

BARASAT GOVT COLLEGE
POST GRADUATE DEPARTMENT OF ZOOLOGY
B.Sc. Zoology (General) CBCS Syllabus
With effect from 2018-19

Programme Specific Outcomes

- Capable of demonstrating comprehensive knowledge and understanding of major concepts, theoretical principles and experimental findings in Zoology and its different subfields (animal diversity, Environment and Public Health, physiology and biochemistry, applied Zoology, aquatic biology, immunology, Food, Nutrition and Health and insect, vectors and diseases).
- Skilled communicator: Ability to impart complex technical knowledge relating to Zoology in a clear and concise manner in writing and oral skills.
- Sense of inquiry: Capability for asking relevant/appropriate questions relating to issues and problems in the field of Zoology, and planning, executing and reporting the results of an experiment or investigation.
- Team player/worker: Capable of working effectively in diverse teams in both classroom, laboratory and in industry and field-based situations.
- Skilled project manager: Capable of identifying/mobilizing appropriate resources required for a project, and manage a project to completion, while observing responsible and ethical scientific conduct; and safety and chemical hygiene regulations and practices.
- Lifelong learners: Capable of self-paced and self-directed learning aimed at personal development and for improving knowledge/skill development and reskilling.

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. degree course
Under CBCS semester system
GENERAL COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Generic Elective/Department Specific Core Course-1
Course Code: ZOOHGEC01T & ZOOHGEC01P / ZOOGCOR01T & ZOOGCOR01P
Topic Name: Animal Diversity

Course Outcome: Knowledge on the followings:

1. Develop understanding on the diversity of life with regard to protists, non-chordates and chordates.
2. Group animals on the basis of their morphological characteristics / structures.
3. Develop critical understanding how animals changed from a primitive cell to a collection of simple cells to form a complex body plan.
4. Examine the diversity and evolutionary history of a taxon through the construction of a basic phylogenetic/cladistics tree.
5. Understand how morphological change due to change in environment helps drive evolution over a long period of time.
6. The project assignment will also give them a flavour of research to find the process involved in studying biodiversity and taxonomy besides improving their writing skills.
7. It will further enable the students to think and interpret individually due to different animal species chosen.

Course Name: Generic Elective/Department Specific Core Course-2
Course Code: ZOOHGEC02T & ZOOHGEC02P / ZOOGCOR02T & ZOOGCOR02P
Topic Name: Human Physiology & Biochemistry

Course Outcome: Knowledge on the followings

1. Understand the process of digestion and its control.
2. Develop understanding in muscle structure and contraction mechanism.
3. Learn the process of respiration and transport of gases.
4. Understand kidney structure and regulation of urine formation.
5. Understand heart structure and functioning.
6. Understand function of endocrine glands and formation of gametes.
7. Understand about the importance and scope of biochemistry.

Course Name: Generic Elective/Department Specific Core Course-3
Course Code: ZOOHGEC03T & ZOOHGEC03P / ZOOGCOR03T & ZOOGCOR03P
Topic Name: Insect Vectors and Diseases

Course Outcome: Knowledge on the followings

1. To learn understand the general features of insects and gain knowledge about their distribution and success on Planet Earth and to learn Insect's taxonomy, general morphology and physiology
2. Learn about vector and vector borne diseases.
3. Describe the mechanisms for transmission, virulence and pathogenicity in pathogenic micro-organisms.
4. Diagnose the causative agents, describe pathogenesis and treatment for important diseases like malaria, leishmaniasis, Dengue, Chikungunya, Viral encephalitis, Filariasis
5. Explain how the infectious disease can transmit to human.
6. Properly understand the prevention and control mechanism of infectious diseases
7. Develop education, communication programme and learn how to maintain proper WHO guidelines about infectious diseases.

Course Name: Generic Elective/Department Specific Core Course-4
Course Code: ZOOHGEC04T & ZOOHGEC04P / ZOOGCOR04T & ZOOGCOR04P
Topic Name: Environment and Public Health

Course Outcome: Knowledge on the followings

1. Understand different causes of environmental pollution and their remedies
2. Learn about the depletion and contamination of natural resources.
3. To learn waste management technologies and its applications.
4. Develop awareness about the causative agents and control measures of many commonly occurring diseases.

Course Name: Department Specific Elective-1
Course Code: ZOOGDSE01T & ZOOGDSE01P
Topic Name: Applied Zoology

Course Outcome: Knowledge on the followings

1. Describe the mechanisms for transmission, virulence and pathogenicity in pathogenic micro-organisms.
2. Diagnose the causative agents, describe pathogenesis and treatment for important diseases like Tuberculosis, Typhoid ,Entamoeba histolytica, Plasmodium vivax and Trypanosoma gambiense , Ancylostoma duodenale and Wuchereria bancrofti etc
3. Develop an understanding of the classification of fishesand integrating structure, function and physiology
4. Gain an overview of the fishery and aquaculture industry
5. Express the importance of aquaculture
6. To understand the techniques involved in aquaculture practices.

Course Name: Department Specific Elective-2
Course Code: ZOOGDSE03T & ZOOGDSE03P
Topic Name: Aquatic Biology

Course Outcome: Knowledge on the followings

1. Understand and apply relevant scientific principles in the area of aquatic biology.
2. Employ scientific methodologies such as experimentation and data analysis in the area of aquatic biology.
3. Critically analyse, interpret and evaluate information relevant to aquatic biology.
4. Appreciate the multidisciplinary nature of the study of aquatic biology and engage positively with people and ideas beyond their own discipline.
5. Explore some of the unique environmental problems dealing with aquatic environments.
6. Develop employable skills in freshwater biological water quality analysis.

BARASAT GOVT COLLEGE

POST GRADUATE DEPARTMENT OF BOTANY

B.Sc. Botany (General) CBCS Syllabus

With effect from 2018-19

Programme Specific Outcomes

- The CBCS course in Botany has been designed not only to impart knowledge regarding traditional as well as interdisciplinary areas of plant science but also to develop a thorough understanding about the overall scope and importance of modern plant biology.
- Through the course, the students can gain in-depth knowledge regarding classical as well as advanced topics like Research Methodology, Bioinformatics, Biotechnology and Bioinstrumentation.
- The course aims to make the students proficient in basic and applied aspects of plant biology through the transfer of knowledge in the classroom as well as in the laboratory.
- The ability and skill enhancement courses included in the curriculum will facilitate understanding of students on few allied areas of the subject (like Environmental Science, Plant Diversity, Ethnobotany etc.) and enable them to gain exposure to future places/areas of employment.

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. degree course
Under CBCS semester system
GENERAL COURSE IN BOTANY
With effect from the session: 2018 – 2019

Course Name: Generic Elective/Department Specific Core Course-1
Course Code: BOTHGEC01T & BOTHGEC01P / BOTGCOR01T & BOTGCOR01P
Topic Name: Biodiversity (Microbes, Algae, Fungi and Archegoniate)

Course Outcome: Upon successful completion of the course including practical: Students will know about biological variety, variations and components of biodiversity as a whole.

1. They will be familiar with different groups of plant including viruses and bacteria.
2. Understand the general structure and difference between prokaryotes and eukaryotes.
3. Familiar with characteristics, diversity, growth form, classification, ecological and economic importance of algae, fungi, bryophytes, pteridophytes and gymnosperms.
4. After completion of laboratory study, students will be familiar with the diversity of algae, fungi, bryophytes, pteridophytes and gymnosperms in various habitats and identification using morphological techniques.

Course Name: Generic Elective/Department Specific Core Course-2
Course Code: BOTHGEC02T & BOTHGEC02P / BOTGCOR02T & BOTGCOR02P
Topic Name: Plant Ecology and Taxonomy

Course Outcome: Upon successful completion of the course including practical, students will be able to:

1. Understand the interactions of abiotic and biotic components of environment- maintaining an equilibrium essential for the very existence of all living beings including ours.
2. Gather knowledge of plant communities and ecosystems which are the basic footsteps of environmental studies.
3. Get knowledge of different aspects of environmental issues which help us to protect biodiversity in turn sustaining ourselves.
4. Identify plants, learning their names and characters in plant taxonomy.
5. Sound knowledge of Plant Ecology and Taxonomy together helps to boost knowledge and love for our environment.

Course Name: Generic Elective/Department Specific Core Course-3
Course Code: BOTHGEC03T & BOTHGEC03P / BOTGCOR03T & BOTGCOR03P
Topic Name: Plant Anatomy and Embryology

Course Outcome: Upon successful completion of the course including practical, students will be able to understand:

1. Study of the internal structure of plants and relationship of different group with their external structure as well as the surrounding environment.
2. The adaptations of different plants to survive in different environmental conditions thus helping to protect environment.
3. Study of structural organization of flowers to identify plants which is in turn important for study of plant biodiversity.
4. Knowledge of pollination and fertilization to know plant reproductive behaviors. It helps to understand whether any plant species is vulnerable or going towards criticalness in survivorship.

Course Name: Generic Elective/Department Specific Core Course-4
Course Code: BOTHGEC04T & BOTHGEC04P / BOTGCOR04T & BOTGCOR04P
Topic Name: Plant Physiology and Metabolism

Course Outcome: Upon successful completion of the course including practical, students will be able to understand:

1. General concepts of Plant Physiology and Metabolism which includes water relations, photosynthesis, respiration and nitrogen metabolism.
2. Structure function and synthesis of plant hormones as plant growth regulators.
3. Students will learn to carry out different plant physiological experiments photosynthesis, respiration, transpiration, plasmolysis etc.

Course Name: Department Specific Elective-1

Course Code: BOTGDSE01T & BOTGDSE01P

Topic Name: Cell and Molecular Biology

Course Outcome: Upon successful completion of the course including practical:

1. This course will familiarize the students with very basic aspects of cell biology.
2. Through this course the students will get a basic idea on the structural details and functional aspects of major cell organelles.
3. This course will also focus on understanding the fundamental mechanisms for the organization, replication, expression, variation, and evolution of the genetic material at a molecular level.
4. To acquire hands on training to different experiments of cell and molecular biology.

Course Name: Department Specific Elective-2

Course Code: BOTGDSE04T & BOTGDSE04P

Topic Name: Analytical Techniques in Plant Sciences

Course Outcome: After successful completion of this course including practical students will be able to understand techniques used in Plant Sciences like imaging, Flow cytometry, FACS, FISH, centrifugation, use of radio isotopes, spectrophotometry, biostatistics etc

BARASAT GOVT COLLEGE

UNDER GRADUATE DEPARTMENT OF CHEMISTRY

Programme Specific Outcomes

B.Sc. Chemistry (General) CBCS Syllabus

With effect from 2018-19

At the completion of this program, students will be able to

- **PSO1:** Understand the basic concepts, principles and applications of chemistry, viz. Physical, Organic Inorganic and Analytical chemistry.
- **PSO2:** Acquire knowledge of the preparation procedures of several everyday chemical compounds like cement, paint, ceramic, glass etc. along with their properties.
- **PSO3:** Estimate and analyse inorganic and organic compounds both qualitatively and quantitatively and learn the use of analytical instruments.
- **PSO4:** Get acquainted with the composition of biological systems viz. carbohydrates, proteins, lipids, enzymes, their properties, functionalities and structure along with their estimation procedures.
- **PSO5:** Learn the composition, properties and estimation techniques of environmental constituents like soil, water, food products etc.

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Three year B.A. /B.Sc. degree course
Under CBCS semester system
GENERAL COURSE IN CHEMISTRY
With effect from the session: 2018 – 2019

Course Name: Generic Elective/Department Specific Core Course-1
Course Code: CEMHGEC01T & CEMHGEC01P / CEMGCOR01T & CEMGCOR01P
Topic Name: ATOMIC STRUCTURE, CHEMICAL PERIODICITY, ACID AND BASE, REDOX REACTIONS, GENERAL CHEMISTRY & ALIPHATIC HYDROCARBONS

Course Outcome: After the completion of the course students will learn the followings:

1. fundamental of Quantum mechanics and atomic structure, chemical periodicity, acid & base, redox reactions.
2. fundamentals of organic chemistry, concept of Stereochemistry, elementary mechanistic aspects of nucleophilic substitution and Elimination Reactions, fundamental group approach of Aliphatic Hydrocarbons.
3. Estimation of sodium carbonate and sodium bicarbonate present in a mixture, estimation of oxalic acid, water of crystallisation in Mohr's salt, Fe (II) ions and Cu (II) ions by different methods.
4. Qualitative Analysis of Single Organic Compounds.

Course Name: Generic Elective/Department Specific Core Course-2
Course Code: CEMHGEC02T & CEMHGEC02P / CEMGCOR02T & CEMGCOR02P
Topic Name: STATES OF MATTER & CHEMICAL KINETICS, CHEMICAL BONDING & MOLECULAR STRUCTURE, p-BLOCK ELEMENTS

Course Outcome: After successful completion of the theoretical and practical modules of this course the students will learn:

- (1) The general behaviour and properties of the different state of matter viz. solid, liquid and gas.
- (2) The different factors that affect the rate of a chemical reaction and the methods of determination of rate and order.
- (3) The various types of bonding involved in a molecular structure and the concept of resonance.
- (4) Properties and reactions of p-block elements (6) Hands on experience in qualitative analysis of inorganic samples and measurement of properties of liquids like viscosity, surface tension etc.

Course Name: Generic Elective/Department Specific Core Course-3
Course Code: CEMHGEC03T & CEMHGEC03P / CEMGCOR03T & CEMGCOR03P
Topic Name: CHEMICAL ENERGETICS, EQUILIBRIA, ORGANIC CHEMISTRY-II

Course Outcome: After successful completion of both theoretical and practical modules of this course the student would acquire knowledge of

- (1) the basic principles and laws of thermodynamics
- (2) the concept of chemical equilibrium and the factors affecting it
- (3) Idea about ionic equilibria, pH and solubility
- (4) Preparation and properties of organic compounds like alcohols, aromatic hydrocarbons etc.
- (5) Hands on determination of pH and identification of organic compounds.

Course Name: Generic Elective/Department Specific Core Course-4
Course Code: CEMHGEC04T & CEMHGEC04P / CEMGCOR04T & CEMGCOR04P
Topic Name: SOLUTIONS, PHASE EQUILIBRIA, CONDUCTANCE, ELECTRO CHEMISTRY & ANALYTICAL AND ENVIRONMENTAL CHEMISTRY-I

Course Outcome: After successful completion of both theory and practical modules of the course students will be able to

1. Understand the fundamental concept of basic physical chemistry based on solution, phase equilibrium, conductance and electromotive force. They are also acquainted with the problem solving technique based on aforesaid physical phenomenon.
2. Understand few analytical concepts based on gravimetric and volumetric analysis. Side by side they are also acquainted with chromatographic methods of analysis using column and thin layer chromatography. They also acquire some knowledge on environmental chemistry, related pollution, their consequence and probable remedies.
3. Perform some practical based on aforesaid knowledge.

Course Name: Department Specific Elective-1
Course Code: CEMGDSE01T & CEMGDSE01P
Topic Name: Polymer Chemistry

Course Outcome: The students learn about the classification, the nature of molecular forces in polymers, the functionality of monomers, the degree of polymerization. They study the kinetic of addition and condensation polymerization. They become familiar with the determination of molecular weight of polymers, the concept of glass transition temperature. They learn about the preliminary ideas of thermodynamics of polymer solutions. They get ideas on the brief introduction to preparation, structure, properties and application of the some important polymers. In the laboratory the students learn how to

- (i) synthesize some of the polymers. (ii) measure the molecular weight and (iii) analyze the polymers.

Course Name: Department Specific Elective-2
Course Code: CEMGDSE03T & CEMGDSE03P
Topic Name: Inorganic Materials of Industrial Importance

Course Outcome: After studying of the course, both theory and practical, the following outcome is expected

1. Learning the procedure of preparation of cement, ceramics and glass and their applications.
2. Learning the procedure of preparation of important fertilizers, paints and pigments
3. Learning the procedure of preparation of different types of batteries and alloys and their properties
4. Learning the utility of using different catalysts in different chemical reactions.
5. Learning of different kinds of explosives
6. hands on experiment in analyzing useful materials like fertilisers, cement, plastic etc.