



RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur

(Affiliated to University of Gour Banga, Malda)

Recognized by UGC U/S 2f & 12(B)

NAAC accredited College with "B"+Grade (December'2016)

2.6.1: Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered at Raiganj Surendranath Mahavidyalaya

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Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





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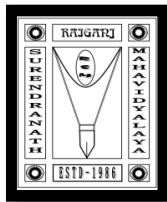
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Programme Outcomes (POs)

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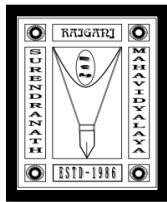
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B.Sc. (Honours) Physics Program Outcomes

POs	After Completion of the B.Sc. (Honours) Physics Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Basic and Program Specific Knowledge: Apply knowledge of basic mathematics and science fundamentals to solve Physics oriented problems and enhance their learning aptitude.
PO-2	Problem Analysis: Identify and analyse well-defined physical laws and theories related to various natural phenomena and their relevance in day-to-day life.
PO-3	Development of solutions: Develop a problem-solving aptitude to apply the theories learnt and the skills acquired to solve real time problems.
PO-4	Conduct investigations of complex problems: Acquire a wide range of problem-solving skills, both analytical & computational, and build concepts to simplify complex problems towards achieving logical solutions.
PO-5	Laboratory tools usage and Experimentation: Develop skills of observations & drawing logical inferences from them, learn usage of modern laboratory tools & appropriate technique to conduct standard tests & measurements.
PO-6	Practices for Society: Realize how disciplinary & interdisciplinary knowledge & skills acquired through generic courses helps in providing better solutions and new ideas for specific needs of the society.
PO-7	Environment, Sustainability and Ethics: Nurture creatively to propose novel ideas towards sustainable, ethical & Environment-friendly solutions to real world problems, for a holistic development of the self and the society
PO-8	Individual and Team work: Develop and regenerate scientific competence independently and also in collaboration with others.
PO-9	Effective Communication and Project Management: Learn managing skills to work as a team member or a leader to manage projects and effectively communicate the same to relevant stakeholders.
PO-10	Life-long learning: Analyse individual needs and engage in updating oneself in the context of scientific & technological changes.


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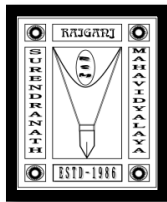
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B.Sc. (Honours) Mathematics Program Outcomes

POs	After Completion of the B.Sc. (Honours) Mathematics Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations , terminology
PO-2	Students will possess basic subject knowledge required for higher studies, professional and applied courses
PO-3	Scientific temper will be developed in Students
PO-4	Students will possess basic subject knowledge required for higher studies, professional and applied courses
PO-5	Students will possess basic subject knowledge required for higher studies, professional and applied courses
PO-6	Student is equipped with mathematical modeling ability, problem solving skills, creative talent and power of communication necessary for various kinds of employment.
PO-7	Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study.
PO-8	Student should be able to apply their skills and knowledge that is translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion


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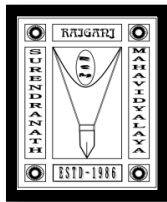
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B.Sc. (Honours) Botany Program Outcomes

POs	After Completion of the B.Sc. (Honours) Botany Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Understanding of Plant Diversity and its importance in the maintenance of ecological balance.
PO-2	Students learn to carry out practical work, in the field and in the laboratory, interpreting plant morphology and anatomy, Plant identification, Vegetation analysis techniques.
PO-3	Apply the knowledge of basic science, life sciences and fundamental process of plants.
PO-4	Apply modern techniques and instruments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological studies of plants with an understanding of the applications in human life.
PO-5	Apply the knowledge gained from the studies for the upliftment of society via addressing health, environmental issues, food scarcity etc.
PO-6	To inculcate the scientific and research temperament among students outside the scientific community
PO-7	Conceive the idea of artificial propagation of plants via vegetative methods and to find a livelihood via establishing miniature plant nurseries.
PO-8	Compare and contrast the characteristics of the different groups of plants such as algae, fungi, bryophytes, pteridophytes, gymnosperms and angiosperms
PO-9	To be able to understand the interdisciplinary nature of botany and develop basic research oriented skills.
PO-10	The course curriculum incorporates basics and advanced training in order to make a graduate student capable of expressing the subject through technical writing as well as through oral presentation.


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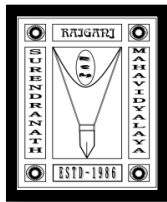
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B.Sc. (Honours) Chemistry Program Outcomes

POs	After Completion of the B.Sc. (Honours) Chemistry Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	A graduate student is expected to be capable of demonstrating comprehensive knowledge and understanding both theoretical and practical knowledge in all disciplines of Chemistry.
PO-2	Understanding of major concepts in all disciplines of chemistry and able to apply those concept in problem solving
PO-3	Think methodically, independently and draw a logical conclusion
PO-4	Recognise your own value system, understand the morality aspect of your decisions and take responsibility of your actions out of your decisions
PO-5	Find out the green route for chemical reaction for sustainable development.
PO-6	To inculcate the scientific temperament among students outside the scientific community
PO-7	Create awareness among the people about impact of chemistry on our daily life and help the society to build and maintain a sustainable environment.
PO-8	Gain the knowledge in all basic areas of chemistry such as organic, inorganic, physical, analytical chemistry through theory and practical courses in the programme.
PO-9	To be able to understand the interdisciplinary nature of chemistry and develop basic research oriented skills.
PO-10	The course curriculum incorporates basics and advanced training in order to make a graduate student capable of expressing the subject through technical writing as well as through oral presentation.


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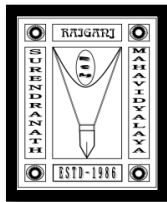
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B.Sc. (Honours) Zoology Program Outcomes

POs	After Completion of the B.Sc. (Honours) Zoology Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Students will understand biodiversity, phylogeny, morphology of invertebrates and vertebrates, cellular structures, genetics, ecosystems, development, biochemistry, physiology, taxonomy, and evolution, including key theories and concepts.
PO-2	They will understand endocrine glands, aquaculture, life cycles of various parasites, immunity, central dogma, biotechnology, genomics, statistical tools, behavior patterns, insect physiology, and clinical diagnostic techniques.
PO-3	To inculcate the scientific and research temperament among students outside the scientific community
PO-4	The course curriculum incorporates basics and advanced training in order to make a graduate student capable of expressing the subject through technical writing as well as through oral presentation.
PO-5	Analyse individual needs and engage in updating oneself in the context of scientific & technological changes.


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B.Sc. (General) Program Outcomes

POs	After Completion of the B.Sc. (General) Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Apply the knowledge of basic science, life sciences and fundamental process of lifescience and physical sciences
PO-2	To inculcate the scientific and research temperament among students outside the scientific community
PO-3	Analyse individual needs and engage in updating oneself in the context of scientific & technological changes.
PO-4	Understanding of major concepts in all disciplines of science and able to apply those concept in problem solving
PO-5	Create awareness among the people about impact of science on our daily life and help the society to build and maintain a sustainable environment.


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B.A. (General) Program Outcomes

POs	After Completion of the B.A. (General) Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Apply the knowledge of humanities and social science.
PO-2	To inculcate the scientific temperament among students
PO-4	Understanding of major concepts in all disciplines of humanities and able to apply those concept in problem solving
PO-5	Create awareness among the people about impact of humanities on our daily life and help the society to build and maintain a sustainable society.


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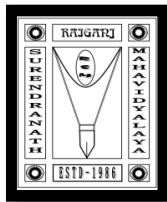
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B.A. (Honours) Economics Program Outcomes

POs	After Completion of the B.A. (Honours) Economics Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Comprehensive Knowledge of Economic Theories: Graduates will have a strong understanding of fundamental economic principles, including microeconomics, macroeconomics, and econometrics.
PO-2	Quantitative and Analytical Skills: Students will develop the ability to apply mathematical and statistical tools to analyze economic data and model economic scenarios, which is essential for both BA and BSc graduates.
PO-3	Critical Thinking and Problem-Solving: The program fosters the ability to critically evaluate economic problems, assess various solutions, and make informed decisions based on economic reasoning.
PO-4	Understanding of Global and Local Economies: Graduates will gain insights into how global and local economic systems function, the interplay between different economies, and the implications for policy and business.
PO-5	Research Proficiency: Students will be equipped with research skills, enabling them to conduct independent studies, analyze data, and present their findings effectively.
PO-6	Policy Analysis and Application: The program prepares students to understand and evaluate economic policies, considering their impacts on various sectors of the economy and different population groups.
PO-7	Environment, Sustainability and Ethics: Nurture creatively to propose novel ideas towards sustainable, ethical & Environment-friendly solutions to real world problems, for a holistic development of the self and the society
PO-8	Ethical Understanding and Responsibility: The program instills a sense of ethical responsibility, ensuring that graduates consider the societal impacts of economic decisions and policies.
PO-9	Communication Skills: Graduates will be able to communicate complex economic concepts and data effectively to both specialized and non-specialized audiences, whether through writing or presentations.
PO-10	Interdisciplinary Awareness: Students will appreciate the interconnections between economics and other disciplines, such as political science, sociology, and environmental studies, which is particularly emphasized in a BA program.
PO-11	Career and Further Education Readiness: Graduates will be well-prepared for careers in economics-related fields, such as finance, public policy, and research, as well as for pursuing advanced studies in economics or related disciplines.


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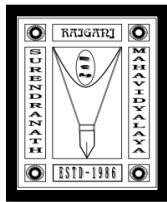
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B.A. (Honours) Education Program Outcomes

POs	After Completion of the B.A. (Honours) Education Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Understanding of Teaching-Learning Process: Develop an understanding of the teaching-learning process and various pedagogical techniques.
PO-2	Subject Matter Expertise: Gain in-depth knowledge of the chosen subject area (e.g., Mathematics, Science, English, etc.).
PO-3	Classroom Management: Learn effective classroom management skills to create a conducive learning environment.
PO-4	Lesson Planning: Develop skills to plan and prepare engaging lessons, curricula, and assessments.
PO-5	Assessment and Evaluation: Understand various assessment and evaluation methods to measure student learning outcome.
PO-6	Communication Skills: Improve communication skills to effectively interact with students, colleagues, and parents.
PO-7	Critical Thinking and Problem-Solving: Develop critical thinking and problem-solving skills to address diverse educational challenges.
PO-8	Inclusive Education: Understand the principles and practices of inclusive education to cater to diverse learner needs.
PO-9	Technology Integration: Learn to effectively integrate technology into teaching and learning.
PO-10	Professional Development: Cultivate a commitment to ongoing professional development and lifelong learning.
PO-11	Enhance Research Skills: Cultivate critical thinking, research, and analytical skills, preparing students for advanced academic pursuits or professional roles.


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B.A. (Honours) English Program Outcomes

POs	After Completion of the B.A. (Honours) English Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Broad Literary Knowledge: Students will learn about English literature from different regions and times, including Britain, America, India, and the Commonwealth. They will also be introduced to Indian Literature in Translation, which will expand their understanding of literature.
PO-2	Cultural and Historical Understanding: The program will help students understand the social and cultural history of different regions, giving them a deeper appreciation of the cultural significance of literature.
PO-3	Philosophical and Theoretical Understanding: Students will gain knowledge about different philosophical and theoretical ideas related to the humanities and social sciences. This includes learning about modern critical theories and trends in literature and cultural studies.
PO-4	Skills in Analysis and Interpretation: Students will learn to read and analyze various types of literary texts, such as novels, poetry, drama, short stories, and essays. They will be encouraged to form their own interpretations of these texts.
PO-5	Language Skills: The program will help students develop strong language skills, which are important for both their academic and professional success.
PO-6	Exploration of Other Fields: The program encourages students to explore other areas of study where they can use the knowledge and skills, they gain from studying literature. This broadens their academic and career options.
PO-7	Better Job Opportunities: By improving language skills and critical thinking, the program increases students' chances of finding jobs in teaching, media, Information Technology (IT), and other fields.

Keynote from the HoD: *The B.A. English Honours Programme at Raiganj Surendranath Mahavidyalaya is dedicated to providing a well-rounded education in English literature. The program not only deepens students' understanding of literature but also prepares them for various career opportunities. By developing their analytical skills, cultural awareness, and language proficiency, the program ensures that graduates are ready to succeed in both academic and professional environments.*


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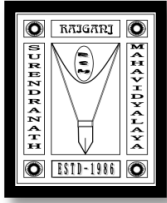
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B.A. (Honours) Sociology Program Outcomes

POs	After Completion of the B.A.. (Honours) Sociology Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Understanding of Sociological Concepts and Theories Students will demonstrate an understanding of key sociological concepts, theories, and frameworks. Examples: Ability to explain concepts such as socialization, culture, stratification, and institutions, and apply major sociological theories like Functionalism, Conflict Theory, and Symbolic Interactionism to social phenomena.
PO-2	Application of Sociological Knowledge Students will be able to apply sociological theories and concepts to analyze social issues and real-world scenarios. Examples: Analyze current social problems like inequality, race relations, gender dynamics, or globalization using sociological perspectives..
PO-3	Research Skills Students will develop skills in designing and conducting sociological research. Examples: Ability to create research questions, design surveys, conduct interviews or ethnographies, and analyze data using qualitative and quantitative methods.
PO-4	Critical Thinking and Analytical Skills Students will enhance their ability to think critically about social issues and structures. Examples: Critically evaluate social policies, media representations, or public discourses; deconstruct common sense assumptions about society.
PO-5	Ethical Awareness and Social Responsibility Students will demonstrate an understanding of ethical issues in sociological research and practice, and develop a sense of social responsibility. Examples: Recognize the ethical implications of sociological research, respect for diversity, and the importance of social justice in addressing social problems.
PO-6	Communication Skills Students will improve their ability to communicate sociological knowledge effectively in both written and oral forms. Examples: Write clear, well-organized essays and research reports, and present findings in a coherent and persuasive manner.
PO-7	Global Awareness Students will gain an understanding of global social processes and how they affect local and global communities. Examples: Analyze the impact of globalization on different societies, understand cross-cultural differences, and the interconnectedness of global social issues.
PO-8	Development of a Sociological Imagination Students will develop the ability to see the connection between personal experiences and larger social structures. Examples: Link individual challenges or successes to broader social forces, such as economic conditions, historical changes, or social policies.
PO-9	Engagement with Sociological Literature Students will be able to critically engage with sociological texts and literature. Examples: Read and critique academic articles, integrate theoretical perspectives into analyses, and synthesize findings from multiple sources.
PO-10	Preparation for Advanced Study or Professional Careers Students will be prepared for further academic study in sociology or related fields, or for careers that require sociological knowledge and research skills. Examples: Apply sociological insights in fields such as social work, public policy, education, or community development.


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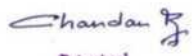
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B.A. (Honours) Political Science Program Outcomes

POs	After Completion of the B.A. (Honours) Political Science Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Critical Understanding of Political Theories and Concepts: Students will develop a solid foundation in political theories, ideologies, and concepts, allowing them to critically analyze political systems, government structures, and political behavior.
PO-2	Knowledge of Indian Political System: Students will gain a deep understanding of the Indian political system, including its constitution, governance, political parties, electoral process, and public policies.
PO-3	Global Political Awareness: Students will be equipped with the knowledge to understand international relations, global political issues, and the role of international organizations in world politics.
PO-4	Policy Analysis and Advocacy: Students will develop the ability to assess public policies, understand their implications, and advocate for policy changes that promote social justice and democratic governance.
PO-5	Civic Responsibility and Ethics: Students will be encouraged to actively participate in civic life, promoting ethical standards in political processes, and contributing to the development of a more just and equitable society.
PO-6	Civic Responsibility and Ethics: Students will be encouraged to actively participate in civic life, promoting ethical standards in political processes, and contributing to the development of a more just and equitable society.
PO-7	Career Preparedness: The program will prepare students for various career opportunities in government, public administration, non-governmental organizations, political journalism, and academia.

Keynote from the HoD: The Bachelor of Arts in Political Science is a three-year program that provides students with a comprehensive understanding of the theoretical and practical aspects of politics, government, and public policy. Students are trained to critically analyze political systems, ideologies, and the dynamics of power and governance. The program also prepares students for advanced studies and various career opportunities in the field of political science.


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B.A. (Honours) History Program Outcomes

POs	After Completion of the B.A. (Honours) History Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	With reference to the course contents and its outcomes, after completion of the 3 yrs degree course in History, it is believed that students would be well versed and acquainted with the developments of historical data and facts, historical perspective of various relating to ancient, medieval and modern developments of states all over the world.
PO-2	To provide the students with an insight to some current problems and to give an understanding of various issues relating to history.
PO-3	Students should be able to have a critical analysis of the subject.
PO-4	Students will be able to understand the basic themes, concepts, chronology and the scope of Indian History.
PO-5	Acquaint with range of issues related to Indian History that span distinct eras.
PO-6	Think and argue historically and critically in writing and discussion.
PO-7	Critically recognize the Social, Political, Economic and Cultural aspects of History.
PO-8	Developing a range of historical skills, essential for the process of historical inquiry.

Note from the HoD: *The CBCS system provides academic flexibility to meet various needs of the students through learner-centric approach. It establishes relation between education, employment and skill development by improving course-curricula and evaluation system. The students are expected to acquire some abilities at the time of their graduation such as a. Critical Thinking b. Self-directed Learning c. Ethics and Social Interaction etc.*


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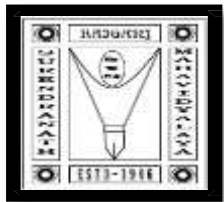
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B.A. (Honours) Bengali Program Outcomes

POs	After Completion of the B.A. (Honours) Bengali Program, the graduates will gain the following knowledge, skill or attitude:
PO-1	Bangla is the most prominent modern Indian language in our country. It is the mother tongue of the major population of East India. Bengali literature and Bengali language have been enriching genres since their inception. Therefore, the curriculum and the syllabus of Bangla honours and general courses have been designed to promote Bangla language and literature to their own glory.
PO-2	From the perspective of historiography, students will learn about the history of Bengali literature, its various eras, and its various ages spanning nearly a thousand years. They will gain in-depth knowledge of Bengali's origins and gradual development from the past to the present
PO-3	Modern Bengali literature consists of world class novels, short stories, and poems. Essays and many other forms of literature. This syllabus gives our undergraduate students a foundation in all aspects of modern Bengali literature
PO-4	This syllabus covers the basic knowledge of philology and linguistics with respect to Bengali. This curriculum emphasises the development of proper grammar senses among our students so that they can write proper sentences, words, and phrases and express their views in a proper way.
PO-5	This syllabus encourages our students to engage in creative writing and build up independent thought and ideas.
PO-6	This syllabus consists of discipline-specific elective courses and skill enhancement courses. DSE (Discipline Specific Elective Course) introduces our students to the different dimensions of Bengali literature, such as children's literature, women's literature, science fiction, etc. The SEC (Skill Enhancement Course) introduces applied knowledge such as proofreading, text editing, and script writing. This course leads students directly into their professional field


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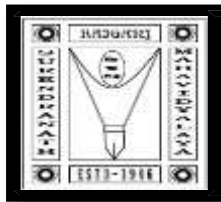
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Course Outcomes (COs) CBCS


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Course Outcome

B.Sc. (Honours)

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Programme Name	Semester	Course Code/ Course Name	Course Syllabus	Course Outcomes
B. Sc. (Honours) Botany (under CBCS)	1 st Semester	DC 1: PAPER-1: Algae and Microbiology	<p><u>ALGAE</u></p> <p>1.General characteristics; Ecology and distribution; range of thallus organization; Cell structure and components; cell wall, pigment system, reserve food (of only groups represented in the syllabus), flagella; methods of reproduction;</p> <p>2.Classification; criteria, system of Fritsch, and evolutionary classification of Lee (only upto groups);</p> <p>3.Cyanophyta and Xanthophyta: Characteristic features, Morphology and life-cycle of Anabaena (Asexual cycle) and Vaucheria, Ultra Structure of cell; Heterocyst and role in N₂ fixation.</p> <p>4.Chlorophyta and Charophyta: Characteristic features, Morphology and life-cycle of Chlamydomonas, Volvox, Oedogonium and Chara. 7. Phaeophyta and Rhodophyta: Characteristic features, Morphology and life-cycle of Ectocarpus and Polysiphonia. 8. Diatom: Cell structure, Cell division, Auxospore formation in</p>	<p>By the end of this course, the student should have-</p> <p>1.Gain skills in identifying various types of algae and microorganisms, including their taxonomy and classification.</p> <p>2.Learn about the ecological roles of algae and microorganisms, such as their contributions to nutrient cycling, primary production, and environmental sustainability.</p> <p>3.Understand the physiological processes, metabolic pathways, and nutritional requirements of algae and microorganisms.</p> <p>4.Explore practical applications of algae and microorganisms in areas such as biotechnology, medicine, environmental management, and agriculture.</p> <p>5.Develop proficiency in using microscopy and other techniques to observe and analyze algae and microorganisms.</p> <p>6.Demonstrate the methods for cultivating algae and microorganisms, and understand the factors that influence their growth and development.</p>

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			<p>Centrales and Pennales. 9. Role of algae in the environment, agriculture, biotechnology and industry.: Biotechnology potential of microalgae for SCP; Production of Agar-agar; Algae as bio-fertilizer; Mass cultivation of algae for biodiesel production.</p> <p><u>MICROBIOLOGY</u></p> <p>1.Introduction to microbial world: Discovery, general characteristics; Types-archaeobacteria, eubacteria, wall-less forms (mycoplasma and spheroplasts); Cell structure: Flagella (ultrastructure) & Pilli; Cell wall – chemical structure and differences between Gram +ve & Gram – ve bacteria; Bacterial genome and plasmid; Endospore - formation, structure and function.</p> <p>2.Bacterial reproduction: Vegetative and asexual; Genetic Recombination (a) Transformation – with special emphasis on Natural and Induced competence and DNA uptake, (b) Conjugation – F- factor, F+ x F–, Hfr x F–, concept of F', chromosome mobilization, (c) Transduction– Generalised and specialized.</p> <p>3. Economic importance of bacteria: Industrial Production of Vinegar and Streptomycin (brief outline); Enzyme</p>	<p>7. Interactions with Other Organisms and Understand how algae and microorganisms can affect human health, both positively (e.g., probiotics) and negatively (e.g., pathogens).</p>
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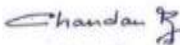


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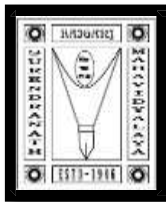
			<p>(Amylase, Protease); Plant Growth Promoting Rhizobacteria (PGPR): Biological nitrogen fixation and nodulation process in legumes. Role of PGPR in agriculture as Biofertilizer and Biopesticides. Concept of Bioplastics.</p> <p>4. Viruses: Discovery, physiochemical and biological characteristics; classification (Baltimore), general, structure with special reference to viroids and prions; replication (general account) 5.DNA virus, (T-phage), lytic and lysogenic cycle; RNA virus (TMV). Economic importance of viruses with reference to vaccine production, role in research, medicine and diagnostics, as causal organisms of plant diseases</p>	
		<p>DC2: PAPER 3: Fungi, Lichens and Plant Pathology</p>	<p><u>FUNGI AND LICHENS</u> 1.Introduction to true fungi; General characteristics; Thallus organization; Cell wall composition; Teleomorphic and Anamorphic; Degeneration of sex in fungi; Parasexuality; Nutrition; Life Cycle Patterns. 2.Classification (Ainsworth 1973) up to sub-division diagnostic characters and</p>	<p>By the end of this course, the student should have knowledge of practical skills related with plants and disease managements.</p> <p>1. Develop the ability to identify and classify fungi, lichens, and plant pathogens based on their morphological, genetic, and biochemical characteristics.</p>


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	<p>significance; Thallus organisation; Reproduction; Life cycle with reference to <i>Rhizopus</i>, <i>Ascobolus</i>, <i>Agaricus</i> and <i>Penicillium</i>.</p> <p>4.Symbiotic associations: Lichen – Occurrence; General characteristics; Growth forms and range of thallus organization; Nature of associations of algal and fungal partners; Reproduction and ecological role in pollution monitoring;</p> <p>Mycorrhiza- Ectomycorrhiza, Endomycorrhiza, Phosphate mobilization by AMF. Significance and role in Agriculture.</p> <p>5.Applied Mycology: Role of fungi in biotechnology; Application of fungi in food industry. Fungi as Biocontrol agents; Mycotoxins.</p> <p>6.Industrial production of Cheese, Ethanol, Baker's yeast, Amylase and Rivo flavin.</p> <p><u>PLANT PATHOLOGY</u></p> <p>1.Introduction to plant pathology; Plant pathology in India and Global perspective; Concept of Disease in Plants and Types of Diseases.</p> <p>2.Terms and definitions: Disease concept, Symptoms, Etiology, Inoculum and Infection, Pathogenesis, SAR and ISR, Disease triangle and disease cycle, Epidemic and Endemic, Sporadic and Pandemic Disease. Koch's postulate.</p> <p>3.Mechanism of infection (Pre-penetration, Penetration and Post-Penetration), Plant defense responses</p>	<p>2.Understand the ecological roles of fungi and lichens, including their symbiotic relationships with plants and their contributions to nutrient cycling and ecosystem health.</p> <p>3.Gain insights into the mechanisms by which plant pathogens cause diseases, including infection strategies, disease development, and symptom expression.</p> <p>4.Strategies for managing and controlling plant diseases, including cultural practices, chemical treatments, and integrated pest management approaches.</p> <p>5.Explore the applications of fungi and lichens in biotechnology, such as their use in bioremediation, pharmaceuticals, and agriculture.</p> <p>6.Assess the impact of plant diseases on agricultural productivity and ecosystem stability, and understand the economic and environmental consequences of plant pathology.</p>
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		<p>with reference to Phytoalexins and PR proteins. Signal transduction leading to SAR and ISR.</p> <p>4. Concept of plant disease management: IPM, Chemical, Biological and Quarantine. Concept of crop rotation.</p> <p>5. Symptoms, Causal organism, Disease cycle and control measures of: Bacterial diseases – Citrus canker, Viral diseases – Tobacco Mosaic Disease. Fungal diseases – Late blight of potato and Black stem rust of wheat.</p> <p>6. Worldwide development of plant pathology as a profession: Indian and International institutions of crop protection, Plant disease clinics.</p>	
2 nd Semester	DC 3: PAPER 5: Archegoniate and Paleobotany	<p>1. Introduction: Unifying features of archegoniate; Transition to land habit; Alternation of generations.</p> <p>2. Bryophytes: General characteristics; Adaptations to land habit; Classification (Proskauer, 1957) up to class. Range of thallus organization. Ecological and economic importance of bryophytes with special reference to <i>Sphagnum</i>.</p> <p>3. Type Studies- Bryophytes: Morphology, anatomy and reproduction and sporophyte development and alternation of generation of <i>Marchantia</i>, <i>Anthoceros</i>, <i>Sphagnum</i> and <i>Funaria</i>.</p> <p>4. Pteridophytes: General characteristics; Classification up to class (Sporne, 1975); Concept of heterospory and origin of seed habit; Apogamy, and apospory; Stellar evolution. Ecological and</p>	<p>By the end of the course, the student should have</p> <p>1. Develop the ability to identify and classify archegoniate plants (such as mosses, liverworts, and ferns) and fossil plants based on their morphological and anatomical features.</p> <p>2. Understand the evolutionary history and significance of archegoniate plants and how they have contributed to the development of modern plant lineages.</p>

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		<p>economic importance of pteridophytes. Early land plants <i>Rhynia</i> and <i>Lepidodendron</i> (Reconstructed).</p> <p>5.Type Studies- Pteridophytes: Morphology, anatomy and reproduction of <i>Psilotum</i>, <i>Lycopodium</i>, <i>Selaginella</i>, <i>Equisetum</i> and <i>Pteris</i> (Developmental details not to be included).</p> <p>6.Gymnosperms: General characteristics, classification up to order (Stewart and Rothwell, 1993), Ecological and economic importance.</p> <p>7.Vegetative morphology, anatomy and reproduction of <i>Cycas</i>, <i>Pinus</i> and <i>Gnetum</i> (Developmental details not to be included)</p> <p>8.Paleobotany: Fossil: types and modes of preservation (Schopf, 1975), conditions of preservations, fossilization process; Geological time scale and major events of plant life through geological ages.: Indian Gondwana system with major megafossil assemblages; Importance of study of fossil.</p>	<p>3.Know about the reproductive structures and life cycles of archegoniate plants, including their role in plant evolution and adaptation.</p> <p>4.Acquire skills in paleobotanical methods for studying fossil plants, including techniques for fossil extraction, preparation, and analysis.</p> <p>5.Use fossil plant evidence to reconstruct past environments and climates, enhancing knowledge of historical ecological and climatic changes.</p> <p>6.Explore the ecological roles and adaptations of archegoniate plants and their influence on ancient and modern ecosystems.</p>
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	<p>DC 4 : PAPER 7: Morphology and Anatomy of Angiosperms</p>	<p>1.Introduction to angiospermic morphology, Palynology and Anatomy, scope and applications in systematics, forensic and pharmacognosy. 2.Leaf: Types, Margin, Base, Venation and Phyllotaxy, Petiole and modifications. 3.Inflorescence: types with examples; Flower: Floral parts, Thalamus and insertion of floral parts, Calyx, Corolla, Aestivation, Perianth, floral diagram and floral formula. Stamen: Types and anther shape. Carpel : types, placentation-types, ovule structure and types; Fruit types with examples. 4.Meristimatic and permanent tissues: Organization of shoot apex (Tunica-carpus concept) and organization of root apex (Korper-Kappe concepts); Structure of dicot and monocot leaf, Kranz anatomy. Structure of Xylem and Phloem tissue; Types and evolution of stele; Vascular bundle -types and function. Root-Stem transition and its significance; Normal and Anomalous secondary growth (citing examples of <i>Bignonia</i> and <i>Dracaena</i> and <i>Tinospora</i> root), different types of wood. Concept and application of Dendrochronology. 5.Adaptive and Protective Systems: Epidermal tissuesystem, cuticle, epicuticular waxes, trichomes(uniand multicellular, glandularand nonglandular, two examples of each), stomata (classification); Adcrustation and incrustation;Anatomical adaptations of xerophytes and hydrophytes.</p>	<p>By the end of this course, the student should have knowledge of practical skills related with plants and their parts.</p> <p>1.Develop the ability to identify the different plant parts and their morphological characteristics.</p> <p>2.Know about the reproductive structures of a flower and their arrangement patterns in different plant species.</p> <p>3.Explore the variations in flower arrangement in floral axis i.e. inflorescence and some special features.</p> <p>4.Understand the anatomical characters of different plant parts, from root to stem and leaves.</p> <p>5. Students will learn the internal structure of plants. It will enhance the basic understanding of organization of plant body by cells and tissues.</p> <p>6.Students will be able to recognize the different types of tissue system.</p>
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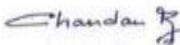


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			<p>7. Students will be acquainted with the internal structure of plant root, stem and leaf.</p> <p>8. Students will learn the technique of section cutting and slide preparation.</p>
3rd Semester	DC 5: PAPER 9: Plant Systematics	<p>1. Significance of Plant systematics: Introduction to systematics; Plant identification, Classification, Nomenclature. Field inventory; Functions of Herbarium; Important herbaria and botanical gardens of the world and India; Virtual herbarium; E- flora; Documentation: Flora, Monographs, Journals; Keys: Single access and Multi-access.</p> <p>2. Taxonomic hierarchy: Concept of taxa (family, genus, species); Categories and taxonomic hierarchy; Species concept (taxonomic, biological, evolutionary).</p> <p>3. Botanical nomenclature: Principles and rules (ICN); Ranks and names; Typification, author citation, valid publication, rejection of names, principle of priority and its limitations; Names of hybrids.</p> <p>4. Systems of classification: Major contributions of Theophrastus, Bauhin, Tournefort, Linnaeus, Adanson, de Candolle, Bessey, Hutchinson, Takhtajan and Cronquist; Outline of classification systems of Linnaeus (1753), Bentham and Hooker (1862-</p>	<p>By the end of this course, the student should have knowledge of practical skills related with plant families.</p> <p>1. Students will be acquainted with the vegetative and floral characteristics of the enlisted plant families.</p> <p>2. Develop the ability to accurately identify plant species using morphological, anatomical, and genetic characteristics.</p> <p>3. Understand and apply various plant classification systems, such as the Linnaean system and modern phylogenetic approaches.</p> <p>4. Comprehend the hierarchical structure of plant taxonomy, including categories like family, genus, species, and subspecies.</p>


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		<p>1883) upto series and Engler and Prantl (upto series); Brief reference of Angiosperm Phylogeny Group (APG III) classification.</p> <p>5. Biometrics, numerical taxonomy and cladistics : Characters; Variations; OTUs, character weighting and coding; Cluster analysis; Phenograms, cladograms (definitions and differences).</p> <p>6. Phylogeny of Angiosperms: Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence, monophyly, Paraphyly, polyphyly and clades). Origin and evolution of angiosperms; Co-evolution of angiosperms and animals; Methods of illustrating evolutionary relationship (phylogenetic tree, cladogram).</p> <p>7. Diagnostic features of Families: Dicotyledons- Ranunculaceae, Brassicaceae, Malvaceae, Leguminosae (sensu lato), Apiaceae, Solanaceae, Lamiaceae, Cucurbitaceae, Rubiaceae, Euphorbiaceae, Asteraceae. Monocotyledons- Alismataceae, Poaceae, Zingiberaceae and Orchidaceae.</p>	<p>5. Gain insight into the diversity of plant life and the evolutionary relationships between different plant groups.</p> <p>6. Know about the practical skills for plant collection, preservation, and examination, both in the field and laboratory settings.</p> <p>7. Apply taxonomic knowledge to research, conservation, and management of plant resources, contributing to biodiversity preservation and ecosystem understanding</p>
	<p>DC 6: PAPER 11: Plant Ecology , Phytogeography and Biodiversity</p>	<p>1. Introduction : Basic concepts; Levels of organization. Inter-relationships between the living world and the environment, the components and dynamism, homeostasis.</p> <p>2. Soil: Importance; Origin; Formation; Composition; Physical; Chemical and Biological components; Soil profile; Role of climate in soil development. Water: Importance:</p>	<p>By the end of the course, the student should have</p> <p>1. Grasp the principles of ecosystems, including energy flow, nutrient cycling, and the interactions between biotic and abiotic components.</p> <p>2. Species Interactions: Analyze various types of species interactions, such as predation, competition, and symbiosis,</p>

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		<p>States of water in the environment; Atmospheric moisture; Precipitation types (rain, fog, snow, hail, dew); Hydrological Cycle; Water in soil; Water table.</p> <p>3.Trophic organization: basic source of energy, Models of energy flow, autotrophy, heterotrophy; symbiosis, commensalism, parasitism; food chains and webs; ecological pyramids; biomass, standing crop. Population ecology: Characteristics and Dynamics .Ecological Speciation</p> <p>4.Plant communities: Concept of ecological amplitude; Habitat and niche; Characters: analytical and synthetic; Ecotone and edge effect; Dynamics: succession – processes, types; climax concepts.</p> <p>5.Ecosystems: Structure; Processes; Trophic organisation; Food chains and Food webs; Ecological pyramids. Functional aspects of ecosystem: Principles and models of energy flow; Production and productivity; Ecological efficiencies; Biogeochemical cycles; Carbon, Nitrogen and Phosphorus.</p> <p>6.Phytogeography: Principles; Continental drift; Theory of tolerance; Endemism; Brief description of major terrestrial biomes (one each from tropical, temperate & tundra); Phytogeographical division of India; Local Vegetation.</p> <p>7.Plant Biodiversity: Biodiversity and</p>	<p>and their effects on ecological balance.</p> <p>3.Understand the factors influencing plant and animal distribution across different habitats and geographic regions, as well as the concept of ecological niches.</p> <p>4.Explore the spatial distribution of plant species and communities, including the impact of historical, climatic, and geological factors on plant geography.</p> <p>5.Know about the methods for assessing and quantifying biodiversity, including species richness, evenness, and the use of indices to evaluate ecosystem health.</p> <p>6.Apply ecological and phytogeographic knowledge to develop and implement strategies for conserving biodiversity, managing natural resources, and restoring degraded ecosystems.</p>
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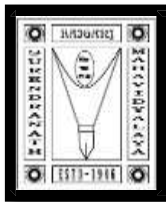
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		<p>Conservation: Biodiversity – definition, scope, types (genetic, species and ecosystem), importance and threats; Threatened plants (IUCN Categories); knowledge on Red Data Book; Hotspots.</p> <p>8. <i>In situ</i> and <i>ex situ</i> conservation strategies for rare and endangered plants with emphasis on National parks, Sanctuaries and Biosphere reserves, seed banks, cryopreservation in India.</p>	
	DC 7. PAPER 13: Economic botany	<p>1.Origin of Cultivated Plants: Concept of Centres of Origin, their importance with reference to Vavilov’s work. Examples of major plant introductions; Crop domestication and loss of genetic diversity; evolution of new crops/varieties, importance of germplasm diversity.</p> <p>2. Cereals: Wheat and Rice (origin, morphology, processing & uses); Brief account of millets.</p> <p>3.Legumes: Origin, morphology and uses of Chick pea, Pigeon pea and fodder legumes. Importance to man and ecosystem.</p> <p>4.Sources of sugars and starches: Morphology and processing of sugarcane, products and by-products of sugarcane industry. Potato – morphology, propagation & uses.</p> <p>5.Spices: Listing of important spices, their family and part used. Economic importance with special reference to fennel, saffron, clove and black pepper.</p> <p>6. Beverages: Tea, Coffee (morphology,</p>	<p>By the end of the course, the student should have</p> <ol style="list-style-type: none"> 1.Understand environmental botany. 2.Know nature and its co-relation with human society. 3.Realize the impact of human activities on the environment. 4.Understand global issues concerned to the environment. 5.Know the sustainable development and care of the environment. 6.Understand the connection between material wealth & resource exploitation. 7.Worth the relationship between economic growth and environmental degradation.

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		<p>processing & uses)</p> <p>7.Sources of oils and fats: General description, classification, extraction, their uses and health implications groundnut, coconut, linseed, soybean, mustard and coconut (Botanical name, family & uses). Essential Oils: General account, extraction methods, comparison with fatty oils & their uses.</p> <p>8.Natural Rubber: Para-rubber: tapping, processing and uses.</p> <p>9.Drug-yielding plants: Therapeutic and habit-forming drugs with special reference to <i>Cinchona</i>, <i>Digitalis</i> and <i>Cannabis</i>; Tobacco (Morphology, processing, uses and health hazards).</p> <p>10.Timber plants: General account with special reference to teak and pine.</p> <p>11.Fibers: Classification based on the origin of fibers; Cotton and Jute (morphology, extraction and uses)</p>	
4 th Semester	DC 8: PAPER 15: Cell biology and Plant Breeding	<p>CELL BIOLOGY</p> <p>1.The cell: Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell (Endosymbiotic theory).</p> <p>2.Cell wall and plasma membrane: Chemistry, structure and function of Plant cell wall. Overview of membrane function; fluid, mosaic model; Chemical composition of membranes; Membrane transport – Passive, active and facilitated transport, endocytosis and exocytosis.</p> <p>3.Cell organelles: Nucleus: Structure- nuclear envelope, nuclear pore complex, nuclear lamina, molecular</p>	<p>By the end of the course, the student should have</p> <p>1. Understand the structure and roles of cellular organelles and membranes, and how they contribute to overall cell function.</p> <p>2. Comprehend key cellular processes like division, signaling, and metabolism, along with DNA replication, gene expression, and regulation.</p> <p>3. Gain proficiency in microscopy techniques and cell culture methods for analyzing cellular structures and</p>



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		<p>organization of chromatin; nucleolus. 4.Chloroplast, mitochondria and peroxisomes: Structural organization; Function; Semiautonomous nature of mitochondria and chloroplast. 5.Cytoskeleton: Role and structure of microtubules, microfilaments and intermediary filament.. 6.Endomembrane system: Endoplasmic Reticulum – Structure, targeting and insertion of proteins in the ER, protein folding, processing; Smooth ER and lipid synthesis, export of proteins and lipids; Golgi Apparatus – organization, protein glycosylation, protein sorting and export from Golgi Apparatus; Lysosomes. 7.Cell division: Phases of eukaryotic cell cycle, mitosis and meiosis; Regulation of cell cyclecheckpoints, role, of protein kinases.</p> <p><u>PLANT BREEDING</u> 1.Concept of plant breeding; Significance and role in crop improvement. 2.Types of variety selection – mass selection, pure line selection, clonal selection, bulk and pedigree selection and hybridization. 3.Heterosis and Hybrid vigour; Male sterility in plants- types and application.</p>	<p>functions.</p> <p>4.Understanding the principles of inheritance, genetic variation, and modern breeding techniques including marker-assisted and genomic selection.</p> <p>5.Understand how to breed plants for specific traits such as yield, quality, and environmental adaptation.</p> <p>6.Evaluate the impact of breeding practices on sustainability, ethics, and regulatory issues surrounding GMOs and environmental considerations.</p>
	<p>DC 9: PAPER 17: Genetics and Biostatistics</p>	<p><u>GENETICS</u> 1. Mendelian genetics and its extension: Mendelism: Principles of inheritance; Chromosome theory of</p>	<p>By the end of this course, the student should have knowledge of genetics and biostatistics. 1. Understand Mendelian inheritance,</p>

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		<p>inheritance; Autosomes and sex chromosomes; Probability and pedigree analysis; Incomplete dominance and co-dominance; Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Recessive and Dominant traits.</p> <p>2.Linkage, crossing over and chromosome mapping: Linkage and crossing over-Cytological basis of crossing over; Recombination frequency, two factor and three factor crosses; Interference and coincidence; Numericals based on gene mapping; Sex Linkage.</p> <p>3.Extrachromosomal Inheritance: Basic concepts with examples in chloroplast and mitochondria</p> <p>4.Variation in chromosome number and structure: Deletion, Duplication, Inversion, Translocation,</p> <p>5.Position effect, Euploidy and Aneuploidy</p> <p>6.Gene mutations: Types of mutations; Molecular basis of Mutations; Mutagens – physical and chemical (Baseanalog, deaminating, alkylating and intercalating agents); Detection of mutations: CIB method. Role of Transposons in mutation.DNA repair mechanisms.</p> <p>7.Fine structure of gene: Classical vs molecular concepts of gene; Cis-Trans complementation test for functional allelism; Structure of Phage T4, rII Locus.</p> <p>8.Operon concept : Lac Operon and Trp- Operon</p> <p>9.Population and Evolutionary</p>	<p>genetic variation, and patterns of inheritance in populations and individuals.</p> <p>2.Comprehend DNA structure, gene expression, mutation, and the mechanisms of genetic regulation.</p> <p>3.Learn techniques for mapping genes, including linkage analysis and the use of genetic markers.</p> <p>4.Gain proficiency in statistical techniques used in genetics, such as hypothesis testing, regression analysis, and analysis of variance (ANOVA).</p> <p>5.Apply biostatistical methods to analyze biological data, including survival analysis, clinical trials, and epidemiological studies.</p> <p>6.Develop skills in interpreting genetic and biostatistical data, and effectively communicate findings through reports and scientific papers.</p>
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		<p>Genetics: Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection, mutation, genetic drift. Genetic variation and Speciation.</p> <p>BIostatistics</p> <p>1.Introduction to Biostatistics: Characteristics, Usefulness and Limitation, Types of Data.</p> <p>2.Sampling methods-concept of sampling of population, measures of central tendency and dispersal: determination of mean, mode, median, variance, standard deviation and standard error.</p> <p>3.Rules of probability (Addition and Multiplication theorem), Null-hypothesis, Tests of significance: chisquare test, t-test (student and paired t-test).</p> <p>4.Correlation and Regression.</p>	
	<p>DC 10: PAPER 19: Reproductive Biology of Angiosperms</p>	<p>1. Introduction: History (contributions of G.B. Amici, W. Hofmeister, E. Strasburger, S.G. Nawaschin, P.Maheshwari, B.M. Johri, W.A. Jensen, J. Heslop-Harrison) and scope.</p> <p>2. Reproductive development: Induction of flowering; flower as a modified determinate shoot. Flower development: genetic and molecular aspects.</p> <p>3.Anther and pollen biology: Anther wall: Structure and functions, microsporogenesis, callose deposition and its significance. Microgametogenesis; Pollen wall structure, MGU (male germ unit) structure, NPC system; Palynology and</p>	<p>By the end of the course, the student should have</p> <ol style="list-style-type: none"> 1. Students will be able to understand plant development. 2.Understand the scope & importance of Anatomy and Embryology. 3.Understand the various developments of SAM and RAM 4.Understand the mechanism of seed germination and seedgrowth 5.Know various tissue systems. 6.Understand the normal and

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		<p>scope (a brief account); Pollen wall proteins; Pollen viability, storage and germination; Abnormal features: Pseudomonads, polyads, massulae, pollinia.</p> <p>4.Ovule: Structure; Types; Special structures– endothelium, obturator, aril, caruncle and hypostase; Female gametophyte– megasporogenesis (monosporic, bisporic and tetrasporic) and megagametogenesis (details of <i>Polygonum</i> type); Organization and ultrastructure of mature embryo sac.</p> <p>5.Pollination and fertilization: Pollination types and significance; adaptations; structure of stigma and style; path of pollen tube in pistil; double fertilization.</p> <p>6.Self incompatibility: Basic concepts (interspecific, intraspecific, homomorphic, heteromorphic, GSI and SSD); Methods to overcome self-incompatibility: mixed pollination, bud pollination, stub pollination.</p> <p>7.Embryo, Endosperm and Seed: Structure and types; General pattern of development of dicot and monocot embryo and endosperm; Suspensor: structure and functions; Embryo-endosperm relationship; Nutrition of embryo; Unusual features; Embryo development in <i>Paeonia</i>. Seed structure, importance and dispersal mechanisms.</p>	<p>anomalous secondary growth in plants and their causes.</p> <p>7.Perform the techniques in anatomy.</p> <p>8.Understand the structure an</p> <p>9.Understand microsporogenesis and megasporogenesis.</p> <p>10.Understand male and female gametophytes.</p> <p>11.Know fertilization, endosperm, and embryogenesis.</p>
5 th Semester	DC 11. PAPER 21: Plant Physiology	<p>1. Plant-water relations: Water Potential and its components, water absorption by roots, aquaporins, pathway of water movement, symplast, apoplast, transmembrane pathways, root</p>	<p>By the end of the course, the student should have</p> <p>1. Understand plant structures in the context</p>

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	<p>pressure, guttation. Ascent of sap– cohesion-tension theory. Transpiration and factors affecting transpiration, antitranspirants, mechanism of stomatal movement. Soil-Plant-Atmosphere continuum concept, Cavitation and embolism. 2.Mineral nutrition: Essential and beneficial elements, macro and micronutrients, mineral deficiency symptoms, roles of essential elements, chelating agents. Nutrient Uptake: Soil as a nutrient reservoir, transport of ions across cell membrane, passive absorption, electrochemical gradient, facilitated diffusion, active absorption, role of ATP, carrier systems, proton ATPase pump and ion flux, uniport, co-transport, symport, antiport. 3.Translocation in the phloem: Experimental evidence in support of phloem as the site of sugar translocation. Pressure–Flow Model; Phloem loading and unloading; Source–sink relationship. 4.Transpiration: Stomata - micellation of guard cell; Role of CO₂, K⁺ - ion, blue light & abscisic acid in stomatal movement; Anti-transpirant. 5.Plant growth regulators: Discovery, chemical nature (basic structure), bioassay and physiological roles of Auxin, Gibberellins, Cytokinin, Abscisic acid, Ethylene, Brassinosteroids and Jasmonic acid. 6. Physiology of flowering:</p>	<p>of the physiological functions of plants and mineral nutrition in plants. 2. Understand the growth and developmental and movement processes in plants their regulations. 3. Understand the process of translocation of solutes in plants. 4. Know nitrogen metabolism and its importance 5. Understand the physiological details of photosynthesis and respiration, lipid metabolism in plants. 6. They will learn about the metabolites synthesized by plants. 7. They will be able to understand the redox systems of plants. 8. They will be able to understand the enzymes and plant hormones.</p>
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		<p>Photoperiodism, flowering stimulus, florigen concept, vernalization, seed dormancy; Phytochrome, cryptochromes and phototropins: Discovery, chemical nature, role in photomorphogenesis, low energy responses (LER) and high irradiance responses (HIR), mode of action. 7. Seed Dormancy: Types, causes and methods of breaking seed dormancy.</p>	
	<p>DC 12: PAPER 23: Plant Metabolism</p>	<p>1. Concept of Metabolism in plants: Introduction, anabolic and catabolic pathways, regulation of metabolism, role of regulatory enzymes (allosteric, covalent modulation and Isozymes). 2. Carbon assimilation: Historical background, photosynthetic pigments: Structure of chlorophyll a & b, role of photosynthetic pigments (chlorophylls and accessory pigments), antenna molecules and reaction centres, photochemical reactions, photosynthetic electron transport, PSI, PSII, Q cycle, CO₂ reduction, photorespiration, C₄ pathways; efficiency of C₃ & C₄ plants on crop productivity; CAM and its ecological significance. Crassulacean acid metabolism; Factors affecting CO₂ reduction. 3. Carbohydrate metabolism: Synthesis and catabolism of sucrose and starch. 4. Carbon Oxidation: Glycolysis and its significance, fate of pyruvate, oxidative pentose phosphate pathway, oxidative decarboxylation of</p>	<p>By the end of the course, the student should have</p> <ol style="list-style-type: none"> 1. Understand the primary metabolic pathways in plants, including photosynthesis, respiration, and nitrogen metabolism, and how they contribute to energy production and growth. 2. Comprehend the mechanisms of light-dependent and light-independent reactions in photosynthesis, and how plants convert light energy into chemical energy. 3. Learn about the processes of glycolysis, the citric acid cycle, and oxidative phosphorylation, and their roles in energy production and metabolism. 4. Recognize the roles of secondary metabolites such as alkaloids, flavonoids, and terpenoids in plant defense, communication, and adaptation.



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		<p>pyruvate, regulation of PDH, NADH shuttle; TCA cycle, amphibolic role, anaplerotic reactions, regulation of the cycle, mitochondrial electron transport, oxidative phosphorylation, cyanide-resistant respiration, factors affecting respiration.</p> <p>5.ATP-Synthesis: Mechanism of ATP synthesis, substrate level phosphorylation, chemiosmotic mechanism (oxidative and photophosphorylation), ATP synthase, Boyers conformational model, Racker’s experiment, Jagendorf’s experiment; role of uncouplers.</p> <p>6.Lipid metabolism:Synthesis and breakdown of triglycerides, β - oxidation, glyoxylate cycle, gluconeogenesis and its role in mobilisation of lipids during seed germination, α oxidation.</p> <p>7.Nitrogen metabolism: Nitrate assimilation, biological nitrogen fixation (examples of legumes and nonlegumes); Physiology and biochemistry of nitrogen fixation; Ammonia assimilation and transamination.</p> <p>8.Mechanisms of signal transduction: Receptor-ligand interactions; Second messenger concept, Calcium calmodulin, MAP kinase cascade.</p>	<p>5. Understand how metabolic pathways are regulated at the molecular level, including the roles of enzymes, cofactors, and feedback mechanisms.</p> <p>6. Analyze how environmental factors (e.g., light, temperature, water availability) and developmental stages affect plant metabolic processes and overall plant health.</p>

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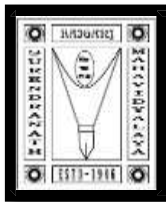
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<p>6th Semester</p>	<p>DC 13: Biomolecules (Biochemistry)</p>	<p>1.Biomolecules: Types and significance of chemical bonds (Covalent, non-covalent & hydrogen bonds, van der Waals interactions); Structure and properties of water; pH and buffers.</p> <p>2.Carbohydrates: Nomenclature and classification; Monosaccharides ; Disaccharides; Oligosaccharides and polysaccharides.</p> <p>3.Lipids: Definition and major classes of storage and structural lipids; Fatty acids structure and functions; Essential fatty acids; saturated and unsaturated fatty acids; Triacyl glycerols structure, functions and properties; Phosphoglycerides.</p> <p>4.Proteins: Structure of amino acids and classification; Levels of protein structure-primary, secondary, tertiary and quaternary; Protein denaturation and biological roles of proteins.</p> <p>5.Nucleic acids: Structure of nitrogenous bases; Structure and function of nucleotides; Types of nucleic acids; Structure of A, B, Z types of DNA; Types of RNA; Structure of tRNA.</p> <p>6.Bioenergetics: Laws of thermodynamics, concept of free energy, endergonic and exergonic reactions, coupled reactions, redox reactions. ATP: structure, its role as a energy currency molecule.</p> <p>7.Enzymes: Definition, Structure of enzyme: holoenzyme, apoenzyme, cofactors, coenzymes and prosthetic group; Classification of enzymes;</p>	<p>By the end of the course, the student should have</p> <ol style="list-style-type: none"> 1.Macromolecules: Understand the structure and function of plant macromolecules, including carbohydrates, proteins, lipids, and nucleic acids. 2.Comprehend the roles of carbohydrates in energy storage and structural functions, and the processes of photosynthesis and starch synthesis. 3.Learn about the diversity of plant proteins, their functions, and the role of enzymes in metabolic pathways and regulatory processes. 4.Recognize the importance of lipids in forming cellular membranes, storing energy, and signaling. 5.Understand the functions of DNA and RNA in genetic information storage, expression, and replication, and their roles in plant development and response to environmental changes. 6.Explore the biosynthesis and functions of secondary metabolites, such as alkaloids, terpenes, and phenolics, in plant defense, communication, and adaptation.
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		Features of active site, substrate specificity, mechanism of action(activation energy, lock and key hypothesis, induced - fit theory), Michaelis – Menten equation, enzyme inhibition and factors affecting enzyme activity.	
	DC 14:Plant Biotechnology	<p>1. Plant Tissue Culture Historical perspective; Totipotency; Organogenesis; Embryogenesis (somatic and zygotic); Composition of tissue culture media; Nutrient and hormone requirements (role of vitamins and hormones).</p> <p>2. Micropropagation: methods and stages, advantages, disadvantages and application, organogenesis and embryogenesis (zygotic and somatic, induction of somatic embryogenesis, role of plant growth regulators, application – synthetic seeds); callus culture; application of plant tissue culture in agriculture and forestry.</p> <p>3. Protoplast isolation, culture and fusion; Application of Tissue culture applications (micropropagation, secondary metabolite production, haploids, triploids and hybrids; Cryopreservation; Germplasm Conservation).</p> <p>4. Recombinant DNA technology : Restriction Endonucleases (History, Types I-IV, biological role and application); Restriction Mapping (Linear and Circular); Cloning Vectors: Prokaryotic (pUC 18 and</p>	<p>1. Understand Plant Tissue Culture Techniques and Applications</p> <p>2. Master Micropropagation Methods and Applications</p> <p>3. Explore Protoplast Isolation and Fusion</p> <p>4. Apply Knowledge of Recombinant DNA Technology</p> <p>5. Learn Gene Cloning Techniques and Library Construction</p> <p>6. Evaluate Methods and Applications of Gene Transfer.</p>

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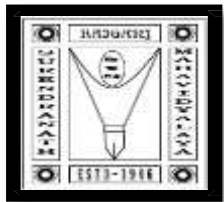
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		<p>pUC19, pBR322, Ti plasmid, BAC); Lambda phage, M13 phagemid, Cosmid, Shuttle vector; Eukaryotic Vectors (YAC). 5.Gene Cloning: Recombinant DNA, Bacterial Transformation and selection of recombinant clones, PCR mediated gene cloning; Gene Construct; construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by genetic selection; complementation, colony hybridization; PCR 6.Methods of gene transfer: Brief idea about different methods of gene transfer, <i>Agrobacterium</i> mediated, Direct gene transfer by Electroporation, Microinjection, Microprojectile bombardment; Selection of transgenics– selectable marker and reporter genes (Luciferase, GUS, GFP). 7.Applications of Biotechnology: Pest resistant (Bt-cotton); herbicide resistant plants (RoundUp Ready soybean); Transgenic crops with improved quality traits (Golden rice); Improved horticultural varieties (Moondust carnations); Role of transgenics in bioremediation (Superbug); edible vaccines; Industrial enzymes (Aspergillase.); Genetically Engineered Products– Human Growth Hormone; Humulin; Biosafety concerns.</p>	
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Course Outcome

B.Sc. (Honours)

Department of Chemistry


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Raiganj Surendranath Mahavidyalaya**Course Outcomes: B.Sc. in Chemistry (Honours)**

Course Name	Course Outcomes
CEMHT-1 Organic Chemistry – I	Understand basic concepts of organic chemistry including basic reaction mechanisms, stereochemistry and optical activities
CEMHP-1 Organic Chemistry-I (Practical)	To be able to identify organic compounds and measure their melting and boiling points
CEMHT-2 Physical Chemistry – I	To understand the basic concept of kinetic theory of gases and know how to solve numerical problems related to that topic. Understanding of chemical kinetics, rates of reactions, problem solving. Basic concepts of 1 st and 2 nd law of thermodynamics, able to write and solve differential equations; differentiate between partial and absolute derivatives;
CEMHP-2 Physical Chemistry – I (Practical)	Able to carry out time bound titration experiments related to chemical kinetics; able to use concept of buffer solutions to determine pH
CEMHT-3 Inorganic Chemistry-I	Understand concepts behind formation of quantum numbers, structure of atoms and understanding of periodic table, understand concept of redox titrations, basics of electrochemistry and acid-base chemistry
CEMHP-3 Inorganic Chemistry- I (Practical)	Able to carry out acid-base and redox titrations in the laboratory

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CEMHT-4 Organic Chemistry -II	Advanced understanding of stereochemistry and conformation of organic compounds including relation to thermodynamics and kinetics
CEMHP-4 Organic Chemistry – II (Practical)	Preparation of Simple Organic compounds using laboratory procedures
CEMHT-5 Physical Chemistry – II	Understand concept of quantum mechanics and mathematics involving operators; Understand of conductance and transport phenomenon; Able to understand and apply thermodynamical concepts on reaction equilibrium and state of chemical properties
CEMHP-5 Physical Chemistry – II (Practical)	Use of simple instruments to carry out variety of Physical chemistry experiments such as conductometric titration, determination of equilibrium constant and able to perform calculation and analyse the data/result
CEMHT-6 Inorganic Chemistry – II	Detailed understanding of chemical bond formation including MO theory, able to predict nature of any chemical bond and able to predict structure of any molecule, understand radioactivity related principles
CEMHP-6 Inorganic Chemistry – II (Practical)	Able to estimate various elements/compounds via quantitative methods with industrial importance
CEMHT-7 Organic Chemistry – III	Detailed understanding of aliphatic and aromatic chemistry, prediction of any organic reactions and related mechanisms, detailed understanding of organometallics chemistry, reaction mechanism and catalytic processes involving organometallics
CEMHT-8 Physical-III	Able to apply thermodynamical concepts on multi-phase systems, electrochemistry, Basic understanding of quantum chemistry with regard to hydrogen like atoms

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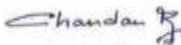


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CEMHP-8 Physical-III (Practical)	Application of knowledge of thermodynamics and related phenomenon in laboratory Potentiometric titration, Phase diagram, pH metric titration.
CEMHT-9 Inorganic Chemistry – III	Detailed understanding of various properties of compounds of periodic table elements including noble gasses, basic understanding of coordination chemistry and IUPAC nomenclature of coordination compounds
CEMHP-9 Inorganic Chemistry – III (Practical)	Able to prepare coordination compounds and inorganic complexes in the laboratory and gather knowledge on complexometric titration.
CEMHT-10 Organic Chemistry – IV	Able to understand and predict rearrangement mechanisms and synthesis of organic compounds; Able to decipher spectra or organic compounds and identify organic molecules via spectroscopic analysis
CEMHP-10 Organic Chemistry – IV (Practical)	Estimation of various organic compounds of industrial importance
CEMHT-11 Inorganic- IV	Complete understanding of Coordination Compounds, their structure, magnetic properties and ability to explain colour of compounds with help of spectroscopy and CFSE.
CEMHP-11 Inorganic Chemistry – IV (Practical)	Able to perform chromatographic experiments on inorganic compounds in the laboratory
CEMHT-12 Organic Chemistry – V	Understanding concept of Heterocyclic compounds, understand apply the effect of organic biomolecules in chemistry
CEMHP-12 Organic Chemistry – V (Practical)	Able to perform spectroscopic analysis of basic organic compounds


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CEMHTDSE -1A Advance Physical (Theory)	Understanding concept of Solid and crystal , statistical thermodynamics, specific heat of solid. Thermodynamics 3 rd law.
CEMHPDSE -1A Advance Physical (Practical)	Understanding the computer programming based on numerical methods.
Analytical Chemistry (Theory)	Understand and apply various analytical techniques to analyse various problems related to chemical compounds and reactions
Analytical Chemistry (Practical)	Understanding concept of Chromatographic separation, analysis of soil.
CEMHSE-1B Basic analytical chemistry	Understanding concept of complexometric, soil analysis, analysis of water, chromatography technique.
CEMHT-13 Inorganic Chemistry – V (Theory)	Complete understanding of various biological and physiological processes involving metals and organic compounds
CEMHP-13 Inorganic Chemistry – V (Practical)	Able to analyse and detect cations and anions present in a mixture of Inorganic compounds
CEMHT-14 Physical Chemistry – IV (Theory)	Able to apply the knowledge of molecular spectroscopy to analyse phenomena related to chemical compounds, To know details about surface energy and surface tension; Classification, Adsorption Isotherms and applications of adsorption understand about the photochemistry
CEMHP-14 Physical Chemistry – IV (Practical)	To knowledge about verification of Beer and Lambert's Law for KMnO_4 and $\text{K}_2\text{Cr}_2\text{O}_7$ solution spectrophotometrically, how to determine surface tension of a liquid.
CEMHTDSE-3B Industrial Chemistry (Theory)	Understanding concept of various industrial importance and application Glass, Cements, Fertilizers and Surface coating.

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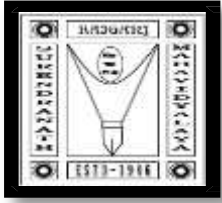
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CEMHPDSE-3B Industrial Chemistry (Practical)	To know about analysis of alloy, cements and metal estimation.
CEMHTDSE-4 Green Chemistry (Theory)	Understanding of Green chemistry, Principle of green chemistry, example of green synthesis of
CEMHPDSE-4 Green Chemistry (Practical)	Able to perform reaction using green solvent and using renewable resources.
CEMHSE-2A Pharmaceutical Chemistry	Complete understanding of drug discovery and pharmaceutical, fermentation and production of some organic compound.

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Course Outcome
B.A. (Honours)
Department of Economics

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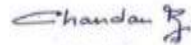
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Raiganj Surendranath Mahavidyalaya Department of**Economics (Honours /CBCS) Course Outcomes**

Sl. No.	Subject Code	Subject Name	Subject Category	Course Outcome
Semester-I				
1	Core 1	Introductory Microeconomics	DC1	Students will develop the ability to apply microeconomic theories to real-world situations, critically evaluating market scenarios, and policy decisions. They will learn to use economic models to assess the impact of government interventions, market failures, and externalities, thereby enhancing their analytical and problem-solving skills.
2	Core 2	Mathematical Methods in Economics I	DC2	By completing the basic mathematical economics course, undergraduate students will gain proficiency in applying mathematical methods such as calculus, linear algebra, and optimization to economic models. This will enable them to analyze and solve economic problems with precision, facilitating a deeper understanding of both microeconomic and macroeconomic theories.
Semester-II				
3	Core 3	Introductory Macroeconomics	DC3	By completing the introductory macroeconomics course, undergraduate students will gain a solid grasp of key macroeconomic indicators such as GDP, inflation, unemployment, and interest rates. They will understand how these indicators


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				are measured, how they interact, and their significance in assessing the overall health of an economy.
4	Core 4	Statistical Methods for Economics	DC4	Students will be able to acquire the skills to collect, analyze, and interpret economic data using statistical tools. They will be able to apply techniques such as regression analysis, hypothesis testing, and probability distributions to draw meaningful conclusions about economic relationships and trends.
Semester-III				
5	Core 5	Intermediate Microeconomics I	DC5	By completing the course, undergraduate students will achieve a more advanced understanding of economic theories microeconomics. They will delve into complex concepts such as market dynamics, game theory, economic growth, and business cycles, building upon the foundational knowledge gained in introductory courses.
6	Core 6	Intermediate Macroeconomics I	DC6	Students will develop the skills to critically assess the effectiveness of various macroeconomic policies. They will learn to apply theoretical models to real-world situations, evaluating the impacts of government interventions, central bank actions, and international economic developments on national and global economies. This will prepare them to engage in informed discussions about



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				current macroeconomic challenges and policy solutions
7	Core 7	Mathematical Methods in Economics II	DC7	Students will develop the ability to use mathematical methods to analyze economic relationships and optimize economic outcomes. This course equips them with the skills necessary to tackle complex economic problems, conduct quantitative research, and engage in higher-level economic analysis in both academic and professional settings. This mastery enables them to express complex economic theories with mathematical precision and rigor.
Semester-IV				
8	Core 8	Intermediate Microeconomics II	DC8	By the end of this course, undergraduate students will have a comprehensive grasp of complex microeconomic concepts, including advanced consumer and producer theory, general equilibrium, and welfare economics. They will be able to critically analyze and interpret the intricate behaviors of individuals, firms, and markets under various conditions.
9	Core 9	Intermediate Macroeconomics II	DC9	Students will develop advanced skills in empirical analysis and quantitative research, using advanced macroeconomic models and techniques. They will learn to critically evaluate macroeconomic policies, conduct in-depth analyses of economic trends and fluctuations, and contribute to high-level research, preparing them for advanced academic work or specialized professional roles in economics.





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10	Core 10	Introductory Econometrics	DC10	Students will acquire foundational skills in econometric techniques such as linear regression, hypothesis testing, and model specification. They will learn to apply these methods to analyze economic data and interpret empirical results. In addition, Students will develop the ability to use statistical software to perform econometric analyses. They will gain experience in evaluating real-world economic data, understanding model outputs, and making data-driven inferences
Semester-V				
11	Core 11	International Economics	DC11	Students will gain insight into international trade theories, such as comparative advantage and trade policy, and their effects on global markets. They will learn to analyze the impact of trade agreements, tariffs, and trade barriers on economies. Further, students will explore international financial systems, including exchange rates, international capital flows, and global financial markets. They will understand how these systems influence and are influenced by macroeconomic policies and global economic conditions.
12	Core 12	Public Economics	DC12	Students will understand the principles of government revenue and expenditure, including taxation, public spending, and budgeting processes. They will learn to evaluate the effectiveness and equity of public finance policies. In addition, students will develop skills to assess the

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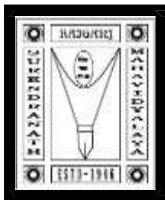
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				impact of fiscal policies on economic stability and growth. They will analyze how government interventions affect economic behavior and public welfare.
13	DSE 5.1/1	Economics of Health and Education	DSE1	Students will learn to apply economic principles to evaluate health and education policies, focusing on cost-benefit and cost-effectiveness analyses. They will understand how to measure and improve the efficiency and equity of these sectors.
14	DSE 5.1/2	Issues in Indian Economy		Students will examine key issues facing the Indian economy, including poverty, inequality, and development challenges. They will analyze the impact of economic reforms and policies on various sectors of the economy. In addition, students will develop the skills to evaluate the effectiveness of Indian economic policies and programs. They will learn to assess the outcomes of policy interventions and their implications for economic growth and social development.
15	DSE 5.1/3	Resource and Environmental Economics		Students will learn about the economic principles related to the management and conservation of natural resources, including theories of resource depletion and sustainable use. They will analyze how economic activities impact resource availability and environmental quality. They will assess the costs and benefits of various environmental regulations and management practices, focusing on achieving sustainable development.

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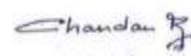


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16	DSE 5.2/1	Money and Financial Economics	DSE2	By the end of this course, students will gain a comprehensive understanding of financial markets, instruments, and institutions. They will learn how these components interact and influence economic activities. Students will also develop skills to analyze and evaluate monetary policies and their impact on inflation, interest rates, and economic stability. They will understand the role of central banks and financial regulators in shaping economic outcomes.
17	DSE 5.2/2	West Bengal Economy		Students will study the economic structure, growth patterns, and development challenges specific to West Bengal. They will understand regional economic issues, including industry, agriculture, and labor markets. Students will also be able to analyze policies and development strategies implemented in West Bengal. They will assess their effectiveness in promoting regional growth, addressing socio-economic issues, and enhancing quality of life.
18	DSE 5.2/3	Gender and Development		Students will explore the economic dimensions of gender, including labor market disparities, income inequality, and access to resources. They will analyze how gender affects economic outcomes and development. Students will also develop skills to evaluate gender-focused policies and programs. They will learn to propose and advocate for policies aimed at reducing gender inequality and promoting equitable development.


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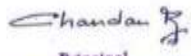


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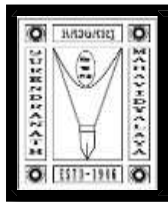
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19	SE 5.3	Advanced Statistics	SE1	Students will master advanced statistical methods such as multivariate analysis, time series analysis, and advanced regression techniques. They will learn to apply these techniques to complex economic data and research questions. In addition, students will develop expertise in designing and conducting empirical research using advanced statistical tools. They will gain experience in interpreting complex data sets and drawing valid conclusions for economic analysis.
Semester-VI				
20	Core 13	Indian Economy	DC13	Students will gain insight into the structure and performance of the Indian economy, including key sectors such as agriculture, industry, and services. They will study trends and challenges affecting economic growth and development in India.
21	Core 14	Development Economics	DC14	Students will understand theories and models of economic development, including factors influencing growth, poverty reduction, and human capital development. They will assess the effectiveness of interventions in improving living standards and achieving sustainable development goals.
22	DSE 6.1/1	Indian Financial Instruments and Markets	DSE3	Students will gain knowledge of various financial instruments available in the Indian market, including stocks, bonds, derivatives, and mutual funds. They will understand their characteristics, uses, and valuation methods. Students will also able


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				to analyze the functioning of Indian financial markets, including stock exchanges, bond markets, and money markets.
23	DSE 6.1/2	Issues in Open Economy		Students will be able to explore key issues in open economies, including international trade, exchange rates, and capital flows. They will analyze how global economic interactions affect domestic economies and vice versa. They can develop the ability to evaluate the impact of international economic policies on national economies.
24	DSE 6.2/1	Field Based Project	DSE4	Students will be able to apply economic theories and methodologies to real-world situations through field-based projects. They will gain hands-on experience in collecting data, conducting surveys, and analyzing empirical evidence related to economic issues, enhancing their practical understanding of economic concepts.
25	DSE 6.2/2	Term Paper		Students will learn how to undertake comprehensive research on a specific economic topic, demonstrating their ability to conduct thorough literature reviews, develop research questions, and apply economic theories and methods to analyze the topic. This process will deepen their understanding of the subject matter and refine their analytical skills.
26	SE 6.3/1	Data Analysis & Applied Economics	SE1	Students will develop advanced skills in handling and analyzing economic data using statistical and econometric techniques. They will also be able to apply

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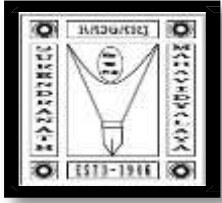
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			<p>econometric methods to real-world economic problems, including model estimation, hypothesis testing, and forecasting. They will gain experience in interpreting empirical results and drawing conclusions based on data.</p>
27	DSE 6.3/2	General Equilibrium and Welfare Economics	<p>By the end of this course, students will able to explore welfare economics concepts, including social welfare functions, efficiency, and equity. Students will study general equilibrium models that explain how supply and demand interact in multiple markets simultaneously. They will assess how different economic policies and market outcomes impact social welfare and distributional equity etc.</p>
29	SE 6.3/3	Input-Output Analysis and Linear Programming	<p>Students will learn to use input-output analysis to understand the interdependencies between different sectors of an economy. They will analyze how changes in one sector affect others and the overall economy. Students will able to gain skills in using linear programming techniques to solve optimization problems in economics. They will learn to formulate and solve problems related to resource allocation, production planning, and cost minimization.</p>

*DC= Discipline Core Course; DSE= Discipline Specific Elective Course; SEC= Skill Enhancement Course



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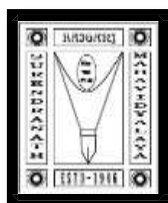
Course Outcome

B.A. (Honours)

Department of Education

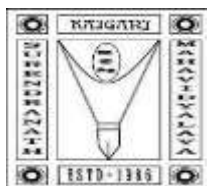
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2021-22)**SEMESTER I****DC -1 Philosophical Foundation of Education**

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Meaning of Education	1	After the completion of the course, students will develop an understanding of the meaning, aims, objectives, roles of philosophy in education, major components in education and their interrelationship and an understanding of the need of the discipline.
II	Philosophy of Education	2	
III	Forms and factors of Education	1	
IV	Roles of Education	1	
V	Education for Discipline	1	

DC -2 Sociological Foundation of Education

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Sociology of Education	1	After the completion of the course, students will develop an understanding of the meaning of sociology and education, the processes of social change and its impact on education, social groups, culture and its impact on education and examination of the social problems in present society.
II	Social Change	2	
III	Social group & socialisation	2	
IV	Education and culture	1	
V	Current social problems in India	1	

Semester II**DC -3 Psychological Foundation of Education**

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Psychological foundation of education	1	After the completion of the course, students will develop an understanding of the meaning & scope of educational psychology, dimensions of growth, process of learning and teaching, intelligence & creativity, different aspects of personality.
II	Growth & development	1	
III	Learning and Creativity	2	
IV	Intelligence and personality	2	

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DC -4 Education in Ancient, Medieval and Pre-Independence

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Education in ancient India	2	After the completion of the course, students will be acquainted with the salient features of education in India in Ancient & Medieval times, development of education in Independent India, recommendations of various commissions and committees on Indian Education.
II	Education in medieval India	2	
III	Education in Pre-Independent India	2	

SEMESTER III

DC- 5 Education of India after Independence

UNIT	CREDIT	COURSE OUTCOME
I	2	After the completion of the course, students will have an adequate knowledge of the recommendations of various commissions and committees on Indian Education.
II	2	
III	2	

DC-6 Approaches of Indian Education

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Elementary Education	1	After the completion of the course, students will develop an understanding of the significant trends in contemporary education, awareness of various organisations and their role in the implementation of policies and programs, certain major national and social issues and role of education in relation to them.
II	Secondary Education	1	
III	Higher Education	2	
IV	Open, Distance and Correspondence Education	1	
V	Technical and Vocational Education	1	

DC-7 Contemporary Issues in Indian Education

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Women Education	2	After the completion of the course, students will develop an understanding of the meaning and perspectives of women education, social Education, Environmental education, population education, peace and value education.
II	Social Education	1	
III	Environmental Education	1	
IV	Population Education	1	
V	Peace and value Education	1	

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SEMESTER IV

DC-8 Educational Evaluation

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Meaning of measurement and evaluation	2	After the completion of the course, students will develop an understanding of the concepts of measurement and evaluation in education, types of measuring instruments and their uses, principles of test construction, validity and reliability.
II	Measurement instrument	2	
III	Test Standardisation	2	

DC -9 Statistics in Education

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Concept of Statistics	1	After the completion of the course, students will develop the ability to represent educational data through graphs and to develop skill in analysing.
II	Concept of Variable and Data	1	
III	Measures of Central Tendency	1	
IV	Concept of Normal Distribution	1	
V	Bivariate Distribution	2	

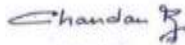
DC -10 Educational Management

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Educational Management	1	After the completion of the course, students will develop the knowledge and understanding of the meaning, scope of management, various institutionalised managerial activities, ability of making objective decisions in educational management.
II	Leadership	1	
III	Aspects of Educational Management	1	
IV	Educational Planing	1	

SEMESTER V

DC -11 Educational Technology

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Educational Technology	1	After the completion of the course, students will be able to understand about the concept, nature and scope of educational technology.a
II	Communication	2	
III	Instructional Techniques	2	
IV	Open and distance learning	1	


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DC -12 Educational Guidance and Counselling

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	The concept of Guidance	1	After the completion of the course, students will be able to understand the meaning and importance of guidance and counselling, the qualities of an ideal counsellor, develop interest in one's own personal and professional growth.
II	Educational Guidance	2	
III	The Concept of counselling	2	
IV	Maladjustment and adjustment mechanism	1	

DSE -1 Inclusive Education

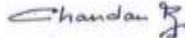
UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Introduction of Inclusive Education	3	After the completion of the course, students will be able to comprehend the basic characteristics of Inclusive Education, needs of inclusive education in modern society, design the platform of inclusive education
II	Designing the classroom for Inclusive Education	3	

DSE -2 Mental Health

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Concept of mental health and hygiene	3	After the completion of the course, students will be able comprehend the meaning of mental health and mental hygiene, mental illness and maladjustment.
II	Concept of mental illness	3	

DC -12 SEC 1 Standardization of test

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Standardizing	2	After the completion of the course, students will be able to comprehend the perspectives of test standardization
II	Standardization of achievement test	2	
III	Teaching Methods and aids	2	
IV	Function of a Teacher	2	


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SEMESTER VI

DC -13 Curriculum Construction

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Curriculum Construction	2	After the completion of the course, students will be able to understand the meaning and scope of curriculum , basics of curriculum, transaction, evaluation and innovation.
II	Curriculum Framework	2	
III	Curriculum Development	1	
IV	Curriculum Evaluation	1	

DC -14 Educational Thoughts

UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Educational Thinkers of East	3	After the completion of the course, students will be able to understand the thoughts of great educationists and their contributions in education
II	Educational Thinkers of West	3	

DSE-3 Basics of Research Methodology

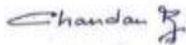
UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Meaning of Research	2	After the completion of the course, students will be able to understand the nature and process of research in education, various methods of sampling and research
II	Hypothesis and Sampling	2	
III	Research Methods	2	

SEC-2 Development of Academic Achievement test and its standardization

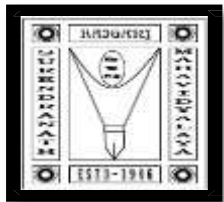
UNIT	NAME OF THE UNIT	CREDIT	COURSE OUTCOME
I	Standardization of Academic Achievement Test	6	After the completion of the course, students will be able to develop and standardize academic achievement test.

DSE-4 Project Work

Course Outcome: The students after completing their project work will have a brief knowledge about carrying out a project work which includes field work as a compulsion.


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Course Outcome

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University Of Gour Banga Raiganj Surendranath
Mahavidyalaya

Department of English

B.A. Honours Course Outcomes CBCS Syllabus for 6 Semesters

SEMESTER – I

Sl. No	Course Code	Course Title	Course Outcomes	
1	101- ENGH-C 1	British Poetry and Drama: 14th to 17th Centuries	CO1	Trace the development of British poetry and drama during the 17th and 18th centuries, identifying key trends and shifts in literary forms.
			CO2	Analyse the works of prominent writers like John Milton, John Dryden, and Alexander Pope, focusing on their thematic concerns and stylistic innovations.
			CO3	Understand the impact of historical events, such as the English Civil War and the Restoration, on the literature of the period.
			CO4	Engage with critical debates surrounding the literature of the 17th and 18th centuries, and develop well-supported arguments in written and oral presentations.
2	102- ENGH-C 2	British Poetry and Drama: 17th and 18th Centuries	CO1	Gain interdisciplinary insights by integrating knowledge from a non-English discipline, fostering a holistic academic perspective.
			CO2	Develop the ability to apply methodologies and analytical techniques from another discipline to the study of literature.
			CO3	Enhance critical thinking and problem-solving skills by engaging with diverse subject matter.
			CO4	Demonstrate the ability to synthesize and communicate interdisciplinary knowledge effectively.
3	103- ENGH-C 3	One core course from General discipline Other than Hons. Discipline	CO1	Gain interdisciplinary insights by integrating knowledge from a non-English discipline, fostering a holistic academic perspective.
			CO2	Develop the ability to apply methodologies and analytical techniques from another discipline to the study of literature
			CO3	Enhance critical thinking and problem-solving skills by engaging with diverse subject matter.

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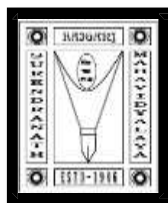
			CO4	Demonstrate the ability to synthesize and communicate interdisciplinary knowledge effectively
4	104- ENGH-C 4	Environmental Studies	CO1	Understand the basic concepts and importance of environmental science and its interdisciplinary nature.
			CO2	Analyse the impact of human activities on the environment and recognize the importance of sustainable development.
			CO3	Develop awareness of various environmental issues, including pollution, climate change, and biodiversity conservation.
			CO4	Apply knowledge of environmental policies and regulations in real-life scenarios, promoting environmentally responsible behaviour.

SEMESTER – II

Sl. No	Course Code	Course Title	Course Outcomes	
1	201- ENGH-C 3	British Literature: 18th Century	CO1	Identify and explain the major literary movements and genres of the 18th century, including satire, the novel, and neoclassicism.
			CO2	Analyse the works of key authors such as Jonathan Swift, Alexander Pope, and Samuel Johnson, focusing on their thematic concerns and stylistic approaches.
			CO3	Understand the socio-political and cultural contexts that influenced 18th-century British literature, including the Enlightenment and the rise of the middle class.
			CO4	Develop critical thinking skills by engaging with the moral and philosophical questions raised in 18th-century literary texts.
2	202- ENGH-C 4	British Romantic Literature	CO1	Recognize the defining characteristics of Romantic literature, including its emphasis on emotion, nature, and individualism.
			CO2	Analyse the works of major Romantic poets and novelists, such as William Wordsworth, Samuel Taylor Coleridge, and Mary Shelley, focusing on their innovative use of language and form.
			CO3	Explore the historical and cultural factors that shaped the Romantic movement, including the Industrial Revolution and the French Revolution.

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			CO4	Apply literary theories to interpret Romantic texts, considering perspectives such as nature, imagination, and the sublime.
3	203-GE2	One core course from General discipline Other than Hons. Discipline	CO1	Gain interdisciplinary insights by integrating knowledge from a non-English discipline, fostering a holistic academic perspective.
			CO2	Develop the ability to apply methodologies and analytical techniques from another discipline to the study of literature
			CO3	Enhance critical thinking and problem-solving skills by engaging with diverse subject matter.
			CO4	Demonstrate the ability to synthesize and communicate interdisciplinary knowledge effectively
4	204-AEC2 ENG	MIL / Communicative Englis	CO1	Enhance proficiency in the English language, with a focus on effective communication skills, both verbal and written.
			CO2	Apply language skills in real-life scenarios, demonstrating clarity, coherence, and appropriateness in communication.
			CO3	Develop the ability to use English in diverse contexts, including academic, professional, and social settings.
			CO4	Improve listening and speaking skills through interactive activities, presentations, and discussions.

SEMESTER – III

Sl. No	Course Code	Course Title	Course Outcomes	
1	301- ENGH- C 5	British Literature: 19th Century	CO1	Analyse the major literary movements of the 19th century, such as Romanticism, Victorianism, and Realism, and their impact on British literature.
			CO2	Explore the works of key authors, including Charles Dickens, Jane Austen, and the Brontë sisters, focusing on their themes, characters, and narrative techniques.
			CO3	Understand the socio-political and cultural developments of the 19th century, such as industrialization, social reform, and colonialism, and their influence on literature.
			CO4	Develop the ability to critically engage with 19th-century texts, considering various perspectives and interpretations.

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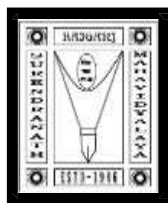
2	302- ENGH- C 6	British Literature: The Early 20th Century	CO1	Identify and explain the major literary trends of the early 20th century, including Modernism, and their departure from 19th-century literary conventions.
			CO2	Identify and explain the major literary trends of the early 20th century, including Modernism, and their departure from 19th-century literary conventions.
			CO3	Explore the impact of historical events, such as World War I and the changing social order, on early 20th-century British literature.
			CO4	Engage with complex literary texts from this period, applying critical theories and methodologies to develop well-supported interpretations.
3	302- ENGH- C 7	European Classical Literature	CO1	Gain an understanding of the foundational texts of European classical literature, including works from ancient Greece and Rome.
			CO2	Analyse the major themes, characters, and narrative structures in works by authors such as Homer, Virgil, and Sophocles.
			CO3	Develop the ability to draw connections between classical literature and later European literary traditions, recognizing the influence of classical works on Western literary canon.
			CO4	Understand the cultural, philosophical, and historical contexts that shaped classical European literature.
4	304- GE3	One course from General discipline	CO1	Enhance interdisciplinary knowledge by engaging with a course outside the English discipline..
			CO2	Apply methodologies from another discipline to enrich the study and understanding of literature.
			CO3	Foster a comprehensive academic skill set by integrating concepts from multiple fields of study.
			CO4	Communicate interdisciplinary insights effectively, both in writing and orally, demonstrating a broad perspective on academic and real-world issues..

SEMESTER – IV

Sl. No	Course Code	Course Title	Course Outcomes	
1	401- ENGH- C 8	Indian Classical Literature	CO1	Understand the key texts and literary traditions of Indian classical literature, including works from Sanskrit, Tamil, and other classical languages.
			CO2	Analyse the major themes, narrative techniques, and philosophical concepts in works like the Mahabharata, Ramayana, and classical Tamil poetry.
			CO3	Explore the cultural, religious, and historical contexts that shaped Indian classical literature, including its oral and written traditions.

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			CO4	Develop the ability to compare and contrast Indian classical literature with classical traditions from other cultures, recognizing both unique and universal elements.
2	402- ENGH- C 9	American Literature	CO1	Trace the development of American literature from its colonial origins to the present, recognizing key literary movements and periods.
			CO2	Analyse the works of significant American writers, such as Nathaniel Hawthorne, Walt Whitman, and Toni Morrison, focusing on their exploration of American identity, race, and individualism.
			CO3	Understand the socio-political and cultural contexts that have influenced American literature, including the American Revolution, Civil War, and Civil Rights Movement.
			CO4	Engage with diverse voices in American literature, including Native American, African American, and immigrant perspectives, to develop a comprehensive understanding of the American literary landscape.
3	402- ENGH- C 10	Modern European Drama	CO1	Identify and explain the key characteristics of modern European drama, focusing on its break from traditional forms and themes.
			CO2	Analyse the works of influential dramatists such as Henrik Ibsen, Anton Chekhov, and Bertolt Brecht, with attention to their innovative techniques and social critique.
			CO3	Explore the historical and cultural contexts that shaped modern European drama, including the impact of industrialization, war, and social change.
			CO4	Apply critical theories to interpret modern European plays, considering themes such as alienation, existentialism, and the human condition.
4	404- GE4	One from pool of Generic Electives	CO1	Broaden academic horizons by engaging with a course outside the core English discipline, fostering interdisciplinary learning.
			CO2	Apply knowledge and methods from another discipline to enhance critical thinking and analytical skills in literature and other areas of study.
			CO3	Develop a well-rounded academic skill set by integrating concepts and perspectives from different fields.
			CO4	Demonstrate the ability to communicate interdisciplinary knowledge effectively, both in written and oral formats, in various academic and real-world contexts.

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SEMESTER – V

Sl. No	Course Code	Course Title	Course Outcomes
1	501-ENGH-C 11	Postcolonial Literatures	CO1 Understand the key concepts and themes of postcolonial literature, including identity, power, resistance, and the legacy of colonialism.
			CO2 Analyse the works of major postcolonial writers, such as Chinua Achebe, Salman Rushdie, and Arundhati Roy, focusing on their representation of postcolonial experiences.
			CO3 Explore the historical, cultural, and political contexts that shaped postcolonial literatures, particularly in regions such as Africa, the Caribbean, and South Asia.
			CO4 1. Apply postcolonial theory to interpret texts, considering perspectives on race, gender, language, and diaspora in the postcolonial world.
2	502-ENGH-C 12	Indian Writing in English	CO1 Trace the development of Indian writing in English, from its colonial beginnings to contemporary works, recognizing key literary trends and movements.
			CO2 Analyze the works of significant Indian authors, such as R.K. Narayan, Arundhati Roy, and Amitav Ghosh, focusing on their exploration of Indian society, culture, and identity.
			CO3 Understand the socio-political and cultural contexts that have influenced Indian writing in English, including issues of language, nationalism, and globalization.
			CO4 Engage with diverse voices within Indian writing in English, including those of women, marginalized communities, and the Indian diaspora.
5	503-ENGH DSE-1A OR 503-ENGH DSE- 1B	Basics of English Language OR British Literature Post World War II	CO1 Understand the fundamental principles of the English language, including its grammar, phonetics, and syntax.
			CO2 Analyse the historical development of the English language, from Old English to Modern English, recognizing key linguistic changes.
			CO3 Identify and explain the major themes and trends in British literature after World War II, including the impact of modernity, war, and social change.
			CO4 Analyse the works of prominent post-war British writers, such as George Orwell, Doris Lessing, and Ian McEwan, focusing on their exploration of contemporary issues.
4	504-ENGH DSE-2A Or 504- ENGH DSE-2B	Criticism and Theory Or Detective Literature	CO1 Understand the foundational concepts and approaches in literary criticism and theory, including formalism, structuralism, and post-structuralism.
			CO2 Analyse literary texts using various critical theories, developing the ability to interpret and critique literature from multiple perspectives.
			CO3 OR Trace the development of detective literature, from its origins in the 19th century to contemporary works, recognizing key conventions and sub-genres.

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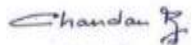
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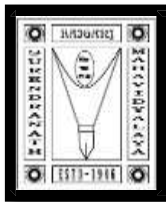
			CO4	Analyse the works of major detective writers, such as Arthur Conan Doyle, Agatha Christie, and Raymond Chandler, focusing on their narrative strategies and thematic concerns.
5	505-ENGH-SEC-1	Creative Writing	CO1	Develop the ability to write creatively across various genres, including fiction, poetry, and creative non-fiction.
			CO2	Enhance writing skills through practice, feedback, and revision, focusing on elements such as voice, style, and narrative structure.

SEMESTER – VI

Sl. No	Course Code	Course Title	Course Outcomes	
1	601-ENGH-C 13	Popular Literature	CO1	Understand the characteristics and evolution of popular literature, recognizing its distinction from canonical literature.
			CO2	Analyse the themes, styles, and cultural significance of various forms of popular literature, such as genre fiction, graphic novels, and young adult literature.
			CO3	Explore the role of popular literature in reflecting and shaping societal values, beliefs, and trends.
			CO4	Critically engage with popular texts, applying literary theories to understand their appeal and influence on mass culture.
2	602-ENGH-C 14	Women’s Writing	CO1	Gain an understanding of the historical and cultural contexts that have shaped women’s writing across different periods and regions.
			CO2	Analyse the works of significant women writers, focusing on themes of gender, identity, power, and resistance.
			CO3	Explore the ways in which women’s writing challenges traditional literary canons and contributes to feminist literary discourse.
			CO4	1. Apply feminist literary theory to interpret texts by women writers, considering issues of representation, voice, and agency.
3	603-ENGH DSE-3A OR 603-ENGH DSE- 3B	Literature of the Indian Diaspora OR Partition Literature	CO1	Understand the experiences of the Indian diaspora as reflected in literature, including themes of migration, identity, and belonging.
			CO2	Analyse the works of prominent diaspora writers, such as V.S. Naipaul, Jhumpa Lahiri, and Salman Rushdie, focusing on their exploration of cultural hybridity and displacement.
			CO3	OR Gain an understanding of the historical and cultural impact of the Partition of India in 1947, as reflected in literature.


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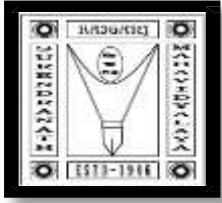
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			CO4	Analyse the works of key writers on Partition, such as Saadat Hasan Manto, Khushwant Singh, and Bapsi Sidhwa, focusing on themes of trauma, loss, and memory.
4	604-ENGH DSE-4A OrR 604-ENGH-DP	Research Methodology OR Dissertation Project	CO1	Understand the fundamental concepts and approaches in literary research, including qualitative and quantitative methods.
			CO2	Develop the skills needed to design and conduct research projects, including formulating research questions, gathering data, and analysing results.
			CO3	OR Develop a research project on a chosen topic in literature, demonstrating the ability to conduct independent and original research.
			CO4	Apply appropriate research methodologies and theoretical frameworks to analyse the chosen topic, producing a coherent and well-argued dissertation.
5	605-ENGH- SEC-2	English Language Teaching (ELT)	CO1	Analyse different ELT methodologies, such as Communicative Language Teaching (CLT) and Task-Based Language Teaching (TBLT), and their application in diverse classroom settings.
			CO2	Develop the skills to design and implement effective lesson plans, assessment tools, and teaching materials for English language learners.

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Course Outcome
B.A. (Honours)
Department of History


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RAIGANJ SURENDRANATH MAHAVIDYALAY

Department of History

Name of the Programme: B.A. History-Honours (Under CBCS)

COURSE OUTCOME

Semester I

DC-1: Pre –history to 6th Century BC

- After completing this course, students will be able to develop detailed concept about India's past.
- They will learn to use different tools of reconstructing the past.

DC-2: 6th Century BC-Gupta Period

- Students will be able to understand about the rise of 16th Mahajanapadas, Jainism and Buddhism in ancient times of India.
- They will learn about the political development during Mauryan period to Gupta Period.
- They will learn about the social, economic and cultural developments of India for different span of time.

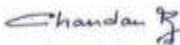
Semester II

DC-3: Post Gupta to 1200 AD

- After completing this course, students will be able to grasp the significance of the Early medieval period in India.
- Students will develop ideas about early medieval trade and commerce and culture.
- Students will be familiarized with Early Medieval political structure.

DC-4: History of India-1200 AD to 1526 AD (Political)

- At the end of this course, students will get a clear idea of the Delhi Sultanate.
- Students will be able to comprehend the political structure of the Delhi Sultanate and various regional dynasties.
- Students will know about the rise of Sufism and Bhaktism during Sultanate Period.


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Semester III

DC-5: 1200 AD to 1526 AD (Socio, Cultural, economic history of India)

- After completing this course, students will acquire knowledge about the society, culture and economy of the Sultanate era.
- Students will gain the knowledge about the key rulers of the Illius Sahi and Hussain Sahi dynasty.
- Students will have the idea of Vijaynagar and Bahamani kingdom.

DC-6: Political history of India: 1526 AD to 1707 AD

- After completion of this course, students will have clear concept about polity of the Mughals from Babur to Aurangzeb.
- Students will understand about the establishment, expansion and decline of the Mughal Empire.
- Students will gain the knowledge about the key rules, administrative innovations and their contribution on India's socio-political structure and also know about the role of Shivaji.
- Students will comprehend the nature of the Jagir crisis and various revolts of the Mughal era.

DC-7: Socio, Economic, Cultural history of India: 1526 AD to 1707 AD

- After completion of this course, students will have clear concept about the economy, society and culture during the Mughal India.
- Students will develop ideas about painting, architecture, trade and commerce of Mughal India.

Semester IV

DC-8: History of India: 1707 AD to 1818 AD

- Students will be familiarised with the establishment of the company rule.
- Students will develop ideas about different ideologies.
- Students will be acquainted with colonial economic policy.
- Students will develop clear concept about popular uprisings like Chuars, Pindaries, Santhal Rebellion.

DC-9: History of India from 1818 AD to 1885 AD

- After completion of this course, students will understand about the Bengal Renaissance,
- Students will understand about social reforms and cultural revival.
- Students will develop clear concept about the causes failures and significance of the revolt of 1857 in Indian independence history.

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➤ Students will develop clear concept about the causes failures and significance of the revolt of 1857 in Indian independence history.

DC-10: History of India from 1885 AD to 1950 AD

➤ After completion of this course, students will be able to discuss various trends of nationalism in India.

➤ Students will gate the idea about the process of nation making through the partition dilemma and re-organisation of states.

Semester V

DC-11: Rise of the Modern West (Mid 15th Century to 17th Century)

➤ After completion of this course, students will be able to explain the transitions which took place in Europe.

DC-12: Rise of the Modern West (Mid 17th Century to Mid 18th Century)

➤ On completion of this course, students will be able to identify key developments in Europe during 17th century ton 18th centuries.

➤ Students will be able to explain the political and intellectual trends of this period and modern scientific advancements.

DSE-1B: Economic history of Modern India

➤ After completion of this course, students will have a clear understanding about economic transformation of the colonial India.

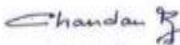
DSE-2A: History of China and Japan

➤ After completion of this course, students have the knowledge about the political evolution of China.

➤ Students will able to understand about political evolution of Japan, cultural identity, modernization, imperialism, Meiji constitution, post-war recovery and global influence.

SEC-1: Understanding Indian Heritage

➤ After completion of this course, students have the knowledge about India's cultural heritage, historical events, diverse traditions, antiquity, various archaeological sites and relationship between cultural heritage, landscape and travel.


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Semester VI

DC-13: History of Europe: 1789 AD to 1870 AD

- The students will be able to understand about the European revolutionary movements.
- Students will get an idea about the political changes that shaped modern Europe between 1789-1870.

DC-14: History of Europe: 1871 AD to 1945 AD

- After completion of this course, students will be able to comprehend the political trends in Europe vis a vis world in the interwar period, the Versailles Treaty, the Russian Revolution and the Great Depression.

DSE-3A: Contemporary World (1945-1990)

- Students, at the completion of this course will be in a position to discuss different points about the Cold War politics, position of USA and USSR in world politics, Korean crisis, Vietnam War and Cuban Crisis.
- Students will also know about the rise of Unipolar World system.

DSE-4A: Contemporary World (1990-till date)

- After completion of this course, students will know about the Globalisation and its impact on Third World.
- Students will be able to understand about information revolution, geopolitical shifts and evolving social and cultural dynamics.

Submitted by

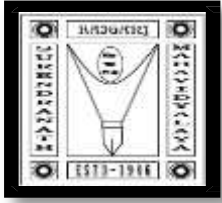
Head of the Department

Department of History

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B.A. (Honours)
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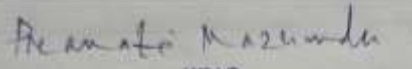
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DEPARTMENT OF POLITICAL SCIENCE

LESSON PLAN FOR HONOURS
COURSE AS PER CBCS SYLLABUS

*(We follow the directives of Gour Banga
University, Malda)*

SIGNATURE:



HEAD
Department of Political Science
Raiganj Surendranath Mahavidyalaya
Sudarshanpur, Raiganj, U/Dinajpur

SMT. PRANATI

MAZUMDER

HEAD.



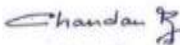
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SEMESTER	Name of the Faculty	Course Code	NAME OF THE PAPER	MODULE	COURSE SPECIFIC OUTCOMES	NO. OF LECTURES
SEM-1 (PLSH/CORRE)	PRANATI MAZUMDER (PM)	DC-1	CONSTITUTIONAL GOVERNMENT AND DEMOCRACY IN INDIA	3 TOPICS	Understand the evolution and making of the constitution, Examine the concept of Indian Citizenship, the nature of Indian Federalism, Democracy and acquire an overview of the working of the Governmental structures.	48 lectures
	PM	DC-2	POLITICAL PROCESS IN INDIA	7 TOPICS	Understand the Indian Party System. Evaluate and analyze the Electoral Process and Electoral Reforms in India, the role of various social forces like caste, class, women, the regions in Indian Politics	42 lectures


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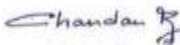
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SEM-II(PLSH/CORE)	UJJWAL BHATTACHARYA (UB)	DC-3	UNDERSTANDING POLITICAL THEORY	2 TOPICS	Understand the scope and content of politics and political theory Understand the origin, evolution, features and objectives of state, sovereignty and political obligation Understanding Democracy	70 lectures
	PM	DC-4	POLITICAL THEORY: CONCEPTS AND DEBATES	8 TOPICS (2 SECTIONS)	Gaining an specialised understanding of Political Theory, and approaches to studying Political Science. Introduces detailed concepts of Rights, Equality, Freedom, Justice. Major Debates in the discipline are covered.	67 lectures


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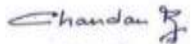
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SEM III (PLSH/COR E)	PM	DC 5	UNDERSTANDING COMPARITIVE GOVERNMENT AND POLITICS	3 TOPICS	Tracing the coming into being of Comparative Politics, dealing with its nature and scope, looking into the models of Comparative Politics. Learning about the modern government, Learning about the Political Systems of Britain, Brazil, Nigeria and China	48 lectures
	AYASHA PARVEEN (AP)	DC-6	PROCESSES AND INSTITUTION IN COMPARATIVE PERSPECTIVE	6 TOPICS	Introduction of specialised concepts like Political culture, democratizat ion, federalism and new institutionali sm. Understandi ng Party system, electoral system and nation- states.	48 lectures
	PM	DC-7	WESTERN POLITICAL THOUGHT	4 TOPICS	Understand the main ideas of the ancient and the interlude political philosophers	6 weeks


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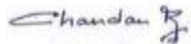
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					. Gain knowledge about Modern Political philosophy.	
SEM IV(PLSH/C ORE)	MHE	DC-8	INDIAN POLITICAL THOUGHT	11 TOPICS	Understand both Ancient and Modern Indian Political Thought and Thinkers.	96 lectures
	PM	DC-9	UNDERSTANDING POLITICAL SOCIOLOGY	1 MODULE	Understand the social bases of politics, gain knowledge regarding gender, religion and military role in politics, know about Political Culture, Socialisation and Participation and the Electorate and Electoral Behaviour	40 lectures
	PM	DC 10	POLITICS AND SOCIETY	1 MODULE	Understanding political systems and concepts like Political Culture, Socialisation, Participation and Modernisation	


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SEM V (PLSH/CORE /DSE/SEC)	AP	DC-11	PERSPECTIVES ON INTERNATIONAL RELATIONS AND WORLD HISTORY	3 MODULES	Introducing International Relations to young learners and understanding theories of International Relations.	60 lectures
	PM	DC-12	GLOBAL POLITICS	3 MODULES	Understandin g Globalisation, the various Global Issues and Global shifts in power and governance.	48 lectures
	PM	DSE- 1B	HUMAN RIGHTS IN COMPARATIVE PERSPECTIVE	3 MODULES	Understandin g the concept of Human Rights and issues pertaining to it along with the idea of structural violence.	12 lectures
	UB	DSE 2B	PUBLIC POLICY	3 MODULES	Understandin g Policy Analysis and Public Policy in India	60 lectures
	AP	SEC-1	LEGISLATIVE PRACTICES PROCEDURES AND DEMOCRATIC AWARENESS IN INDIA	5 TOPICS	Understandin g governance at different tiers, the legislative process, legislative committees, budget document and support in media and communicatio n.	24 lectures

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SEM VI (PLSH/CORE /DSE/SEC)	PM	DC-13	PERSPECTIVES ON PUBLIC ADMINISTRATION	4 TOPICS	Understand the various theories of Public Administra- tion. Analyse the Administra- tive Processes: decision making; communica- tion and control; leadership; co- ordination. Public Policy and implementati- on.	70 lectures
	MHE	DC-14	PUBLIC POLICY AND ADMINISTRATION IN INDIA	5 TOPICS	Understand- ing the concept of Public Policy, Decentraliza- tion, Budget and the idea of Citizen Administra- tion and Social Welfare Administra- tion	67 lectures
	AP	DSE-3A	INDIA'S FOREIGN POLICY IN A GLOBALISING WORLD	6 TOPICS	Understand the evolution of India's foreign policy and acquire knowledge of India's relations with Global and Regional powers.	41 lectures

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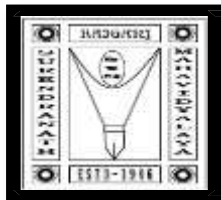
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	PM	DSE-4B	UNDERSTANDING SOUTH ASIA	4 TOPICS	Understand the importance of South Asia as a region and acquire knowledge of issues specific to South Asia, such as terrorism, refugee crisis etc.	60 lectures
	UB	SEC-2	PUBLIC OPINION AND SURVEY RESEARCH	5 TOPICS	Understandin g Public Opinion and the basics of Survey Research and quantitative data analysis	32 lectures


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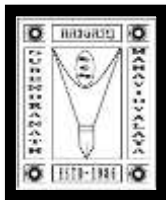
Course Outcome

B.Sc. (Honours)

Department of Zoology


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DEPARTMENT OF ZOOLOGY

LESSON PLAN FOR HONOURS **COURSE AS PER CBCS SYLLABUS**

*(We follow the directives of Gour Banga
University, Malda)*

SIGNATURE:

Priyanjalee Banerjee 21/5/20
Dr. Priyanjalee Banerjee

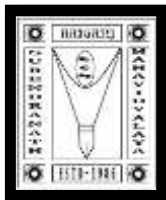
Head of the Department, Zoology

Raiganj Surendranath

Mahavidyalaya

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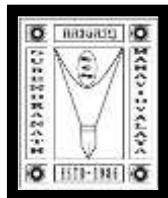
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SEMESTER	Name of the Faculty	Course Code	NAME OF THE PAPER	Units	COURSE SPECIFIC OUTCOMES	NO. OF LECTURES
SEM-I (ZOOLOGY-H-DC1)	Debajit Chakraborty & Banashree Barman	DC-1	Non-chordate-I	7	Students will be able to understand-biodiversity, phylogeny, morphological features of invertebrates, particularly of pseudocoelomates.	96
SEM-I (ZOOLOGY-H-DC2)	Dr. Priyanjalee Banerjee & Dr. Arijit Pal	DC-2	Non-Chordate-II	7	Students will be able to understand-biodiversity, phylogeny, morphological features of invertebrates, particularly of coelomates.	96

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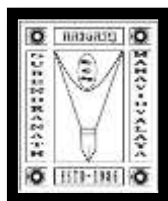
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SEM-II (ZOOLOGY-H-DC3)	DC & BB	DC-3	Chordate	9	Students will be able to understand-biodiversity, phylogeny, morphological features of vertebrates.	96
SEM-II (ZOOLOGY-H-DC4)	AP & PB	DC-4	Comparative Anatomy of Vertebrates	7	Students will be able to understand-morphological as well as anatomical features of vertebrates.	96

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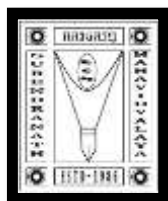
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SEM-III (ZOOL-H-DC3)	AP & PB	DC-5	Cell biology & Principle of Genetics	12	1). Students will be able to define the structure and functions of cellular component and understand signaling cascade. 2). They can build up concept of classical genetics, mutation, linkage, recombination, chromosomal and extra chromosomal inheritance.	95
SEM-III (ZOOL-H-DC6)	BB & DC	DC-6	Ecology and Conservation Biology	6	1). Students will be able to define Ecosystem and its components and understand the strategies for conserving Nature and Wildlife.	95
SEM-III (ZOOL-H-DC7)	PB & AP	DC-7	Developmental biology & Reproductive Biology	7	Students will be able to understand embryonic development, develop concept of reproductive endocrinology and reproductive health.	95

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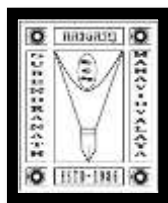
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SEM-IV (ZOOL-H-DC8)	AP & PB	DC-8	Biochemistry	6	1). Students will be able to define the structure, function, synthesis pathways and catabolism of carbohydrate, protein, lipid and nucleic acids. 2). Define enzymes, their classification and mode of actions, mechanism of enzyme catalyzed biochemical reactions, ETS.	96
SEM-IV (ZOOL-H-DC9)	PB & AP	DC-9	Animal Physiology: Life sustaining system	9	Students will be able to demonstrate the architecture and physiological roles of various life sustaining systems.	96
SEM-IV (ZOOL-H-DC10)	BB & DC	DC-10	Evolution and Systematics	14	1). Students will be able to define taxonomic approaches, demonstrate principles of binomial nomenclature, and can build up concepts of molecular taxonomy. 2). Build up concepts on organic evolution of life, Lamarckism,	96

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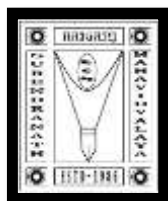
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					Darwinism, Hardy- Weinburg equilibrium, speciation, evolutionary forces, extinction, succession and Zoogeographic al realms.	
SEM-V (ZOOLOGICAL H-DCC11)	DC & BB	DC-11	Histology and Endocrinology	7	Students will be able to develop concept on architectural plan of various endocrine glands, their functions and biosynthesis of hormones.	95

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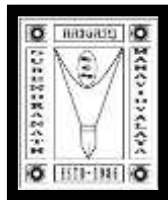
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SEM-V (ZOOL-H-DC12)	Tanya Majumdar & Nandini Das	DC-12	Economic and Industrial Zoology	9	Students will be able to develop knowledge on aquaculture, IPM, animal husbandry, poultry farming, and lac culture.	96
SEM-VI (ZOOL-H-DC13)	DC & BE	DC-13	Parasitology and Immunology	13	1). Students will be able to develop knowledge on protozoan, helminth and insect parasites. 2). Can develop knowledge on types of immunity, antigen, antibody basic concepts, MHC, hypersensitivity and different types of immune response	96
SEM-VI (ZOOL-H-DC14)	AP & PB	DC-14	Molecular Biology	9	1). Students will be able to demonstrate central dogma and its regulation, mutation, DNA repair system, mechanism of cancer progression. 2). They will be acquainted with modern biotechnological tools like blotting, sequencing and finger printing	96
SEM-V (ZOOL-H-DSE-1A)	AP & PB	DSE-1A	Animal Biotechnology	5	Students will gain knowledge on prokaryotic and eukaryotic genomics, gene manipulation tools, GMOs, cell culture techniques and its	96

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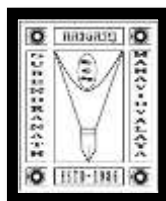
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					applications, and monoclonal antibody production, vaccines and immunization techniques.	
SEM-V (ZOOLOGY-H- DSE-2A)	AP And PB	DSE-2A	Biostatistics	1	Students will gain knowledge on statistical tools available for analyzing experimental data related to genetics, and evolution.	96

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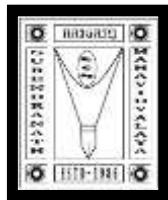
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SEM-VI (ZOOL-H- DSE-3A)	TM and ND	DSE-3A	Animal behaviour and chronology	6	Students will gain knowledge on patterns of behavior, social and sexual behaviors, migration, biological clock and its regulation and various types of biological rhythms. .	96
SEM-VI (ZOOL-H- DSE-4)	DC and BB	DSE-4	Insect Biology	6	Students will develop knowledge on classification, various organ systems, physiology of insects	96
SEM-V (ZOOL-H- SEC-1A)	DC and BB	SEC-1A	Sericulture	5	Students will develop knowledge on classificati on, various organ systems, physiology of insects	24

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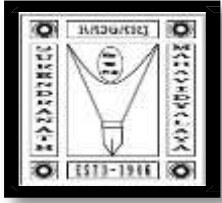
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SEM-VI (ZOOLOGY- SEC-2B)	AP and PB	SEC-2B	Medical Diagnostic Techniques	8	Students will able to demonstrate modern laboratory techniques related to Clinical diagnostics	24
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Programme Outcome: Students will understand biodiversity, phylogeny, morphology of invertebrates and vertebrates, cellular structures, genetics, ecosystems, development, biochemistry, physiology, taxonomy, and evolution, including key theories and concepts. They will understand endocrine glands, aquaculture, life cycles of various parasites, immunity, central dogma, biotechnology, genomics, statistical tools, behavior patterns, insect physiology, and clinical diagnostic techniques.

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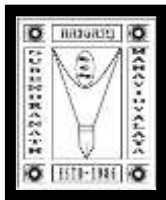
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Course Outcome
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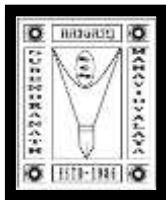
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Raiganj Surendranath Mahavidyalaya Department of Sociology (Honours /CBCS)

Course Outcomes

Sl. No.	Subject Code	Subject Name	Subject Category	Course Outcome
Semester-I				
1	Core 1	Introduction to Sociology	DC1	Students will understand foundational concepts in sociology, including the roles and functions of family, marriage, institutions, folkways, mores, social groups, and society, fostering critical thinking.
2	Core 2	FOUNDATIONS OF SOCIAL THOUGHT (WESTERN AND INDIAN)	DC2	By the end of this course, students will have a foundational understanding of key Western and Indian social thinkers, including Comte, Durkheim, Pareto, Marx, Parsons, Binoy Sankar, and Mead. They will critically analyze their contributions to social thought and apply these perspectives to contemporary sociological issues.
Semester-II				
3	Core 3	SOCIOLOGICAL THEORY	DC3	Upon completing this course, students will gain a comprehensive understanding of key sociological theories, including functionalism, conflict theory, exchange theory, and symbolic interactionism. They will be equipped to critically analyze social structures, power dynamics, and human interactions, applying these



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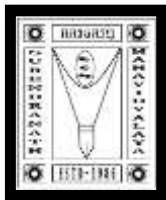
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				theoretical perspectives to real-world social issues.
4	Core 4	SOCIAL RESEARCH METHODS	DC4	By the end of the Social Research Methods course, students will grasp the fundamentals of social research, including formulating research designs, understanding various methodologies, and applying them effectively. They will develop the skills to conduct independent research, critically analyze data, and contribute to scholarly discourse in sociology.
Semester-III				
5	Core 5	SOCIETY IN INDIA	DC5	Students will gain an in-depth understanding of the social structures and institutions in India, including the family, village, community, and religion. They will explore the dynamics of caste, class, tribe, and the roles of the state and market, equipping them with a critical perspective on Indian society.
6	Core 6	PROTEST, RESISTANCE AND MOVEMENTS	DC6	By completing this course, students will gain a comprehensive understanding of the theoretical frameworks and typologies of social movements. They will critically analyze old and new social movements in colonial and post-colonial India, exploring leadership, organization, and objectives, with a focus on peasant, working class, tribal, caste-based, environmental, and women's



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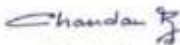
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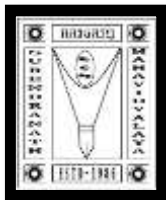
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				movements.
7	Core 7	RURAL SOCIETY IN INDIA	DC7	By the end of this course, students will gain a comprehensive understanding of Rural Sociology, exploring the formation and evolution of rural societies, agrarian social structures, and the transformation of rural India from pre-colonial times to the present. Students will critically analyze the impact of democratic decentralization, rural leadership, and development programs on contemporary rural society.
Semester-V				
8	Core 8	URBAN SOCIETY IN INDIA	DC8	By the end of this course, students will understand the nature and scope of urban sociology, including the processes of urbanization and urbanism. They will analyze urban communities, study early towns, and examine the history and trends of urbanization in India. The course will also cover the characteristics of urban society, urban problems, and relevant policies in India.
9	Core 9	CRIME AND SOCIETY	DC9	Upon completing this course, students will critically analyze various types of crime, including white-collar, organized, and cybercrime. They will understand key criminological theories and perspectives, examine the evolving profile of crime and criminals in India, and evaluate theories of


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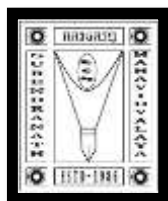
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				punishment, prison systems, and correctional methods.
10	Core 10	INDUSTRIAL SOCIOLOGY	DC10	Upon completing this course, students will understand key concepts in industrial sociology, including industrialization, productive systems, and organizational theory. They will analyze the impact of industrialization on society, particularly in India, and evaluate industrial policies such as liberalization and globalization, preparing them for insightful analysis in industrial contexts.
Semester-V				
11	Core 11	POPULATION AND SOCIETY	DC11	By the end of this course, students will understand key concepts in population studies, including theories, demographic processes, and population dynamics. They will analyze the relationship between population studies and social sciences, evaluate population policies and family planning programs, and assess their impact on economic development in India.
12	Core 12	SOCIOLOGY OF TRIBAL SOCIETY	DC12	Upon completing this course, students will understand the demographic, cultural, and socio-economic profiles of Indian tribes. They will be able to analyze tribal classification, socio-cultural characteristics, and the impacts of social change and colonialism. Additionally, students will evaluate tribal movements, issues, and

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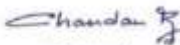
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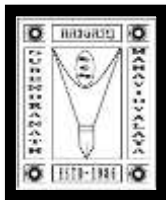
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				Integration efforts, contributing to a comprehensive view of tribal dynamics.
13	DSE	GENDER AND SOCIETY	DSE1A	By the end of this course, students will critically analyze gender roles and functions from a sociological perspective, understanding patriarchal influences, feminist critiques, and the socio-economic challenges faced by women in India. They will evaluate issues affecting women's quality of life, including education, health, and violence.
14	DSE	INDIAN SOCIETY: IMAGES AND REALITIES	DSE1B	Students will critically analyze India's evolution from a civilization to a modern nation, examining the interplay of institutions, such as village structures, caste, and gender dynamics. They will evaluate the political economy and offer critiques on contemporary societal issues, integrating theoretical perspectives with practical insights.
15	DSE	SCIENCE, TECHNOLOGY AND SOCIETY	DSE2A	By the end of this course, students will critically analyze the evolution of modern science in the West and its Indian adaptation, including institutionalization and policy impacts. They will evaluate scientific developments, anti-science critiques, and contemporary issues related to globalization, intellectual property, and technology's role in Indian society.
16	DSE	RETHINKING	DSE2B	Upon completing this course, students


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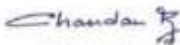
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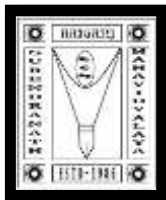
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		DEVELOPMENT		will critically analyze concepts of development, including underdevelopment, knowledge-power dynamics, and globalization. They will understand various development theories, assess developmental regimes in India, and address practical issues in development, enabling them to engage effectively in developmental discourse and practice.
17	SEC	SURVEY METHOD IN SOCIAL RESEARCH	SEC-1	By the end of this course, students will understand the significance of research design in surveys, including conceptualization, measurement, and operationalization. They will be adept at quantifying information using scales and indices, applying scientific sampling methods, and conducting univariate, bivariate, and multivariate analyses for robust survey research.
Semester-VI				
18	Core 13	STATISTICS FOR SOCIOLOGY	DC13	By the end of this course, students will understand the fundamental concepts of statistics, including population, parameters, samples, and variables. They will be proficient in data analysis and presentation, including classification, coding, tabulation, and the calculation of mean, median, mode, range, variance, and standard deviation
19	Core 14	SOCIOLOGY OF ENVIRONMENT	DC14	Upon completing this course, students will understand core environmental


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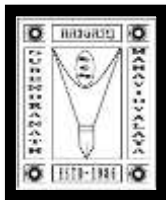
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				concepts, historical initiatives, and theoretical foundations. They will analyze major various environmental movements, assess the impact of significant legal frameworks and international agreements, and critically evaluate approaches to environmental protection, equipping them with a comprehensive perspective on environmental issues.
20	DSE	SOCIOLOGY OF HEALTH AND MEDICINE	DSE-3A	By completing this course, students will understand the origins and development of health and medicine sociology, conceptualize disease, sickness, and illness, and explore their social and cultural dimensions. They will critically assess theoretical orientations, including political economy and feminist approaches, and analyze medical practices and health policies in India.
21	DSE	FAMILY AND INTIMACY	DSE-3B	Upon completing this course, students will gain a comprehensive understanding of family structures, the significance of intimacy within familial contexts, and various theoretical and practical perspectives on these topics. They will critically analyze traditional and contemporary themes related to family dynamics and intimacy, assess the impact of social changes on these concepts, and engage with critiques and transformations to develop nuanced insights into modern family

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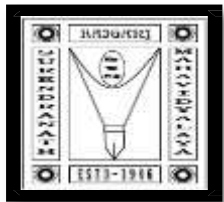
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				systems
22	SEC	SOCIAL WELFARE, LEGISLATION AND JUSTICE	SEC-2	Students will gain a comprehensive understanding of the social welfare system within the framework of the Indian Constitution. They will explore the role of legislation, government bodies, and policies in promoting social welfare, focusing on issues like education, employment, health, and social security, with particular emphasis on marginalized groups, including Dalits, Tribes, and other disadvantaged communities.
23	DSE-4	DISSERTATION	DSE-4	Upon completing this course, students will develop practical research skills through fieldwork, enabling them to collect, analyze, and interpret sociological data. They will gain experience in writing structured reports, enhancing their ability to present research findings clearly and effectively. The course will also foster critical thinking and problem-solving abilities, as students apply theoretical knowledge to real-world social contexts, culminating in a comprehensive understanding of field research methodologies.

*DC= Discipline Core Course; DSE= Discipline Specific Elective Course; SEC= Skill Enhancement Course

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Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA


Sudarshanpur, Raiganj, Uttar Dinajpur (Affiliated to University of Gour Banga,
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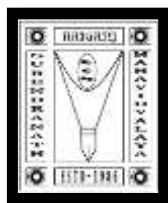
Course Outcome

B.Sc. (Honours)

Department of Physics


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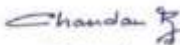
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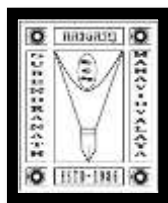
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Program Outcomes

POs	After Completion of the B.Sc. Physics Program, the graduates will be able to
PO-1	Basic and Program Specific Knowledge: Apply knowledge of basic mathematics and science fundamentals to solve Physics oriented problems and enhance their learning aptitude.
PO-2	Problem Analysis: Identify and analyse well-defined physical laws and theories related to various natural phenomena and their relevance in day-to-day life.
PO-3	Development of solutions: Develop a problem-solving aptitude to apply the theories learnt and the skills acquired to solve real time problems.
PO-4	Conduct investigations of complex problems: Acquire a wide range of problem-solving skills, both analytical & computational, and build concepts to simplify complex problems towards achieving logical solutions.
PO-5	Laboratory tools usage and Experimentation: Develop skills of observations & drawing logical inferences from them, learn usage of modern laboratory tools & appropriate technique to conduct standard tests & measurements.
PO-6	Practices for Society: Realize how disciplinary & interdisciplinary knowledge & skills acquired through generic courses helps in providing better solutions and new ideas for specific needs of the society.
PO-7	Environment, Sustainability and Ethics: Nurture creatively to propose novel ideas towards sustainable, ethical & Environment-friendly solutions to real world problems, for a holistic development of the self and the society
PO-8	Individual and Team work: Develop and regenerate scientific competence independently and also in collaboration with others.
PO-9	Effective Communication and Project Management: Learn managing skills to work as a team member or a leader to manage projects and effectively communicate the same to relevant stakeholders.
PO-10	Life-long learning: Analyse individual needs and engage in updating oneself in the context of scientific & technological changes.


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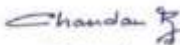
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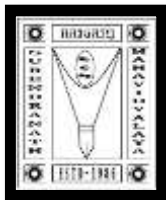
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Program Specific Outcomes

PSOs	After completion of the B.Sc. Physics Program, the graduates will be able to	Mapping with POs
PSO-1	Build a deep and profound base on fundamental concepts of Physics and related areas to lead a career in industry, administration and academia.	PO-1, PO-10
PSO-2	Master experimental techniques in designing and performing laboratory experiments including data collection, analysis etc. and visualising them using suitable graphical softwares.	PO-4, PO-5
PSO-3	Identify & formulate complex problems in Physics, and obtain their appropriate solutions utilizing their basic concepts.	PO-2, PO-3, PO-4
PSO-4	Develop a strong foundation in computational skills using Python allowing them to solve Physics problems numerically and analyse experimental data effectively.	PO-1, PO-4, PO-5
PSO-5	Communicate complex scientific concepts in writing and orally through professional softwares like Latex, Word, Power Point etc.	PO-8, PO-9
PSO-6	Acquire analytical, logical and transferable skills to pursue higher education or entrepreneurships, and grow themselves as responsible citizens.	PO-6, PO-7, PO-8, PO-10


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Course Outcomes

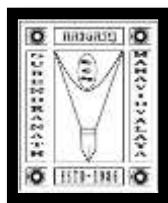
The Course Outcomes are developed based on various levels of the revised Bloom's Taxonomy of Cognitive learning, as shown below.



Revised Bloom's Taxonomy of Cognitive Learning

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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC1T
Course Name	Mathematical Physics-1 (Theory)
Course Type	Discipline Core Course
Semester	I
Credit	4

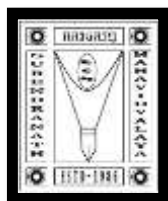
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Solve problems of calculus, including limits, continuity, differentiation, and also obtain solutions of first and second-order differential equations.	PSO-1, PSO-3	L3: Apply
CO-2	Perform vector differentiation and integration, and apply vector identities in various physical contexts.	PSO-1, PSO-3	L3: Apply
CO-3	Evaluate gradient, divergence, curl, and Laplacian, in Cartesian, spherical, and cylindrical coordinate systems.	PSO-3	L4: Analyze
CO-4	Explain the properties and applications of the Dirac delta function in solving physical problems.	PSO-1	L2: Understand

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC1P
Course Name	Mathematical Physics-1 (Practical)
Course Type	Discipline Core Course
Semester	I
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Exhibit computational analysis, including binary and decimal arithmetic, floating point numbers, and iterative methods.	PSO-1	L1: Remember
CO-2	Perform error analysis, including truncation and round-off errors, and absolute and relative errors.	PSO-1	L2: Understand
CO-3	Plot graphs using software like gnuplot, fit data and modify graph appearances.	PSO-2, PSO-5	L3: Apply
CO-4	Write program in Python, including data types, operators, expressions, and use them for mathematical calculation.	PSO-5	L3: Apply


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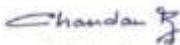
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC2T
Course Name	Mechanics (Theory)
Course Type	Discipline Core Course
Semester	I
Credit	4

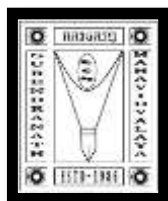
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Employ Newton's laws of motion to solve problems involving the dynamics of particles and systems of particles.	PSO-1, PSO-3	L3: Apply
CO-2	Apply the work-energy theorem and the principles of conservation of energy in various physical contexts.	PSO-1, PSO-3	L3: Apply
CO-3	Analyze the motion of bodies under central forces, including gravitational forces, and apply Kepler's laws to planetary motion.	PSO-3	L4: Analyze
CO-4	Explain the effects of non-inertial reference frames for producing fictitious forces such as centrifugal and Coriolis forces.	PSO-1	L2: Understand
CO-5	Evaluate the dynamics of rigid bodies, including the concepts of torque, angular momentum, and moment of inertia, and solve related problems.	PSO-3	L5: Evaluate
CO-6	Describe the principles of elasticity and fluid dynamics, including the behaviour of materials under stress and the flow of fluids.	PSO-1	L2: Understand

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC2P
Course Name	Mechanics (Practical)
Course Type	Discipline Core Course
Semester	I
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Measure fundamental physical quantities accurately using appropriate instruments.	PSO-2	L2: Understand
CO-2	Conduct experiments to determine Young's modulus, modulus of rigidity, and moment of inertia of various materials.	PSO-2	L2: Understand
CO-3	Analyze experimental data, calculate errors, and interpret results to draw meaningful conclusions about physical phenomena.	PSO-2	L3: Apply
CO-4	Determine the value of gravitational acceleration using different pendulum methods.	PSO-2	L2: Understand


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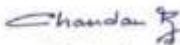
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC3T
Course Name	Electricity and Magnetism (Theory)
Course Type	Discipline Core Course
Semester	II
Credit	4

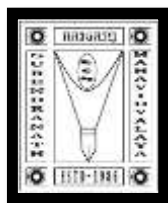
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Explain Coulomb's law, electric fields, Gauss' theorem, and solve problems involving charge distributions.	PSO-1, PSO-3	L3: Apply
CO-2	Illustrate Dielectric properties of material.	PSO-1	L1: Remember
CO-3	Define Biot-Savart's law, Ampere's circuital law, and apply them to calculate magnetic fields in various configurations.	PSO-1, PSO-3	L2: Understand
CO-4	Describe Faraday's laws of electromagnetic induction, Lenz's law, and use them in appropriate situations.	PSO-3	L3: Understand
CO-5	Analyze AC and DC circuits using Kirchhoff's laws, Thevenin's and Norton's theorems, and the behaviour of LCR circuits.	PSO-1	L4: Analyze
CO-6	Derive Maxwell's equations of electrodynamics, and explain its significance in electromagnetic wave propagation.	PSO-3	L3: Apply

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC3P
Course Name	Electricity and Magnetism (Practical)
Course Type	Discipline Core Course
Semester	II
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Measure resistances, voltages, and currents using a multimeter, and demonstrate the functioning of basic circuit components.	PSO-2	L3: Understand
CO-2	Apply network theorems such as Thevenin's, Norton's, and Maximum Power Transfer to analyze and solve electrical circuits.	PSO-2	L3: Apply
CO-3	Conduct experiments to determine unknown resistances and inductances using methods like Potentiometer and Anderson's bridge.	PSO-2	L3: Understand
CO-4	Analyze the response of series and parallel LCR circuits, determining key parameters such as resonant frequency, impedance, and quality factor.	PSO-2	L3: Understand


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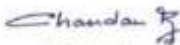
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC4T
Course Name	Waves and Optics (Theory)
Course Type	Discipline Core Course
Semester	II
Credit	4

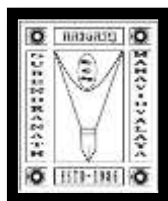
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Explain the principles of simple harmonic motion, damped and forced oscillations, and resonance.	PSO-1	L2: Understand
CO-2	Describe the properties of plane & spherical waves, including longitudinal & transverse waves.	PSO-1	L2: Understand
CO-3	Differentiate between interference and diffraction patterns, including Young's double slit experiment and diffraction gratings.	PSO-3	L4: Analyze
CO-4	Analyze the nature of polarized light and the methods of producing polarized light.	PSO-3	L4: Analyze
CO-5	Demonstrate the principles behind optical instruments such as Michelson interferometers and Fresnel biprisms.	PSO-1	L2: Understand
CO-6	State the principle of Holography.	PSO-3	L1: Remember

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC4P
Course Name	Waves and Optics (Practical)
Course Type	Discipline Core Course
Semester	II
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Set up and conduct experiments related to wave phenomena and optical systems.	PSO-2	L3: Understand
CO-2	Record, analyze, and interpret experimental data, enhancing their ability to draw meaningful conclusions.	PSO-2	L4: Analyze
CO-3	Handle precision instruments, such as spectrometers, interferometers, diffraction gratings etc. to perform experiments.	PSO-2	L3: Apply
CO-4	Obtain general proficiency in Optics experiments like Schuster's method, focussing of microscope etc.	PSO-2	L3: Understand


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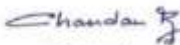
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC5T
Course Name	Mathematica Physics - II (Theory)
Course Type	Discipline Core Course
Semester	III
Credit	4

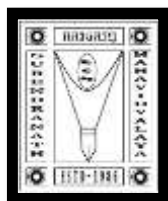
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Illustrate Fourier Series and its applications.	PSO-1	L2: Understand
CO-2	Use Frobenius method to solve second order linear differential equations including Legendre, Hermite, Bessel and Laguerre polynomials	PSO-1, PSO-3	L3: Apply
CO-3	Define beta and gamma functions with associated integrals.	PSO-1	L1: Remember
CO-4	Apply variational principle in different Physics applications.	PSO-3	L3: Apply
CO-5	Solve partial differential equations in cartesian, spherical & cylindrical coordinates using standard techniques.	PSO-1, PSO-3	L3: Apply

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC5P
Course Name	Mathematica Physics - II (Practical)
Course Type	Discipline Core Course
Semester	III
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Use Numpy and Scipy in Numerical Computation.	PSO-4	L2: Understand
CO-2	Find numerical solution of linear equations, perform matrix operations, and generate & plot special functions in Python.	PSO-4, PSO-5	L3: Apply
CO-3	Perform root finding, interpolation & differentiation using standard numerical methods.	PSO-4	L3: Apply
CO-4	Exhibit numerical integration, solve ODE and master 3D graph plotting using specialized tools.	PSO-4, PSO-5	L3: Apply


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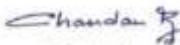
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC6T
Course Name	Thermal Physics (Theory)
Course Type	Discipline Core Course
Semester	III
Credit	4

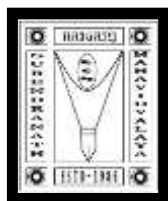
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Explain Zeroth, first and second laws of Thermodynamics, and their applications to Carnot's theorem and Entropy.	PSO-1, PSO-3	L4: Analyze
CO-2	Define Thermodynamic Potentials along with their applications to thermal Physics.	PSO-1	L2: Understand
CO-3	Apply Kinetic theory of gases to describe speed distribution, molecular collisions and properties of real gases.	PSO-1, PSO-3	L3: Apply
CO-4	Explain the phenomena of heat conduction.	PSO-1	L2: Understand

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC6P
Course Name	Thermal Physics (Practical)
Course Type	Discipline Core Course
Semester	III
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Measure thermal conductivity of materials using standard methods.	PSO-2	L3: Apply
CO-2	Perform experiments related to Thermocouple.	PSO-2	L2: Understand
CO-3	Determine mechanical equivalent of heat and temperature coefficient of resistance experimentally.	PSO-4	L2: Understand


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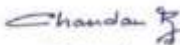
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC7T
Course Name	Digital Systems and Applications (Theory)
Course Type	Discipline Core Course
Semester	III
Credit	4

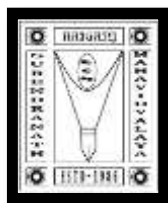
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Analyze different parts and components of Integrated and Digital circuits including use of number systems and logic gates.	PSO-1, PSO-3	L4: Analyze
CO-2	Perform Boolean algebra to simplify Boolean expressions and digital circuits.	PSO-1	L2: Understand
CO-3	Explain concepts of multiplexers, de-multiplexers, decoders, encoders and applications of multivibrators in electronic circuits.	PSO-1	L2: Understand
CO-4	Illustrate arithmetic circuits including adders & subtractors and sequential circuits including flip-flops, and also differentiate between them.	PSO-1	L4: Analyse
CO-5	Examine the functions of registers and counters in digital systems.	PSO-1	L3: Apply
CO-6	Describe the organization of a digital computer.	PSO-1	L1: Remember

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC7P
Course Name	Digital Systems and Applications (Practical)
Course Type	Discipline Core Course
Semester	III
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Design combinational logic system using logic gates.	PSO-2	L2: Understand
CO-2	Use Boolean algebra to simplify logic circuits and verify the same experimentally.	PSO-2	L2: Understand
CO-3	Verify applications of adders and subtractors in digital circuits experimentally.	PSO-2	L3: Apply
CO-4	Construct sequential electronic circuits including counter & register using flip-flops.	PSO-2	L4: Analyze


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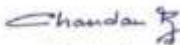
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC8T
Course Name	Mathematical Physics - III (Theory)
Course Type	Discipline Core Course
Semester	IV
Credit	4

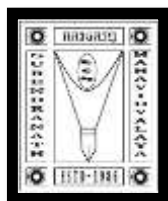
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Solve problems related to Complex Analysis.	PSO-1, PSO-3	L3: Apply
CO-2	Describe applications of Fourier transform in different branches of Physics.	PSO-3	L2: Apply
CO-3	Perform probabilistic calculations involving random variables, various distribution functions, etc.	PSO-3	L2: Understand
CO-4	Explain basic postulates of special relativity and study their applications in four dimensional spacetime.	PSO-1	L2: Understand

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC8P
Course Name	Mathematical Physics - III (Practical)
Course Type	Discipline Core Course
Semester	IV
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Solve ordinary and partial differential equations using numerical methods such as Modified-Euler and Runge-Kutta methods, and apply these techniques to physical problems.	PSO-2	L2: Understand
CO-2	Explain the Dirac Delta function, its properties, and applications, including evaluating integrals involving the Dirac Delta function.	PSO-2	L2: Understand
CO-3	Compute Fourier coefficients for periodic functions, perform Fourier transforms, and apply these techniques to solve differential equations.	PSO-2	L3: Apply
CO-4	Perform complex analysis, including numerical integration and root finding for complex functions.	PSO-2	L3: Apply


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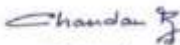
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC9T
Course Name	Elements of Modern Physics (Theory)
Course Type	Discipline Core Course
Semester	IV
Credit	4

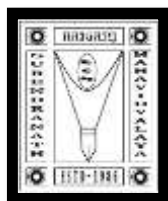
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Explain Black body radiation, Photoelectric effect, Compton effect, De-Broglie's hypothesis, Heisenberg's uncertainty relation etc.	PSO-1, PSO-3	L2: Understand
CO-2	Illustrate fundamental principles of quantum mechanics, including the Schrödinger equation and its applications to simple problems.	PSO-3	L3: Apply
CO-3	Describe the structure of nucleus, nuclear forces, nuclear models etc.	PSO-1	L2: Understand
CO-4	State the principles of radioactivity, nuclear fission-fusion, and the origin & applications of LASER.	PSO-1	L2: Understand

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC9P
Course Name	Elements of Modern Physics (Practical)
Course Type	Discipline Core Course
Semester	IV
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Determine Plank's constant using black body radiation and LEDs.	PSO-2	L2: Understand
CO-2	Study photoelectric effect and determine work function of a material.	PSO-2	L2: Understand
CO-3	Measure ionization potential of mercury and e/m of electron.	PSO-2	L2: Understand
CO-4	Measure wavelength of a LASER source using single slit, double slit and diffraction grating.	PSO-2	L2: Understand


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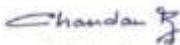
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC10T
Course Name	Analog Systems and Applications (Theory)
Course Type	Discipline Core Course
Semester	IV
Credit	4

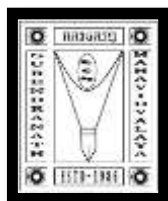
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Describe the properties of Semiconductor Diodes.	PSO-1	L2: Understand
CO-2	Demonstrate the use of Semiconductor Diodes in rectification, filtration and regulation.	PSO-3	L3: Apply
CO-3	Illustrate the properties and functions of transistors including BJT and FET.	PSO-1, PSO-3	L3: Apply
CO-4	Construct transistor amplifiers, feedback amplifiers, coupled amplifiers and oscillators.	PSO-1	L3: Apply
CO-5	Utilize OP-AMPs in designing essential electronic circuits.	PSO-3	L3: Apply

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC10P
Course Name	Analog Systems and Applications (Practical)
Course Type	Discipline Core Course
Semester	IV
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Study V-I characteristics of p-n junction diodes, Zener diodes and solar cells.	PSO-2	L2: Understand
CO-2	Study BJT characteristics in CE mode and frequency response of voltage gain of an RC coupled transistor.	PSO-2	L2: Understand
CO-3	Design Wein bridge oscillator, inverting & non-inverting amplifiers using OP-AMPs.	PSO-2	L2: Understand
CO-4	Investigate use of OP-AMPs as integrator, differentiator, adder and differential amplifier.	PSO-2	L2: Understand


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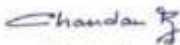
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC11T
Course Name	Quantum Mechanics and Applications (Theory)
Course Type	Discipline Core Course
Semester	V
Credit	4

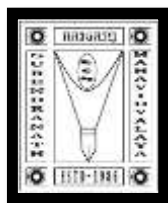
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Analyze free particle and general bound state problems in one dimension using Schrodinger equation.	PSO-1, PSO-3	L4: Analyze
CO-2	Obtain solutions of two classic problems in quantum mechanics - Harmonic oscillator and Hydrogen atom.	PSO-1, PSO-3	L4: Analyze
CO-3	Explain the concepts of Angular momentum and Spin.	PSO-1, PSO-3	L2: Understand
CO-4	Describe the line spectra of Hydrogen atom and its dependency on Zeeman effect.	PSO-1	L3: Apply
CO-5	Illustrate the Physics of many electron atoms including fine structure splitting.	PSO-3	L3: Apply

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC11P
Course Name	Quantum Mechanics and Applications (Practical)
Course Type	Discipline Core Course
Semester	V
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Solve Schrodinger equation for the ground and first excited states of Hydrogen atom in Coulomb potential.	PSO-4	L3: Apply
CO-2	Find solutions of Schrodinger equation for the ground and first excited states of Hydrogen atom in screened Coulomb potential.	PSO-4	L3: Apply
CO-3	Evaluate Schrodinger equation for the ground and first excited states of Hydrogen atom in anharmonic oscillator potential.	PSO-4	L3: Apply
CO-4	Obtain solution of Schrodinger equation for the vibrations of Hydrogen molecule in Morse potential.	PSO-4	L3: Apply


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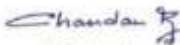
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC12T
Course Name	Solid State Physics (Theory)
Course Type	Discipline Core Course
Semester	V
Credit	4

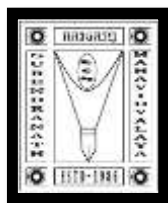
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Determine crystal structure of solids.	PSO-1	L2: Understand
CO-2	Describe elementary lattice dynamics.	PSO-1	L3: Apply
CO-3	Explain magnetic properties of matter.	PSO-1, PSO-3	L2: Understand
CO-4	Define dielectric and ferro-electric properties of materials.	PSO-1	L2: Understand
CO-5	Express band theory of solids including its applications.	PSO-1, PSO-3	L2: Understand
CO-5	Illustrate the origin and applications of Superconductivity.	PSO-1	L3: Apply

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC12P
Course Name	Solid State Physics (Practical)
Course Type	Discipline Core Course
Semester	V
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Measure electric and magnetic susceptibility of given material.	PSO-2	L3: Understand
CO-2	Determine coupling constant of Piezoelectric crystal and dielectric constant of given materials.	PSO-2	L3: Understand
CO-3	Study PE hysteresis of a ferroelectric crystal and BH hysteresis of Iron.	PSO-2	L3: Understand
CO-4	Obtain the refractive index of a dielectric layer using SPR.	PSO-2	L3: Understand


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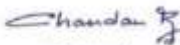
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC13T
Course Name	Electromagnetic Theory (Theory)
Course Type	Discipline Core Course
Semester	VI
Credit	4

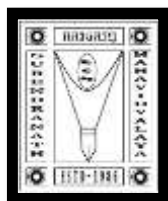
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Describe Maxwell's equations, concepts of scalar & vector potentials, gauge transformations, Poynting theorem etc.	PSO-1, PSO-3	L3: Apply
CO-2	Explain electromagnetic wave propagations in unbounded and bounded media.	PSO-1	L2: Understand
CO-3	Analyze electromagnetic origin of wave Optics including Kirchhoff's integral theorem and Fresnel-Kirchhoff integral formula.	PSO-1	L2: Understand
CO-4	Illustrate Polarization of light in uniaxial and biaxial crystals, double refraction, retardation plates and rotatory polarization.	PSO-1	L3: Apply

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC13P
Course Name	Electromagnetic Theory (Practical)
Course Type	Discipline Core Course
Semester	VI
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Verify Malus law for plane polarized light	PSO-2	L2: Understand
CO-2	Analyze elliptically polarized light using a Babinet's compensator.	PSO-2	L2: Understand
CO-3	Determine specific rotation of sugar using a Polarimeter, and wavelength & velocity of ultrasonic waves using ultrasonic grating.	PSO-2	L2: Understand
CO-4	Study polarization by reflection to obtain polarizing angle and V-I characteristics of p-n junction diode to evaluate Boltzmann constant.	PSO-2	L2: Understand


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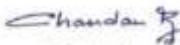
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Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC14T
Course Name	Statistical Mechanics (Theory)
Course Type	Discipline Core Course
Semester	VI
Credit	4

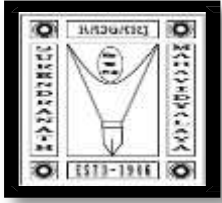
COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Define macro & micro states, micro-canonical, canonical, grand-canonical ensembles and law of equipartition of energy.	PSO-1	L2: Understand
CO-2	Explain classical and quantum theories of thermal radiation.	PSO-1	L2: Understand
CO-3	Illustrate Bose-Einstein statistics including strongly degenerate Bose gas, B-E condensation, photon gas etc.	PSO-1	L3: Apply
CO-4	Describe Fermi-Dirac statistics including strongly degenerate Fermi gas, electron gas, specific heat etc.	PSO-1	L3: Apply

Program Name	B.Sc. Physics (Honours) CBCS
Course Code	DC14P
Course Name	Statistical Mechanics (Practical)
Course Type	Discipline Core Course
Semester	VI
Credit	2

COs	Upon completion of the course, students will be able to	Mapping with PSOs	Cognitive Level
CO-1	Perform computational analysis of the behaviour of a collection of particles under various initial conditions.	PSO-4	L4: Analyze
CO-2	Compute partition function numerically and study its variation under multiple scenarios.	PSO-4	L3: Apply
CO-3	Plot Planck's law for Black Body radiation and compare it with Raleigh- Jeans law at high and low temperatures.	PSO-2, PSO-5	L2: Understand
CO-4	Study variations of specific heat of solids with different distribution functions, and plot MB, BE & FD distributions with temperature.	PSO-2, PSO-5	L2: Understand


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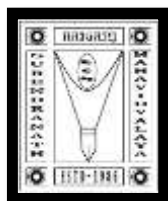
Course Outcome

B.A. (Honours)

Department of Bengali

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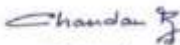
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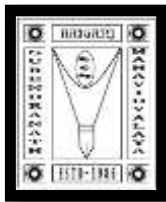
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Course outcome
B.A. (Honours) Bengali

Semester	Course Name & Paper code	Course Outcomes
1 ST SEM	History of Bengali Literature (101) BNGH C-1	If we do not know our past, we cannot shape our future. History provides the real base to understand aspects like the social, political, religious, and economic life of our society, and without knowing it, students will roam in a directionless path.
	Linguistics (101) BNGH C-2	It enhances the way we think about language and its uses. It helps by using the rules of language in its analysis. As language reflects our mind, its study will help the students understand the matter in a better way.
2 nd SEM	History of Bengali Literature in the Modern Age (201) BNGH C-3	It is said that Bengali is a modern language. To understand the journey of the language, students must read its history.


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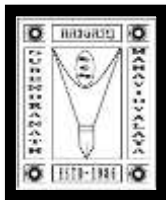
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	Rhythm and art of Rhetoric (202) BNGH C-4	Aesthetic sense in literature is reflected in the proper use of rhythm and the art of rhetoric. It will help the students feel the inner beauty of poetry.
3RD SEM	Mediaeval Literature 1st part (301) BNGH C-5	BaishnabPatabali By reading the BaishnabPadabali, Bengali as a race has discovered themselves in a mystic way. Not only Bengali but also other races in India got benefited by BaishnabPadabali. So, it is a must-read to know the roots of Bengali as a unique race. Padmapuran - Bijay Gupta Religious literature plays a greater role in understanding our own religious life in the mediaeval era. That is why 'Padmapuran' is included in the syllabus.
	Theory of poetry, history of Sanskrit & English Literature (302) BNGH C-6	Theory of poetry It is important for student of literature to know Sanskrit poetics if they want to experience poetry deeply. In Sanskrit poetics there is an attempt to reach the depth of poetry through poetic beauty. English Literature Studying comparative literature is essential for a deeper understanding of one's own language and literature. So it will encourage the students to do deeper study.First Year Sanskrit Literature Comparative literature reading is essential for deeper understanding of one's own language and literature. So it will encourage the students to do a deeper study.

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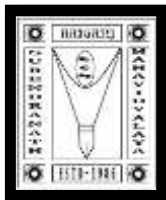
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	Mediaeval Literature 1st part (303) BNGH C-7	Shivayan- Rameswar Chakrabarty Shiva is the primary God of Indian culture. In Bengal He is the farmer God. In medieval Bengali literature, various poets wrote poems about his pastimes. Shivayan is one of them. Students will understand the main image of Bengali section, culture through this poetry lesson. Maimannsingha Gitika By including Maimonsingha Gitika in the syllabus, interest in folk-literature can be created among the students.
4th SEM	Poetry of Rabindranath Tagore, form & style of Short Story and some stories by Pravat Kumar Mukhopadhyay. (401) BNGH C-8	The poetry of Rabindranath Tagore is relevant in Bengali literature and in world literature as well. It has a clear impact on the short stories of Prabhat Kuma Mukhopadhyay. Short stories of Prabhatkurama Muk and Tagore have been included in the syllabus to help the students understand themselves and others.
	Drama: Dakghar by Rabindranath Thakur & History of Theatre. 402 BNGH C- 9	Daakghar by Rabindranath Thakur is a spiritual drama. Students will be able to come to a positive idea of God’s connection with people. The play talks about liberation from various pains of life. It shows choosing the right way in the conflicts of life. Students learn the values of life.

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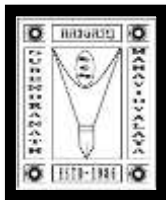
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	<p>The Form of Novel & Novel. 402 BNGH C-10</p>	<p>The Form of Novel</p> <ol style="list-style-type: none">1 Social & Political awareness will increase among students through this syllabus.2 The history of politics and society will become clear to them.3 Literature is taught to see it in a larger context. <p>Novel: Bishbriksha by Bankimchandra Chattopadhyay</p> <ol style="list-style-type: none">1. Education about women empowerment.2. This novel is the literary source of Bengali social movement of 19th century. As a result, it will help to know the 19th century society in depth.3. A novel is a mirror of our society. That's why 'Bishbriksha' by Bankim Chandra Chattopadhyay, is inseparable parts of the syllabus to make the students visualise society through them.
5 th SEM	<p>The Form of Essay & Essay. 501 BNGH C-11</p>	<p>Essay</p> <ol style="list-style-type: none">1. Essays enhance socio-economic and political knowledge. Essays enhance mindfulness.2. Different form of essays will enhance students' skills. <p>Prachin Sahitya: Rabindranath Thakur</p> <ol style="list-style-type: none">1. The successful essay writers who established the Bengali intellectual to root out the problems of our society. So, careful reading of his writing is must to know the existing social issues.2. Women's pain shines through in his essays demanding social rights.3. A clear understanding of Indian heritage will be developed.4. An emotional connection will be created with the main stream poetry of Indian.

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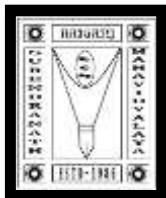
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	The form of Poetry & Rabindra-follower poet & post-Rabindra poetry 502, BNGH C- 12	The form of Poetry <ol style="list-style-type: none">1. There is considerable importance in poetry and the theory of poetry in literary studies.2. To create reflection of social tone in various poetic forms of poetry and narrative epic, ballad, sonnet can be seen. Rabindra- follower poet. <ol style="list-style-type: none">1. 19th century lyric poetry shows signs of individual distinction in socio-economic context.2. Transcending formal social boundaries, women poets have made their debut on a larger scale.3. Women's sacrifice is engaged in the service of the country. Post-Rabindra poetry <ol style="list-style-type: none">1. The own words of flesh and blood people have been noticed in the modern poetry.2. The new dream of survival of the marginalized people in the poems will make the students aware of the society.3. It is especially important to know the history of human helplessness between the two world wars and after the second world war.
	Short story 503 BNGH , DSE-IA	1.Short stories are about small but intense problems in people's lives . knowing all those problems can make life beautiful.
	Essay 503,BNGH, DSE-IB	Bankim Chandra Chattopadhyay is the first successful essay writer in Bengali literature, and Sumitri Kumar Chattopadhyay, Annadashankar Roy, Abanindranath Thakur, Atul Gupta, Bhabatash Dutta are the other successful essay writers who established the Bengali intellectual to root out the problems of our society. So, careful reading of their writing is must to know the existing social issues.
	Poetry 503,BNGH,DSE-2A	Birangana by Michel Madhusudhan Dutta. 1.19 th century women's individualism flourished. The history of that development will inspire the students to read Birangana poetry.

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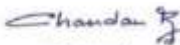
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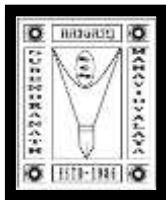
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		<p>2. Women's self-discovery has happened through this poetry, which will make the society beautiful.</p> <p>Jatindranath Sengupta selected poetry</p> <p>1. The words of hardworking people came up in his poems.</p> <p>2. Instead of romance, real life topics have come up again and again.</p>
<p>Novel and Short Story 504,BNGH, DSE-2A</p>		<p>1. Like every literature, Bengali literature finds its soul through novels and short stories. Bankimchandra Chattopadhyay, BibhutibhusanBandhopadhyay, Abhijit Sen, and AdairyaMalla Barman have all contributed a lot in this field. To understand the subaltern and marginalised, students have to study this part of literature.</p> <p>2. Abhijit Sen's Rahu Chandaler Haar the story of the struggle for livelihood of a special class of people from the lower stratum.</p> <p>3. Modern short stories depict the struggle between individual and social being. Amiyabhushan Majumdar's Tata Kim story brings up a life question.</p> <p>4. Binai Kar's Shiter math story brings up the helplessness of the unemployed.</p> <p>5. In Asim Roy's story Dona Pola, love comes out in a beautiful form.</p> <p>6. Syed Mustafa Siraj's Bharatbarsha story deals with communal riots.</p> <p>7. In Narendranath Mitra's story Rasa, the life of a hardworking man has become one with war and love.</p> <p>8. Love and economic struggle come together in Samaresh Bose's story Shshshharitu.</p>
<p>Essay 504,BNGH DSE- 2B</p>		<p>1. In Pramath Chowdhury's collection of essays, Bengal's life, literature and history, the struggle of extraordinary people has emerged. Which became the inspiration of student life.</p> <p>2. Criticism teaches students to think clearly and to understand. The life view of the students is formed in the context of criticism of various branches of literature.</p>


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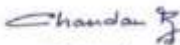
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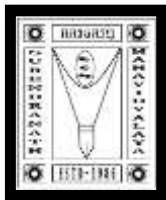
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	Poetry and Drama 504,DSE-2C	<p>Purubikram by Jyotirindranath Tagore's</p> <ol style="list-style-type: none"> 1. Jyotirindranath Tagore's entire play Purubikram teaches history while instilling patriotism. 2. The glory of women's power is revealed here. <p>Chitra by Rabindranath Tagore</p> <ol style="list-style-type: none"> 1. The spiritual form of human life is developed in Rabindranath's Chitra Kavya. 2. Beauty is established in Chitra Kavya.
	Seminar and presentation 505,BNGH SEC-1	<ol style="list-style-type: none"> 1. Seminar preparation is a suitable means to make students research. 2. As a result, their desire for knowledge, meditation and field work increases. 3. Students learn to write. 4. Learn to speak and answer questions
6th SEM	The Form of Drama and A Drama, 601 BNGH C-13	<p>The Form of Drama</p> <ol style="list-style-type: none"> 1. If you know about the aspect of the drama, you will get the overall knowledge about the drama 2. At the same time, knowledge about world drama literature will be gained. <p>Jana By Grishchandra Ghosh</p> <ol style="list-style-type: none"> 1. To know about mythology, Girish Chandra Ghosh's Jana Nataka is essential for every Indian to have knowledge about Indian heritage. Sri Krishna is an important part of Indian traditional life and it is important to know about him. 2. The special history of women's awakening in the 19th century has come up in this play in the wonderful art
	Hindi & Others Indian Literature, 602 BNGH C-14	<p>Hindi & Others Indian Literature</p> <ol style="list-style-type: none"> 1. Comparative literature reading is essential for deeper understanding of one's own language and literature. So it will encourage the students to do a deeper study
	Kapal Kundola by Bankimchandra	Kapal Kundola by Bankimchandra Chaattya padhyay


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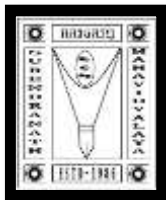
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<p>Chaattya padhyay and Gharabaire by Rabindranath Thakur,603 BNGH DSE – 3A</p>	<p>1. Bankim Chandra Chattopadhyay's Kapalkundala makes clear the various honest thoughts of human life.</p> <p>2. Contemporary norms are established on historical basis.</p> <p>3. The writer makes clear the contemporary family picture with romantic thoughts.</p> <p>Gharabaire by Rabindranath Thakur</p> <p>1. In Rabindranath Tagore's novel Ghorebaire, patriotism and contemporary politics are brought to the fore with artistic skill.</p> <p>2. The novel is simultaneously a signature of art and history.</p>
<p>Sanjeev Chatterjee's Palamau and Atmcharit by Shibnath Shastri 603 BNGH DSE – 3B</p>	<p>Sanjeev Chatterjee's Palamau</p> <p>1. Sanjeev Chatterjee's Palamau creates a sense of beauty and the reader learns to recognize life in the heart of the reader.</p> <p>2. The relationship of man with nature has played a major role in this book.</p> <p>3. The book is very necessary in the field of ecology.</p> <p>Atmcharit by Shibnath Shastri</p> <p>1. Shivnath Shastri's autobiography shows deep thoughts about the 19th century sense of life</p> <p>2. The book of contemporary theology has given a new dimension, which is the path of our future.</p>
<p>Chenratar By Tulshi Lahiri and two One-Act Play 603 BNGH DSE- 3C</p>	<p>Chenratar By Tulshi Lahiri</p> <p>1. The human crisis during 2nd World War is brought up in this play.</p>

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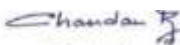
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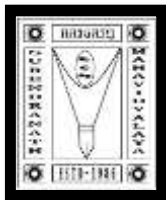
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		<p>2. At the same time there is a religious crisis.</p> <p>3. Conflict between love and hard reality is the content of this play.</p> <p>Two One-Act Play</p> <p>1. After the First World War, instead of a larger crisis due to the various helplessness of people, individual dramas were written about small but intense pains.</p> <p>2. Manmath Roy's Muktir Dak is the first solo play.</p> <p>3. The conflict between caste and love is present in this play. The drama "Call of Liberation" teaches that humanity is greater than caste.</p> <p>4. Mohit Chattopadhyay's Rakshasa is a play to remove that fear that people are always afraid of. This play teaches the mantra of becoming fearless among the students.</p>
	<p>Novel and Short Story of Bangladesh 604 BNGH DSE- 4A</p>	<p>Novel</p> <p>1. The life practice, sense of life, history and cultural world of neighboring country Bangladesh is important in reading Bengali literature.</p> <p>2. Through the stories and novels of Bangladesh, we can learn about their cultural revolution and people's struggle.</p> <p>3. Akhtaruzzaman Ilyas's Chlekothar Sepai evokes people's personal helplessness as well as incites them to social struggle.</p> <p>Short Story</p> <p>1. Selina Hussain and Humayun Ahmed's short stories similarly depict various pains in various aspects of life. Awakens human qualities.</p>
	<p>Essay of Rabindranath</p>	<p>Essay of Rabindranath Tagore</p>


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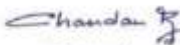
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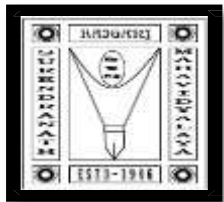
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<p>Tagor 604 BNGH DSE – 4B</p>	<ol style="list-style-type: none">1. Rabindranath Tagore has his own achievements in various branches of literature.2. Analytical discussion on various issues at the same time in the article.3. Adopting his thoughts on education can improve our education system.4. His thoughts on literature show us new ways.5. His thoughts on the environment are expressed in wonderful artistic skills.
<p>KabyaNatya : Chitrangoda By Rabindranath Tagor and Tapashshi- Taranggini By Buddhodeb Basu 604 BNGH DSE – 4C</p>	<p style="text-align: center;">Chitrangoda By Rabindranath Tagore</p> <ol style="list-style-type: none">1. At the same time it develops a sense of drama and poetry.2. Rabindranath Tagore's Chitrangada talks about the empowerment of women, which is very necessary in today's world. <p style="text-align: center;">Tapashshi-Taranggini By Buddhodeb Basu</p> <ol style="list-style-type: none">1. Here is the history of how politics and religion influence common people at the same time.2. Contemporary history becomes clear. Food movement merges with mythology.
<p>Project 605 BNGH SEC - 2</p>	<ol style="list-style-type: none">1. Only theoretical knowledge is not enough for the overall development of the students. For greater exposure of their creativity and feelings, the preparation of an essay is an effective tool. Thus, it is included in the syllabus. It will help them develop research skills.2. Project on Literature and Culture of Goud Banga through seminar preparation, students are encouraged to engage in research and at the same time develop reflective writing skills.


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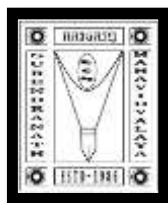
Course Outcome

B.Sc. (Honours)

Department of Mathematics


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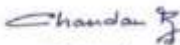
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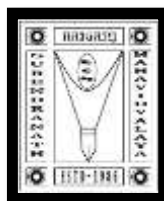
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Course Outcomes For UG Programmes
Department Of Mathematics
Raiganj Surendranath Mahavidyalaya

	Course Codes	Course Names	Marks	Credits
SEM:I	DC-01	Calculus & Geometry	50	6
	DC-02	Algebra	50	6
SEM:II	DC-03	Real Analysis I	50	6
	DC-04	Abstract Algebra	50	6
SEM:III	DC-05	Real Analysis II	50	6
	DC-06	Linear Algebra	50	6
	DC-07	Multivariate calculus & Vector calculus	50	6
SEM:IV	DC-08	Differential Equations	50	6
	DC-09	Mechanics	50	6
	DC-10	Probability & Statistics	50	6
SEM:V	DC-11	Advanced analysis on \mathbb{R} & \mathbb{C}	50	6
	DC-12	Numerical Methods & C programming Language	50	6
	DSE-1	Number Theory	50	6
	DSE-2	Differential Geometry	50	6
	SEC-1	Discrete Mathematics	50	2
SEM:VI	DC-13	Linear Programming Problems & Game Theory	50	6
	DC-14	Computer Aided Laboratory	50	6
	DSE-3	Integral Transform	50	6
	DSE-4	Dissertation/ Project	50	6
	SEC-2	Problem Solving Techniques in Probability & Statistics	50	2


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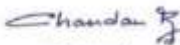
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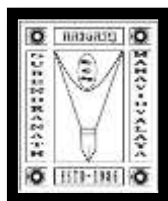
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SEMESTER-I		
Course Code	Course Name	Course Outcomes
DC-01	Calculus & Geometry	<ul style="list-style-type: none"> • Plotting of graphs of function. • Sketching parametric curves (Trochoid, cycloid, epicycloids, hypocycloid). • Ability to solve higher dimensional derivatives. • Obtaining surface of revolution of curves. • Ability to solve higher dimensional integration. • Tracing of conics in Cartesian coordinates/polar coordinates. • Sketching ellipsoid, hyperboloid of one and two sheets, elliptic cone, elliptic, paraboloid, and hyperbolic paraboloid.
DC-02	Algebra	<ul style="list-style-type: none"> • Ability to go abstract from concrete. • Foundations of abstract algebraic thinking. • Applying the notions for the study of subtle concepts like Congruence relations. • Developing skills in solving higher degree algebraic equation. • Enhancing interest in number theory. • Qualitative analysis of systems of linear equations.
SEMESTER-II		
Course Code	Course Name	Course Outcomes
DC-03	Real Analysis I	<ul style="list-style-type: none"> • Plotting of recursive sequences. • Study the convergence of sequences through plotting. • Study the convergence/divergence of infinite series by plotting. • Generalization of concept of differentiability. • Simplifications of proofs or understanding by using compactification. • Ability to learn/understand any topic/subject related to real analysis. • Developing interest in complex analysis & topology.
DC-04	Abstract Algebra	<ul style="list-style-type: none"> • Solving problems using the powerful concept of group action. • Finding the number of subgroups, normal subgroups of a finite group. • Applying the concept of a group action to real life problems such as Counting • Facility in handling problems involving polynomial equations. • Facility in working with situations involving commutative Groups & Rings.


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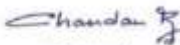
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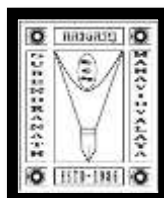
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SEMESTER-III		
Course Code	Course Name	Course Outcomes
DC-05	Real Analysis II	<ul style="list-style-type: none"> • Working knowledge of Beta and Gamma function • Solving problems using rectifiable paths and arc length. • Applicative knowledge of improper integration • Developing skills in solving problems using Fourier series. • Study Riemann integration and its extensions. • Concept of extended real numbers • Developing interest in integral calculus.
DC-06	Linear Algebra	<ul style="list-style-type: none"> • Vector Spaces, linear independence and foundations of abstract algebraic thinking. • Solving Systems of linear equations. • Applications of matrix algebra. • Ability to go abstract from concrete: from concrete notion of solution spaces to vector spaces. • Ability to learn/understand any topic/subject related to Linear operator.
DC-07	Multivariate calculus & Vector calculus	<ul style="list-style-type: none"> • Generalization of concept of differentiability • Apply inverse and implicit function theorems. • Ability to solve higher dimensional derivatives. • Chain rule. Notions of partial derivatives. • Application of Green's theorem, Gauss (Divergence) theorem and Stoke's theorem. • Concept of vector analysis.
SEMESTER-IV		
Course Code	Course Name	Course Outcomes
DC-08	Differential Equations	<ul style="list-style-type: none"> • Solution method for higher order equations. Power series solutions. • Reducing linear system of equations into matrix differential equation • Computing Wronskian and fundamental solutions • Solving eigen-value problems. • Qualitative analysis of special functions.
DC-09	Mechanics	<ul style="list-style-type: none"> • Concept of virtual displacements and virtual work. • Conservative force field & its application. • Analysis of Kinematics & kinetics of a particle • Study Kepler's laws on planetary motion • Slightly disturbed orbits & motion of artificial satellites. • Ability to learn/understand any topic/subject related to Newtonian mechanics • Developing interest in Lagrangian & Hamiltonian mechanics.


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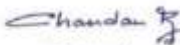
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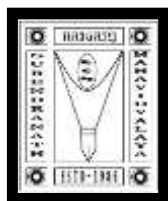
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DC-10	Probability & Statistics	<ul style="list-style-type: none"> • Create and analyze distributions of random variables • Concept and method of probability theory • Foundation of probabilistic and statistical analysis • Developing strong strategies for probability and statistics. • Analyzing descriptive techniques to describe statistical data. • Developing interest in application of probability and statistics to engineering and science.
SEMESTER-V		
Course Code	Course Name	Course Outcomes
DC-11	Advanced analysis on \mathbb{R} & \mathbb{C}	<ul style="list-style-type: none"> • Study of metric spaces and analyze it in abstract spaces. • Viewing $C[a,b]$ with sup norm and complete metric spaces. • Analyzing famous Cantor's intersection theorem. • Understanding of geometric properties of the complex plane. • Differentiation and integration of functions on \mathbb{C} • Development of analytic functions into power series. • Range of a bounded entire function. • Location of maximum and minimum points of an analytic function.
DC-12	Numerical Methods & C programming Language	<ul style="list-style-type: none"> • Overview of the C-Programming Languages, • Ability to understand syntax in C (data types, arrays, pointers, C-files, C-functions, etc.) • Newton-Raphson method & its Convergence • Study of least square polynomial approximation. • Analyzing the method of successive approximations. • Ability to solve various numerical problems occurring in applied mathematics, theoretical physics, and biological science.
DSE-1	Number Theory	<ul style="list-style-type: none"> • Solving a Diophantine equation and system of Diophantine equations. • Use of congruence as a tool to reduce a hard labour of work in some calculations • Finding primitive roots • Useful tools in various areas of number theory; viz. analytic and algebraic number theory, cryptography, modular forms etc • Ability to deal with modules which is indispensable in wide ranges of mathematical disciplines such as algebra, topology, number theory, operator theory etc.
DSE-2	Differential Geometry	<ul style="list-style-type: none"> • Study different curves and surfaces and its natures • Verify smooth surfaces, regular surface, orientable surfaces etc • Construct differential maps between smooth surfaces • Evaluate 1st and 2nd fundamental forms of surface patches. • Realizing the behaviors of different surfaces. • Analyze different curves and surfaces. • Characterize different surfaces.


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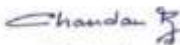
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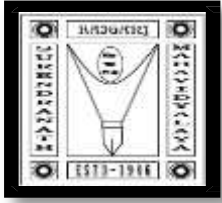
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SEC-1	Discrete Mathematics	<ul style="list-style-type: none"> • Efficiency in handling with discrete structures. • Efficiency in solving concrete combinatorial problems. • Proving validity and invalidity of arguments • Ability to use graphs as unifying theme for various combinatorial problems. • Ability to apply combinatorial intuitions in network theory, data structure and various other fields of science. • Understanding of symbolic logic
SEMESTER-VI		
Course Code	Course Name	Course Outcomes
DC-13	Linear Programming Problems & Game Theory	<ul style="list-style-type: none"> • LPP in canonical form to get the initial BFS and method of improving current BFS. • Introduction to artificial variables, • Economic interpretation of the duality. • Fundamental theorem of LPP and its illustration through examples. • Application of LPP to real life problems viz., transportation problem, assignment problem. • Study of linear programming solution of games.
DC-14	Computer Aided Laboratory	<ul style="list-style-type: none"> • Ability to understand LINUX in C (data types, arrays, pointers, C-files, C-functions, etc.) • Efficiency in handling with data types, C-operators, expression in C, conditional branching, looping. • Construct C-functions, use of Standard C library functions • Efficiency in solving numerical problems such as interpolation, differentiation, integration, matrix problem, ODE, PDE etc. using Cprogramming. • Ability to solve various numerical problems occurring in applied mathematics, theoretical physics, and biological science
DSE-3	Integral Transform	<ul style="list-style-type: none"> • Applications of Fourier transforms in solving ODE & PDE • Applications of Z-Transforms to Finite Difference Equations • Analyzing Laplace transformation and its usage in mathematical physics. • Knowledge of Dirac-Delta function and its application to Quantum mechanics. • Ability to use Integral transform in engineering science.
SEC-2	Problem Solving Techniques in Probability & Statistics	<ul style="list-style-type: none"> • Application problems based on Classical Definition of Probability • Fitting of binomial distributions after computing mean and variance. • Lines of regression, angle between lines and estimated values of variables • Problems based on combined mean and variance and coefficient of variation • Checking consistency of data and finding association among attributes.


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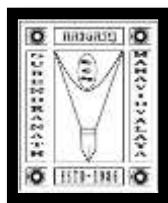
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Course Outcome
B.A. (Honours)
Department of Economics

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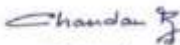
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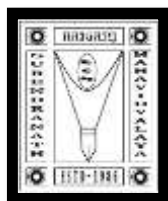
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Course Outcomes

Sl. No.	Subject Code	Subject Name	Subject Category	Course Outcome
Semester-I				
1	Core 1	Introductory Microeconomics	DC1	Students will develop the ability to apply microeconomic theories to real-world situations, critically evaluating market scenarios, and policy decisions. They will learn to use economic models to assess the impact of government interventions, market failures, and externalities, thereby enhancing their analytical and problem-solving skills.
2	Core 2	Mathematical Methods in Economics I	DC2	By completing the basic mathematical economics course, undergraduate students will gain proficiency in applying mathematical methods such as calculus, linear algebra, and optimization to economic models. This will enable them to analyze and solve economic problems with precision, facilitating a deeper understanding of both microeconomic and macroeconomic theories.
Semester-II				
3	Core 3	Introductory Macroeconomics	DC3	By completing the introductory macroeconomics course, undergraduate students will gain a solid grasp of key macroeconomic indicators such as GDP, inflation, unemployment, and interest rates. They will understand how these indicators


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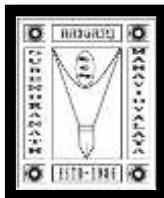
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				are measured, how they interact, and their significance in assessing the overall health of an economy.
4	Core 4	Statistical Methods for Economics	DC4	Students will be able to acquire the skills to collect, analyze, and interpret economic data using statistical tools. They will be able to apply techniques such as regression analysis, hypothesis testing, and probability distributions to draw meaningful conclusions about economic relationships and trends.
Semester-III				
5	Core 5	Intermediate Microeconomics I	DC5	By completing the course, undergraduate students will achieve a more advanced understanding of economic theories microeconomics. They will delve into complex concepts such as market dynamics, game theory, economic growth, and business cycles, building upon the foundational knowledge gained in introductory courses.
6	Core 6	Intermediate Macroeconomics I	DC6	Students will develop the skills to critically assess the effectiveness of various macroeconomic policies. They will learn to apply theoretical models to real-world situations, evaluating the impacts of government interventions, central bank actions, and international economic developments on national and global economies. This will prepare them to engage in informed discussions about

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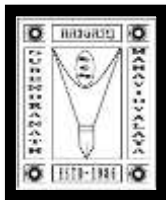
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				current macroeconomic challenges and policy solutions
7	Core 7	Mathematical Methods in Economics II	DC7	Students will develop the ability to use mathematical methods to analyze economic relationships and optimize economic outcomes. This course equips them with the skills necessary to tackle complex economic problems, conduct quantitative research, and engage in higher-level economic analysis in both academic and professional settings. This mastery enables them to express complex economic theories with mathematical precision and rigor.
Semester-IV				
8	Core 8	Intermediate Microeconomics II	DC8	By the end of this course, undergraduate students will have a comprehensive grasp of complex microeconomic concepts, including advanced consumer and producer theory, general equilibrium, and welfare economics. They will be able to critically analyze and interpret the intricate behaviors of individuals, firms, and markets under various conditions.
9	Core 9	Intermediate Macroeconomics II	DC9	Students will develop advanced skills in empirical analysis and quantitative research, using advanced macroeconomic models and techniques. They will learn to critically evaluate macroeconomic policies, conduct in-depth analyses of economic trends and fluctuations, and contribute to high-level research, preparing them for advanced academic work or specialized professional roles in economics.

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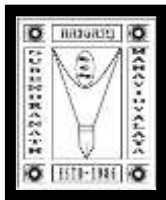
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10	Core 10	Introductory Econometrics	DC10	Students will acquire foundational skills in econometric techniques such as linear regression, hypothesis testing, and model specification. They will learn to apply these methods to analyze economic data and interpret empirical results. In addition, Students will develop the ability to use statistical software to perform econometric analyses. They will gain experience in evaluating real-world economic data, understanding model outputs, and making data-driven inferences
Semester-V				
11	Core 11	International Economics	DC11	Students will gain insight into international trade theories, such as comparative advantage and trade policy, and their effects on global markets. They will learn to analyze the impact of trade agreements, tariffs, and trade barriers on economies. Further, students will explore international financial systems, including exchange rates, international capital flows, and global financial markets. They will understand how these systems influence and are influenced by macroeconomic policies and global economic conditions.
12	Core 12	Public Economics	DC12	Students will understand the principles of government revenue and expenditure, including taxation, public spending, and budgeting processes. They will learn to evaluate the effectiveness and equity of public finance policies. In addition, students will develop skills to assess the

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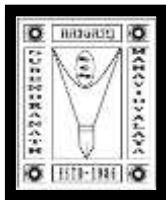
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				impact of fiscal policies on economic stability and growth. They will analyze how government interventions affect economic behavior and public welfare.
13	DSE 5.1/1	Economics of Health and Education	DSE1	Students will learn to apply economic principles to evaluate health and education policies, focusing on cost-benefit and cost-effectiveness analyses. They will understand how to measure and improve the efficiency and equity of these sectors.
14	DSE 5.1/2	Issues in Indian Economy		Students will examine key issues facing the Indian economy, including poverty, inequality, and development challenges. They will analyze the impact of economic reforms and policies on various sectors of the economy. In addition, students will develop the skills to evaluate the effectiveness of Indian economic policies and programs. They will learn to assess the outcomes of policy interventions and their implications for economic growth and social development.
15	DSE 5.1/3	Resource and Environmental Economics		Students will learn about the economic principles related to the management and conservation of natural resources, including theories of resource depletion and sustainable use. They will analyze how economic activities impact resource availability and environmental quality. They will assess the costs and benefits of various environmental regulations and management practices, focusing on achieving sustainable development.

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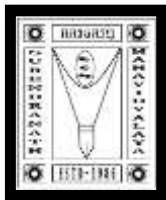
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16	DSE 5.2/1	Money and Financial Economics	DSE2	By the end of this course, students will gain a comprehensive understanding of financial markets, instruments, and institutions. They will learn how these components interact and influence economic activities. Students will also develop skills to analyze and evaluate monetary policies and their impact on inflation, interest rates, and economic stability. They will understand the role of central banks and financial regulators in shaping economic outcomes.
17	DSE 5.2/2	West Bengal Economy		Students will study the economic structure, growth patterns, and development challenges specific to West Bengal. They will understand regional economic issues, including industry, agriculture, and labor markets. Students will also be able to analyze policies and development strategies implemented in West Bengal. They will assess their effectiveness in promoting regional growth, addressing socio-economic issues, and enhancing quality of life.
18	DSE 5.2/3	Gender and Development		Students will explore the economic dimensions of gender, including labor market disparities, income inequality, and access to resources. They will analyze how gender affects economic outcomes and development. Students will also develop skills to evaluate gender-focused policies and programs. They will learn to propose and advocate for policies aimed at reducing gender inequality and promoting equitable development.

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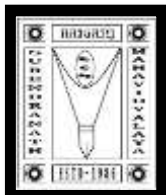
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19	SE 5.3	Advanced Statistics	SE1	Students will master advanced statistical methods such as multivariate analysis, time series analysis, and advanced regression techniques. They will learn to apply these techniques to complex economic data and research questions. In addition, students will develop expertise in designing and conducting empirical research using advanced statistical tools. They will gain experience in interpreting complex data sets and drawing valid conclusions for economic analysis.
Semester-VI				
20	Core 13	Indian Economy	DC13	Students will gain insight into the structure and performance of the Indian economy, including key sectors such as agriculture, industry, and services. They will study trends and challenges affecting economic growth and development in India.
21	Core 14	Development Economics	DC14	Students will understand theories and models of economic development, including factors influencing growth, poverty reduction, and human capital development. They will assess the effectiveness of interventions in improving living standards and achieving sustainable development goals.
22	DSE 6.1/1	Indian Financial Instruments and Markets	DSE3	Students will gain knowledge of various financial instruments available in the Indian market, including stocks, bonds, derivatives, and mutual funds. They will understand their characteristics, uses, and valuation methods. Students will also able

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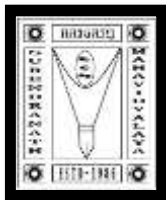
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				to analyze the functioning of Indian financial markets, including stock exchanges, bond markets, and money markets.
23	DSE 6.1/2	Issues in Open Economy		Students will be able to explore key issues in open economies, including international trade, exchange rates, and capital flows. They will analyze how global economic interactions affect domestic economies and vice versa. They can develop the ability to evaluate the impact of international economic policies on national economies.
24	DSE 6.2/1	Field Based Project	DSE4	Students will be able to apply economic theories and methodologies to real-world situations through field-based projects. They will gain hands-on experience in collecting data, conducting surveys, and analyzing empirical evidence related to economic issues, enhancing their practical understanding of economic concepts.
25	DSE 6.2/2	Term Paper		Students will learn how to undertake comprehensive research on a specific economic topic, demonstrating their ability to conduct thorough literature reviews, develop research questions, and apply economic theories and methods to analyze the topic. This process will deepen their understanding of the subject matter and refine their analytical skills.
26	SE 6.3/1	Data Analysis & Applied Economics	SE1	Students will develop advanced skills in handling and analyzing economic data using statistical and econometric techniques. They will also able to apply

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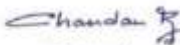
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			econometric methods to real-world economic problems, including model estimation, hypothesis testing, and forecasting. They will gain experience in interpreting empirical results and drawing conclusions based on data.
27	DSE 6.3/2	General Equilibrium and Welfare Economics	By the end of this course, students will be able to explore welfare economics concepts, including social welfare functions, efficiency, and equity. Students will study general equilibrium models that explain how supply and demand interact in multiple markets simultaneously. They will assess how different economic policies and market outcomes impact social welfare and distributional equity etc.
29	SE 6.3/3	Input-Output Analysis and Linear Programming	Students will learn to use input-output analysis to understand the interdependencies between different sectors of an economy. They will analyze how changes in one sector affect others and the overall economy. Students will be able to gain skills in using linear programming techniques to solve optimization problems in economics. They will learn to formulate and solve problems related to resource allocation, production planning, and cost minimization.

*DC= Discipline Core Course; DSE= Discipline Specific Elective Course; SEC= Skill Enhancement Course


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