BOTONY

COURSE OUTCOMES

Bloom's Taxonomy: Remember, Understand, Apply, Analyze, Evaluate, Create (R, U, Ap, Az, E, C)

SEMESTER I

MICROBIAL DIVERSITY AND EARLY LAND PLANTS			
Sem-I	**Credits: 4**	**Course Code:BOT102T**	**Year/Group: I BtBC HPW: 4**
Course Outcomes			**Blooms Level**
CO1	Understand General characters, structure, reproduction and classification of algae and Plant pathology.		R
CO2	Examine the significant role of cyanobacteria as bio fertilizers.		U
CO3	Able to know the evolution of sporophytes in bryophytes.		U
CO4	Able to identify the stellar evolution and seed formation habit in Pteridophytes		R

MICROBIAL DIVERSITY AND EARLY AND PLANTS (Practicals)			
Sem-I	**Credits: 1**	**Course Code:BOT102P**	**Year/Group: I BtBC HPW: 3**
Course Outcomes			**Blooms Level**
CO1	Identify morphological characters of Algae, Fungi, Bryophytes &Pteridophytes.		U
CO2	Identify pathogens of infected plant materials.		U

SEMESTER II

GYMNOSPERMS, ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS			
Sem II	**Sem-II Credits: 4**	**Course Code:BOT202T**	**Year/Group: I BtBC HPW: 4**
Course Outcomes			**Blooms Level**
CO1	Can relate life cycles of Gymnosperm plants.		U
CO2	Able to describe Meristems, root & shoot apices, tissues and tissue systems.		U
CO3	Distinguish anomalous secondary growth and wood structure in plant species		Ap,
CO4	Discuss Anther and Ovule structures, pollen –pistil interaction, development of seed, Endosperm and types of embryos. .		Az

GYMNOSPERMS, ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS(Practicals)			
Sem II	**Sem-II Credits: 1**	**Course Code:BOT202P**	**Year/Group: I BtBC HPW: 3**
Course Outcomes			**Blooms Level**
CO1	Perform and identify anatomical features of Gymnosperms		U,Az
CO2	Learn the primary , secondary internal structure of monocots and dicots plants.Identify pollen grains, viability, ovule types and developmental stages of embryo sac.		Ap

SEMESTER III

PLANT ANATOMY & EMBRYOLOGY			
Sem III	**Credits: 4**	**Course Code:BOT302T**	**Year/Group: II BtBC HPW: 4**
Course Outcomes			**Blooms Level**
CO1	Understand meristems, Tissues systems, Leaf ontogeny and Adaptations		R
CO2	Illustrate stem and root anatomy along with Anomalous secondary growth.		U
CO3	Examine Anther , Ovule structure and types		Az
CO4	Categorize Endosperm development and types, Polyembryony.		Az
PLANT ANATOMY & EMBRYOLOGY (Practicals)			
Sem III	**Credits: 1**	**Course Code:BOT302P**	**Year/Group: II BtBC HPW: 2**
Course Outcomes			Blooms Level
CO1	Able to Prepare double stain permanent slides of anomalous secondary structure of dicot and monocot stem.		Az, Ap
CO2	Identification of pollen viability		U

SEMESTER III (SEC-2)

BIOFERTILIZERS AND ORGANIC FARMING (SEC-2)			
Sem III	**Credits: 2**	**Course Code: SEC-2**	**Year/Group: II BtBC HPW: 2**
Course Outcomes			Blooms Level
CO1	Exemplifying types of Bio fertilizers and Organic farming.		U

CO2	Experimenting the use of Bio fertilizers on crop productivity.	Ap

SEMESTER IV

CELL BIOLOGY, GENETICS & PLANT PHYSIOLOGY			
Sem IV	**Credits: 4**	**Course Code:BOT402T**	**Year/Group: II BtBC HPW: 4**
Course Outcomes			Blooms Level
CO1	Recall ultrastructure of plant cell and cell division.		R
CO2	Understand Mendelian inheritance, Linkage Crossing over, Gene mutation.		U
CO3	Demonstrate Plant-water relations and enzyme activity.		U
CO4	Distinguish the process of photosynthesis, Respiration, Phytohormones.		Az

CELL BIOLOGY, GENETICS & PLANT PHYSIOLOGY(Practicals)			
Sem IV	**Credits: 1**	**Course Code:BOT402P**	**Year/Group: II BtBC HPW: 2**
Course Outcomes			Blooms Level
CO1	Identification of various stages of mitosis. Solving genetic problems on Mendelian and Non Mendelian inheritance.		U, Ap
CO2	Identify and analyse various plant physiology experiments.		Az

SEMESTER IV (SEC-4)

MUSHROOM CULTURE TECHNOLOGY (SEC-4)			
Sem IV	**Credits: 2**	**Course Code: SEC-4**	**Year/Group: II BtBC HPW: 2**
Course Outcomes			Blooms Level
CO1	Know the life cycle, and ecological requirements of various mushroom species .		U
CO2	Learn a variety of techniques for cultivating different types of mushrooms		Ap

SEMESTER IV (SEC-4B)

GREENHOUSE TECHNOLOGY SEC -4B)			
SEM-IV	**Credits: 2**	**Course Code: BOTSEC- 4B**	**Year/Group: II BtBC HPW: 2**
Course Outcomes			Blooms Level
CO1	Learn techniques for crop selection, planting, cultivation, and harvesting within greenhouse environments.		R& U
CO2	Develop skills in operating and maintaining greenhouse equipment.		Ap

SEMESTER V

Generic Elective (GE) Industrial Microbiology			
SEM-V	**Credits: 4**	**Course Code:BOT502**	**Year/Group: III BtBC HPW: 4**
Course Outcomes			Blooms Level
CO1	Understand utilization of microbes to manufacture a wide array of products by fermentation process in bioreactors.		U
CO2	Employing fermentation techniques in various types of bioreactors and downstream processing.		Ap
CO3	Choosing and applying microorganisms of industrial interest		Az
CO4	Understanding the diversity microorganisms present in water sources and production of bio fertilizers.		U

SEMESTER V

BIODIVERSITY AND CONSERVATION			
SEM -V	**Credits: 4**	**Course Code:BOT502(A)T**	**Year/Group: III BtBC HPW: 4**
Course Outcomes			Blooms Level
CO1	Explain biodiversity at genetic, species, and ecosystem levels, and recognize its importance in maintaining ecological balance		U
CO2	Understand and implement conservation techniques, including in-situ andex-situ conservation methods		R& Az
CO3	Gain knowledge of global and national biodiversity conservation laws		U
CO4	Apply critical thinking and problem-solving approaches to real-world biodiversity conservation challenges		Ap
BIODIVERSITY AND CONSERVATION **(Practicals)**			
Sem-V	**Credits: 1**	**Course Code:BOT502(A)P**	**Year/Group: III BtBC HPW: 2**
Course Outcomes			Blooms Level
CO1	Explore and promote sustainable development practices that balance human needs with environmental protection		U
CO2	Engage in public awareness campaigns, environmental education, and community-based conservation programs		Ap

SEMESTER V

Economic Botany			
SEM-V	**Credits: 4**	**Course Code:BOT502(B)T**	**Year/Group: III BtBC HPW: 4**
Course Outcomes			Blooms Level
CO1	Learn the origin and diversity and domestication of cultivated plants		U
CO2	Have awareness for economically important plants		R
CO3	Re call Knowledge of plants and plant products which are used as a human diet.		U
CO4	Describe the cultivation practices of oil seeds, timber, and drug yielding plants.		Ap

Economic Botany(Practicals)			
SEM-V	**Credits: 1**	**Course Code:BOT502(B)P**	**Year/Group: IIIBtBCHPW: 2**
Course Outcomes			Blooms Level
CO1	Learn the economically important plants through specimens,sections and microchemical tests.		U& Ap
CO2	Learn the collection of plants through herbarium preparation.		Ap

SEMESTER V

SEED TECHNOLOGY			
SEM-V	**Credits: 4**	**Course Code:BOT502(C)T**	**Year/Group: III BtBC HPW: 4**
Course Outcomes			Blooms Level
CO1	Explain the fundamentals of seed biology, including seed development, structure, dormancy, and germination		R
CO2	Understand techniques like cleaning, drying, grading, and packaging to enhance seed quality and longevity.		U
CO3	Understand the production of hybrid seeds, their advantages, and the role of biotechnology in seed improvement		U ,Ap
CO4	Analyze the role of seed technology in food security, sustainable agriculture, and conservation of genetic resources		Az

SEED TECHNOLOGY PRACTICALS			
SEM-V	**Credits: 1**	**Course Code:BOT502(C)P**	**Year/Group: III BtBC HPW: 2**
Course Outcomes			Blooms Level
CO1	Learn appropriate methods for seed storage to maintain viability and prevent deterioration		R
CO2	Develop hands-on experience in seed testing, handling, and management		Ap

SEMESTER VI

PLANT MOLECULAR BIOLOGY			
SEM-VI	**Credits: 4**	**Course Code:BOT602(A)T**	**Year/Group: III BtBC HPW: 4**
Course Outcomes			Blooms Level
CO1	Compare the structure of Nucleic acids and organelle DNA		U
CO2	Explain the replication of DNA Central dogma and genetic code.		U
CO3	Identify Mechanism of Transcription and RNA editing.		Az
CO4	Distinguish Translation in prokaryotes, Transcriptional regulation in prokaryotes.		U

PLANT MOLECULAR BIOLOGY (Practicals)			
SEC-VI	**Credits: 1**	**Course Code:BOT602(A)P**	**Year/Group: III BtBC HPW: 2**
Course Outcomes			Blooms Level
CO1	Estimate DNA by different techniques		Ap
CO2	Understand and Categorize experimental methods of nucleic acids.		U

SEMESTER VI

TISSUE CULTURE AND BIOTECHNOLOGY			
SEM-VI	**Credits: 4**	**Course Code:BOT602(B)T**	**Year/Group: III BtBC HPW: 4**
Course Outcomes			Blooms Level
CO1	Explain the main techniques of in vitro culture of plant cells & tissues.		U
CO2	Know the methods used for the bio-production of plant secondary metabolites.		U
CO3	Have knowledge of the basic concept of gene cloning & enzymes involved in it		R, U
CO4	Understand the main techniques of genetic manipulation of plant organisms		U

TISSUE CULTURE AND BIOTECHNOLOGY (Practicals)				
SEC-VI	**Credits: 1**	**Course Code:BOT602(B)P**	**Year/Group: III BtBC**	**HPW: 2**
Course Outcomes				Blooms Level
CO1	Explore the isolation of plant DNA			Ap
CO2	Learn to preparation of plant tissue culture medium			Az

SEMESTER VI

ANALYTICAL TECHNIQUES IN PLANT SCIENCES			
SEM-VI	**Credits: 4**	**Course Code:BOT602(C)T**	**Year/Group: III BtBC HPW: 4**
Course Outcomes			Blooms Level
CO1	Understand Imaging and related techniques		U
CO2	Identify Cell fractionation, Radioisotopes and Spectrophotometry.		U
CO3	Compare Chromatography, Electrophoresis and Mass spectrometry.		Az
CO4	Analyze data by various Biostatistical methods.		Az

ANALYTICAL TECHNIQUES IN PLANT SCIENCES(Practicals)			
SEM-VI	**Credits: 1**	**Course Code:BOT602(C)P**	**Year/Group: III BtBC HPW: 2**
Course Outcomes			Blooms Level
CO1	Demonstrate various analytical techniques.		Ap
CO2	Prepare permanent slides by staining techniques.		Az