



Department of Botany
Suren Das College
CHOICE BASED CREDIT SYSTEM
B.Sc. Botany Programme

Effective from Academic Session 2019-2020

Programme Outcomes (POs) B.Sc. Botany Honours (CBCS)

Programme Outcomes (POs)	<p>After successfully completion of three years Bachelor degree program in Botany under CBCS, the student will be able to-</p> <p>POs-I: Understand Plant Diversity and its importance in the maintenance of ecological balance.</p> <p>POs-II: Students will learn to carry out practical work, in the field and in the laboratory, interpreting plant morphology and anatomy, Plant identification, Vegetation analysis techniques.</p> <p>POs-III: Apply the knowledge of basic science, life sciences and fundamental process of plants.</p> <p>POs-IV: Apply modern techniques and instruments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological studies of plants with an understanding of the applications in human life.</p> <p>POs-V: Apply the knowledge gained from the studies for the upliftment of society via addressing health, environmental issues, food scarcity etc.</p>
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SEMESTER I

BOT-HC-1016Phycology and -Microbiology (Credits: Theory-06, Practical 02)

BOT-HC-1026Biomolecules and Cell Biology (Credits: Theory-06, Practical 02)

SEMESTER II

BOT-HC-2016Mycology and Phytopathology(Credits: Theory-06, Practical 02)

BOT-HC-2026 Archegoniate (Credits: Theory-06, Practical 02)

SEMESTER III

BOT-HC-3016Morphology and Anatomy of Angiosperms (Credits: Theory-06, Practical 02)

BOT-HC-3026Economic Botany (Credits: Theory-06, Practical 02)

BOT-HC-3036 Genetics (Credits: Theory-06, Practical 02)

BOT-SE-3014: Biofertilizers (Credits: 4)

SEMESTER IV

BOT-HC-4016Molecular Biology (Credits: Theory-06, Practical 02)

BOT-HC-4026Plant Ecology and Phytogeography (Credits: Theory-06, Practical 02)

BOT-HC-4036Plant Systematics (Credits: Theory-06, Practical 02)

BOT-SE-4014: Nursery and Gardening (Credits: 4)

SEMESTER V

BOT-HC-5016: Reproductive Biology of Angiosperms (Credits: Theory-06, Practical 02)

BOT-HC-5026: Plant Physiology (Credits: Theory-06, Practical 02)

BOT-HE-5016: Natural Resource Management (Credits: Theory-04, Practical 02)

BOT-HE-5026: Horticultural Practices and Post-Harvest Technology (Credits: Theory-04, Practical 02)

SEMESTER VI

BOT-HC-6016 Plant Metabolism (Credits: Theory-06, Practical 02)

BOT-HC-6026 Plant Biotechnology (Credits: Theory-06, Practical 02)

BOT-HE-6016: Industrial and Environmental Microbiology (Credits: Theory-04, Practical 02)

BOT-HE-6036: Project Work/ Dissertation (Credits: 6)

Programme Specific Outcomes

<p>Programme Specific Outcomes (PSOs)</p>	<p>PSOs-I: Critical evaluation of ideas and arguments by collecting relevant information about the plants,so as to recognize their position in the classification systems and at phylogenetic level.</p> <p>PSOs-II: Students will be able to access the primary literature, identify relevant works for a particulartopic, and evaluate the scientific content of these works.</p> <p>PSOs-III:Students will be able to compare and contrast the characteristics of the different groups ofplants such as algae, fungi, bryophytes, pteridophytes, gymnosperms and angiosperms.</p> <p>PSOs-IV: Students will be able to use the evidence of comparative biology to explain how the theory ofevolution offers the only scientific explanation for the unity and diversity of life on earth.</p> <p>PSOs-V: Students will be able to explain how Plants function at gene, genome, cellular and tissue level.</p> <p>PSOs-VI:Students will be will be able to relate the physical features of the environment to the structureof populations, communities, and ecosystems.</p> <p>PSOs-VII:Students will be able to conceive the idea of artificial propagation of plants via vegetativemethods and to find a livelihood via establishing miniature plant nurseries.</p>
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Course Outcomes (Botany Honours Core papers, CBCS)

Course	Outcomes
Semester I	
BOT-HC-1016 Phycology and Microbiology	<p>On completion of this course, the students will be able to:</p> <p>CO-I: Detailed knowledge on microbes, viruses and bacteria, and their importance in agriculture and medicine.</p> <p>CO-II: Knowledge on Algal classification, Economic and ecological importance of Algae.</p> <p>CO-III: Practical knowledge on structure of T-Phage and TMV, lytic and lysogenic life cycle.</p> <p>CO-IV: Practical knowledge on microscopy of bacteria and algae.</p>
BOT-HC-1026 Biomolecules and Cell Biology	<p>On completion of this course, the students will be able to:</p> <p>CO-I: Knowledge on structure, classification and physicochemical properties of biomolecules and enzymes.</p> <p>CO-II: Detailed knowledge on structure, properties and functions of cell and its components.</p> <p>CO-III: Practical knowledge on properties of cell and cell membrane, DNA staining techniques and microscopy of plant cell.</p> <p>CO-IV: Knowledge on qualitative tests of biomolecules.</p>
Semester II	

<p>BOT-HC-2016 Mycology and Phytopathology</p>	<p>On completion of this course, the students will be able to:</p> <p>CO-I: Detailed knowledge on different classes of fungi, their structure, classification, life cycle and reproduction.</p> <p>CO-II: Knowledge on diseases in plants caused by viruses, bacteria and fungi and biotechnological applications of fungi.</p> <p>CO-III: Structural analysis of different classes of fungi and their reproductive stages.</p> <p>CO-IV: Knowledge on structures of symbiotic associations (Lichens, Mycorrhiza).</p>
<p>BOT-HC-2026 Archegoniate</p>	<p>On completion of this course, the students will be able to:</p> <p>CO-I: Detailed knowledge on morphology, anatomy, classification and properties of bryophytes, pteridophytes and gymnosperms.</p> <p>CO-II: Knowledge on reproduction and economic importance and ecological significance of bryophytes, pteridophytes and gymnosperms.</p> <p>CO-III: Practical knowledge on morphology and reproductive structures of archegoniates.</p> <p>CO-IV: Spore morphology analysis and detailed knowledge on male and female reproductive structures in gymnosperms.</p>
<p>Semester III</p>	
<p>BOT-HC-3016 Morphology and Anatomy of Angiosperms</p>	<p>On completion of this course, the students will be able to:</p> <p>CO-I: Knowledge on morphology of angiosperms and developmental biology of plant body.</p> <p>CO-II: Knowledge on structural and anatomical organization of tissue system in plants and their classification.</p> <p>CO-III: Practical knowledge on inflorescences and fruits of angiosperms.</p> <p>CO-IV: Practical knowledge on anatomical features of plant body parts.</p>

BOT-HC-3026 Economic Botany	<p>On completion of this course, the students will be able to:</p> <p>CO-I:Knowledge on morphology, uses and economic importance of crop plants.</p> <p>CO-II:Knowledge on uses of industrially important plants.</p> <p>CO-III:Practical knowledge on economically important plant parts and their products.</p>
BOT-HC-3036 Genetics	<p>On completion of this course, the students will be able to:</p> <p>CO-I:Knowledge on Mendelian concepts in genetics; structure, functions and properties of chromosome; chromosomal aberration.</p> <p>CO-II:Knowledge on gene structures and gene mutations, population genetics.</p> <p>CO-III:Practical knowledge on chromosomal mapping and gene interaction studies.</p> <p>CO-IV: Practical visualization of chromosomal anomalies.</p>
Semester IV	
BOT-HC-4016 Molecular Biology	<p>On completion of this course, the students will be able to:</p> <p>CO-I:Detailed knowledge on architecture of nucleic acids, organization of DNA in organisms, models of replication and the factors associated with it.</p> <p>CO-II:Detailed knowledge on transcriptional and post transcriptional events in a cell, translation of proteins.</p> <p>CO-III:Practical acquaintance of isolation and quantification of DNA from plants.</p> <p>CO-IV:Knowledge on photographic study of RNA polymerases and RNA modification machinery.</p>

<p>BOT-HC-4026 Plant Ecology and Phytogeography</p>	<p>On completion of this course, the students will be able to:</p> <p>CO-I: Knowledge on origin, formation and properties of abiotic components of the ecosystem, interactions and adaptation of plants with biotic and abiotic factors.</p> <p>CO-II: Knowledge on properties of communities in a population and trophical and habitat organization in an ecosystem.</p> <p>CO-III: Practical knowledge on property analysis of abiotic components of the ecosystem.</p> <p>CO-IV: Practical knowledge on vegetation study and different ecological sites.</p>
<p>BOT-HC-4036 Plant Systematics</p>	<p>On completion of this course, the students will be able to:</p> <p>CO-I: Knowledge on plant identification and classification systems, plant nomenclature.</p> <p>CO-II: Knowledge on phylogenetic and evolutionary relationships of angiosperms.</p> <p>CO-III: Practical knowledge on foliar morphology and taxonomical study of angiosperms.</p>
<p>Semester V</p>	
<p>BOT-HC-5016 Reproductive Biology of Angiosperms</p>	<p>On completion of this course, the students will be able to understand:</p> <p>CO-I: Knowledge on detailed morphological and anatomical study of reproductive structures of angiospermic plants.</p> <p>CO-II: Knowledge on embryology and embryological abnormalities in angiosperms.</p> <p>CO-III: Structural documentation of reproductive structures of angiosperms.</p> <p>CO-IV: Practical knowledge on developmental biology of embryo and endosperms.</p>

<p>BOT-HC-5026 Plant Physiology</p>	<p>On completion of this course, the students will be able to:</p> <p>CO-I: Knowledge on mechanisms of water, minerals and nutrient absorption of plants.</p> <p>CO-II: Knowledge on roles of plant hormones and mechanism of flowering in plants.</p> <p>CO-III: Practical knowledge on effects of growth regulators on plant parts.</p> <p>CO-IV: Practical knowledge on determination of osmotic and water potential.</p>
<p>Semester VI</p>	
<p>BOT-HC-6016 Plant Metabolism</p>	<p>On completion of this course, the students will be able to:</p> <p>CO-I: Detailed knowledge of metabolic events of photosynthesis and nutrient metabolism.</p> <p>CO-II: Knowledge of signalling molecules and pathways in the plant cell.</p> <p>CO-III: Practical knowledge on different types of chromatographic techniques.</p> <p>CO-IV: Estimation of TAN, sugar and protein contents in plant sample.</p>
<p>BOT-HC-6026 Plant Biotechnology</p>	<p>On completion of this course, the students will be able to:</p> <p>CO-I: Knowledge on applications of tissue culture techniques, construction of recombinant DNA and transformation into hosts, construction of DNA libraries.</p> <p>CO-II: Knowledge on development of transgenic plants for agricultural or industrial use.</p> <p>CO-III: Practical utility on isolation of plasmid DNA, its digestion and separation of fragments through gel electrophoresis.</p> <p>CO-IV: Preparation of media for tissue culture techniques and photographic study of plant tissue culture.</p> <p>CO-V: Photographic study of generating transgenic plants for agriculture.</p>

Course Outcomes (Botany Honours Skill Enhancement Course)

Course	Outcomes
Semester-III	
BOT-SE-3014 Biofertilizers	<p>On completion of this course, the students will be able to understand:</p> <p>CO-I: Basic knowledge on the microbes used as biofertilizer and understand the process of their isolation, identification, mass multiplication, carrier-based inoculants and knowledge on Actinorhizal symbiosis.</p> <p>CO-II: Concept on the general characteristics, isolation, mass multiplication carrier-based inoculants of <i>Azospirillum</i> and <i>Azotobacter</i> also the knowledge on the crop response to <i>Azotobacter</i>.</p> <p>CO-III: Basic knowledge on Cyanobacteria including factors affecting growth of Cyanobacteria, concept on the nitrogen fixation and use of blue green algae in rice cultivation.</p> <p>CO-IV: Brief knowledge on the Mycorrhizal association and understand the details of various types, taxonomy, occurrence, distribution and growth parameters of Mycorrhiza.</p> <p>CO-V: Details about the organic farming, maintenance and recycling of biodegradable waste material and understand the methods of making bio-compost and vermicompost with applications.</p>
Semester-IV	
BOT-SE-4014 Nursery and Gardening	<p>On completion of this course, the students will be able to understand:</p> <p>CO-I: Brief idea about objectives, scope, infrastructure and maintenance of Nursery.</p> <p>CO-II: Concept on structure, types and dormancy of seeds and brief idea about seed storage including types and process and knowledge on seed production technology.</p> <p>CO-III: Knowledge on various modes of vegetative propagation and maintenance of plants in green house.</p>

	<p>CO-IV: Brief idea about development and maintenance of gardening including scope and types and understand the various gardening operations including management of pests and diseases.</p> <p>CO-V: Detail knowledge on managements of seeds and seedlings and concept about cultivation, storage and marketing of important vegetables.</p>
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Course Outcomes (Botany Honours Discipline Specific Elective)

Course	Outcomes
Semester-V	
<p>BOT-HE-5016</p> <p>Natural Resource Management</p>	<p>On successful completion of this course, the students will be able to:</p> <p>CO-I: Comprehensive knowledge on different types of natural resources and their ecological, economical and socio-cultural values.</p> <p>CO-II: Basic understandings of land, water and forest resources.</p> <p>CO-III: Overall knowledge on resource degradation, their judicious use and management for sustainability.</p> <p>CO-IV: Knowledge on biodiversity - its importance, management and Bioprospecting.</p> <p>CO-V: Knowledge on IPR, and global arena on resource management, conservation and benefit sharing.</p> <p>CO-VI: Hands on experience on the domestic solid waste estimation and determining its impact on land degradation.</p> <p>CO-VII: Hands on experience on forest study using tools like GPS/GIS, and understanding of ecological importance of forest resources.</p>
<p>BOT-HE-5026</p> <p>Horticultural Practices and Post-Harvest Technology</p>	<p>On successful completion of this course, the students will be able to:</p> <p>CO-I: Basic understandings on Horticultural science and its importance in employment generation and socio-economic development.</p> <p>CO-II: Classification of horticultural crops, identification of potential horticultural crops – their cultivation, production, management and commercialization.</p>

	<p>CO-III: Knowledge on horticultural techniques, landscaping and gardening.</p> <p>CO-IV: Overall knowledge on post-harvest technology, disease management, and germplasm management for horticulture.</p> <p>CO-V: Field knowledge of gardening, nurseries, standing crops of horticultural importance.</p>
Semester-VI	
<p>BOT-HE-6016</p> <p>Industrial and Environmental Microbiology</p>	<p>On successful completion of this course, the students will be able to:</p> <p>CO-I: Understanding the roles of microbes in industries and environment.</p> <p>CO-II: Basic knowledge of different kinds of bioreactors and fermentation processes.</p> <p>CO-III: Knowledge on production processes of some microbial products in industries through site visits.</p> <p>CO-IV: Knowledge on application of enzymes in industries.</p> <p>CO-V: Diversity and distribution of microbes in air, water and soil.</p> <p>CO-VI: Basic understandings on water microbiology and water analysis methods.</p> <p>CO-VII: Usefulness of microbes in agriculture and bioremediation of contaminated soils.</p> <p>CO-VIII: Practical experiences on basic microbiological techniques and handlings.</p>
<p>BOT-HE-6036</p> <p>Project Work/ Dissertation</p>	<p>On successful completion of this course, the students will be able to:</p> <p>CO-I: Practical knowledge on addressing relevant scientific questions through experimentation.</p>

B.Sc.Botany General (CBCS)

Semester I

BOT-RC-1016: Biodiversity (Microbes, Algae, Fungi and Archegoniate) (Credits: Theory-06, Practical 02)

Semester II

BOT-RC-2016: Plant Ecology and Taxonomy(Credits: Theory-06, Practical 02)

Semester III

BOT-RC-3016: Plant Physiology and Metabolism(Credits: Theory-06, Practical 02)

BOT- SE-3014: Biofertilizers (Credits: 4)

Semester IV

BOT-RC-4016: Plant Anatomy and Embryology (Credits: Theory-06, Practical 02)

BOT-SE-4014: Nursery and Gardening (Credits: 4)

Semester V

BOT-SE-5014: Medicinal Botany (Credits: 4)

BOT-RE-5016: Cell and Molecular Biology (Credits: Theory-04, Practical 02)

Semester VI

BOT-SE-6024: Mushroom Culture Technology (Credits: 4)

BOT-RE-6026: Dissertation (Credits: 6)

Course Outcomes (Botany General Core papers, CBCS)

Course	Outcomes
Semester I	
BOT-RC-1016: Biodiversity (Microbes, Algae, Fungi and Archegoniate)	On successful completion of this course, the students will be able to: CO-I: Understand the origin, structure, reproduction pattern and economic importance of virus and bacteria. CO-II: Knowledge on characteristics features, classifications, reproductive mechanisms, life cycle pattern and ecology of different genera of algae and fungi. CO-III: Understand the importance/significance and mechanism of symbiotic associations of algae-fungi and fungi-higher plants. CO-IV: Knowledge on archegoniate and alternation of generations. CO-V: Knowledge on classifications, reproductive mechanisms, ecology, evolution and economic significances of bryophyte, pteridophyte and gymnosperm. CO-VI: Knowledge on T phage and TMV, lytic and lysogenic cycles of viruses. CO-VII: Know about different types of bacteria, their structure and reproduction types, gram staining procedures. CO-VIII: Knowledge on morphology, anatomy and reproductive structures of different general of algae, fungi, bryophytes, pteridophyte and gymnosperms.
Semester II	
BOT-RC-2016: Plant Ecology and Taxonomy	On successful completion of this course, the students will be able to understand: CO-I: Basic knowledge on Ecology, Know about ecological factors, law of tolerance, Adaptation of hydrophytes and xerophytes. CO-II: Knowledge on plant communities and its characteristics, processes and types of succession.

CO-III: Understand concept of ecosystem and its structure, knowledge on production and productivity in ecological pyramids, biogeochemical cycles of Carbon, Nitrogen and Phosphorus.

CO-IV: Knowledge on phytogeography and principle of biogeographical zones of India.

CO-V: Knowledge on plant taxonomy, its identification, Classification and Nomenclature.

CO-VI: Understand on plant Identification, importance of herbarium and botanical gardens of the world and India, documentation and Keys.

CO-VII: Knowledge on taxonomic evidences from palynology, cytology, phytochemistry and molecular data, understanding about taxonomic hierarchy such as ranks, categories and taxonomic groups.

CO-VIII: Knowledge on Botanical nomenclature, binominal system Principles and rules (ICN), classifications and types of classification.

CO-IX: Knowledge on characters used in taxonomy and variations of biometrics, numerical taxonomy and cladistics.

CO-X: Practical Knowledge on ecological instruments such as Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter.

CO-XI: Practical knowledge on determination of minimal quadrat size for the study of herbaceous vegetation by species area curve method.

CO-XII: Practical knowledge on Quantitative analysis of herbaceous vegetation for frequency and comparison with Raunkiaer's frequency distribution law.

CO-XII: Practical knowledge on vegetative and floral characters of plant family Brassicaceae, Solanaceae and Lamiaceae.

CO-XIII: Hands on preparation of herbarium sheet with proper mounting and pressing of dried wild plant specimen.

Semester III

<p>BOT-RC-3016:</p> <p>Plant Physiology and Metabolism</p>	<p>On successful completion of this course, the students will be able to:</p> <p>CO-I: Knowledge on different types of plant-water relationship, their significance and factors.</p> <p>CO-II: Knowledge on different mineral nutrients, their roles on plants, different types of transport and their mechanisms, knowledge on different carriers, channels and pumps.</p> <p>CO-III: Understanding phloem loading and unloading, pressure flow model.</p> <p>CO-IV: Knowledge on different types of photosynthetic pigments, Photosystem I and II, electron transport and mechanism of ATP synthesis, different types of pathways of photorespiration and carbon fixation.</p> <p>CO-V: Basic knowledge on different pathways of respiration.</p> <p>CO-VI: Knowledge on structure and properties of enzyme and their catalysis and inhibition mechanisms.</p> <p>CO-VII: Knowledge on biological nitrogen fixation and metabolism.</p> <p>CO-VIII: Knowledge on discovery and physiological roles of different plant growth regulators, Understanding plant responses to light and temperature.</p> <p>CO-IX: Knowledge on estimation of osmotic potential, Understanding on effects of light on transpiration, Basic idea on stomatal index and frequency, knowledge on enzyme activity and effect of pH, Knowledge on bicarbonate concentration and O₂ evolution in photosynthesis of some plants.</p> <p>CO-X: Understanding on Bolting, RQ and root respiration, Knowledge on auxin's role on rooting, basic idea on transpiration suction.</p>
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Semester IV

<p>BOT-RC-4016:</p> <p>Plant Anatomy and Embryology</p>	<p>On successful completion of this course, the students will be able to:</p> <p>CO-I: Understand the meristematic and permanent tissue of plants.</p> <p>CO-II: Knowledge on the structure of monocot and dicot root, stem and leaf.</p> <p>CO-III: Basic knowledge on vascular cambium, secondary growth in root and stem.</p> <p>CO-IV: Knowledge on epidermis, cuticle, stomata, adaptation in xerophytes and helophytes.</p> <p>CO-V: Knowledge on the structure of anther and pollen, structure and types of ovules, types of embryo sacs, organization and ultrastructure of mature embryo sac.</p> <p>CO-VI: Understand the mechanism of pollination and adaptations, double fertilization, seed structure, and dispersal mechanism.</p> <p>CO-VII: Knowledge on endosperm types, structure, functions, and embryo-endosperm relationship.</p> <p>CO-VIII: Basic knowledge on apomixis, polyembryony and their applications.</p> <p>CO-IX: Knowledge on meristems, parenchyma, collenchyma, sclerenchyma, xylem, phloem, anatomy of root, stem, and leaf, adaptations in xerophytes, helophytes, structure of anther, types of ovules, female gametophyte, pollination, seed dispersal embryo and endosperm.</p>
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Course Outcomes (Botany General Skill Enhancement Course)

Course	Outcomes
Semester III	
BOT-SE-3014: Biofertilizers	<p>On successful completion of this course, the students will be able to know:</p> <p>CO-I: Basic knowledge on the microbes used as biofertilizer, and understanding the process of their isolation, identification, mass multiplication, carrier-based inoculants and knowledge on Actinorrhizal symbiosis.</p> <p>CO-II: Concept on the general characteristics, isolation, mass multiplication carrier-based inoculants of <i>Azospirillum</i> and <i>Azotobacter</i> also the knowledge on the crop response to <i>Azotobacter</i>.</p> <p>CO-III: Basic knowledge on Cyanobacteria including factors affecting growth of Cyanobacteria, concept on the nitrogen fixation and use of blue green algae in rice cultivation.</p> <p>CO-IV: Brief knowledge on the Mycorrhizal association and understand the details of various types, taxonomy, occurrence, distribution and growth parameters of Mycorrhiza.</p> <p>CO-V: Details about the organic farming, maintenance and recycling of biodegradable waste material and understand the methods of making biocompost and vermicompost with application.</p>
Semester IV	
BOT-SE-4014: Nursery and Gardening	<p>On successful completion of this course, the students will be able to know:</p> <p>CO-I: Brief idea about objectives, scope, infrastructure and maintenance of Nursery.</p> <p>CO-II: Concept on structure, types and dormancy of seeds and brief idea about seed storage including types and process and knowledge on seed production technology.</p> <p>CO-III: Knowledge on various modes of vegetative propagation and maintenance of plants in green house.</p> <p>CO-IV: Brief idea about development and maintenance of gardening</p>

	<p>including scope and types and understand the various gardening operations including management of pests and diseases.</p> <p>CO-V: Detail knowledge on managements of seeds and seedlings and concept about cultivation, storage and marketing of important vegetables.</p>
Semester V	
<p>BOT-SE-5014:</p> <p>Medicinal Botany</p>	<p>On successful completion of this course, the students will be able to know:</p> <p>CO-I: Knowledge on medicinal plants and indigenous medicinal sciences/systems of India.</p> <p>CO-II: Understanding about the endangered and endemic medicinal plants, conservation issues and types.</p> <p>CO-III: Knowledge on ethno-medicinal gardens, nursery and its classifications and components.</p> <p>CO-IV: Understand ethno-botany, folk medicines and ethnic communities; Knowledge on applications of ethno-medicine/natural products for treatment of jaundice, cardiac, infertility, diabetics, blood pressure and skin diseases.</p>
Semester VI	
<p>BOT-SE-6024:</p> <p>Mushroom Culture Technology</p>	<p>On successful completion of this course, the students will be able to:</p> <p>CO-I: Understand concept of mushroom culture technology, Knowledge on edible and poisonous mushrooms, medicinal values of mushrooms and types of edible mushrooms.</p> <p>CO-II: Understand the cultivation techniques of mushrooms and factors associated with their cultivations, Knowledge on lowcost technology for mushroom production.</p> <p>CO3. Knowledge on storage and nutraceutical values of mushrooms, Understanding on food preparations and marketing of mushrooms.</p>

Course Outcomes (Botany General Discipline Specific Elective)

Course	Outcomes
Semester V	
BOT-RE-5016: Cell and Molecular Biology	<p>On successful completion of this course, the students will be able to:</p> <p>CO-I: Understand the basic principle, function and working of microscopy used in research.</p> <p>CO-II: Learn about the basics of cell and cell theory.</p> <p>CO-III: Learn about the structure, composition and function of different cell organelles.</p> <p>CO-IV: Understand the structure and functions of cell membrane, membrane proteins and carbohydrates, membrane permeability and cell wall.</p> <p>CO-V: Learn about cell cycle and its regulation at molecular level.</p> <p>CO-VI: Knowledge on history of DNA discovery, experiments related to DNA as the genetic material, structure and types of DNA and different modes of replication.</p> <p>CO-VII: Learn about types and structure of RNA, various types of RNA polymerases, basic knowledge on prokaryotic and eukaryotic translation and genetic code.</p> <p>CO-VIII: Understand about regulation of gene expression in prokaryotes and eukaryotes.</p> <p>CO-IX: Practical knowledge on prokaryotic cells (bacteria), viruses and eukaryotic cells with the help of light and electron micrographs.</p> <p>CO-X: Practical knowledge on photomicrographs of cell organelles.</p> <p>CO-XI: Practical knowledge on the structure of plant cell through temporary mounts.</p> <p>CO-XII: Practical knowledge on mitosis and meiosis.</p> <p>CO-XIII: Practical knowledge on plasmolysis and deplasmolysis.</p>

	<p>CO-XIV: Practical knowledge on micrometry.</p> <p>CO-XV: Understand the structure of nuclear pore complex by photograph and learn about special chromosomes either by slides or photographs.</p> <p>CO-XVI: Practical knowledge on micrograph study of DNA packaging.</p> <p>CO-XVII: Practical knowledge on karyotype and ideogram preparation.</p>
<p>Semester VI</p>	
<p>BOT-RE-6026: Dissertation</p>	<p>On successful completion of this course, the students will be able to:</p> <p>CO-I: Practical knowledge on addressing relevant scientific questions through experimentation.</p>