

DEPARTMENT OF BOTANY

Programme Outcomes (BOTANY)::

Students having an academic background of science at 10+2 level can pursue B.Sc programme in various branches. After the completion of the B.Sc degree there are various options available for the science students, they can pursue master degree in Science i.e. M.Sc, work in research related fields and can even look for professional job oriented courses. Often, in some reputed universities or colleges the students are recruited directly by big MNC's after the completion of the course. The student is also eligible for the job of a Medical Representative. The student after graduating will be eligible for various government exams conducted by UPSC, SSC etc.

Programme Specific Outcomes (BOTANY)::

By the end of the course, the students will be able to:

PO1. Knowledge and understanding of:

1. The range of plant diversity in terms of structure, function and environmental relationships.
2. The evaluation of plant diversity.
3. Plant classification and the flora of Maharashtra.
4. The role of plants in the functioning of the global ecosystem.
5. A selection of more specialized, optional topics.
6. Statistics as applied to biological data.

PO2. Intellectual skills – able to:

1. Think logically and organize tasks into a structured form.
2. Assimilate knowledge and ideas based on wide reading and through the internet.
3. Transfer of appropriate knowledge and methods from one topic to another within the subject.
4. Understand the evolving state of knowledge in a rapidly developing field.
5. Construct and test hypothesis.
6. Plan, conduct and write a report on an independent term

project.::

P03.

Practical skills: Students learn to carry out practical work, in the field and in the laboratory, with minimal risk. They gain introductory experience in applying each of the following skills and gain greater proficiency in a selection of them depending on their

choice of optional modules.

1. Interpreting plant morphology and anatomy.
2. Plant identification.
3. Vegetation analysis techniques.
4. A range of physiochemical analyses of plant materials in the context of plant physiology and biochemistry.
5. Analyze data using appropriate statistical methods and computer packages.
6. Plant pathology to be added for sharing of field and lab data obtained.

P04.

Transferable skills:

1. Use of IT (word-processing, use of internet, statistical packages and databases).
2. Communication of scientific ideas in writing and orally.
3. Ability to work as part of a team.
4. Ability to use library resources.
5. Time management.
6. Career planning.

P05.

Scientific Knowledge:

Apply the knowledge of basic science, life sciences and fundamental process of plants to study

and analyze any plant form.

P06.

Problem analysis: Identify the taxonomic position of plants, formulate the research literature, and analyze non reported plants with substantiated conclusions using first principles and methods of nomenclature and classification in Botany.

P07.

Design/development of solutions: Design solutions from medicinal plants for health problems, disorders and disease of human beings and estimate the phytochemical content of plants which meet the specified needs to appropriate consideration for the public health

P08.

Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and development of the information to provide valid conclusions.

P09.

Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern instruments and equipments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants with an understanding of the application and limitations. health problems, disorders and disease of human beings and estimate the phytochemical content of plants which meet the specified needs to appropriate consideration for the public health

P08.

Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and development of the information to provide valid conclusions.

P09.

Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern instruments and equipments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants with an understanding of the application and limitations.

P010.

The Botanist and society: Apply reasoning informed by the contextual knowledge to assess plant diversity, its importance for society, health, safety, legal and environmental issues and the consequent responsibilities relevant to the biodiversity conservation practice.

P011.

Environment and sustainability: Understand the impact of the plant diversity in

The Botanist and society: Apply reasoning informed by the contextual knowledge to assess plant diversity, its importance for society, health, safety, legal and environmental issues and the consequent responsibilities relevant to the biodiversity conservation practice.

Course Outcomes of B.Sc. Botany

C01. Critically evaluation of ideas and arguments by collection relevant information about the plants, so as recognize the position of plant in the broad classification and phylogenetic level.

C02. Identify problems and independently propose solutions using creative approaches, acquired through interdisciplinary experiences, and a depth and breadth of knowledge/expertise in the field of Plant Identification.

C03. Accurately interpretation of collected information and use taxonomical information to evaluate and formulate a position of plant in taxonomy.

C04. Students will be able to apply the scientific method to questions in botany by formulating testable hypotheses, collecting data that address these hypotheses, and analyzing those data to assess the degree to which their scientific work supports their hypotheses.

C05. Students will be able to present scientific hypotheses and data both orally and in writing in the formats that are used by practicing scientists.

C06. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.

C07. Students will be able to apply fundamental mathematical tools (statistics, calculus) and

physical principles (physics, chemistry) to the analysis of relevant biological situations.

C08. Students will be able to identify the major groups of organisms with an emphasis on plants and be able to classify them within a phylogenetic framework. Students will be able to compare and contrast the characteristics of plants, algae, and fungi that differentiate them from each other and from other forms of life.

C09. Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped plant morphology, physiology, and life history

C010. Students will be able to explain how Plants function at the level of the gene, genome, cell, tissue, Flower development. Drawing upon this knowledge, they will be able to give specific examples of the physiological adaptations, development, reproduction and mode of life cycle followed by different forms of plants.

CourseOutcomes:				
S.No.	Semester	Course	Credits	CourseOutcomes
BS 104	I	Microbial Diversity and Lower Plants	4	<p>Students will be able to:</p> <ul style="list-style-type: none"> • To gain knowledge about microbial diversity. • To have the ability to utilize the concept of mushroom cultivation. • To understand the phylogeny of plants. • To know about various plant diseases and their control measures. • To understand life cycles of

				<p>different algal species.</p> <ul style="list-style-type: none"> • To explore economic importance of algae& fungi.
BS- 204	II	<p>BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS AND</p> <p>PALAEOBOTANY</p>	4	<p>By the end of this course, Students will be able to:</p> <ul style="list-style-type: none"> • To understand the phylogeny from Bryophytes to Gymnosperms. • To know the evolution of sporophytes in bryophytes. • To understand the stellar evolution and seed formation habit in pteridophytes. • To gain knowledge about life cycles of gymnosperm plants. • To explain about fossils and fossilization. • To understand about geological time scale.

BS 304	III	PLANT ANATOMY, EMBRYOLOGY AND PALYNOLOGY	4	<p>y the end of this course, Students will be able to:</p> <p>On Completion of this Course students will be able</p> <ul style="list-style-type: none"> • To gain knowledge of plant cells , tissues and their functions. • To make connections between plant anatomy and the other major disciplines of biology. • To identify and compare structural differences among different taxa of vascular plants. • To know the structure and development of monocot and dicot embryos. • To compare the function and morphology of pollen grains. • Describe and illustrate modern and fossil spores and pollen grains.
				<p>Understand about varying and alternating currents.</p>
BS 404	IV	PLANT PHYSIOLOGY	5	<p>Students will be able to:</p> <ul style="list-style-type: none"> • To understand plant physiological processes and metabolism. • To explain the role of micro nutrients in plant growth and development. • To relate photosynthesis with the formation of primary and secondary metabolites. • To explain the main techniques of in vitro culture of plant cells & tissues. • To know the methods used for the bio-production of plant secondary metabolites.

			<ul style="list-style-type: none"> • To Know the main techniques of genetic manipulation of plant
BS 304	v Paper-V	BIODIVERSITY AND CONSERVATION	<p>students will be able to:</p> <p style="text-align: center;">Biodiversity Outcomes: What We Want to Achieve</p> <p>Healthy and Diverse Ecosystems: Reducing human impacts and restoring damaged ecosystems enhance the productivity and resilience of our ecosystems, and preserve the goods and services essential to our well-being.</p> <p>*Viable Populations of Species: Maintaining the structure and function of ecosystems requires the full complement of native species. Conservation at the ecosystem level sustains most species, but special efforts are needed for some.</p> <p>*Genetic Resources and Adaptive Potential Maintained: Genetic diversity is nature's insurance policy. It makes increased production, assures ecological resilience and creates options for future innovation.</p> <p>*Sustainable Use of Biological Resources: Ecologically sustainable production and consumption of natural resources assure stable jobs, traditional lifestyles, long-term food security and human health.</p>

6	V GE paper	Industrial Microbiology	<p>Medical microbiology is a subject where basic knowledge of microbiology is in focus. In the course one learns more about medical microbiology with a focus on bacteriology and virology.</p> <p>* Introduction to bacteriology includes the structure and properties of bacteria, both as a normal flora and as a pathogen. You learn more about bacterial cells such as morphology, virulence factors, genetics and growth factors. You will learn more about diagnostics in medical microbiology, with a focus on bacteriology and virology.</p> <p>* This includes laboratory technology within agglutination, biochemical and serological analysis, culture, identification and resistance determination of bacteria and reference systems, as well as identification of virus by PCR. Furthermore, one looks at how infectious disease can occur and learns more about selected pathogenic microorganisms.</p> <p>* Other important areas in medical microbiology such as epidemiology, virology, infection control and antimicrobial strategies are also included in the course. In the course you will learn more about innovative thinking and innovation, and you will learn more about scientific writing, literature search and communication.</p>
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BS 602	VI Paper-	Tissue Culture and Biotechnology	<p>5</p> <p>*Plant tissue culture involves excising plant tissues and growing them on nutrient media.</p> <p>*It is used rather broadly to include several variations, such as meristem culture for propagation of virus-free plants, protoplast culture, cell suspension culture, tissue and organ culture, and anther or pollen culture for producing haploid plants.</p> <p>*This chapter focuses on various technical aspects of plant tissue culture. A suitable explant is selected and prepared for culture, and later incubated on an appropriate nutrient medium for growth and differentiation.</p> <p>* The basic laboratory setup, handling of explant tissue, nutrient medium and establishing the culture, and incubation of cultures are also discussed in this study.</p> <p>* A laboratory that can handle plant biochemistry or physiology-type experiments meets most of the general requirements of plant tissue culture. It is a valuable tool for research on morphogenesis,</p>
BS - 601		Project	<p>4</p> <p>Students will be able to:</p> <p>Project outcomes are valuable for businesses because they help create deliverables to meet their purpose and goal. Other benefits of understanding your project outcomes include:</p> <ul style="list-style-type: none"> *Determining if you met your business objectives *Learning lessons for future projects and identifying areas for improvement *Providing an overall purpose for your project *Discovering ways for meeting the needs

				<p>of your clients</p> <p>*Helping make sure all parts of the project serve the end goal</p>
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