

## **Department of Botany**

### **Programme Outcomes (PO)**

**At the completion of the programme, the prospective teachers will attain the ability to:**

**PO1:** To provide thorough knowledge about various plant groups from primitive to highly evolved

**PO2:** To equip the student with skills related to laboratory as well as field-based studies

**PO3:** To highlight the potential of these studies to become an entrepreneur

**PO4:** To make the student aware about conservation and sustainable use of plants as well as to address the socio-economical challenges related to plant sciences

**PO5:** To make the student aware about conservation and sustainable use of plants as well as to address the socio-economical challenges related to plant sciences

### **Programme Specific Outcomes (PSO)**

**At the completion of the programme, the prospective teachers will attain the ability to:**

**PSO1:** This program imparts excellence with an aptitude for higher studies, research and to meet competitive exams.

**PSO2:** Practical work in the field and laboratory experiments enhances skills in handling scientific instruments.

**PSO3:** This program is a Research oriented learning, so enhances presentation (oral and writing) skills.

**PSO4:** The study of Genetics has various applications, especially in development of genetically engineered crops.

**PSO5:** This program develops skills and ability to use knowledge efficiently in areas related to specializations and current updates in the subject.

**PSO6:** It also provides Entrepreneurship skill development for small scale start-ups.

## **SEMESTER I**

### **BOT CC101: Microbiology and Phycology**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Classify the Plant kingdom
- CO2:** Describe the diversity, structure and importance of viruses and bacteria
- CO3:** Describe the general account of Mycoplasma and diseases caused by them
- CO4:** Explain the thallus organization, economic importance and the life cycle of various algae

## **Semester I**

### **BOT CC102: Biomolecules and Cell Biology**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Describe the structure and properties of biomolecules
- CO2:** Explain the classification, properties and functions of enzymes

**CO3:** Describe cell wall, cell membrane and the structure, chemistry and functions of cellular organelles

**CO4:** Explain the eukaryotic cell cycle, mitotic and meiotic cell divisions; and regulation of cell cycle

## **SEMESTER- II**

### **BOT CC203: Mycology and Phytopathology**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

**CO1:** Describe the thallus organization, nutrition and economic importance and life cycle of various fungi

**CO2:** Explain the diversity, structure and importance of lichen and mycorrhiza

**CO3:** Describe the terminologies, scope and importance of plant pathology

**CO4:** Describe the etiology, symptoms and control measures of plant diseases

## **Semester II**

### **BOT CC204: Archegoniate**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

**CO1:** Explain the morphological diversity and evolution of bryophytes, pteridophytes and gymnosperms

**CO2:** Compare the life cycle of various bryophytes, pteridophytes and gymnosperms

**CO3:** Describe the economic importance of the bryophytes, pteridophytes and gymnosperms

**CO4:** Describe Fossil pteridophytes (*Rhynia* and *Calamites*)

### **SEMESTER – III**

#### **BOT CC305: Anatomy of Angiosperms**

##### **Course Outcomes**

**After the completion of the course, the student will be able to:**

**CO1:** Explain the tissue system in plants and their functions

**CO2:** Understand the normal and anomalous secondary growth in plants and their causes

**CO3:** Learn about the structural adaptations in plants growing in different environmental conditions

**CO4:** Describe the structure and function of periderm

### **Semester III**

##### **Course Outcomes**

#### **BOT CC306 Economic Botany**

**After the completion of the course, the student will be able to:**

**CO1:** Learn about the economically important plant products with special reference to the Botanical name, family, morphology of useful part and the uses

**CO2:** Increase the awareness and appreciation of plants & plant products encountered in everyday life

**CO3:** Appreciate the diversity of plants and the plant products in human use

**CO4:** Analyze the importance of economically important plants

### **BOT CC307 :Basics of Genetics**

#### **Course Outcome:**

**After the completion of the course, the student will be able to:**

- CO1:** Have conceptual understanding of Mendelian laws of inheritance, its variations and applications
- CO2:** Comprehend the effect of chromosomal abnormalities leading to genetic disorders
- CO3:** Analyze the effect of mutations on gene functions and dosage
- CO4:** Develop critical understanding of chemical basis of genes and their interactions at population and evolutionary levels, sex determination and sex linked inheritance

### **SEMESTER – IV**

### **BOT CC408 Molecular Biology**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Analyze the structures and chemical properties of DNA and RNA and their role
- CO2:** Know gene expression and regulation in prokaryotes and eukaryotes
- CO3:** Gain an understanding of various steps in transcription and translation in prokaryotes and eukaryotes

**CO4:** Gain knowledge of application of recombinant DNA technology for human welfare

#### **Semester IV**

#### **BOT CC409 :Plant Ecology and Phytogeography**

#### **Course Outcomes**

**After the completion of the course, the student will have:**

- CO1:** Knowledge of plant communities and ecological adaptations in plants
- CO2:** Knowledge about the soils on the basis of physical, chemical and biological components and states of water and their importance
- CO3:** Knowledge about the conservation of biodiversity, nonconventional energy, types and control of pollution; and the phytogeographical divisions of India
- CO4:** Knowledge about energy sources of ecological system

#### **Semester IV**

#### **BOT CC410 Plant Systematics**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Classify Plants and recognize the preparation and importance of herbarium
- CO2:** Interpret the rules of ICN in botanical nomenclature
- CO3:** Assess terms and concepts related to Phylogenetic Systematics
- CO4:** Generalize the characters of the families according to Bentham & Hooker's system of Classification

#### **SEMESTER – V**

## **BOT CC511 Reproductive Biology of Angiosperms**

### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Recall the history of reproductive biology of angiosperms & recognize the importance of genetic and molecular aspects of flower development
- CO2:** Understand structure and functions of anther wall and pollen wall, pollen biology
- CO3:** Learn detailed study of structure of pistil, megasporangium, double fertilization and endosperm
- CO4:** Comprehend the causes of Polyembryony and apomixes with its classification

## **BOT CC512 Plant Physiology**

### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Understand Water relation of plants with respect to various physiological processes
- CO2:** Explain chemical properties and deficiency symptoms in plants
- CO3:** Classify aerobic and anaerobic respiration, significance of respiration and Photosynthesis
- CO4:** Assess dormancy and germination in plants; learn about types and roles of phytohormones

## **SEMESTER – VI**

### **BOT CC61: Plant Metabolism**

### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Understand the anabolic and catabolic pathways of metabolism
- CO2:** Recognize the importance of Carbon assimilation in photorespiration
- CO3:** Explain the ATP-Synthesis
- CO4:** Interpret the Biological nitrogen fixation in metabolism

### **BOT CC614: Plant Biotechnology**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Understand the principle and basic protocols for Plant Tissue Culture and its application
- CO2:** Explain the blotting techniques
- CO3:** Have knowledge about fundamentals of Recombinant DNA Technology
- CO4:** Describe role of transgenic in bioremediation; Genetically engineered products and bio safety concerns

### **SEMESTER – I**

#### **BOT GE101      **Biodiversity (Microbes, Algae, Fungi and Archegoniate****

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Explain the fundamental concepts related to microbes, algae, fungi and archegoniate
- CO2:** Analyze the discovery and general structure of viruses and bacteria



- CO3:** Evaluate the significance of algae and fungi and its different types
- CO4:** Analyze the anatomy and reproduction of specified bryophytes, pteridophytes and gymnosperms along with their ecological and economical importance

## **SEMESTER – II**

### **BOT GE202:Plant Ecology and Taxonomy**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Comprehend the basic concepts of plant ecology and taxonomy and botanical nomenclature
- CO2:** Analyze the characteristics of different plant communities
- CO3:** Examine the structure and functions of eco-system
- CO4:** Analyze about environmental pollution

## **SEMESTER – III**

### **BOT GE303:Plant Anatomy and Embryology**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Understand the fundamental concepts of plant anatomy and embryology
- CO2:** Learn about the structural adaptations in plants growing in different environmental conditions
- CO3:** Analyze and recognize the different organs of plant and secondary growth
- CO4:** Evaluate the structural organization of flower and the process of pollination and fertilization

## **SEMESTER – IV**

### **BOT GE404 :Plant Physiology and Metabolism**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Understand Water relation of plants with respect to various physiological processes
- CO2:** Explain chemical properties and deficiency symptoms in plants
- CO3:** Classify aerobic and anaerobic respiration, significance of respiration and Photosynthesis
- CO4:** Interpret the Biological nitrogen fixation in metabolism

## **SEMESTER – I**

### **ENG AEC101 :English Communication**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Communicate effectively using the techniques in the area of spoken as well as written communication.
- CO2:** Hone their LSRW skills within their communication.
- CO3:** Design and answer job interview questions.
- CO4:** Demonstrate the ability to craft professional messages that are clear yet courteous.

### **HINAECC101– हिंदी-व्याकरण और सम्प्रेषण**

परिणाम - 1. विभिन्न प्रतियोगी परीक्षाओं के लिए तैयार करना ।

२. सम्प्रेषण-क्षमता की वृद्धि करना ।

३. कार्यालयी-पत्र लेखन की क्षमता विकसित करना ।

४. हिंदी के व्याकरणिक एवं सैद्धांतिक स्वरूप की जानकारी हासिल करना ॥

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### **SEMESTER – II**

#### **EVS AEC202 :Environmental Science**

##### **Course Outcomes**

**After the completion of the course, the student will be able to:**

**CO1:** Understand multidisciplinary nature of environmental studies.

**CO2:** Understand the concept and types of natural resources and environmental pollution.

**CO3:** Evaluate the anomalies created due to haphazard population growth and its impact on environment.

**CO4:** Understand about the organizations, conventions and legislations working on mitigation of environmental issues.

### **SEMESTER – III**

#### **PHIL SEC301: Inter-Religious Studies (Value Based)**

##### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Develop Inter-religious harmony & better understanding of other religions.
- CO2:** Interpret the different religions of the world.
- CO3:** Identify the common elements that bind different religions together.
- CO4:** Acquaint with the salient features of different religions.

#### **Semester IV**

#### **BOT SEC 402 : Mushroom Culture Technology**

##### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Recall various types and categories of mushrooms.
- CO2:** Demonstrate mushroom cultivating technology
- CO3:** Examine various types of food technologies associated with mushroom industry
- CO4:** Value the economic factors associated with mushroom cultivation

#### **SEMESTER – V**

#### **BOT DSE501: Genetics and Plant Breeding**

##### **Course Outcomes**

**After the completion of the course, the student will be able to:**

- CO1:** Understand the patterns of inheritance in different organisms

**CO2:** Outline basics of linkage of genes, sex determination and quantitative inheritance

**CO3:** Examine the methods of crop improvement

**CO4:** Describes the various methods of plant propagation and its importance in human welfare

## **Semester V**

### **BOT DSE502: Biostatistics**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

**CO1:** Comprehend the fundamental concepts related to descriptive and inferential biostatistics

**CO2:** Develop skills in data tabulation, its treatment, analysis, interpretation and graphical representation of data

**CO3:** Analyze the implications of inferential statistics in biology

**CO4:** Develop the competence in hypothesis testing and interpretation

## **SEMESTER – VI**

### **BOT DSE603: Research Methodology**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

**CO1:** Understand the concept of research and different types of research in the context of biology

**CO2:** Develop laboratory experiment related skills

**CO3:** Develop competence on data collection and process of scientific documentation

**CO4:** Analyze the ethical aspects of research

## **Semester VI**

### **BOT DS604 : Dissertation**

#### **Course Outcomes**

**After the completion of the course, the student will be able to:**

**CO1:** Acquire special/advanced knowledge through a project work with an advisory support by a teacher/faculty member

**CO2:** Apply knowledge involving / analyzing /exploring a real life situation / difficult problem

**CO3:** Enhance presentation (oral and writing) skills

**CO4:** Practical work in the field and laboratory experiments will enhance skills in handling scientific instruments