

**BARASAT COLLEGE**

**DEPARTMENT OF BOTANY**

**B.Sc. Botany (Hons) CBCS Syllabus**

**With effect from 2018-19**

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**Programme Specific Outcomes**

- Successfully completing the course the students will obtain a foundation in classical as well as contemporary aspects of plant science and basic concepts of all the plant groups, their taxonomy, diversity, metabolism, biochemistry, genetics and other advanced interdisciplinary areas which will be fruitful for their future studies.
  - Practical on-hand training will help the students in developing practical skills for handling of laboratory equipment, collection, analysis and interpretation of scientific data.
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**Course Outcome or Learning Outcome**

**HONOURS COURSE IN BOTANY**

**Course Name: Core Course-1**

**Course Code: BOTACOR01T & BOTACOR01P**

**Topic Name: Phycology and Microbiology**

**Course Outcome:**

By studying this course, students acquire knowledge about the general structure, ultrastructure and activities of the viruses, different prokaryotic organisms (cyanobacteria, other forms of eubacteria and archaea) and some primitive eukaryotic algal life forms.

Upon successful completion of the course students will have the practical knowledge on - 1. Models of viruses, bacteria, Gram staining of bacteria, endospore 2. Preparation of media sterilization of media for culturing.

**Course Name: Core Course-2**

**Course Code: BOTACOR02T & BOTACOR02P**

**Topic Name: Biomolecules and Cell Biology**

**Course Outcome:**

This course will familiarize the students with very basic aspects of cell biology and bio molecules.

Upon successful completion of the course students will have the practical knowledge on carbohydrates, proteins and lipids - various qualitative tests to confirm these biomolecules.

**Course Name: Core Course-3**

**Course Code: BOTACOR03T & BOTACOR03P**

**Topic Name: MYCOLOGY AND PHYTOPATHOLOGY**

**Course Outcome:**

Upon successful completion of the course, students will be able to Understand fungi as most important eukaryotic microorganisms on earth, playing role in ecosystem processes, degradation of organic matters and nutrient recycling, plant symbiosis and as pathogens of plants, animals and humans.

Upon successful completion of the course students will have the practical knowledge on Micrometry and study fungal genera from different classes like Rhizopus, Aspergillus, Penicillium, Ascobolus, Alternaria, Puccinia, Agaricus, Albugo etc.

**Course Name: Core Course-4**

**Course Code: BOTACOR04T & BOTACOR04P**

**Topic Name: Archegoniate**

**Course Outcome:**

Understand the importance of diseases caused by representative pathogens.

Upon successful completion of the course students will have the practical knowledge on Lower plants like Bryophytes, Pteridophytes and Gymnosperms, their vegetative and reproductive structures with special emphasis on Marchantia, Anthoceros, Sphagnum, Funaria.

**Course Name: Core Course-5**

**Course Code: BOTACOR05T & BOTACOR05P**

**Topic Name: Morphology and Anatomy of Angiosperms**

**Course Outcome:**

Understand different structural categories among the plants around us.

Upon successful completion of the course students will have the practical knowledge on Anatomical details of plant parts through permanent and temporary slides, staining methods.

**Course Name: Core Course-6**

**Course Code: BOTACOR06T & BOTACOR06P**

**Topic Name: Economic Botany**

**Course Outcome:**

They will study the relationship between people (individuals and cultures) and plants around the world, encompassing the past, present and potential use of plant.

Upon successful completion of the course students will have the practical concept in Cereals, legumes, sources of sugar and starches in sugar yielding plants.

**Course Name: Core Course-7**

**Course Code: BOTACOR07T & BOTACOR07P**

**Topic Name: Genetics**

**Course Outcome:**

They will have solid foundation in classical and modern molecular genetics as the focus is on understanding central principles and fundamental mechanisms for the organization, replication, expression, variation, and evolution of the genetic material at a molecular level.

Upon successful completion of the course students will have the practical knowledge on Various stages of mitosis and meiosis from temporary and permanent slides.

**Course Name: Core Course-8**

**Course Code: BOTACOR08T & BOTACOR08P**

**Topic Name: Molecular Biology**

**Course Outcome:**

This course will familiarize the students with very basic aspects of molecular biology.

Upon successful completion of the course students will have the practical understanding of Preparation of Lysogeny broth (LB) medium, Isolation of DNA from plants sources, estimation of DNA, Laboratory principles on RNA polymerases.

**Course Name: Core Course-9**

**Course Code: BOTACOR09T & BOTACOR09P**

**Topic Name: Plant Ecology and Phytogeography**

**Course Outcome:**

Understand the landscape detail and it's vegetation composition at our local area as well as India as a whole.

Upon successful completion of the course students will have the practical knowledge on Morphological and anatomical adaptations in plants.

**Course Name: Core Course-10**

**Course Code: BOTACOR10T & BOTACOR10P**

**Topic Name: Plant Systematics**

**Course Outcome:**

Helps to identify the plants with their local and global names.

Upon successful completion of the course students will have the practical concepts on Morphological characters in angiosperms to identify different families of flowering plants.

**Course Name: Core Course-11**

**Course Code: BOTACOR11T & BOTACOR11P**

**Topic Name: Reproductive Biology of Angiosperms**

**Course Outcome:**

Upon completion of the course the students will have following concepts Reproductive development in plants, anther and pollen biology.

Upon successful completion of the course students will have the practical knowledge on Laboratory techniques to study anther, pollen, pollen viability.

**Course Name: Core Course-12**

**Course Code: BOTACOR12T & BOTACOR12P**

**Topic Name: Plant Physiology**

**Course Outcome:**

After successful completion of this core course students will be able to understand The basic concepts of plant Physiology.

Upon successful completion of the course students will have the laboratory knowledge on Determination of water potential, osmotic potential, Study of transpiration, factors affecting transpiration.

**Course Name: Core Course-13**

**Course Code: BOTACOR13T & BOTACOR13P**

**Topic Name: Plant Metabolism**

**Course Outcome:**

After successful completion of this course the students will be able understand Metabolic activities taking place in plants and their relationship.

Upon successful completion of the course students will have the practical knowledge on Isolation of photosynthetic pigments and absorption spectra of these pigments.

**Course Name: Core Course-14**

**Course Code: BOTACOR14T & BOTACOR14P**

**Topic Name: Plant Biotechnology**

**Course Outcome:**

On completion of the course the student will be knowledgeable about Principles and methods of micropropagation, basics of r-DNA technology and several applied aspects of plant biotechnology.

Upon successful completion of the course students will have the practical knowledge on Preparation of MS medium, sterilization, inoculation methods.

**Course Name: Discipline Specific Elective-1**

**Course Code: BOTADSE01T & BOTADSE01P**

**Topic Name: Natural Resource Managements**

**Course Outcome:**

Understand different categories of resources around us and how they help us.

Upon successful completion of the course students will have the practical knowledge on Estimation of solid waste generated in the domestic system, Study of vegetation cover, collection of data, identifying dominant woody species.

**Course Name: Discipline Specific Elective-2**

**Course Code: BOTADSE03T & BOTADSE03P**

**Topic Name: Industrial and Environmental Microbiology**

**Course Outcome:**

Upon successful completion of this course the student will be familiarize with different microbial industrial products- their formulation, processing and purification.

Upon successful completion of the course students will have the practical knowledge on Principles and functioning of instruments in microbiology laboratory.

**Course Name: Discipline Specific Elective-3**

**Course Code: BOTADSE04T & BOTADSE04P**

**Topic Name: Analytical techniques in Plant Sciences**

**Course Outcome:**

After successful completion of this course students will be able to understand techniques used in Plant Sciences which are Imaging, Flow cytometry, FACS, FISH, Centrifugation, its types and various utility, Use of radio isotopes, Spectrophotometry its principles and significances.

Upon successful completion of the course students will have the practical knowledge on Blotting techniques, DNA fingerprinting, sequencing, PCR.

**Course Name: Discipline Specific Elective-4**

**Course Code: BOTADSE05T & BOTADSE05P**

**Topic Name: Bioinformatics**

**Course Outcome:**

After successful completion of the course students will be able to understand regarding Use of databases in biological sciences, Biological sequence databases like NCBI, search tools like BLAST, nucleotide and protein databases.

Upon successful completion of the course the students will have a practical knowledge on Different databases available in the internet.

**Course Name: Skill Enhancement Course-1**

**Course Code: BOTSSEC01M**

**Topic Name: Plant Diversity and Human Welfare**

**Course Outcome:**

Understand biodiversity- kind and importance for us and our environment.

Learn about the activities of different organizations in relation to environmental conservation like IUCN, UNESCO, UNEP, WWF, NBPGR.

**Course Name: Skill Enhancement Course-2**

**Course Code: BOTSSEC02M**

**Topic Name: Ethnobotany**

**Course Outcome:**

Upon completion of the course the students will be able to have a detailed idea regarding ethnobotany, an interdisciplinary science.

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### **GENERAL COURSE IN BOTANY**

**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.

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 Understand the interactions of abiotic and biotic components of environment- maintaining an equilibrium essential for the very existence of all living beings including ours.

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 Study of the internal structure of plants and relationship of different group with their external structure as well as the surrounding environment.

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 General concepts of Plant Physiology and Metabolism which includes water relations, photosynthesis, respiration and nitrogen metabolism.

**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 This course will familiarize the students with very basic aspects of cell biology, Through this course the students will get a basic idea on the structural details and functional aspects of major cell organelles.

**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.