

PROGRAMME OUTCOME AND COURSE OUTCOMES OF UNDERGRADUATE COURSE

B.Sc BOTANY

AIMS AND OBJECTIVES

The revised Curriculum for Undergraduate Programme of B.Sc. Botany focuses on imparting knowledge in basic and applied aspects of Botany. Due importance is given to fundamental and modern aspects of Botany, spanning many specialties and interests. An attempt has been made to make the study of Botany interesting and enjoyable, and to keep up with the speed with which technology advances. Formulation of the syllabus has been done by revamping the existing syllabus, with an understanding that the syllabus is addressing the 'digital native' generation.

The expected outcome of the syllabus:

- The fundamental objective of the curriculum is to impart effective science education at the undergraduate level, exposing them to recent trends and developments in the subject.
- Creating scientific temper is another major objective of this curriculum. Incorporating research components along with a sound academic foundation enables students to develop independent creative thinking. Sufficient emphasis is given for training in laboratory skills and instrumentation. The curriculum is meant to inspire creativity and combine passion with critical thinking skills in students who one day will be the citizens working to convert the world to more sustainable systems.
- Another major thrust given here is to develop an environmental concern in all activities of the students. 'Go green', the motto of the syllabus emphasizes the urgent need to conserve nature without destruction of natural resources.

PROGRAMME OUTCOMES (POs)

1. **Critical Thinking:** Take informed actions after identifying the assumptions that frame students' thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at their ideas and decisions (intellectual, organizational, and personal) from different perspectives.
2. **Problem Solving:** Understand and solve problems of relevance to society to meet the specified needs using the knowledge, skills and attitudes acquired.
3. **Effective Communication:** Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
4. **Effective Citizenship:** Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
5. **Environment and Sustainability:** Understand the issues of environmental contexts and sustainable development.
6. **Self-directed and Life-long Learning:** Acquire the ability to engage in independent and lifelong learning in the broadest context of socio-technological changes.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

1. **Scope and importance of Botany:** Understand scope and importance of Botany in every field especially in dealing with societal and environmental issues, agriculture, ethics and healthcare.
2. **Environmental concern:** Understand the and the role of plants in sustaining life on earth and the interrelationship between human beings and nature, create awareness on natural resources and their importance in sustainable development,

analyze the importance of biodiversity conservation, estimate biodiversity loss and develop conservation strategies.

3. **Scientific temper:** Develop scientific temper and undertake scientific projects.

4. **Practical applications:** Identify and classify plants according to the principles of plant systematics, apply techniques like plant propagation methods, organic farming, mushroom cultivation, preparation of biofertilizers, biopesticides etc. in daily life.

5. **Awareness on life processes:** Understand plant life processes, biomolecules, basic hereditary and evolutionary principles.

COURSE OUTCOMES (COS)

CORE COURSE: 1 ANGIOSPERM ANATOMY, REPRODUCTIVE BOTANY AND PALYNOLOGY

By the end of the course, students are expected to:

1. Demonstrate the ability to differentiate plant organs by observing anatomical features.
2. Understand the non-living inclusions of plants and their significance.
3. Differentiate tissues and their functions.
4. Illustrate primary and secondary (normal and anomalous) structures of plant organs.
5. Explain various developmental details of angiosperms.
6. Realize the significance and applications of palynology.

CORE COURSE: 2 MICROBIOLOGY, MYCOLOGY, LICHENOLOGY AND PLANT PATHOLOGY

By the end of the course, students are expected to:

1. Understand basics of microbial life and their economic importance.
2. Develop general awareness on the diversity of microorganisms, fungi and lichens.
3. Analyze the ecological role played by bacteria, fungi and lichens

4. Identify plant diseases and find out control measures.
5. Realize the significance of plant diseases as far as crop production is concerned.

CORE COURSE : 3 PHYCOLOGY, BRYOLOGY AND PTERIDOLOGY

By the end of the course, students are expected to:

1. Appreciate the diversity and evolutionary significance of lower plant groups.
2. Classify algae, bryophytes and pteridophytes.
3. Understand the economic and ecological importance of lower plant groups.

CORE COURSE: 4 METHODOLOGY AND PERSPECTIVES IN PLANT SCIENCE

By the end of the course, students are expected to:

1. Develop scientific temper and problem solving skills.
2. Undertake scientific projects and prepare project reports
3. Summarize, organize and display quantitative data and derive conclusions
4. Prepare permanent slides, applying the histochemical techniques

CORE COURSE : 6 GYMNOSPERMS, PALAEOBOTANY, PHYTOGEOGRAPHY AND EVOLUTION

By the end of the course, students are expected to:

1. Understand the role of gymnosperms as a connecting link between pteridophytes and angiosperms
2. Appreciate the process of organic evolution.
3. Realize the importance of fossil study.
4. Understand the climatic conditions of the past and realize the changes happened
5. Recognize the phytogeographic zones of India.

CORE COURSE: 7 ANGIOSPERM MORPHOLOGY AND SYSTEMATICS

By the end of the course, students are expected to:

1. Appreciate the diverse morphology of angiosperms.
2. Identify and classify plants based on taxonomic principles.
3. Make scientific illustrations of vegetative and reproductive structures of plants.
4. Develop the skill of scientific imaging of plants.
5. Realize the importance of field study.
6. Change their attitude towards over exploitation of rare/endemic plants.

CORE COURSE: 8 TISSUE CULTURE, HORTICULTURE, ECONOMIC BOTANY AND ETHNOBOTANY

By the end of the course, students are expected to:

1. Critically evaluate the advantages of tissue culture and horticulture over conventional methods of propagation.
2. Apply various horticultural practices in the field.
3. Experiment on the subject and try to become entrepreneurs.
4. Identify the economically important plants.

CORE COURSE: 9 CELL BIOLOGY AND BIOCHEMISTRY

By the end of the course, students are expected to:

1. Appreciate the ultra-structure of a plant cell.
2. Enumerate the functions of each cell organelle.
3. Draw and explain the structure of biomolecules.

CORE COURSE: 10 GENETICS AND PLANT BREEDING

By the end of the course, students are expected to:

1. Appreciate the facts behind heredity and variations.
2. Understand the basic principles of inheritance.
3. Solve problems related to classical genetics.
4. Predict the pattern of inheritance.

5. Understand various plant breeding techniques.
6. Realize the role of plant breeding in increasing crop productivity.

CORE COURSE: 11 BIOTECHNOLOGY, MOLECULAR BIOLOGY AND BIOINFORMATICS

By the end of the course, students are expected to:

1. Analyze the role of biotechnology in daily life.
2. Understand the basic aspects of bioinformatics.
3. Explain the concepts in molecular biology

CORE COURSE: 12 PLANT PHYSIOLOGY AND METABOLISM

By the end of the course, students are expected to:

1. Identify the physiological responses of plants.
2. Analyze the role of external factors in controlling the physiology of plants.
3. Explain the metabolic processes taking place in each cell.
4. Appreciate the energy fixing and energy releasing processes taking place in cells.

CORE COURSE: 13 ENVIRONMENTAL SCIENCE

By the end of the course, students are expected to:

1. Realize the importance of ecological studies.
2. Develop environmental concern in all their actions and practise Reduce, Reuse and Recycle.
3. Try to reduce pollution and environmental hazards and change their attitude towards throwing away plastic wastes.
4. Spread awareness of the need of conservation of biodiversity and natural resources.
5. Analyze the reasons for climate change and find out ways to combat it.

CORE COURSE: 14 ELECTIVE- : GENETICS AND CROP IMPROVEMENT

By the end of the course, students are expected to:

1. Understand various techniques employed for increasing crop productivity.
2. Identify diseases affecting crop plants.
3. Attain general awareness on various crop research stations of the country.

COMPLEMENTARY COURSE: 1 ANGIOSPERM ANATOMY AND MICROTECHNIQUE

By the end of the course, students are expected to:

1. Explain the types, structure and functions of plant tissues.
2. Explain primary and secondary (normal and anomalous) structures of plant organs.
3. Identify plant organs by observing anatomical features.
4. Illustrate primary and secondary (normal and anomalous) structures of plant organs.
5. Apply the histochemical techniques in laboratory works.

COMPLEMENTARY COURSE: 2CRYPTOGAMS, GYMNOSPERMS AND PLANT PATHOLOGY

By the end of the course, students are expected to:

1. Analyze the role of the lower plants in the process of evolution.
2. Explain the ecological significance of lower plants.
3. Identify plant diseases and take remedial measures to control them.

COMPLEMENTARY COURSE : 3 MORPHOLOGY, SYSTEMATIC BOTANY, ECONOMIC BOTANY, PLANT BREEDING AND HORTICULTURE

By the end of the course, students are expected to:

1. Appreciate the diverse morphology of angiosperms.
2. Identify and classify plants based on taxonomic principles
3. Make scientific illustrations of vegetative and reproductive structures of plants

4. Identify the economically important plants
5. Understand the basic principles of plant breeding
6. Apply various horticultural practices in the field.

COMPLEMENTARY COURSE: 4 PLANT PHYSIOLOGY, ECOLOGY AND GENETICS

By the end of the course, students are expected to:

1. Explain the physiological processes in plants.
2. Understand the basic principles of heredity and variation.
3. Realize the importance of ecology.
4. Spread awareness of the necessity of conservation of biodiversity and natural resources
5. Solve problems related to classical genetics

OPEN COURSE APPLIED BOTANY

By the end of the course, students are expected to:

1. Develop general awareness on applied aspects of Plant science.
2. Realize the role of plants in everyday life.
3. Apply vegetative propagation methods in everyday life.
4. Realize the economic importance of plants