDERSTANDING OF BACTERIAL SYSTEMATIC AND IMPORTANT ARCHAEAL AND EUBACTERIAL GROUPS iii. PERFORM BASIC LABORATORY EXPERIMENTS TO STUDY MICROORGANISMS AND METHODS TO PRESERVE BACTERIA IN THE LABORATORY.
II	CC3 - BIOCHEMISTRY	i. DEVELOP A VERY GOOD UNDERSTANDING OF VARIOUS BIOMOLECULES THAT ARE REQUIRED FOR THE FUNCTIONING OF A CELL. ii. ABLE TO MAKE BUFFERS, PERFORM QUANTITATIVE AND QUALITATIVE ESTIMATION OF BIOMOLECULES, STUDY ENZYME KINETICS AND CALCULATE Vmax, Km, Kcat VALUES.

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	CC4 - CELL BIOLOGY	i. DEVELOP KNOWLEDGE ON STRUCTURAL AND FUNCTIONAL ORGANISATION OF CELLS ii. UNDERSTANDING OF PROTEIN SORTING AND TRANSPORT ACROSS VARIOUS CELLULAR COMPARTMENTS iii. ABLE TO EXPLAIN CELL CYCLE, CELL GROWTH AND SIGNALLING. iv. ABLE TO PERFORM EXPERIMENTS ON CELL AND ORGANELLE IDENTIFICATION, STAINING, AND IDENTIFICATION OF CELL DIVISION STAGES.
III	CC5 - VIROLOGY	i. UNDERSTAND WHAT ARE VIRUSES AND THE CHEMICAL NATURE OF VIRUSES, DIFFERENT TYPES OF VIRUSES INFECTING ANIMALS, PLANTS, AND BACTERIA (BACTERIOPHAGES) ii. UNDERSTAND ABOUT THE BIOLOGY OF BACTERIOPHAGES. iii. GAIN KNOWLEDGE OF A VARIETY OF PLANT VIRUSES AND ANIMAL VIRUSES. iv. GAIN ABILITY TO DESCRIBE ROLE OF VIRUSES IN THE CAUSATION OF THE CANCER. v. ABLE TO PERFORM IDENTIFICATION OF VARIOUS VIRUSES AND ISOLATION AND ENUMERATION OF BACTERIOPHAGES.
	CC6 - MICROBIAL PHYSIOLOGY AND METABOLISM	i. UNDERSTAND MICROBIAL GROWTH AND THE EFFECT OF THE ENVIRONMENT ON MICROBIAL GROWTH ii. DEVELOP CONCEPTS OF DIFFERENT TPES OF MICROBIAL METABOLISM iii. ABLE TO DETERMINE THE GROWTH CURVE OF MICROORGANISMS AND THE EFFECT OF DIFFERENT PARAMETERS ON MICROBIAL GROWTH
	CC7 – MOLECULAR BIOLOGY	i. UNDERSTAND THE STRUCTURE AND FUNCTION OF GENETIC MATERIAL ii. GAIN DETAIL KNOWLEDGE OF CENTRAL DOMA AND GENE REGULATION iii. ABLE TO ISOLATE, ESTIMATE AND VISUALISE NUCLEIC ACIDS AND PROTEINS
	SEC A2 – BIOFERTILIZERS AND BIOPESTICIDES	i. DEVELOP CONCEPTS OF BIOFERTILIZERS AND ITS IMPORTANCE IN AGRICULTURE ii. UNDERSTAND ABOUT ISOLATION, CHARACTERISTICS AND FIELD APPLICATION OF DIFFERENT TYPES OF BIOFERTILIZERS
IV	CC8- MICROBIAL GENETICS	i. UNDERSTAND THE GENOME ORGANIZATION OF MODEL ORGANISMS THE MOLECULAR MECHANISMS THAT UNDERLIE MUTATIONS.

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		ii. DEVELOPED KNOWLEDGE ABOUT THE TRANSFER OF GENETIC MATERIAL AMONG THE MICROORGANISMS. iii. BE ABLE TO DESCRIBE DIFFERENT TYPES OF THE EXTRA-CHROMOSOMAL ELEMENTS OR THE PLASMIDS; THE NATURE OF THE TRANSPOSABLE ELEMENTS IN THE PROKARYOTIC AND THE EUKARYOTIC CELLS. iv. GAIN HANDS-ON SKILLS OF REPLICA PLATING, STUDY OF EFFECT OF DIFFERENT MUTAGENTS ON BACTERIAL CELLS, ISOLATION AND VISUALIZATION OF PLASMID DNA FROM BACTERIAL CELLS.
	CC9- ENVIRONMENTAL MICROBIOLOGY	i. UNDERSTAND DIFFERENT TYPES OF ENVIRONMENTS AND HABITATS WHERE MICROORGANISMS GROW INCLUDING THE MICROBIOMES OF THE HUMAN AND ANIMAL GUT. ii. IDENTIFY DIFFERENT LEVELS OF HOST MICROBE INTERACTIONS AND THE ROLE OF BIOGEOCHEMICAL CYCLING IN MAINTAINING ENVIRONMENTAL BALANCE. iii. UNDERSTAND THE IMPORTANT ROLE MICROORGANISMS PLAY IN MAINTAINING HEALTHY ENVIRONMENT BY DEGRADATION OF SOLID/LIQUID WASTES; HOW THESE ACTIVITIES OF MICROORGANISMS ARE USED IN SEWAGE TREATMENT PLANTS, PRODUCTION OF ACTIVATED SLUDGE AND FUNCTIONING OF SEPTIC TANKS iv. DEVELOP PRACTICAL SKILLS FOR ISOLATION AND ENUMERATION OF RHIZOSPHERIC BACTERIA AND FUNGI, CONDUCTING EXPERIMENTS TO ASSESS THE BOD/COD OF WASTE WATERS AND THEIR INTERPRETATION; PRACTICALLY ASSESS THE PORTABILITY OF DRINKING WATER BY THE USE OF STANDARD MICROBIOLOGICAL TESTS.
	CC10- RECOMBINANT DNA TECHNOLOGY	i. DEVELOP FAIRLY GOOD KNOWLEDGE OF TOOLS AND STRATEGIES OF GENETIC ENGINEERING AND METHODS OF MOLECULAR CLONING ii. UNDERSTAND DNA SEQUENCING, GENETIC LIBRARY AND APPLICATIONS OF RECOMBINANT DNA TECHNOLOGY. iii. DEVELOP PRACTICAL SKILLS IN RECOMBINANT DNA TECHNIQUES LIKE TRANSFORMATION, RESTRICTION DIGESTION CLONING AND PCR

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	SEC B2- MICROBIOLOGICAL ANALYSIS OF AIR AND WATER	i. UNDERSTAND THE BASICS OF AIR MICROBIOLOGY, AIR SAMPLE COLLECTION AND ANALYSIS AND VARIOUS CONTROL MEASURES. ii. DEVELOP KNOWLEDGE ON WATER MICROBIOLOGY, MICROBIOLOGICAL ANALYSIS OF WATER AND CONTRL MEASURES.

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V	CC11- FOOD AND DAIRY MICROBIOLOGY	i. DEVELOP CONCEPTS ON FOD AS A SUBSTATE FOR MICROORGANISMS, MICROBIAL SPOILAGE OF VARIOUS FOODS AND METHODS OF FOOD PRESERVATION. ii. GAIN KNOWLEDGE ON FERMENTED FOODS iii. UNDERSTAND ABOUT FOOD BORNE DISEASES, FOOD SANITATION AND CONTROL METHODS iv. DEVELOP PRACTICAL SKILLS ON QUALITY ASSESSMENT OF VARIOUS FOOD ITEMS AND ISOLATION AND IDENTIFICATION OF SPOILAGE CAUSING MICROORGANISMS IN FOOD.
	CC12- INDUSTRIAL MICROBIOLOGY	i. UNDERSTAND ABOUT ISOLATION OF INDUSTRIALLY IMPORTANT MICROBIAL STRAINS AND FERMENTATION MEDIA ii. DEVELOPED AN UNDERSTANDING OF TYPES OF FERMENTATION PROCESSES, BIO-REACTORS AND MEASUREMENT OF FERMENTATION PARAMETERS AND DOWNSTREAM PROCESSING. iii. ACQUIRED A DETAILED KNOWLEDGE OF THE NUMBER OF PRODUCTS THAT ARE PRODUCED BY INDUSTRIAL FERMENTATION PROCESSES. iv. DEVELOP PRACTICAL SKILLS IN THE INDENTIFICATION OF DIFFERENT PARTS OF FERMENTOR, AND MICROBIAL FERMENTATIONS FOR THE PRODUCTION AND ESTIMATION (QUALITATIVE AND QUANTITATIVE) OF ENZYMES, AMINO ACIDS ETC.
	DSE A1- MICROBIAL BIOTECHNOLOGY	i. DEVELOP THE CONCEPT OF MICROBIAL BIOTECHNOLOGY, ITS APPLICATIONS, MICROBIAL PRODUCTS AND THEIR RECOVERY. ii. UNDERSTAND THE CONCEPT OF GENE SILENCING, DRUG RESISTANCE AND HOST-PATHOGEN INTERACTIONS iii. DEVELOP FAIR KNOWLEDGE OF INTELLECTUAL PROPERTY RIGHTS. iv. DEVELOP PRACTICAL SKILLS IN ENZYME IMMOBILIZATION, PIGMENT PRODUCTION FROM FUNGI AND ISOLATION OF XYLANASE OR LIPASE PRODUCING BACTERIA.
	DSE B2- MICROBES IN SUSTAINABLE AGRICULTURE AND DEVELOPMENT	i. DEVELOP CONCEPTS OF MINERALIZATION OF ORGANIC & INORGANIC MATTER IN SOIL, MICROBIAL ACTIVITY IN SOIL, GREEN HOUSE GASES AND MICROBIAL CONTROL OF SOIL BORNE PLANT PATHOGENS ii. UNDERSTAND THE IMPORTANCE OF BIOFERTILIZATION, PHYTOSTIMULATION, BIOINSECTICIDES, SECONDARY AGRICULTURE BIOTECHNOLOGY AND GM CROPS. iii. DEVELOP PRACTICAL SKILLS ON SOIL PROFILE AND MICROFLORA STUDY OF DIFFERENT TYPES OF SOILS, ISOLATION AND FIELD

		APPLICATION OF *Rhizobium* AND *Azotobacter*, DESIGN AND FUNCTIONING OF A BIOGAS PLANT AND ISOLATION OF CELLULOSE DEGRADING ORGANISMS.
VI	CC13- IMMUNOLOGY	i. DEVELOP BASIC CONCEPTS OF THE IMMUNE SYSTEM INCLUDING CELLS OF THE IMMUNE SYSTEM, ANTIGENS, ANTIBODIES AND MAJOR HISTOCOMPATIBILITY COMPLEXES. ii. GROW CONCEPT ON MECHANISM OF DEVELOPMENT OF DIFFERENT LEVELS OF IMMUNITY AND IMMUNOLOGICAL DISORDERS iii. DEVELOP PRACTICAL SKILLS OF VARIOUS IMMUNOLOGICAL TECHNIQUES
	CC14- MEDICAL MICROBIOLOGY	i. UNDERSTAND IMPACT OF NORMAL MICROFLORA OF THE HUMAN BODY AND HOST PATHOGEN INTERACTION ii. DEVELOP KNOWLEDGE OF VARIOUS MICROBIAL DISEASES (EG. BACTERIAL, VIRAL, FUNGAL, PROTOZOAN DISEASES) iii. DEVELOP A FAIR CONCEPT OF ANTIMICROBIAL AGENTS, THEIR GENERAL CHARACTERISTICS AND THEIR MODE OF ACTION iv. GROW HANDS-ON SKILLS IN THE IDENTIFICATION OF BACTERIA USING LABORATORY STRAINS BASED ON CULTURAL, MORPHOLOGICAL AND BIOCHEMICAL CHARACTERISTICS, ANTIMICROBIAL SENSITIVITY ASSAY AND STUDY COMPOSITION AND USE OF IMPORTANT DIFFERENTIAL MEDIA FOR IDENTIFICATION OF BACTERIA.
	DSE A3- PLANT PATHOLOGY	i. DEVELOP CONCEPT OF PLANT DISEASE DEVELOPMENT AND EPIDEMIOLOGY AND HOST PATHOGEN INTERACTION ii. UNDERSTAND THE PRINCIPLES OF CONTROL OF PLANT DISEASES AND SYMPTOMS AND EPIDEMIOLOGY AND CONTROL OF CERTAIN PLANT DISEASES iii. DEVELOP PRACTICAL SKILLS OF DEMONSTRATION OF KOCH'S POSTULATES IN FUNGAL, BACTERIAL AND VIRAL PLANT PATHOGENS AND STUDY OF IMPORTANT DISEASES OF CROP PLANTS BY CUTTING SECTIONS OF INFECTED PLANT MATERIALS.

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	DSE B3- INSTRUMENTATION AND BIOTECHNIQUES	i. UNDERSTAND THE PRINCIPLES AND TYPES OF OF MICROSCOPY, CHROMATOGRAPHY, SPECTROSCOPY, ELECTROPHORESIS AND CENTRIFUGATION. ii. DEVELOP PRACTICAL SKILLS IN SEPARATION OF MIXTURES BY PAPER / THIN LAYER CHROMATOGRAPHY, COLUMN PACKING IN ANY FORM OF COLUMN CHROMATOGRAPHY, SEPARATION OF PROTEIN
		MIXTURES BY ANY FORM OF CHROMATOGRAPHY, SEPARATION OF PROTEIN MIXTURES BY POLYACRYLAMIDE GEL ELECTROPHORESIS (PAGE), DETERMINATION OF ΛMAX FOR AN UNKNOWN SAMPLE AND CALCULATION OF EXTINCTION COEFFICIENT AND SEPARATION OF COMPONENTS OF A GIVEN MIXTURE USING A LABORATORY SCALE CENTRIFUGE

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DEPARTMENT OF PHILOSOPHY UNDERGRADUATE (BA) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/COURSE NAME & DESCRIPTION	OUTCOME
I	CC1- INDIAN PHILOSOPHY-I	INDIAN PHILOSOPHY CONSISTS OF NINE DIFFERENT SCHOOLS OF INDIAN THOUGHTS, BOTH ASTIKA AND NASTIKA SYSTEMS. KNOW ABOUT SOME MAJOR SCHOOLS OF LIKE CARVAKA, JAINISN, BUDDHISM, NYAYA AND VAISHESIKA.
	CC2- HISTORY OF WESTERN PHILOSOPHY-I	THE HISTORY OF WESTERN PHILOSOPHY CONSISTS OF THE EPISTEMOLOGICAL AND METAPHYSICAL PERSPECTIVES OF THE

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		PHILOSOPHERS LIKE SOCRATES, PLATO, ARISTOTLE, DESCARTES, SPINOZA AND LEIBNITZ.
II	CC3- INDIAN PHILOSOPHY-II	AIMS TO ACQUAINT STUDENTS WITH THE VEDIC SCHOOLS OF INDIAN PHILOSOPHY AND THEIR DIFFERENT PHILOSOPHICAL THEORIES SUCH AS PURUSA AND PRAKRTI OF SANKHYA, AND ALSO SANKARADEVA'S PHILOSOPHY OF GOD AND BHAKTI.

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	CC4- HISTORY OF WESTERN PHILOSOPHY-II	STUDENTS GET ACQUAINTED WITH THE EPISTEMOLOGICAL AND METAPHYSICAL THEORIES OF THE WESTERN PHILOSOPHERS LIKE SOCRATES, PLATO, DESCARTES, SPINOZA, LEIBNITZ, LOCKE, BERKELEY, HUME AND KANT.
III	CC5- PHILOSOPHY OF MIND	ACQUIRING AN OVERVIEW OF METHODS OF PSYCHOLOGY, NATURE OF PERCEPTION, GESTALT THEORY, PHILOSOPHICAL THEORIES OF MIND, LEVELS OF MIND AND INTELLIGENCE.
	CC6- SOCIAL AND POLITICAL PHILOSOPHY	BRIEF INTRODUCTION TO SOCIETY, COMMUNITY,

		ASSOCIATION, INSTITUTION, MARX-ENGLES OF SOCIAL CHANGE AND NATURE OF DEMOCRACY AND ITS DIFFERENT FORMS.
	CC7- PHILOSOPHY OF RELIGION	DEVELOPING THE DIFFERENT RELIGIOUS VIEWS REGARDING KARMA, REBIRTH, AND LIBERATION, TEACHINGS OF QURAN AND CHRISTIANITY, ARGUMENTS FOR THE EXISTENCE OF GOD AND RELIGIOUS PLURALISM.

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	SEC-A(b)- MAN AND ENVIRONMENT	THIS PAPER HAS BEEN DESIGNED TO FOSTER ENVIRONMENTAL AWARENESS AND RESPONSIBILITY AMONG THE STUDENTS.
IV	CC8- WESTERN LOGIC-I	CONTINUING TO ACQUIRE KNOWLEDGE OF LOGIC, ARGUMENTS, CATEGORICAL PROPOSITIONS, DISTRIBUTION OF TERMS, CATEGORICAL SYLLOGISM, INDUCTION, CAUSAL CONNECTIONS AND SCIENCE AND HYPOTHESIS.
	CC9- WESTERN LOGIC-II	UNDERSTANDING SYMBOLIC LOGIC, THE METHOD OF TRUTH-TABLE, THE METHOD OF RESOLUTIONN, THE METHOD OF DEDUCTION AND QUANTIFICATION THEORY.

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	CC10- EPISTEMOLOGY AND METAPHYSICS (WESTERN)	ACQUIRE A CLEAR CONCEPT OF NATURE, ORIGIN AND SCOPE OF 'KNOWLEDGE', THE PROBLEM OF INDUCTION, REALISM, IDEALISM AND PHENOMENALISM, SUBSTANCE AND UNIVERSAL.
	SEC-B (b)- PHILOSOPHY OF HUMAN RIGHTS	INTRODUCING THE IDEA OF HUMAN RIGHTS, THE IDEA OF NATURAL LAW, FUNDAMENTAL RIGHTS AND DUTIES, CONTEMPORARY PERSPECTIVES OF JOEL FEINBERG.

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V	CC11- INDIAN LOGIC AND EPISTEMOLOGY-I	BRIEF INTRODUCTION TO DEFINITION OF BUDDHI, THREE KIND OF NON-VERDICAL ANUBHAVA, THREE KINDS OF NON-VERDICAL ANUBHAVA, DEFINITION OF KARANA, NIRVIKALPAKA AND SAVIKALPAKA JNANA, SANNIKARCA AND ITS SIX VARIETIES.
	CC12- ETHICS (INDIAN)	CONTINUING TO ACQUIRE KNOWLEDGE OF STHITAPRANJNA, KARMAYOGA, VIDHI, NISEDHA, BUDDHIST ETHICS, JAINA ETHICS AND MIMAMSA ETHICS.

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	DSE-A(1)a- WESTERN LOGIC-I	ACQUIRING AN OVERVIEW OF I.M.COPI, R.JEFFERY'S FORMAL LOGIC, METHODS OF LOGIC ON W.V.O.QUINE, INTRODUCTION TO LOGIC OF D.P.SUPPES.
	DSE-B(1)a- AN ENQUIRY CONCERNING HUMAN UNDERSTANDING- D.HUME	UNDERSTANDING THE DETAILED KNOWLEDGE OF DAVID HUME, A MODERN WESTERN EMPIRICIST FROM EPISTEMOLOGICAL, METAPHYSICAL AND ETHICAL PERSPECTIVES THROUGH HIS BOOK AN ENQUIRY CONCERNING HUMAN UNDERSTANDING.

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VI	CC13- INDIAN LOGIC AND EPISTEMOLOGY-II	UNDERSTANDING THE DEFINITION OF ANUMANA, DEFINITION OF PAKSADHARMATA, FIVE KINDS OF HETVABHASA, SAKTIGRAHA, ARTHAPATTI AS A DISTINCTIVE PRAMANA AND THE PRABHAKARA THEORY F AKHYATI.
	CC14- ETHICS (WESTERN)	ACQUIRING AN OVERVIEW OF CLASSIFICATION OF ETHICS, MORAL AND NON-MORAL ACTIONS, MORAL THEORIES: PLATO AND ARISTOTLE, UNDERSTANDING THE ETHICAL HEDONISM, KANT'S THEORY AND THEORIES OF PUNISHMENT.
	DSE-A(2)c- PHILOSOPHY OF LANGUAGE	BRIEF INTRODUCTION TO SYNTAX, SEMANTICS,

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	(WESTERN)	PRAGMATICS, VAGUENESS, SENTENCE MEANING AMD TESTABILITY.
	DSE-B(2)d- M.K.GANDHI	UNDER THIS ELECTIVE COURSE STUDENTS WILL STUDY THE PHILOSOPHICAL THINKING OF GREAT INDIAN PHILOSOPHERS LIKE M.K.GANDHI AND HIS THOUGHTS OF GOD AND TRUTH, NATURE OF MAN, NON-VIOLENCE, SATYAGRAHA, SWARAJ AND THEORY OF TRUSTEESHIP.

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DEPARTMENT OF (NAME OF DEPARTMENT) **PHYSICS**

UNDERGRADUATE (BA/BSc) HONOURS PROGRAMME **BSC**

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC1 – Mathematical Physics I	BRIEF EXCURSION WITH THE MATHEMATICAL AND COMPUTATIONAL TOOLS TO HANDLE PHYSICALLY INTRIGUING CONCEPTS, BOTH USING ANALYTICAL MATHEMATICAL RIGOUR AND COMPUTER EXPERIMENTS.
	CC2 – Mechanics	INTRODUCTION TO FORCE AND CELESTIAL MECHANICS, WHERE STUDENTS DIRECTLY USE THE KNOWLEDGE OF CC1 TO SOLVE COMPLEX MECHANICAL PROBLEMS AND HANDS-ON LEARNING OF LABORATORY EXPERIMENTS.
II	CC3 – Electricity and Magnetism	ACQUIRING AN OVERVIEW OF THE ELECTROMAGNETIC WORLD OF PHYSICS VIA THEORY AND EXPERIMENTS OF ELECTRICAL CIRCUITS.
	CC4 – Waves and Optics	ACQUIRING AN OVERVIEW OF WAVES AND OSCILLATIONS AND DIRECT APPLICATION OF THEM IN PHYSICAL OPTICS VIA THEORY AND EXPERIMENTS
III	CC5 – Mathematical Physics II	UNDERSTANDING MORE COMPLEX MATHEMATICAL TOOLS OFTEN USED IN DIFFERENT BRANCHES OF PHYSICS VIA PEN-&-PAPER LEARNING AND MORE EXHAUSTIVE LIST OF COMPUTER EXPERIMENTS THAN CC1.
	CC6 – Thermal Physics	FIRST EXCURSION INTO HEAT AND THERMODYNAMICS VIA THEORY AND EXPERIMENTS WHERE STUDENTS ARE EXPOSED TO THE GUIDING PRINCIPLES OF DESIGNING THEORETICAL REALISTIC MODELS
	CC7 – Modern Physics	FIRST EXPOSITION TO THE PARADOXICAL WORLD OF PHYSICS VIA QUANTUM AND PARTICLE PHYSICS USING THEORY AND EXPERIMENTS
	SEC A1 – Scientific Writing	STUDENT CENTRIC PEDAGOGIC READING AND RESEARCH PROJECTS MADE WITH SCIENTIFIC WRITING TOOLS TO CREATE PROFESSIONAL HYPERREFERENCED C.V., BOOKS, THESES, AESTHETIC PRESENTATIONS, CALENDARS AND MANY MORE, THAT PREPARE STUDENTS BOTH FOR HIGHER ACADEMIA AND INDUSTRIAL STAGE.
IV	CC8 – Mathematical Physics III	ACQUIRING THE HARDEST MATHEMATICAL CONCEPTS LIKE COMPLEX ANALYSIS AS WELL PARADOXIAL RESULTS OF RELATIVITY VIA THEORY AND COMPUTER EXPERIMENTS

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	CC9 – Analog Electronics	INTRODUCING THE SEMICONDUCTOR ANALOG ELECTRONICS VIA THEORY AND EXPERIMENTS TO UNDERSTAND THE WORK OF DIODES, TRANSISTORS
	CC10 – Quantum Mechanics	MORE RIGOROUS EXPOSITION TO THE NONRELATIVISTIC WAVE AND MATRIX MECHANICS OF QUANTUM PHYSICS AND ATOMIC PHYSICS AS WELL AS COMPUTER EXPERIMENTS TO DEAL WITH MORE COMPLEX MATERIAL SCIENCE PROBLEMS AT LATER STAGE
	SEC B1 – Arduino	MASTERING ON PROGRAMMING AND EXECUTING DO-IT-YOURSELF (DIY) PROJECTS USING ARDUINO UNO THAT IS EXTENSIVELY USED IN SIGNALLING SYSTEM, AUTOMATION IN DIFFERENT SCALE AND ENERGY EFFICIENT DEVICE MANUFACTURING.
V	CC11 – Electromagnetic Theory	ACQUIRING AN UNDERSTANDING OF COARSE GRAINED MACROSCOPIC EQUATIONS OF ELECTRODYNAMICS AND OPTICS
	CC12 – Statistical Physics	FIRST EXPOSITION TO LEARN THE THERMAL CONCEPTS IN CLASSICAL AND QUANTUM WORLD FROM A PROBABILISTIC AND STATISTICAL APPROACH
	DSEA1 – Laser and Fiber Optics	ACQUIRING PRELIMINARY KNOWLEDGE OF APPLICATION OF LASERS IN LINEAR AND NONLINEAR MEDIUM AND BASICS OF FIBER OPTICS AND TECHNOLOGICAL APPLICATIONS
	DSEB1 – Nuclear and particle Physics	MORE RIGOROUS EXPOSITION TO NUCLEAR AND PARTICLE PHYSICS AND ACCELERATORS, DETECTORS
VI	CC13 – Digital Electronics	INTRODUCTION OF DIGITAL ELECTRONIC CIRCUITS THEIR FABRICATION AND OPERATION THROUGHS HANDS ON EXPERIENCE
	CC14 – Solid State Physics	INTRODUCTION OF SOLID STATE MATERIALS AND MATERIAL SCIENCE VIA PHYSICAL PRINCIPLES AND EXPERIMENTAL APPLICATIONS
	DSEA2 – Advanced Classical dynamics	FIRST EXPOSURE ON ENERGY MECHANICS AND NONLINEAR MECHANICS BEYOND THE DOMAIN OF FORCE MECHANICS
	DSEB2 – Advanced Statistical Mechanics	MORE RIGOROUS EXPOSITION TO EQUILIBRIUM AND NON EQUILIBRIUM STATISTICAL PHYSICS VIA THE PRINCIPLES OF COARSE GRAINED THEORIES AND THEIR APPLICATIONS

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DEPARTMENT OF POLITICAL SCIENCE

UNDERGRADUATE (BA) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
1	CC- 1, Understanding Political Theory: Concepts	Meaning of politics and political, concept of state, nation, sovereignty, power and authority-types and linkages, concepts of law, liberty and equality and their interrelationships. Concepts of rights and justice, Rawls's theory of justice, freedom, classification of democracy by David Held, authoritarianism, citizenship.
	CC-2, Understanding Political Theory: Approaches and Debates, CC-2	Normative Approaches, legal-institutional, empirical, behavioural, systems analysis, structural functionalism, liberalism, social welfarism, neo-liberalism, postcolonial, feminist, Marxian approach, dialectical materialism, historical materialism, state, relative autonomy, class and class-struggle, surplus value, alienation, party, democratic centralism, Lenin and Rosa Luxemburg debate, ideas of revolution of Lenin and Mao, hegemony and civil society of Gramsci
2	CC-3, Constitutional Government in India,	Evolution of the Indian Constitution, role of the Constituent Assembly, debate, preamble, citizenship, fundamental rights and duties, directive principles, nature of Indian Federalism, Union and State relations, Union executive, President,

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		Vice-President, election, position, functions, emergency powers, Prime Minister, Council of Ministers, relationship of Prime Minister and President, Union legislature, Rajya Sabha, Lok Sabha, Organization, Functions, law-making procedure, Parliamentary procedure, Privileges, Committee system, Speaker, Government in States, Governor, Chief Minister and Council of Ministers, position and functions, state legislature, composition and functions, Supreme court and High court, composition and functions, Judicial activism, Constitutional amendment, recommendation of national commission to review the working of the Constitution
	CC-4, Politics in India: Structures and Processes	Party-system, features and trends, major national political parties in India, ideologies and programmes, coalition politics in India, nature and trends, political parties in West Bengal, electoral process, Election Commission, composition and functions, roles, electoral reforms, role of business groups, working class, peasants in Indian politics, role of religion, language, caste and tribe in Indian politics, regionalism in Indian politics, new social movements since 1970s, environmental movements, women's movements, human rights movements.
3	CC-5, Indian Political Thought-I	Ancient Indian political ideas, Saptanga theory and dandaniti of Kautilya, Diplomacy, Medieval Indian political thought of Barani and Abul Fazal, Legitimacy of kingship, principle of Syncretism, Modern Indian political thought, Rammohan Roy as pioneer of liberalism, rule of law, freedom of thought, social justice, Bankim Chandra Chattopadhyay, Vivekananda and Rabindranath Tagore views on nationalism, Gandhi's view on state, swaraj and satyagraha

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	CC-6, Comparative Government and Politics	Evolution of comparative politics, scope, purposes and methods of comparison, distinction between comparative government and politics, major approaches to the study of comparative politics, institutional approach, systems approach, structural functional approach, limitations, new institutionalism, political economy-origin and key features, development and democratization of S.P. Huntington, Classification of political systems, nature of liberal and socialist political systems, conventions, rule of law, separation of powers, checks and balances, judicial review, democratic centralism, referendum, initiative, political parties, typology, features and roles, interest groups, roles in UK and USA, unitary system, UK, Bangladesh, federal system in USA and Russia, legislature in UK, USA and PRC, composition and functions of legislative chambers, committee system in UK and USA, executive in UK, USA and PRC comparative study,
	CC-7, Perspectives on International Relations	Understanding international relations, evolution of international relation as an academic discipline, classical realism and neo-realism, dependency, world system theory, development, environment, terrorism and migration, making of foreign policy, Indian foreign policy major phases 1947 to tll date, Sino-India relations, Indo-US relations,
4	CC-8, Indian Political Thought-II	Radical humanism of M.N. Roy, socialist ideas of Narendra Deva Ram Monohar Lohia, and J.P. Narayan, Syed Ahmed Khan and Iqbal's views on colonialism and nationalism, Nehru's views on socialism and democracy, Subhas Chandra Bose's views on socialism and fascism, contested notions of nation by Svarkar and Jinnah, Jyotiba Phule and Ambedkar on caste system and untouchability, Pandita Ramabai's views on social justice
	CC-9, Global Politics Since 1945	Cold war and its evolution, emergence of third world, NAM, Pan Africanism, post-cold war world, Globalization-conceptions and perspectives, Europe in transition, European Union, Brexit, major institutions of global governance, World Bank, IMF, WTO, major regional organizations, ASEAN, OPEC, SAFTA, SAARC and BRICS, West Asia and the Palestine question, India and

		her neighbours-Pakistan and Bangladesh, India and her neighbours Nepal, Bhuta, Sri Lanka, UNO background, major organs-General Assembly, Security Council and Secretariat, Secretary General, role of UNO in peace-keeping, human rights and development, Millennium development goals and sustainable development goals
	CC-10, Western Political Thought and Theory-I	Greek political thought, main features, Plato's ideas on justice and communism, Aristotle's state, classification of constitutions, Roman political thought, theories of law and citizenship, contributions of Roman Political thought, medieval political thought in Europe, major features, contribution of Machiavelli, significance of Renaissance, political thought of reformation, Bodin's idea of sovereignty, Hobbes as founder of science of materialist politics, Locke as fonder of liberalism, views on natural rights, property and consent, Rousseau's views on freedom and democracy
5	CC-11,Western Political Thought and Theory II	Bentham on utilitarianism, J.S. Mill's views on liberty and representative government Hegel on civil society and state, T.H. Green's ideas on freedom and obligation, Utopian and Scientific socialism-basic characteristics, varieties of non-Marxist socialism, Fabianism, syndicalism, guild-socialism, anarchism, Cultural Marxism, Frankfurt school, Post-Marxism-emergence and basic contentions

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DEPARTMENT OF POLITICAL SCIENCE

UNDERGRADUATE (BA) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
6	CC- 12, Political Sociology	Social bases of politics, emergence of political sociology, political culture and political socialization-nature, types and agencies, political participation-concept and types, political development and social change, political communication-concepts and types, social stratification and politics, caste, tribe, class, elite, gender and politics-basic issues, religion and politics-varying perspectives, military and politics, conditions and modes of intervention, electorate and electoral behaviour in Indian context
	CC-13, Public Administration-Concepts and Perspectives	Nature, scope and evolution of public administration, difference between private and public administration, principles of socialist management, challenges to discipline of public administration, responses, new public administration, comparative public administration, development administration in Indian context, major concepts of administration, hierarchy, unity of command, span of control, authority, centralization, decentralization, delegation, line and staff, public administration in the era of globalization, liberalization and privatization, governance, conceptual emergence, distinction with government, e-governance, features and significance, bureaucracy, views of Marx and Max Weber, ecological approach to public administration, Riggsian model, administrative processes-decision making, communication and

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		control, leadership, co-ordination, public policy-definitions, characteristics, models, policy implementation
	CC-14, Administration and Public Policy in India	Continuity and change in Indian administration, brief historical overview, civil services in India (bureaucracy), recruitment, role of UPSC, SPSC, training, organization of union government, secretariat administration, PMO, Cabinet Secretariat, organization of state government, chief secretary, relations between secretariat and directorate, district administration, role of district magistrate, SDO, BDO, local self-government, corporations, municipalities, panchayats in West Bengal, structure and functions, 73rd and 74th amendment, planning, Planning Commission, National Development Council, district planning, changing nature of planning, NITI Ayog, Budget-concept and significance, financial administration, Public Accounts Committee, Estimate Committee, role of CAG, citizen and administration, functions of Lok Pal and Lokayukt, Right to Information, citizen charter, citizen and social welfare policies, MGNREGA, Sarva Shiksha Abhiyan (SSA), National Health Mission (NHRM)
5	DSE-5-B (1) Indian Foreign Policy in a Globalising World	India's foreign policy from a postcolonial state to an aspiring global power, India's relations with the USA and USSR, India's engagements with China, India in South Asia, debating regional strategies, India's negotiating style and strategies, trends, environment and security regimes, India in the contemporary multipolar world
6	DSE-6-A (3), Public Policy in India	Introduction to policy analysis, the analysis of policy vis-à-vis the theories of state, political economy and policy, interest groups and social movements, ideology and policy, Nehruvian vision, economic liberalization and recent developments.

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6	DSE-6-B (4) Human Rights in a Comparative Perspective	Human rights, theory and institutionalization, understanding human rights, three generations of rights, institutionalization-universal declaration of human rights, rights in national Constitutions of South Africa and India, issues of torture in USA and India, surveillance and censorship in China and India, terrorism and insecurity of minorities in USA and India, structural violence, caste and race, South Africa and India, gender and violence in India and Pakistan, adivasis/aboriginals and the land question in Australia and India.
3	SEC-3-A (1) , Democratic Awareness through Legal Literacy	Laws relating to criminal jurisdiction, provisions relating to filing an FIR, arrest, bail, search and seizure, some understanding of the question of evidence and procedure in the CrPC, offences under IPC, personal laws and customary laws in India, laws relating to dowry, sexual harassment and violence against women, laws relating to consumer rights, right to information, laws relating to cybercrimes, anti-terrorist laws, implications for security and human rights.

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DEPARTMENT OF POLITICAL SCIENCE

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COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
4	SEC-4-B (1) , Legislative Practices and Procedures	Members of Parliament, powers and privileges, constituency work, state legislative assemblies, powers and functions, functionaries of rural and urban local self-government from zilla parishad to municipal corporation to panchayat/ward, how a bill becomes a law, role of standing committees in reviewing a bill, legislative consultants, the framing of rules and regulations, types of committees, role of committees in reviewing government finances, policy, programmes, legislation, powers and functions of people's representatives at different tiers of governance.
5	DSE-5-A (1), Gender and Politics	Groundings, patriarchy, sex-gender debates, public and private, power, feminism, family, community, state, community, movements and issues, history of the women's movement in India, violence against women, work and labour, visible and invisible work, productive and care work, reproductive and care work, sex work

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DEPARTMENT OF PSYCHOLOGY

UNDERGRADUATE (BA/BSc) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1 – INTRODUCTION TO PSYCHOLOGY	INTRODUCING STUDENTS TO THE BASIC CONCEPTS OF THE FIELD OF PSYCHOLOGY WITH AN EMPHASIS ON APPLICATIONS OF PSYCHOLOGY IN EVERYDAY LIFE.
	CC2 – STATISTICAL METHODS IN PSYCHOLOGICAL RESEARCH - I	FAMILIARISING STUDENTS WITH THE USE OF STATISITICAL METHODS IN PSYCHOLOGICAL RESEARCH AND THE TECHNIQUES OF DESCRIPTIVE STATISTICS FOR QUANTITATIVE RESEARCH.
II	CC3 – BIOPSYCHOLOGY	EXPLORING THE BIOLOGICAL BASIS OF EXPERIENCE AND BEHAVIOUR, DEVELOPING AN UNDERSTANDING OF THE INFLUENCE OF BEHAVIOUR, COGNITION AND THE ENVIRONMENT ON BODILY SYSTEM, AND DEVELOPING AN APPRECIATION FOR NEUROBIOLOGICAL BASIS OF BEHAVIOUR.
	CC4 – PSYCHOLOGY OF INDIVIDUAL DIFFERENCES	DEVELOPING AN UNDERSTANDING OF THE CONCEPT OF INDIVIDUAL DIFFERENCES WITH THE GOAL TO PROMOTE SELF-REFLECTION AND UNDERSTANDING OF SELF AND OTHERS.
III	CC5 – DEVELOPMENT OF PSYCHOLOGICAL THOUGHT	PROVIDING A BASIC INTRODUCTION TO THE DEVELOPMENT OF THE DISCIPLINE BOTH FROM AN INDIAN AND A WESTERN PERSPECTIVE AND REVIEWING THE DEVELOPMENT OF PSYCHOLOGICAL THOUGHT AND INTRODUCE THE ISSUES AND DEBATES IN CONTEMPORARY PSYCHOLOGY.
	CC6 – PSYCHOLOGICAL RESEARCH	EDUCATING STUDENTS WITH THE PROCESS AND METHODS OF QUANTITATIVE AND QUALITATIVE PSYCHOLOGICAL RESEARCH TRADITIONS.
	CC7 – SOCIAL PSYCHOLOGY	DEVELOPING AN UNDERSTANDING OF THE INDIVIDUAL IN RELATION TO THE SOCIAL WORLD AND INTRODUCING STUDENTS TO THE REALM OF SOCIAL INFLUENCE, AS TO HOW INDIVIDUALS THINK, FEEL, AND BEHAVE IN SOCIAL SITUATIONS.

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III	SEC-A-01: BEHAVIOUR MODIFICATION	UNDERSTANDING THE CONCEPT OF BEHAVIOUR MODIFICATION AND ITS APPLICATIONS.
IV	CC8 – UNDERSTANDING PSYCHOLOGICAL DISORDERS	PROVIDING AN OVERVIEW OF THE CONCEPT OF ABNORMALITY AND THE SYMPTOMS AND ETIOLOGY OF VARIOUS PSYCHOLOGICAL DISORDERS.
	CC9 – STATISTICAL METHODS IN PSYCHOLOGICAL RESEARCH - II	EDUCATING STUDENTS WITH THE TECHNIQUES OF INFERENTIAL STATISTICS AND HYPOTHESIS TESTING.
	CC10 – APPLIED SOCIAL PSYCHOLOGY	HELPING STUDENTS UNDERSTAND SOCIAL PROBLEMS AND GAIN KNOWLEDGE ABOUT INTERVENTION STRATEGIES.
	SEC-B-02: STRESS MANAGEMENT	HELPING STUDENTS UNDERSTAND HOW TO MAKE ADJUSTMENTS AND MANAGE HOW TO COPE WITH STRESS MORE EFFECTIVELY.
V	CC11 – UNDERSTANDING AND DEALING WITH PSYCHOLOGICAL DISORDERS	INTRODUCING THE ETIOLOGICAL UNDERSTANDING AND THERAPEUTIC INTERVENTIONS FOR THE VARIOUS PSYCHOLOGICAL DISORDERS AND TO HELP STUDENTS UNDERSTAND HOW TO DEAL WITH MODERATE TO SEVERE PSYCHOPATHOLOGY.
	CC12 – DEVELOPMENTAL PSYCHOLOGY	HELPING STUDENTS UNDERSTAND THE CONCEPT AND PROCESS OF HUMAN DEVELOPMENT ACROSS THE LIFESPAN AND THE VARIOUS DOMAINS OF HUMAN DEVELOPMENT.
	DSE-A-01: POSITIVE PSYCHOLOGY	INTRODUCING THE BASIC CONCEPTS OF THE GROWING APPROACH OF POSITIVE PSYCHOLOGY AND UNDERSTAND ITS APPLICATIONS IN VARIOUS DOMAINS.
	DSE-B-01: HEALTH PSYCHOLOGY	UNDERSTANDING THE RELATIONSHIP BETWEEN PSYCHOLOGICAL FACTORS AND PHYSICAL HEALTH AND LEARN HOW TO ENHANCE WELL-BEING.

VI	CC13 – ORGANISATIONAL BEHAVIOUR	DEVELOPING AN AWARENESS OF THE CONCEPTS RELATED TO

		ORGANISATIONAL BEHAVIOUR AND HELP STUDENTS DEVELOP CONNECTIVITY BETWEEN CONCEPTS AND PRACTICES OF ORGANISATION.
	CC14 –COUNSELLING PSYCHOLOGY	DEVELOPING AN UNDSERSTANDING OF THE BASIC CONCEPTS, PROCESSES, AND TECHNIQUES OF COUNSELLING AND TO ACQUAINT STUDENTS WITH CHALLENGES OF COUNSELLING.
	DSE-A-02: HUMAN RESOURCE MANAGEMENT	HELPING STUDENTS UNDERSTAND THE VARIOUS PROCESSES AND ISSUES INHERENT IN ORGANISATIONS RELATED TO HUMAN RESOURCES.
	DSE-B-02: COMMUNITY PSYCHOLOGY	LEARNING THE LINK BETWEEN INDIVIDUALS AND COMMUNITIES AND DEAL WITH SOCIAL ISSUES MORE EFFECTIVELY WITH PEOPLE'S PERCEPTIONS.

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DEPARTMENT OF SANSKIT

UNDERGRADUATE (BA/BSc) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC 1 - CLASSICAL SANSKRIT LITERATURE (POETRY)	Understading Sanskrit Poetics that constitutes Poetics style
I	CC 2 – CRITICAL SURVEY OF SANSKRIT LITERATURE	For cognitive development on Ramayana, Mahabharata, Puranas, Philosophy, Poetry and Grammar which is helpful for acquiring knowledge.
II	CC 3 - CLASSICAL SANSKRIT LITERATURE (PROSE)	Understading Sanskrit Proses that constitutes Prose style
II	CC 4 – SELF MANAGEMET IN THE GITA	Value of Gita for developing values of spiritual life which is helpful in developing sense of life.
III	CC 5 - CLASSICAL SANSKRIT LITERATURE (DRAMA)	Understading Sanskrit Dramatic that constitutes Poetics style
III	CC 6- POETICS AND LITERARY CRITICISM	To develop aesthetics through rhyme, ornament and poetry.
III	CC 7- INDIAN SOCIAL INSTITUTIONS AND POLITY	To achieve social development through the study of ancient constitutions and political theories
III	SEC-A-1 SANSKRIT WRITING SKILL	To Develop Sanskrit Writting and Composition like letter , Paragraph, Translation
IV	CC 8 – INDIAN EPIGRAPHY,PALAEOGRAPHY AND CHRONOLOGY	Basic Idea Ancient Indian Fact Like - Epigraphy, Paleography and Chronological style area
IV	CC 9 – MODERN SANSKRIT LITERATURE	Depicted Modern Sanskrit Literature like Mahakavya Drisyakavya and Caritkavya
IV	CC 10 – SANSKRIT WORLD LITERATURE	Influence Sanskrit Literature all over the World
IV	SEC –B-2- SPOKEN & COMPUTATIONAL SANSKRIT	To Develop Sanskrit Writting and Composition like letter, Paragraph, Translation

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V	CC 11 – VEDIC LITERATURE	Introduces the functional activities of ancient sages, Vedic rituals, and explorations of epistemology and self-discovery.
V	CC 12 – SANSKRIT GRAMMAR	Development Writing School and Language Like Case Ending,Drive and Composition
V	DSE-1 - DARSANA	Developing through research and the pursuit of knowledge that brings value to life.

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V	DSE-2 - KAVYA	To develop the aesthetic theory of the subject and various aspects of poetry
VI	CC 13 – INDIAN ONTOLOGY & EPISTEMOLOGY	To develop the values of thinking with philosophical ideas and knowledge.
VI	CC 14 – SANSKRIT COMPOSITION & COMMUNICATION	Development Sanskrit Composition (Letter,Paragraph,Translation) and Communication
VI	DSE-3 - VYAKARANA	To develop a sound understanding of vocabulary and sentence structure
VI	DSE -4 - VEDA	To introduce the views of Eastern and Western Vedic scholars and the soul-searching of knowledge.

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DEPARTMENT OF SOCIOLOFY

UNDER GRADUATE (B.A) HONOURS PROGRAMME COURSE OUTCOME UNDER CBCS

Semester	Paper/Course Name & Description	Outcome
I	CC-1Introductory Sociology-I CC-2 Sociology of India- II	CC-I: The students learn to apply the sociological perspective in understanding how society shapes our individual lives. It also provides a foundation for the other more detailed and specialized courses in sociology. CC-2: The course lays the foundation of viewing images and ideas of India through a sociological lens. It further investigates sociological concepts and institutions in the Indian context. Through informed interrogation of images, ideas, concepts and institutions of India, the course contributes to the development of critical and analytical thinking.

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II	CC-3 Introductory Sociology-II CC-4 Sociology of India- II	CC-3: The students are introduced to the relationship between theory and perspectives. The students are introduced to sociological theories which they learn in greater detail during the later semesters. CC-4: The course adds to the sociological interpretation of Indian history and society. The India-specific themes of the course – discourse/knowledge-making, mobilization, transformation, ideology, identity and politics, for example – are treated, moreover, by drawing from sociological concepts and theories. The course connects the practical and conceptual in terms of both substance and relevance.
III	CC-5 Political Sociology	CC-5: An ability to comprehend the embeddedness of political and the social in each other. 2. Familiarity with different theoretical and conceptual issues in political sociology and a capacity to use them to grasp political phenomena in a cross-cultural and comparative perspective.

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	CC-6 Sociology of Religion	CC-6: Students will be acquainted with representative texts that symbolize the development of knowledge in the field of Sociology of Religion. They will be able to identify different theories, approaches and concepts that make up the study of religion, distinguish between them and also use terms specific to the field in specific context.
	CC-7 Sociology of Gender and Sexuality	CC-7: An understanding of concepts such as sex and gender by problematising common-sensical notions of gender. Raising key issues of power and subordination within the purview of gender and the need for and solutions resorted to as measures to initiate change through gender-based movements. Understanding issues relating to gender both at a national and global level.
	SEC-A (2) Gender Sensitization	SEC-A (2): To provide an integrated and interdisciplinary approach to understand the social and cultural constructions of gender that shapes the experiences of women and men in society.

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IV	CC-8 Economic Sociology CC-9 Population Studies CC-10 Social Stratification	CC-8: Develops familiarity with different theoretical and conceptual aspects of economic sociology as a specialized branch of knowledge. Develops background knowledge about the diverse ways in which economy is interlinked with other aspects of society and culture. CC-9: Population education aims to increase awareness and understanding of population-related issues, such as population growth, reproductive health, and sustainable development. It seeks to educate individuals about the social, economic, and environmental implications of population dynamics. CC-10: Students will learn about the socio-historical context of stratification theoretical concerns and problems and contemporary issues related to inequalities s and its forms. Inculcate in them a truly inter-disciplinary approach

	SEC-B (1) Statistical Reasoning for Sociology	in the study of society especially stratification in all its manifestations. SEC-B (1): Some knowledge of elementary statistics is also provided to the students to acquaint them with quantification of data. 2. The thrust of the course is on empirical reasoning, understanding and analysis of social reality, which is integral to the concepts of quantitative research. Students learn to differentiate between qualitative and quantitative aspects of research in terms of collection and subsequent analysis of data.

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V	CC-11 Sociological Thinker-I CC-12 Research Methods-I DSE-A (1) Urban Sociology	CC-11: Understanding the grand foundational themes of sociology. Application of theories and concepts from classical sociological theories to develop intellectual openness and curiosity. CC-12: Students are introduced to sociological research both from a theoretical and methodological perspective. They understand the importance of research in social science. Students develop the ability to evaluate the methodological validity of the claims made by theory. 3. The course enables students to evaluate a piece of research and move towards designing a simple research project. DSE-A (1): Urbanisation is an important aspect of modern society. This course is will provide an exposure to key theoretical perspectives for understanding urban phenomena in historical and contemporary contexts. It also reflects on vital concerns of urban living while narrating the subjective experiences of urban communities. With case studies from India and other parts of the world this course will help students understand and relate to the complexities of urban living. DSE-B (1): Ensure that students have conceptual clarity and can articulate the main debates and arguments with regard to sociology in India. 2. Acquaint the

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	DSE-B (1) Indian Sociological Tradition	

		students to the continuities and contradictions in Indian society 3. To ensure that students have understood the formation of the discipline in India and the challenges that it has faced.

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VI	CC-13 Sociological Thinkers-II	CC-13: Understanding the characteristics and dynamics of the social world, and how postclassical sociologists attempt to understand the social world. Appreciating the relevance and limits of the contemporary theories or theoretical approaches to make sense of social reality.
	CC-14 Research Methods-II	CC-14: Students are introduced to the concept of conducting research, which is inclusive of formulating research designs, methods and analysis of data. Some knowledge of elementary statistics is also provided to the students to acquaint them with quantification of data. The thrust of the course is on empirical reasoning, understanding and analysis of social reality, which is integral to the concepts of quantitative research. Students learn to differentiate between qualitative and quantitative aspects of research in terms of collection and subsequent analysis of data.
	DSE-A (1) Environmental Sociology	DSE-A (1): This course is designed to allow students to reflect on the environment' as an object of sociological inquiry. It would orient them to the core debates of environmental sociology, different approaches within the sub- discipline and how these approaches may be used to understand environmental issues and movements in India. The aim is to convey the fact that since environmental issues in contemporary times have come to assume utmost significance representing a complex interplay of several factors that are material, ideal and social in character; these linkages need to be analyzed from a sociological standpoint as they play out in our societies in varied forms.
		DSE-B (4): Fieldwork is conducted in natural conditions with the aim of gaining first-hand knowledge of the situation. The researcher enters the field

	DSE-B (4) Fieldwork and Dissertation	to observe and

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		study human interaction directly. Taking field notes is an important aspect of fieldwork.

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DEPARTMENT OF STATISTICS

UNDERGRADUATE B.Sc. HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
1	CC1 – DESCRIPTIVE STATISTICS	• UNDERSTADING THE BASIC CONCEPT OF COLLECTING, ORGANIZING, MANAGING AND PRESENTING DATA. • ACQUIRING THE KNOWLEDGE TO REPRESENT AND ANALYZE STATISTICAL DATA THROUGH GRAPHS AND CHARTS. • . ACQUIRING THE KNOWLEDGE TO ANALYZE UNIVARIATE STATISTICAL DATA USING MESURES OF CENTRAL TENDENCY, DISPERSION, SKEWNESS AND KURTOSIS. • UNDERSTANDING THE CONCEPTS OF CORRELATION AND REGRESSION IN ANALYSIS OF BIVARIATE DATA. • UNDERSTANDING THE CONCEPTS OF CATEGORICAL DATA AND METHODS OF ANAYLYZING SUCH DATA.
	CC2 – PROBABILITY AND PROBABILITY DISTRIBUTIONS I	• UNDERSTANDING THE BASIC CONCEPTS OF PROBABILITY THEORY AND ITS APPLICATIONS IN REAL LIFE PROBLEMS. • UNDERSTANDING THE BASIC CONCEPTS OF RANDOM VARIABLES. • ACQUIRING THE KNOWLEDGE TO USE DISCRETE AND CONTINUOUS PROBABILITY DISTRIBUTINS TO SOLVE REAL LFE PROBLEMS.
2	CC3 – MATHEMATICAL ANALYSIS	• UNDERSTANDING THE BASIC CONCEPTS OF SEQUENCE AND SERIES F REAL NUMBERS AND THEIR CONVERGENCES. • ACQUIRING THE KNOWLEDGE TO FIND OUT THE MAXIMA AND MINIMA OF FUNCTIONS. • ACQUIRING THE KNOWLEDGE TO SOLVE PROBLEMS OF INTEGRAL CALCULUS. • UNDERSTANDING THE BASIC CONCEPTS OF FUNCTIONS OF TWO VARIABLES.
	CC4 - PROBABILITY AND PROBABILITY DISTRIBUTIONS II	• UNDERSTANDING THE CHARACTERISTICS OF THE STANDARD DISCRETE AND CONTINUOUS PROBABILITY DISTRIBUTIONS. • ACQUIRING THE KNOWLEDGE TO IDENTIFY THE TYPES OF SITUATIONS WHERE DIFFERENT DISTRIBUTIONS CAN BE APPLIED.

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		• UNDERSTANDING THE BASIC CONCEPTS OF BIVARIATE PROBABILITY DISTRIBUTIONS AND ITS CHARACTERISTICS.
3	CC5 – LINEAR ALGEBRA	• UNDERSTANDING THE BASIC CONCEPTS OF VECTORS SPACES AND SUBSPACES, LINEAR DEPENDENCE AND INDEPENDENCE OF VECTORS. • UNDERSTANDING THE BASIC CONCEPTS OF MATRICES, RANK OF A MATRIX, DETERMINANT AND INVRSE OF MATRICES. • ACQUIRING THE KNOWLEDGE TO USE DETERMINANTS TO SOLVE SYSTEM OF LINEREQUATIONS. • UNDERSTANDING THE BASIC CONCEPTS OF CHARACTERISTIC ROOTS AND QUADRATIC FORMS.
	CC6 – DEMOGRAPHY AND VITAL STATISTICS	• ACQUIRING THE KNOWLEDGE ON VITAL STATISTICS, DEMOGRAPHIC DATA AND ITS SOURCES. • ABLE TO COMPUTE MEASURES OF MORTALITY, FERTILITY, MORBIDITY, POPULATION GROWTH. • UNDERSTANDING THE BASIC CONCEPTS OF LIFE TABLE AND ITS APPLICATION IN REAL LIFE PROBLEMS. • ACQUIRING THE KNOWLEDGE ON POPULATION ESTIMATION, PROJECTION AND FORECASTING.
	CC7 – STATISTICAL COMPUTING AND NUMERICAL ANALYSIS USING C PROGRAMMING	• UNDERSTANDING THE BASIC CONCEPTS OF INTERPOLATION. • ACQUIRING THE KNOWLEDGE TO COMPUTE INTEGRALS AND SOLVE EQUATIONS USING NUMERICAL TECHNIQUES. • LEARNING THE FUNDAMENTALS OF C PROGRAMMING LAUNGUAGE • ABLE TO WRITE PROGRAMS IN C TO SOLVE VARIOUS STATISTICAL PROBLEMS.
	SEC-A1 – STATISTICAL DATA ANALYSIS USING R	• UNDERSTANDING THE FUNDAMENTALS OF R. • LEARNING TO USE R AS A CALCULATOR. • ACQUIRING THE KNOWLEDGE TO USE R AS A GRAPHING CALCULATOR. • ACQUIRING THE KNOWLEDGE TO PEFORM MATRIX OPERATIONS IN R. • ACQUIRING THE KNOWLEDGE TO LOAD DATA FROM A FILE.
4	CC8 – SURVEY SAMPLING & INDIAN OFFICIAL STATISTICS	• UNDERSTANDING THE BASIC CONCEPTS OF SURVEY SAMPLING AND BASIC PRINCIPLES OF SAMPLING. • ACQUIRING THE KNOWLEDGE ON THE VARIOUS SAMPLNG METHODOLOGIES AND THEIR EFFICIENCIES IN THEORETICAL AND PRACTICAL ASPECTS. • ACQUIRING THE KNOWLEDGE ON THE PRESENT OFFICIAL STTISTICAL SYSTEM IN INDIA.

		• UNDERSTANDING THE DIFFERENT METHODS OF COLLECTION OF OFFICIAL STATISTICS AND THEIR RELIABILITY. • GAINING KNOWLEDGE ON THE VARIOUS OFFICIAL AGENCIES RESPONSIBLE FOR DATA COLLECTION AND THEIR FUNCTIONS.
	CC9 – STATISTICAL INFERENCE I & SAMPLING DISTRIBUTIONS	• ACQUIRING THE KNOWLEDGE ON SAMPLING DISTRIBUTION AND THEIR APPLICATIONS IN STATISTICAL INFERENCE. • UNDERSTANDING THE BASIC CONCEPTS OF HYPOTHESIS TESTING • ACQUIRING THE KNOWLEDGE TO APPLY DIFFERENT TESTS IN ANALYZING RELEVANT REAL LIFE PROBLEMS.
	CC10 – INDEX NUMBERS & TIME SERIES ANALYSIS	• ACQUIRING THE KNOWLEDGE ON INDEX NUMBERS. • ABLE TO CALCULATE AND INTERPRET PRICE INDEX NUMBERS FROM GIVEN DATA. • UNDERSTANDING THE CONCEPTS OF TIME SEIES AND ITS DIFFERENT COMPONENTS. • GAINING KNOWLEDGE ON TIME SERIES MODELS AND THEIR APPLICATIONS. • ABLE TO ANALYZE TIME SERIES DATA AND FORECAST.
	SEC-B1 – MONTE CARLO METHODS	• ACQUIRING THE KNOWLEDGE TO USE THE COMPUTER FOR RANDOM NUMBER GENERATION. • ACQUIRING THE KNOWLEDGE TO FIND PROBABILITIES AND MOMENTS USING SIMULATION. • UNDERSTANDING THE BASIC CONCEPTS OF MONTE CARLO INTEGRATION. • ACQUIRING THE KNOWLEDGE TO SIMULATE FROM SOME COMMONLY KNOWN DISTRIBUTIONS.
5	CC11 – STATISTICAL INFERENCE II	• ACQUIRING KNOWLEDGE ON WEAK LAW OF LARGE NUMBERS AND CENTRAL LIMIT THEOREM. • ACQUIRING THE KNOWLEDGE TO DERIVE LARGE SAMPLE DISTRIBUTIONS AND LEARN THEIR USE IN LARGE SAMPLE TESTS. • UNDERSTANDING THE CONCEPTS OF THEORY OF ESTIMATION. • ACQUIRING KNOWLEDGE ON THE PROPERTIES OF ESTIMATORS AND CONSTRUCTION OF POINT AND INTERVAL ESTIMATORS. • UNDERSTANDING THE PROCESS OF HYPOTHESIS TESTING AND ITS APPLICATION IN SOLVING STATISTICAL PROBLEMS.
	CC12 – LINEAR MODELS AND REGRESSION	• UNDERSTANDING THE BASIC CONCEPTS OF LINEAR MODELS. • ACQUIRING KNOWLEDGE ON MULTIPLE REGRESSION AND RELATED PROBLEMS.

		• ACQUIRING KNOWLEDGE ON ANALYSIS OF VARIANCE AND ITS APPLICATION IN REAL LIFE PROBLEMS. • UNDERSTANDING THE BASIC CONCEPTS OF BINARY AND COUNT DATA REGRESSION
	DSE-A1.1 STATISTICAL QUALITY CONTROL	• UNDERSTANDING THE CONCEPTS OF QUALITY CONTROL • ACQUIRING THE KNOWLEDGE TO CONTRUCT CONTROL CHARTS FOR VARIABLES AND ATTRIBUTES. • UNDERSTANDING THE CONCEPTS OF PRODUCER'S AND CONSUMER'S RISK. • ACQUIRING THE KNOWLEDGE ABOUT SAMPLING INSPECTION PLANS.
	DSE-B1.1 OPERATIONS RESEARCH	• UNDERSTANDING THE BASIC CONCEPTS OF OPERATIONS RESEARCH. • ACQUIRING THE KNOWLEDGE TO FORMULATE AND FIND SOLUTIONS TO LINEAR PROGRAMMING PROBLEMS (LPP). • ACQUIRING THE KNOWLEDGE TO REPRESENT TRANSPORTATION AND ASSIGNNMENT PROBLEMS AS LPP AND SOLVING THEM.
6	CC13 – DESIGN OF EXPERIMENTS	• UNDERSTANDING THE CONCEPTS OF DESIGN OF EXPERIENTS. • ACQUIRING THE KNOWLEDGE TO CONDUCT DESIGN OF EXPERIMENTS AND ANALYZE THE DATA THEY YIELD.
	CC14 – MULTIVARIATE ANALYSIS AND NONPARAMETRIC METHODS	• UNDERSTANDING THE BASIC CONCEPTS OF MULTIVARIATE DATA AND RANDOM VECTORS. • ACQUIRING THE KNOWLEDGE TO COMPUTE AND INTERPRET MULTIPLE AND PARTIAL CORRELATION COEFFICIENTS. • ACQUIRING THE KNOWLEDGE TO ANALYZE MULTIVARIATE DATA USING PRINCIPAL COMPONENT ANALYSIS AND FACTOR ANALYSIS. • ACQUIRING THE KNOWLEDGE TO CARRY OUT TESTING OF HYPOTHESIS USING NONPARAMETRIC METHODS.
	DSE-A2 SURVIVAL ANALYSIS	• ACQUIRING THE KNOWLEDGE TO HANDLE CENSORED DATA. • LEARNING DIFFERENT TECHNIQUES AND TOOLS TO ANALYZE SURVIVAL DATA. • ACQUIRING THE KNOWLEDGE TO ESTIMATE SURVIVAL FUNCIONS AND OTHER FUNCTIONS OF SURVIVAL TIME.
	DSE-B2 PROJECT WORK	• ABLE TO CHOOSE A SUITABLE TOPIC FOR STUDY AND FORMULATE THE PROBLEM. • ABLE TO COMPILE RELEVANT LITERATURE AND FRAME THE HYPOTHESIS. • ABLE TO COMPILE RELEVANT DATA, INTERPRET AND ANALYZE IT.

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		• ABLE TO CREATE A COMPREHENSIVE PROJECT REPORT AND DEFEND IT BEFORE A PANEL OF EXAMINERS.

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DEPARTMENT OF (ZOOLOGY)

UNDERGRADUATE (BA/**BSC**) HONOURS PROGRAMME

COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	**CC 1 - NON-CHORDATES I: PROTISTS TO PSEUDOCOELOMATES**	➢ **STUDENTS SHALL LEARN**; 1. THE BASICS OF ANIMAL CLASSIFICATION OF THE FOLLOWING: PROTISTA AND METAZOA, PORIFERA, CNIDARIA, CTENOPHORA, PLATYHELMINTHES AND NEMATODA 2. THE WHOLE MOUNT OF MICROSCOPIC ORGANISMS 3. IDENTIFICATION OF MICROSCOPIC ORGANISMS 4. THE STAINING AND MOUNTING OF PROTOZOA/HELMINTH FROM GUT OF *Periplaneta* sp
	CC 2 - MOLECULAR BIOLOGY	➢ **STUDENTS SHALL LEARN**; 1. SALIENT FEATURES OF NUCLEIC ACIDS 2. MECHANISMS OF THE CENTRAL DOGMA 3. CONCEPT OF POST TRANSCRIPTIONAL MODIFICATIONS AND PROCESSING OF EUKARYOTIC RNA 4. CONCEPT OF GENE REGULATION – BOTH PROKARYOTES AND EUKARYOTES 5. CONCEPT OF DNA REPAIR MECHANISMS 6. KNOWLEDGE ABOUT MOLECULAR TECHNIQUES 7. STRUCTURE OF POLYTENE AND LAMPBRUSH CHROMOSOME 8. HISTOLOGICAL STAINING OF DNA AND RNA

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II	**CC 3 - NON-CHORDATES II – COELOMATES**	➢ **STUDENTS SHALL LEARN**; 1. THE BASICS OF ANIMAL CLASSIFICATION OF THE FOLLOWING: ANNELIDA, ARTHROPODA, ONYCHOPHORA, MOLLUSCA, ECHINODERMATA AND HEMICHORDATA 2. IDENTIFICATION OF PRESERVED ORGANISMS 3. ANATOMICAL STUDY OF *Periplaneta* sp
	CC 4 - CELL BIOLOGY	➢ **STUDENTS SHALL LEARN**; 1. THE BASICS OF PLASMA MEMBRANE, CYTOPLASMIC ORGANELLES, CYTOSKELETON AND NUCLEUS 2. UNDERSTAND THE CONCEPT OF CELL CYCLE AND CELL SIGNALLING 3. THEY SHALL PREPARE SLIDES RELATED TO CELL DIVISION (MITOSIS AND MEIOSIS).
III	**CC 5 - CHORDATA**	➢ **STUDENTS SHALL LEARN;** 1. GENERAL CHARACTERISTICS AND OUTLINE CLASSIFICATION OF PHYLUM CHORDATA 2. GENERAL CHARACTERISTICS AND OUTLINE CLASSIFICATION OF PHYLUM PROTOCHORDATA 3. GENERAL CHARACTERISTICS AND OUTLINE CLASSIFICATION OF AGNATHA, PISCES, AMPHIBIA, REPTILIA, AVES AND MAMMALS.
	CC 6 - ANIMAL PHYSIOLOGY: CONTROLLING AND CO-ORDINATING SYSTEM	➢ **STUDENTS SHALL LEARN;** 1. OUTLINE KNOWLEDGE OF TISSUES 2. OUTLINE KNOWLEDGE OF BONE AND CARTILAGE

		3. SHALL STUDY VARIOUS PHYSIOLOGICAL PROCESSES - NERVOUS SYSTEM, MUSCULAR SYSTEM, REPRODUCTIVE SYSTEM AND ENDOCRINE SYSTEM 4. STUDENTS SHALL LEARN ABOUT TEMPORARY MOUNTING OF SQUAMOUS EPITHELIUM, STRIATED MUSCLE FIBRES AND NERVE CELLS 5. SHALL PREPARE PERMANENT SLIDES OF MAMMALIAN SKIN, SPINAL CORD, PANCREAS, TESTIS, OVARY, ADRENAL, LUNG, PYLORIC STOMACH, CARDIAC STOMACH, THYROID, SMALL INTESTINE AND LARGE INTESTINE OF MAMMAL (WHITE RAT). 6. MICROTOMY: INCLUDING PREPARATION OF PERMANENT SLIDE OF ANY FIVE MAMMALIAN (GOAT/WHITE RAT) TISSUES
	CC 7 - FUNDAMENTALS OF BIOCHEMISTRY	➢ **STUDENTS SHALL LEARN;** 1. STRUCTURE AND BIOLOGICAL IMPORTANCE OF CARBOHYDRATES 2. STRUCTURE AND SIGNIFICANCE OF LIPIDS, PROTEINS, NUCLEIC ACIDS 3. STRUCTURE OF PURINES, PYRIMIDINES, NUCLEOSIDES AND NUCLEOTIDES; NUCLEIC ACID METABOLISM: CATABOLISM OF ADENOSINE, GUANOSINE, CYTOSINE AND THYMINE. 4. NOMENCLATURE AND CLASSIFICATION OF ENZYMES 5. CONCEPT OF OXIDATIVE PHOSPHORYLATION 6. QUALITATIVE TESTS FOR CARBOHYDRATES, PROTEINS AND LIPIDS 7. QUALITATIVE ESTIMATION OF UREA & URIC ACID 8. PAPER CHROMATOGRAPHY OF AMINO ACIDS. 9. QUANTITATIVE ESTIMATION OF WATER-SOLUBLE PROTEINS FOLLOWING LOWRY METHOD

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	SEC - SERICULTURE	➢ **STUDENTS SHALL LEARN**; 1. BIOLOGY OF SILKWORM, REARING OF SILKWORMS 2. KNOWLEDGE ABOUT PESTS AND DISEASES 3. PROSPECTUS OF SERICULTURE IN INDIA
IV	**CC 8 - COMPARATIVE ANATOMY OF VERTEBRATES**	➢ **STUDENTS SHALL LEARN;** 1. STRUCTURE AND FUNCTION OF INTEGUMENTARY SYSTEM, DIGESTIVE SYSTEM, RESPIRATORY SYSTEM, CIRCULATORY SYSTEM, URINOGENITAL SYSTEM, NERVOUS SYSTEM & SENSE ORGANS AND SKELETAL SYSTEM 2. STUDY OF PLACOID, CYCLOID AND CTENOID SCALES THROUGH PERMANENT SLIDES/PHOTOGRAPHS 3. STUDY OF DISARTICULATED SKELETON OF TOAD, PIGEON, GUINEAPIG (LIMB BONES, VERTEBRAE, LIMB AND GIRDLE) 4. STUDENTS SHALL LEARN ABOUT COMPARATIVE STUDY OF HEART AND BRAIN, WITH THE HELP OF MODEL/PICTURE 5. THEY SHALL IDENTIFY SKULLS OF PIGEON, HERBIVORE (GUINEAPIG) AND CARNIVORE (DOG) ANIMAL
	CC 9 - ANIMAL PHYSIOLOGY: LIFE SUSTAINING SYSTEMS	➢ **STUDENTS SHALL LEARN;** 1. PHYSIOLOGY OF DIGESTION, RESPIRATION, CIRCULATION AND HEART 2. CONCEPT OF THERMOREGULATION & OSMOREGULATION 3. RENAL PHYSIOLOGY 4. THEY SHALL DETERMINE ABO BLOOD GROUP 5. ESTIMATION OF HAEMOGLOBIN USING SAHLI'S HAEMOGLOBIN METER 6. IDENTIFICATION OF BLOOD CELLS FROM HUMAN BLOOD

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		7. THEY SHALL PREPARE HAEMIN CRYSTALS AND HAEMOCHROMOGEN CRYSTALS 8. SHALL IDENTIFY BLOOD CELLS FROM COCKROACH HAEMOLYMPH 9. STUDENTS SHALL BE DEMONSTRATED THE PROCESS OF BLOOD PRESSURE MEASUREMENT USING DIGITAL METER
	CC 10 - IMMUNOLOGY	➢ **STUDENTS SHALL LEARN;** 1. AN OVERVIEW OF IMMUNE SYSTEM 2. CONCEPT OF INNATE AND ADAPTIVE IMMUNITY 3. STRUCTURE AND FUNCTION OF ANTIGENS 4. STRUCTURE AND FUNCTION OF IMMUNOGLOBULINS 5. STRUCTURE AND FUNCTION OF MAJOR HISTOCOMPATIBILITY COMPLEX 6. STRUCTURE AND FUNCTION OF CYTOKINES 7. PATHWAYS OF COMPLEMENT SYSTEM 8. HYPERSENSITIVITY AND IT'S TYPES 9. VARIOUS TYPES OF VACCINES; ACTIVE & PASSIVE IMMUNIZATION 10. DEMONSTRATION OF LYMPHOID ORGANS 11. HISTOLOGICAL STUDY OF BURSA FABRICIUS, SPLEEN, THYMUS AND LYMPH NODES 12. DEMONSTRATION OF ELISA
	SEC – AQUARIUM FISHERIES	➢ **STUDENTS SHALL LEARN;** 1. INTRODUCTION TO AQUARIUM FISH KEEPING 2. BIOLOGY OF AQUARIUM FISHES 3. FOOD AND FEEDING OF AQUARIUM FISHES 4. FISH TRANSPORTATION 5. MAINTENANCE OF AQUARIUM

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V	**CC 11 - ECOLOGY**	➢ **STUDENTS SHALL LEARN;** 1. INTRODUCTION TO ECOLOGY 2. CONCEPT OF POPULATION 3. CONCEPT OF COMMUNITY 4. CONCEPT OF ECOSYSTEM 5. APPLIED ECOLOGY 6. DETERMINATION OF POPULATION DENSITY IN A NATURAL/HYPOTHETICAL COMMUNITY BY QUADRATE METHOD AND CALCULATION OF SHANNON-WEINER DIVERSITY INDEX FOR THE SAME COMMUNITY 7. STUDY OF AN AQUATIC ECOSYSTEM: PHYTOPLANKTON AND ZOOPLANKTON, MEASUREMENT OF AREA, TEMPERATURE, SALINITY, DETERMINATION OF PH, AND DISSOLVED OXYGEN CONTENT (WINKLER'S METHOD), CHEMICAL OXYGEN DEMAND AND FREE CO_2 8. PREPARATION OF REPORT AFTER VISIT TO NATIONAL PARK/BIODIVERSITY PARK/WILD LIFE SANCTUARY/ ANY PLACE OF ECOLOGICAL INTEREST/ ECOLOGICAL UNIQUENESS/ ZOOLOGICAL GARDEN
	CC 12 - PRINCIPLE OF GENETICS	➢ **STUDENTS SHALL LEARN;** 1. PRINCIPLE OF GENETICS 2. LINKAGE, CROSSING OVER AND LINKAGE MAPPING 3. MUTATIONS 4. MECHANISMS OF SEX DETERMINATION IN DROSOPHILA AND IN MAN 5. KAPPA PARTICLE IN PARAMOECIUM 6. GENETIC FINE STRUCTURE 7. TRANSPOSABLE GENETIC ELEMENTS

		8. CHI-SQUARE ANALYSIS FOR GENETIC RATIO TEST 9. IDENTIFICATION OF CHROMOSOMAL ABERRATION IN *Drosophila* AND MAN 10. PEDIGREE ANALYSIS OF SOME INHERITED TRAITS IN ANIMALS
	DSE A - PARASITOLOGY	➢ **STUDENTS SHALL LEARN;** 1. CONCEPT OF PARASITOLOGY, PARASITIC PROTISTS, PARASITIC PLATYHELMINTHES, PARASITIC NEMATODES, PARASITIC ARTHROPODS, PARASITE VERTEBRATES 2. STUDY OF LIFE STAGES OF *Giardia intestinalis, Trypanosoma gambiense, Leishmania donovani, Plasmodium vivax, Plasmodium falciparum* 3. ADULT AND LIFE STAGES OF *Schistosoma haematobium, Taenia solium* 4. ADULT AND LIFE STAGES OF *Ancylostoma duodenale* 5. STUDY OF MONOGENEA FROM THE GILLS OF FRESH/MARINE FISH 6. STUDY OF NEMATODE/CESTODE PARASITES FROM THE INTESTINES OF POULTRY BIRD
	DSE B - ENDOCRINOLOGY	➢ **STUDENTS SHALL LEARN;** 1. CONCEPT OF ENDOCRINOLOGY, HYPOTHALAMO-HYPOPHYSEAL AXIS, PERIPHERAL ENDOCRINE GLANDS 2. REGULATION OF HORMONE ACTION 3. NON-MAMMALIAN VERTEBRATE HORMONE 4. DISSECTION OF ENDOCRINE GLANDS IN LABORATORY BRED RAT 5. HISTOLOGY OF ALL THE ENDOCRINE GLANDS 6. TISSUE FIXATION, EMBEDDING IN PARAFFIN, MICROTOMY AND SLIDE PREPARATION OF ANY ENDOCRINE GLAND 7. HAEMATOXYLIN AND EOSIN STAINING OF HISTOLOGICAL SLIDES SHALL BE TAUGHT

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VI	**CC 13 - DEVELOPMENTAL BIOLOGY**	➢ **STUDENTS SHALL LEARN;** 1. PATTERN OF EARLY EMBRYONIC DEVELOPMENT 2. PATTERN OF LATE EMBRYONIC DEVELOPMENT 3. PATTERN OF POST EMBRYONIC DEVELOPMENT 4. IMPLICATIONS OF DEVELOPMENTAL BIOLOGY 5. STUDY OF WHOLE MOUNTS OF DEVELOPMENTAL STAGES OF CHICK EMBRYO THROUGH PERMANENT SLIDES: 24, 48, AND 96 HOURS OF INCUBATION 6. STUDY OF THE DEVELOPMENTAL STAGES AND LIFE CYCLE OF *Drosophila* 7. STUDY OF DIFFERENT SECTIONS OF PLACENTA 8. IDENTIFICATION OF INVERTEBRATE LARVA
	CC 14 - EVOLUTIONARY BIOLOGY	➢ **STUDENTS SHALL LEARN;** 1. ORIGIN OF LIFE 2. HISTORICAL REVIEW OF EVOLUTIONARY CONCEPTS: LAMARKISM, DARWINISM AND NEO DARWINISM 3. GEOLOGICAL TIME SCALE, FOSSIL: TYPES AND AGE DETERMINATION BY CARBON DATING, EVOLUTION OF HORSE 4. NATURAL SELECTION, SPECIES CONCEPT, ISOLATING MECHANISMS, MODES OF SPECIATION 5. ORIGIN AND EVOLUTION OF MAN 6. POPULATION GENETICS: HARDY-WEINBERG LAW; FACTORS DISRUPTING H-W EQUILIBRIUM 7. EXTINCTION, BACK GROUND AND MASS EXTINCTIONS, DETAILED EXAMPLE OF K-T EXTINCTION

		8. PHYLOGENETIC TREES, CONSTRUCTION AND INTERPRETATION OF PHYLOGENETIC TREE USING PARSIMONY, CONVERGENT AND DIVERGENT EVOLUTION
	DSE A – ANIMAL BIOTECHNOLOGY	➢ **STUDENTS SHALL LEARN;** 1. ORGANIZATION OF *E.coli* AND *Drosophila* GENOME 2. MOLECULAR TECHNIQUES IN GENE MANIPULATION 3. GENETICALLY MODIFIED ORGANISMS 4. CULTURE TECHNIQUES AND APPLICATIONS 5. GENOMIC DNA ISOLATION FROM E. COLI AND PLASMID 6. SOUTHERN BLOTTING, NORTHERN BLOTTING, WESTERN BLOTTING, PCR, DNA FINGERPRINTING 7. PREPARATION OF PROJECT REPORT ON ANIMAL CLONING & APPLICATION & ETHICAL ISSUES.
	DSE B – ANIMAL BEHAVIOUR AND CHRONOBIOLOGY	➢ **STUDENTS SHALL LEARN;** 1. PATTERNS OF BEHAVIOUR 2. SOCIAL AND SEXUAL BEHAVIOUR 3. CHRONOBIOLOGY & BIOLOGICAL RHYTHM

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DEPARTMENT OF BENGALI
POST GRADUATE(M.A.) PROGRAMME
COURSE OUTCOME UNDER CBCS
FOR ALL SEMESTER

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CC-1: History of Bengali Language and Historical Descriptive Grammar-1	Students get a fair idea about Bengali Language and Historical Grammar of the language.
	CC-2: Socio-cultural and literary history of Bengal (Medieval Stage)	Students are introduced to the society, culture and literature of medieval Bengal. They learn to know about the past traditions and creations of Bengalis.
	CC-3: Medieval Bengali Literature-1	After learning about medieval society and culture, through this course students are introduced to various aspects of medieval Bengali Literature.
	CC-4: Modern Poetry	

	CC-5: Bengali Drama	Through this course students are introduced to some outstanding works of modern Bengali poetry and develop their interest in poetry. Students are introduced to the outstanding and vast repertoire of Bengali drama literature.
II	CC-6: History of Bengali language and Historical and Descriptive Grammar-2	Students get a broader idea about Bengali Language and Historical Grammar of the language.
	CC-7: Socio-cultural and literary history of Bengal (Modern Stage)	Students are introduced to the society, culture and literature of modern Bengal. They learn to know about the traditions and creations of Bengalis from recent past.
	CC-8: Medieval Bengali Literature-2	After reading the first phase texts of medieval Bengali literature, the students through this course read the second phase texts. Through this, they have developed a comprehensive understanding of the Bengali literature of the Middle Ages.

	CC-9: Bengali Novels	Through the reading of various Bengali novels, the students have been introduced to the invaluable collection of Bengali novels. Besides that, they have gained immense satisfaction.
	CC-10: Tagore's Literature-1	Through this course students learn to understand the content and philosophy of Rabindranath's outstanding creations.
III	CC-11: Bengali Short Stories	Short stories are an invaluable asset of Bengali literature. Students explore that resource through this course. They also enjoy reading stories.
	CC-12: Tagore's Literature-2	After encapsulating one phase of Tagore's literary excellence, this course introduces students to some other invaluable examples of Rabindranath's genius.

	DSE(D)-3-1: Fiction	Students are introduced to the complexities of modern times, the conflict between individual and collective, the position of women in Bengali family life, the thoughts related to the environment and the various trnds of human struggle.
	DSE(D)-3-2: Fiction	Through this course, students will be able to consider the development of short stories as well as the study of novels as a mirror of social reality.
IV	CC-13: Bengali Essays and Critical Literature	Philosophy or thought in Bengali essays and critical literature have spread since the middle of the 19th century. It gained momentum in the 20th century. Through this course students are enriched with various topics related to society and literature.
	CC-14: Eastern and Western Literary Theory	Apart from learning about the forms and aspects of different forms of literature, students also get an idea about the evolution of literature.
		Through this course, students learn about the history of the short story and its syntactic characteristics. Along with that, they also read the text of

	DSE(D)-4-3: Fiction	short stories. Through this, they learn to connect Bengali short stories with short stories from all over the world.
	DSE(D)-4-4: Fiction	Through this course, students read several Bengali novels and short stories from India and Bangladesh. That learning experience helps them gain knowledge about the society, culture and politics of the two countries.

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FOR ALL SEMESTER

SEMESTER	MODULE NO.	MODULE NAME	OUTCOME
1	101	PHILOSOPHY OF GEOGRAPHY	Student will understand the historical evolution of the modern geographical thought through classical, medieval, modern and post-modern era. Acquire the knowledge of philosophy, history and methodology of geography. Different theories of knowledge have shaped the practice of geography will help to understand contemporary modern views and inculcate critical thinking. It develops both inductive and deductive reasoning to attain holistic thinking about geographic systems.
1	102	GEOMORPHOLOGY AND GEOTECTONICS	The module helps to understand the various concepts in Geomorphology including systems, feedback, equilibrium and threshold. Gain knowledge about morphogenetic regions. Understand the plate tectonics as a global unified theory. Acquire knowledge about river hydraulics and different aspects of river basins. Understanding the evolution of landforms with special reference to coastal and periglacial environment. Assess the application of applied geomorphology in different hazards management.

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1	103	SOIL AND BIO GEOGRAPHY	Students will gain the knowledge about soil as a component of biosphere. Comprehend the relation among plant, soil and water. Identify the concept of plant geography, plant ecology and phytogeographical regions. Explaining the zoo geography including dispersal of animals, evolution of species and wild life managements. Understand the principles of physical and human ecology and biological deserts. Recognize the significance of man and biosphere programmes and conservation of biodiversity.
1	104	ECONOMIC GEOGRAPHY	Inculcate the knowledge of resource geography and geographical aspects of economy; types of economic activities. Acquire knowledge of the fundamental and modern issues in Economic Geography including the concepts and approaches; classification of economic activities and their changing trend; theories of economic development. Understand the significance of agricultural economy based on concepts of agricultural regions, World agricultural systems, Agri-business, Green revolution and food security in India, Land tenure systems and land reforms in India. Gain the concept of industrial economy based on industrial geography theories; industrial regions and spatial variation in production. Acquire knowledge on trade and commerce including global trade, international trade, market network, labour market etc.

1	105	GEOSPATIAL ANALYSIS	Students will acquire an understanding of comparative utility of topomaps, aerial photos, and satellite images as a part of geographical data. They will develop a deep knowledge about sinuosity and braiding indices of river channels, hypsometric curves of drainage basins.They will be able to analyse different IRS and Landsat sensors and their suitability to prepare maps extracting physical and cultural features from various satellite images .They can also prepare some analytical maps like land capability map,landslide risk zonation map,flood risk zonation map,coastal erosion vulnerability maps. Change detection map from various multidated maps or images can be prepared too .
2	206	CLIMATOLOGY	Students will learn the importance and linkage among micro, meso and macro climates systems. Know about the nature of tropical climates in association with various weather hazards such as cyclones, heatwaves, ENSO phenomena. Develop an idea of theory of past and recent trends of global climate change and their evidences. Gain knowledge about different approaches of weather forecasting. Identify the 1relation between climate and agriculture. Know a1bout the concept of heat island and bio-climatology.
2	207	HYDROLOGY AND OCEANOGRAPHY	The course examines the concepts of hydrological cycle emphasizing on global storage and transportation of heat. Illustrate the roles of precipitation, evaporation and transpiration. Evaluating the development and characteristics of bottom topography of world oceans. Realize the importance of ocean waves and tides. Identify causes and impacts of sea level changes. Assess the importance and managements of EEZ and CRZ.

2	208	POPULATION AND REGIONAL DEVELOPMENT	This course will help to demonstrate the changing Approaches to population geography and its Demographic characteristics. Learner will get Knowledge about population growth theories of Demographic transition, population quality like Literacy, occupation and health. They will Understand contemporary trends of rural and urban Dimensions of develop and developing countries, Displacement of population and its vulnerability. They will be able to identify the development, spatial integration relating to neoclassical growth models of Keynes, Rostow, Marx. Models of industrialization-urbanization like North, Myrdal etc. They will acquire knowledge about role of institutions in regional development, paradigm shifts and regional disparity of India. Scale of ecomonies and their relation with regional development will help them to understand the convergence and divergence factors.
2	209	SOCIAL AND CULTURAL GEOGRAPHY	Students will learn about social geography and its different perspectives. They will know about social process, social space and its nature in the era of modernity and post modernity and change in social order in postindustrial urban space. The concept of social wellbeing, welfare and social security will help them to understand the concept of social justice. They will learn how the class-caste, rural- urban division in India is increasing the need of social planning for inclusive growth. They will also acquire knowledge about culture, its components and evolution of cultural geography. They will understand the background of cultural geography and its theoretical intersects especially Historical Materialism, Feminism, and Post Structuralism. The cultural characteristics of Colonialism, neo- colonialism and metropolitan culture will discuss about the dominance and dependence in different era. Students will learn about different cultural identities like cultural hearth, realms of the world its current scenario of popular culture and folk culture. They will also learn about Processes of Diffusion and

			Acculturation. Finally, students will understand the multicultural identity of India and its characteristics.
2	210	RS, GIS AND GNSS	This will acquire knowledge about concepts and techniques of remote sensing like Georeferencing, creation of spectral library from LISS 3 and TM data. Image classification and change detection from multidated maps, will help them to identify the landuse and landcover preparations. This course will help them to gather knowledge about Digital Elevation Model ,contour generation, annoted maps, vector overlay and raster to vector creation. Learner will apply knowledge of GNSS data in creation of maps, length and area measurements. Collection and retrieval of GNSS positions and its principles can be analyzed.
3	311	PHYSICAL LANDSCAPE (Elective Paper-1)	The course helps to recognize the idea of cartography with reference to maps, scale and projections. Gain knowledge about Remote Sensing, GIS and GNSS. Develop an idea about concept of Indian monsoon climate and factors behind climate change. Acquire knowledge about Fluvial and Coastal processes and associated landform. Identify the different types of hazards along with managements and mitigations.

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3	312	CULTURAL LANDSCAPE (Elective Paper-2)	Acquire knowledge about social processes, social well-being, cultural segregation, cultural turn. Regional types, bases of regional classification of India, geography of hazards for example landslide, flood etc. Dichotomies and dualism in geography, approaches to geographical studies help them to identify India as cultural landscape.
3	313_B	ADVANCED GEOMORPHOLOGY- I (DSE Paper)	The course elucidates the different perspectives in geomorphology that include various thoughts and ideas as suggested by famous geomorphologists. It helps to understand the different approaches to geomorphology and principles of landform classification. Acquire knowledge about fluvial processes and forms. Students will learn hydrological and morphological properties of channels along with slope process in fluvial landscape. The course illustrates the concept of coastal morphodynamic variables and their impacts on landforms. Students will learn about the roles of human being as active geomorphological agents. Have knowledge about the factors, processes and landform features of Tropical Geomorphology. Students will learn the present scenario of Urban Geomorphology including various problems and prospects.

3	313_M	REGIONAL DEVELOPMENT AND PLANNING-I (DSE Paper)	Acquire knowledge of Concepts of region, regionalization and regional planning; theories on recent development; concept on inequality and regional disparity . Student will gain skills to delineate formal and functional region , Identity the measures of inequality and various indicators of regional development . Inculcate knowledge to analyze the interstate imbalance in India with respect to various indicators . The will develop the ability to prepare plans for development in backward region and backward group
3	314	STATISTICAL TECHNIQUES	Students will learn about probability theory and concept of normal distribution in the field of statistics. Students will gain a clear idea about sampling theory including sampling techniques and sampling error which will help to plan proper sampling during field survey. Scaling techniques like weighted score, rank score and Likert's opinionnaire will give a brief idea to scale the collected data sets during dissertation and future research work. Using Social Affinity Index, t-test, one-tailed and two-tailed tests students will learn how to take statistical decisions. They will have a detailed idea about partial and multiple correlation and also gain idea of inferential statistics and its applications using Factor analysis and ANOVA. They will also learn about non-parametric tests like Chi-square and Mann-Whitney U Test. Student will also acquire the knowledge of computer application to process and represent the statistical data. They will learn data mining, tabulation, and graphical computer application.

3	315	QUANTITATIVE AND FIELD TECHNIQUES	Students will learn about equality and inequalities of different demographic and socio-economic variables applying Gini-coefficient and represent with Lorenz curve. Some brief idea of settlement pattern and occupational structures will be known by applying Nearest Neighbour analysis and ternary diagram. Some demographic characteristics and its comparisons will be analysed by applying different techniques like- Exponential growth curve, population projection, index number, identification of mean Centre of population, population potential by Gravity model etc. they will also learn how to map these demographic and population characteristics and their disparities by Location Quotient, Z score and residual mapping. Students will also have an idea of crop combination and its applications. Student will also acquire proper knowledge of field study using different techniques like observation method (traffic and crop composition) and survey schedule method (household, market, passenger, and tourist). They will also learn to handle and read different field instruments like- Portable weather station, Abney Level, Clinometer which will help them to visit field and collect data with more efficiency. Reading cadastral map will help them to know landuse and landcover pattern more specifically and minutely.

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4	416	HISTORICAL AND POLITICAL GEOGRAPHY	This course will help to acquire knowledge about concepts of historical geography like its nature, scope, content, development of historical geography, sources of historical geography and cartographic materials, elements, travel literature of Hiuen Tsang, Ibn-E- Batuta, Barnier. Concepts of political geography, its spatial perspective, border, frontier, buffer zones, transitions in the political economy, imperialism, post-colonization, neo-liberalism, Neo- Marxist critique. Issues of Indian polity like world wars, strategic relations, electoral geography, SAARC and BRICS, interstate and intra-national issues will help them to get an idea about the overall historical and political system of the world.
4	417	REGIONAL GEOGRAPHY	Students will have a general understanding of selected regional issues for example tectonics and environmental problems of Eastern Himalaya- diversity and resource utilization of the Indian coasts, Problem of the Arid and Semi -Arid regions of India, Ethno cultural diversity of the North East India. They will get to learn issues of regional disparities like socio economic disparities, labour migration, employment scenario, gender discrimination, empowerment etc. Details description of Ganga Delta will help them to get an idea of evolution of GB delta, drainage system, tidal hydrodynamics, biodiversity, resource utilization, human development, agriculture, industry, crop combination and its future prospects.

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4	418_B	ADVANCED GEOMORPHOLOGY- II (DSE Paper)	Students will able to gain the modern applications of Applied Geomorphology in association with rain water harvesting, check dams, Environmental Impact Assessment, Coastal regulation Zones and Drainage Basin Management. Students will acquire knowledge about Case studies of landforms and landuse with special reference to Garhbeta, Santiniketan, Chhotanagpur Plateau and Lower Ganga Deltas. They will also gain a detail concept of geomorphic problems and their management such as mining subsidence, river water discharge, urban water supply and disposal, reclaimed coastal areas etc. They will learn about the origin, causes and consequences of various geomorphic hazards such as landslides, floods, river bank erosion and coastal erosion in West Bengal and their mitigations.

4	418_M	REGIONAL DEVELOPMENT AND PLANNING-II (DSE Paper)	Student will learn about concept of planning region, purpose and method of delineation of planning region and economic planning with special reference to India. They will also gain a detail concept of state level and micro level planning its criteria and applications with special reference to West Bengal and Tamil Nadu. They will learn about concept of different urban regions, its panning and importance. Various case studies of urban planning and its problems will be discussed especially for the metropolitan cities from India like Delhi, Mumbai, and Kolkata. Students will also have knowledge of New towns, national polices for urban development and planning and recent amendments related to this. The knowledge about rural development strategies in India, identification of backward regions and tribal region and their development policies in India will also be shared with students. Finally student will acquire knowledge about role of agriculture, industry, trade and commerce in regional development.
4	419_B	ADVANCED GEOMORPHOLOGY- III (DSE Paper)	Learner will get understanding of quantification and interpretation of fluvial process comprising computation of channel pattern from river platform, determination of discharge with the help of field equipment, calculation of hydraulic geometry, analysis of hydrographs, rating curve and flow duration curve. Quantification of coastal process and sediment analysis along with the image interpretation will help them to assess identification of sedimentary and biogenic forms, wave refraction diagrams, breaker types, vulnerability of coastal erosion, pebble analysis, extraction of geomorphic features from satellite images, measurements of suspended sediment concentration.

4	419_M	REGIONAL DEVELOPMENT AND PLANNING-III (DSE Paper)	Students will gain knowledge how to measure concentration and disparities of different development parameters by using various techniques like- gravity model for identification of zone of influence, inequality measurement by Lorenz curve, Location Quotient for concentration, and Sopher's Index for study the disparity. They will learn how could they apply Detour index and shortest path matrix to measure accessibility and transport network development in any region. By analyzing time series data they could also be compare the growth data for a certain time period. They will also gain the practical knowledge of calculating different techniques of regional growth analysis and inter-region comparison like Rank Size Rule for population distribution, correlations, weighted scores, and combination analysis. Finally they will have proper knowledge of rural urban growth differentials and their spatial correspondence.

4	420 A	SPECIAL PAPER DISSERTATION	Student will able to gain comprehensive knowledge about contemporary research and innovation, and acquire techniques research skills required for identifying problems and issues to produce a well-researched written work using geographical research tools. Upon completing this course, the students will be able to: 1. Identification of research problem and parameters. 2. collection and analysis of data in a systematic and scientific manner. 3. formulation and conduct independent research in the general field of geography. 4. write a scientific research report, thesis, and research proposal. The students should select a specific topic from the following broad areas for conducting the research work in advanced Cartography, Advanced Geomorphology, Industrial Geography, Health Geography, Environmental Geography, Population Geography, Regional Planning and Development etc.
4	420 B	FIELD REPORT	Preparation of field report in the social sciences is to describe the observation of people, places, and/or events and to analyze that observation data in order to identify and categorize common themes in relation to the research problem underpinning the study. Field surveys enhance the understanding about patterns and spatial distributions, their associations and relationships at the local level. It is a process of learning and a method of teaching by which geography can be made real and interesting. It can awaken the spirit of in- query which is so often stifled in boring classroom situations. Moreover it will help learner to co-relate among the physical, socio-economic and environmental relationship through the direct interactions with the different parameters of nature and human being.

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DEPARTMENT OF ENVIRONMENTAL SCIENCE
POST GRADUATE(M.SC.) PROGRAMME
COURSE OUTCOME UNDER CBCS
FOR ALL SEMESTER

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	ENV C 11 - BASICS OF ENVIRONMENTAL SCIENCE AND SUSTAINABLE DEVELOPMENT	This paper covers fundamental environmental science concepts, emphasizing the multidisciplinary nature of the field. It explores the interface between human civilization and the environment, analyses current indian environmental issues, and delves into sustainability, including indices and strategies. Real-world examples highlight ecological restoration, waste land reclamation, and urbanization challenges.
I	ENV C 12- ENVIRONMENTAL MICROBIOLOGY	This paper gives a comprehensive understanding of fundamentals of microbiology, encompassing the classification and growth of microorganisms, their presence in air, water, and soil, and their impact on public health. Develop practical skills in laboratory techniques, safety, microbial isolation, staining, and pathogen detection, laying a strong foundation for applied microbiology.
I	ENV C 13- ENVIRONMENTAL CHEMISTRY	This paper focuses on the classification of elements with an emphasis on heavy metals, biogeochemical cycles, and environmental impact of hydrocarbons, stoichiometry, gibbs energy, chemical potential, and chemical equilibrium. It explores mass and energy transfer across interfaces, material balance, laws of thermodynamics, heat transfer, acid-base reactions, solubility products, and the solubility of gases in water. The environmental aspects of air, water, and soil chemistry are addressed, along with analytical methods such as titrimetry, gravimetry, spectrophotometry, chromatography, and various spectroscopic techniques for environmental quality assessment.

I	ENV C14 -ECOLOGY	This paper explores various aspects of ecology, focusing on ecosystem dynamics, population ecology, community ecology, the concept of niche, and landscape ecology. It delves into topics such as trophic structure, food web complexity, laws governing groundwater movement. The course addresses aquifer elasticity and laws like bernoulli's and darcy's. Groundwater management topics include human water use, safe yield, recharge, discharge areas, land subsidence, rainwater harvesting, and watershed management. The practical component involves solving problems related to groundwater assessment, development, and management, along with interpreting hydrogeological maps and measuring water tables and piezometric surfaces.
II	ENV C 21 -DIVERSITY OF LIFE FORMS AND ENVIRONMENTAL APPLICATIONS	This comprehensive syllabus in this paper covers evolutionary biology, delving into the evolution of the environment, speciation, organism classification, ecological organization, population genetics, and behavioural ecology. Biodiversity studies include diversity types, ethical considerations, global patterns, biogeographic zones, and documentation. Environmental biotechnology explores applications, gm crops, biodegradation, phytoremediation, biofuel, biofertilizer, biopesticides, and integrated pest management. Microorganisms and environmental pollutants are addressed, encompassing biodegradation processes, environmental monitoring, anaerobic biodegradation, bioremediation, and microbial interactions with metals and pesticides. Waste treatment covers wastewater treatment, wetlands, aquaculture systems, and surface bioremediation. The syllabus integrates theoretical knowledge with practical applications in environmental science.

II	ENV C 22- ENVIRONMENTAL GEOSCIENCES	This paper covers fundamental concepts in environmental geosciences, exploring geological time scales, earth's system components, and processes in the lithosphere, atmosphere, hydrosphere, and biosphere. It delves into rock and mineral properties, weathering processes, erosion, and transportation mechanisms. Additionally, it discusses mineral deposit formation, mining-related environmental issues, and geodynamic processes like plate tectonics. Physiography, landforms, glaciers, and india's land use pattern are examined, along with geo-environmental aspects such as essential elements and their impact on health. Practical components involve studying rocks, fossils, geological structures, and interpreting maps using basic survey techniques.
II	ENV C 23- ENVIRONMENTAL BIOCHEMISTRY	This syllabus covers the fundamental aspects of biochemistry, including the chemistry of macromolecules (carbohydrates, amino acids, proteins, lipids, and nucleic acids), protein and enzyme structure/function, bioenergetics, metabolism of carbohydrates, lipids, and proteins, and the role of micronutrients. It delves into the biochemistry of extracellular and intracellular communication, diseases (oxidative stress, lipid roles in cardiovascular disease, drug metabolism), and includes practical components such as biochemical analysis of biomolecules, stress enzymes, and food adulteration tests.
II	ENV C 24 -ENERGY AND ENVIRONMENT	This paper focuses on the diverse landscape of energy resources, including renewable and non-renewable categories, conventional and non-conventional sources. It addresses the global and indian energy use patterns, emphasizing energy security. The study encompasses conventional energy sources, greenhouse gases, global warming, and climate change. Solar energy, bio-energy, alternative energy forms, and their environmental impacts are explored. Additionally, the paper delves into energy conservation, efficiency, and the environmental repercussions of large-scale energy exploitation on ecosystems and land use.

II	ENV C 25 POLLUTION: ASSESSMENT, INSTRUMENTATION AND CONTROL TECHNOLOGIES	This paper on environmental pollution covers air, water, marine, soil, noise, and radioactive pollution. It explores natural and human-induced sources, categorizes primary and secondary pollutants, and delves into transportation and dispersion mechanisms. The socio-political aspects of air pollution and health, gas laws, and monitoring methods are discussed. Water pollution includes fresh water and groundwater issues, with a focus on arsenic contamination. Marine and coastal pollution, soil pollution, noise pollution, and other types are addressed, along with practical applications involving advanced monitoring instruments.
III	ENV C 31- METEOROLOGY, REMOTE SENSING AND GIS	This meteorology and climatology paper covers atmospheric stability, meteorological scales, climatic principles, earth's radiation balance, air masses, and phenomena like el-nino. It explores the thermal structure and chemical composition of the atmosphere, radiation laws, and air-sea interactions. Tropical meteorology topics include trade winds, monsoons, and tropical cyclones. Remote sensing concepts and gis fundamentals are also addressed. Practical applications involve wind data interpretation, satellite image analysis, global positioning system usage, and land use/land cover studies.
III	ENV C 32 -DISASTER MANAGEMENT AND RISK ANALYSIS	This disaster management paper describes the nature, and types of disasters, including natural events like floods, earthquakes, and tropical cyclones, as well as anthropogenic incidents such as industrial and war disasters. It covers disaster prediction, forecasting, management principles, and the role of information systems. The course includes case studies like chernobyl and bhopal, and emphasizes risk analysis, assessment methodologies, and environmental safety measurements for both natural and anthropogenic disasters.

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IV	ENV C 41 -WASTE AND WASTE MANAGEMENT	This paper covers fundamental concepts, classification, and minimization technologies. It delves into industrial wastewater quality control, emphasizing the principles of reduce, reuse, and recycle. Hazardous waste management explores resource conservation, recovery, land disposal, and the handling of radioactive waste. Municipal solid waste management includes composition, disposal methods, and environmental consequences. The course also addresses biomedical waste, e-waste, waste-to-wealth strategies, and criteria for waste disposal in different ecosystems, along with handling, transportation, and compaction.
IV	ENV C42- TOXICOLOGY, ENVIRONMENTAL HEALTH AND OCCUPATIONAL HAZARDS	This area of the syllabus covers the concept of xenobiotics, exploring toxic materials, xenobiotic-induced oxidative stress, and modes of action. It details toxicity assays, including acute and chronic toxicity, dose-response relationships, and bioassays. Ecotoxicology topics include biomarkers, bioaccumulation, and risk assessment. Cytotoxicity and genotoxicity are discussed along with carcinogenesis, reproductive toxicology, and environmental health issues. The course also addresses occupational hazards, stress-related diseases, and practical experiments on eco-toxicity, genotoxicity, and cytotoxicity, as well as in vitro toxicity assays.
IV	ENV C43 - MOLECULAR BIOLOGY AND IMMUNOLOGY	Students will gain comprehensive knowledge of gene functions and regulation, including replication, transcription, and translation. The operon concept and basics of eukaryotic gene regulation will be covered. The course explores recombinant dna technology, focusing on restriction enzymes, expression systems, genetic engineering, transformation, molecular cloning, dna sequencing, and applications like transgenic plants and animals. An overview of the immune system covers cells, organs, and mechanisms of innate and adaptive immunity. Antigen-antibody interactions, mhc, t and b cell maturation and activation, complement, hypersensitivity reactions, and vaccines are also discussed. Practical aspects include basic techniques of recombinant dna technology and immunological assays.

IV	ENV C 44 - STATISTICS, ENVIRONMENTAL MODELLING AND INFORMATICS	In this paper students will master the fundamental elements and tools of statistical analysis, covering probability, sampling, attribute measurement, and various distributions. The course delves into statistical means, moments, matrices, equations, and hypothesis testing. Environmental modelling is introduced, exploring system analysis, model development approaches, linear regression, and validation techniques. Population growth models and interaction models such as lotka-volterra and leslie's matrix are studied, along with pollution models like gaussian plume and box models. The concept of environmental informatics is covered, emphasizing information tools for data management in priority areas like pollution, epidemiology, and toxicology. Practical applications, including android-based tools, are highlighted.
IV	ENV C 45- ENVIRONMENTAL LEGISLATIONS AND ENVIRONMENTAL IMPACT ASSESSMENT	This paper outlines india's robust legal framework for environmental protection, spanning constitutional provisions, policies, and legislation such as the wildlife (protection) act, water act, air act, forest conservation act, and environment (protection) act. It highlights the significance of mechanisms like public interest litigation, the national green tribunal, and public hearings in enforcing environmental laws. The hazardous wastes rules, disaster management act, and environmental impact assessment notification are also discussed, emphasizing their roles in regulating environmental impact and fostering sustainability.
IV	ENV C 46- ENVIRONMENTAL ECONOMICS AND AUDIT	This paper explores the intersection of economics and environmental issues. Key topics include economic efficiency, cost-benefit analysis, consumerism, poverty, and globalization. It addresses monitoring economic and environmental progress, applying economics to enhance environmental quality, rural planning, and development. The field utilizes environmental valuation methods, tackles externalities, and engages in international negotiations on climate change. Natural resource dimensions, environmental audit, and standards like iso 14000 are essential, along with life cycle analysis and green audit concepts.

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SEMESTER	COURSE TYPE	COURSE NAMES WITH CODE	Course Outcome
I	GEOLCT	CT-11: STRUCTURAL GEOLOGY	Students learn advanced level geological structure (Problem based) forms in different geological terrain.
	GEOL CT	CT-12: GEOCHEMISTRY AND ISOTOPE GEOLOGY	Students learn about different geochemical processes of Earth and the use of geochemistry and isotope geology to solve different problems related to petrogenesis and paleoclimate
	GEOL CT	CT-13: MINERALOGY	From this advanced course of mineralogy, students learn about the structures of few selected group of minerals as well as learn about some advanced methods used in the study of minerals.
	GEOL CT	CT-14:IGNEOUS PETROLOGY	Students learn about different component systems and its use in deciphering the texture and genesis. Moreover students also develop a thorough idea about different igneous provinces of India and abroad.
	GEOL CT	CT-15: HYDROGEOLOGY AND WATER MANAGEMENT	Students acquire knowledge about aquifer characteristics, Different groundwater provinces of India and also learn about groundwater management.

	GEOL CP	CP-11: STRUCTURAL GEOLOGY	From this advanced practical course on structural geology, students gather knowledge about structural interpretation from borehole data as well as learn to solve stress-strain related practical problems.
	GEOL CP	CP-12: GEOCHEMISTRY AND ISOTOPE GEOLOGY	In this practical course, students learn to deal with geochemical dataset and isotope data and get abled to decipher complex geological problems.
	GEOL CP	CP-13: FIELD GEOLOGY	In field geology course, students are taken to some geologically important provinces where they learn the technique to interpret geological structures and petrology directly from nature.
	GEOL CP	CP-14: IGNEOUS PETROLOGY	In igneous petrology practical, students get the knowledge of different Petrological technique as well as study the igneous rocks in hand specimen and under microscope.
	GEOL CP	CP-15: HYDROGEOLOGY AND WATER MANAGEMENT	Estimation of the groundwater potential is an important issue about which students get a first-hand knowledge through this practical course. Students learn about different hydrological parameter use and field test.

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II	GEOLCT	GEOL CT 21:PALAEONTOLOGY	Students acquire the advanced knowledge of invertebrate, vertebrate and plant fossils. Students also learn in detail about the microfossils including foraminifera; trace fossils and paleoecolgical study.
	GEOLCT	CT 22:SEDIMENTOLOGY AND BASIN ANALYSIS	From this advanced course on sedimentology, students learn about bedform creation, fluid mechanics-control, facies analysis in different geological setting as well as develop a thorough idea about basin development.
	GEOL CT	CT23: METAMORPHIC PROCESSES AND PHASE EQUILIBRIUM	From this advanced metamorphic petrology course, students get a detail idea about the use of thermodynamics in metamorphic process and also its application in delineating thermobarometric calculations. Moreover, they also learn about various P-T-t paths, extreme metamorphism and metamorphism caused by meteorite impact.
	GEOLCT	GEOL CT 24: GEODYNAMICS	Students learn about the geometry and mechanics of plate motions and plate boundaries and also develop detail understanding of the mantle plume mechanism and study case histories of ancient mountain belts.
	GEOL CT	GEOL CT 25: STRAYIGRAPHY	From this course, students acquire knowledge about the uniqueness of archean tectonics involving komatiite and TTG group of rocks. They also learn about the younger stratigraphic rock records of India and the climatic control.

	GEOL CP	GEOLCP-21: PALAEONTOLOGY	Students develop an in-depth practical knowledge about the applied micropaleontology and its use in paleoecology reconstruction.
	GEOL CP	GEOL CP-22: SEDIMENTOLOGY	In this advanced course of sedimentology practical, students learn litholog preparation and interpretation, paleoecurrent analysis, and detail sedimentological/petrographic study in hand specimen as well as under microscope.
	GEOL CP	GEOL CP-23: METAMORPHIC PROCESSES AND PHASE EQUILIBRIUM	From this practical course, students get problem based understandings of the geothermobarometric conditions a rock had gone through. Moreover in depth study of metamorphic rocks under microscope and also in hand specimen give them detail knowledge about the various metamorphic processes.

	GEOL CT	GEOL CT 31: Environmental Geology & Geotechnical Engineering	From this course on geotechnical engineering, students develop a good grasp on engineering properties of rocks and soils and their application in the construction of bridge, dam or other engineering projects. Students also learn about EIA, EIS, environmental impact of mining and also about the sustainable development procedures.

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III	GEOL CT	GEOL CT 32: Remote Sensing and GIS	Students learn about the science and techniques of remote sensing, (terms and verities), photogrammetry and GIS applications.
	GEOL CP	GEOL CP 31: : Environmental Geology & Geotechnical Engineering	In this practical course students learn RQD calculations, preparation and interpretation of engineering geological maps, and also learn to measure various environmental parameters and ions in test samples.
	GEOL CP	GEOL CP 32: Remote Sensing and GIS	In this practical course, students get knowledge about QGIS and ArcGIS use and also get abled to use stereoscope in the interpretation of areal photographic images.
III continued	GEOL CP	GEOL CP 33: Geomathematics and Geostatistics	From this practical course, students acquire knowledge about various statistical applications like Chi square test, Student's t test or ANOVA to solve different geological problems. Students also learn statistical tests involving non parametric data set.

	GEOL CP	GEOL CP 34: Industrial Training	Students develop hands-on experience in a reputed mining company or geological consultancy firm which make them industry-ready.
	GEOL OT	GEOL OT 81: Energy Resources	In this course, students mainly learn about the three basic non-renewable but traditional main energy source like coal, petroleum and nuclear energy. They acquire knowledge about geological set up, characterization, exploration techniques of these energy sources. Moreover students also develop knowledge about renewable energy potentials.
	GEOL OP	GEOL OP 81:Energy Resources	In this practical course, students learn the macroscopic and microscopic characters of coal. Furthermore proximate analysis and coal reserve estimation as well as seismic section and well log estimation for petroleum are also included in the course.
	GEOL CBCC	CBCC-A: Earth System Science	This theoretical course is offered to the PG students of Geography as a part of their CBCC curricula. From this course students learn about the basics of earth system science.

	GEOL CT	GEOL CT 41: Ore Geology and Mineral Deposits	Students learn in detail about various processes of ore formation and also about the type example all over the world. They also acquire knowledge of the macroscopic and microscopic characters of selected ore minerals and their texture.

IV			
	GEOL CT	GEOL CT 42: Mineral Exploration, Mining & Beneficiation	Students acquire knowledge about geological and geochemical exploration techniques, reserve estimation process, mining methods and also learn about the beneficiation processes of base metals ores and iron ores.
	GEOL OT	GEOL OT 85: Exploration Geophysics	Students develop the knowledge of different geophysical methods which is required in exploration work. They broadly learn seismic, magnetic, electrical and electromagnetic methods.
	GEOL CP	GEOL CP41: Ore Geology and Mineral Deposits	In this practical paper, students develop skill to identify ore minerals and their textures under microscope as well as study them as hand specimen.
	GEOL CP	GEOL CP 42: Mineral Exploration, Mining & Beneficiation	Reserve estimation processes are learnt in this practical paper.
	GEOL CP	GEOL CP 44: Grand Viva	Viva-voce to examine the knowledge acquired in four semesters
	GEOL CP	GEOL CP 45: Thesis	In thesis, students are separately supervised on selected geological problems. They learn to do specialised fieldwork and laboratory work and finally present their findings in a thesis form. The skill acquired in doing M.Sc thesis help students immensely in their higher studies.

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FOR ALL SEMESTER
DEPARTMENT OF COMPUTER SCIENCE
POST GRADUATE(M.SC.) PROGRAMME
COURSE OUTCOME UNDER CBCS

SEMESTER	PAPER/ COURSE NAME & DESCRIPTION	OUTCOME
I	CSMC101 (Th) – Mathematics for Computing	In this Paper students are learning about advanced Mathematical tools to model Combinatorial Problems such as Recurrence Relationship Graph Theory etc. Also students are learning Graduate Courses on Linear Algebra. Some methods from Probability Modelling are also taught here.
	CSMC102 (Th) – Data Structures and Algorithm	To understand a few advanced data structures, different algorithm paradigms, complexity class of different problems. To Apply the appropriate data structures in different problems, to apply the algorithm design paradigm for different problems, different techniques to handle NP-Completeness.
	CSMC103 (Th) – Advanced Computer Architecture	On completion of this course students will be able to understand the basics of Computer Organisation, concept of programs as sequences and operations on computers, different ways of communication with I/O devices and standard I/O interfaces, basics of Memory Systems and Cache memories, design mechanism of Arithmetic and Logical operations with integer operands and fundamentals of basic processing units. Students may pursue higher studies and can go for different industry job after pursuing this course.
	CSMC104 (Th) – Object Oriented Analysis and Design	Object Oriented (OOPS) typed languages like C++, JAVA; Python etc. are very popular in IT industry. This course provides scope of learning, understanding different popular OOPS based software designs that the students can use in implementing quality software in industry. This helps in 1. Code reusability 2. Scalability 3. Improved performance 4. Reliable solutions 5. Maintainability etc.

		w.r.t. any software team/project of which they will be a part in their professional life.
II	CSMC201 (Th) – Advanced Database Management System	In this Paper students are learning how to design a centralized as also as distributed DBMS. Various features of these tow sorts of DBMS are also taught such as Query Processing and Optimization , Transaction System and concurrency control, Recovery management etc.
	CSMC202 (Th) – Advanced Operating System	Along with the knowledge of basics of Operating System and its functions, students gain the knowledge over how an operating system virtualises CPU and memory over distributed structure than only centralized system. They study the designs of various scheduling and swapping policies. And also come to know about Efficiency, Hardware abstraction, Convenience, and System resource management in distributed system.
	CSMC203 (Th) – Automata & Compiler Design	Students are learning here the Mathematical Theory of what is Computing. They are learning here how designing a Turing Machine to simulate an algorithm and how to represent a given problem in a language specific to the problem specific Turing Machine. Also they are learning here some simpler Computing models. In Compiler design part Students are learning about how to design a Compiler. Language models from Automata Part are used here.
	CSMC204 (Th) – Cryptography & Network Security	Cryptography & Network Security analyze data encryption standard. Analyze and evaluate the cyber security needs of an organization. Study cyber security risk assessment and regulations. Measure the performance and troubleshoot cyber security systems. Implement cyber security solutions.
III	CSME301 (Th)- Image Processing and Pattern Recognition	Image processing is a field that focuses on the manipulation, analysis, and interpretation of digital images using computer algorithms. This is a versatile field with numerous applications that range from improving image quality to enabling advanced automation and analysis in various domains.

		Its benefits include enhancing image quality, automating tasks, and extracting valuable information for decision-making and research.
	CSME302 (Th)- CBCS-I From Other Department	NA
	CSME303 (Th)- CBCS-II From Other Department	NA
	CSMC304(Th) - Artificial Intelligence (AI)	One of the central aims of Artificial Intelligence paper is to develop systems that can analyze large datasets, identify patterns, and make data-driven decisions. This ability to solve problems and make decisions efficiently is invaluable across various industries, from healthcare and finance to transportation and manufacturing. It also identifies problems where artificial intelligence techniques are applicable. Apply selected basic AI techniques; judge applicability of more advanced techniques. Learns to design systems that act intelligently and learn from experience.
	CSMP306 (P)- SEMINAR	Describe the specific knowledge, skill, or expertise that a learner may comfortably demonstrate after a course, program, training session, or seminar.

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IV	CSMG 401 (G) Elective I Introduction to Data Science	Students can become proficient in the statistical analysis of data and the use of computation tools for data analysis. They learn to apply different statistical and computational tools to many applied problems, and clearly communicate the results in both written reports and oral presentations. This also helps in their seminar paper in M.Sc. course.
	CSMG 402 (G) Elective II Network and Cyber Security	Analyze and evaluate the cyber security needs of an organization. Conduct a cyber security risk assessment. Measure the performance and troubleshoot cyber security systems. Implement cyber security solutions.
	CSMG 403 (G) Project	From this course, students learn to apply the knowledge gained from previous courses both from B.Sc. and M.sc. They work in individual or in team for completion of a task and thus gain knowledge out of it. In this paper, they submit their report and also present their work as power point presentation in front of Internal and External examiners. This helps them in improvement of their presentation skills.

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	CSMG 404 (G) General Viva Voce	At end semester of M.Sc. course, students face the grand viva paper in front of several Internal and External evaluaters, This paper tests their basic knowledge over the subject since undergraduate times and also evaluate their analytical abilities in the most efficient way.

Dr. Manas Kabi
Principal
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