

<b>Botany</b>	
<b>Name of Course</b>	<b>Course Outcomes</b>
PHYCOLOGY AND MICROBIOLOGY Theory  BOT-A-CC-1-1-TH	<p>CO1: Learn the habitats, cell structures, life histories of algae which are the food base for majority of aquatic life and play a vital role as oxygen producer.</p> <p>CO2: Demonstrate a comprehensive idea about the structure of algal thallus structure, cell structure, life cycle patterns etc.</p> <p>CO3: Understand the criteria and the basis of classification and recognise the significant contributions of important phycologists.</p> <p>CO4: Comprehend the salient features of various divisions of alga and life histories of Chlamydomonas, Oedogonium, Chara, Ectocarpus, and Polysiphonia.</p> <p>CO5: Gather a comprehensive idea about the origin and evolution of sex in algae</p> <p>CO6: Understand the diversity and range within the world of microorganisms.</p> <p>CO7: Demonstrate a broad understanding of basics of bacterial structure, its growth pattern, mode and the process of reproduction.</p> <p>CO8: Recognize and appraise the different types of plant viruses, their translocation and transmission strategies.</p> <p>CO9: Demonstrate a grasp of the growth and life cycle of viruses and sub-viral particles like viroids, prions.</p>
PHYCOLOGY AND MICROBIOLOGY Practical  BOT-A-CC-1-1-P	<p>CO1: Handle simple and compound microscopes.</p> <p>CO2: Prepare temporary slides from algal specimens and use them to study their structure.</p> <p>CO3: Use drawing prism and find out the magnification of specimens observed under the microscope.</p>

	<p>CO4: Develop a better understanding of the morphology, reproductive structures and actual sizes of various algal specimens.</p> <p>CO5: Corroborate their theoretical knowledge after working out the algal specimens and studying the permanent slides.</p> <p>CO6: Develop knowledge of using different instruments to measure the tiny organisms.</p> <p>CO7: Identify different algae from slides.</p> <p>CO8: Learn to stain and sub-culture bacteria. Examine bacteria collected from natural habitats under the microscope.</p> <p>CO9: Develop a broader knowledge on handling lab based microbial instruments.</p> <p>CO10: Learn to explore the surrounding to observe and analyze the diversity of plants in a particular environment.</p> <p>CO11: Collect algae from natural habitat and prepare slides. Then identify the algae collected.</p> <p>CO12: Prepare report on their study of different groups of plants in their natural habitat during excursion.</p>
<p>MYCOLOGY AND PHYTO-PATHOLOGY Theory</p> <p>BOT-A-CC-1-2-TH</p>	<p>CO1: Understand the different life cycle patterns in fungi.</p> <p>CO2: Understand the different types of reproduction in fungi.</p> <p>CO3: Comprehend the concept of degeneration of sex in fungi.</p> <p>CO4: Get a broad understanding of the classification of fungi. CO5: Get an comprehensive account of the life history of the fungi genera included in the syllabus.</p>

	<p>CO6: Know about the different types of mycorrhiza.</p> <p>CO7: Understand the role of mycorrhiza in agriculture and forestry.</p> <p>CO8: Know about the different lichen types.</p> <p>CO9: Understand the economic and ecological importance of lichens.</p> <p>CO10: Understand the terms and definitions associated with Phyto Pathology</p> <p>CO11: Understand the symptoms, causal organism, disease cycle and control measure of different plant diseases.</p> <p>CO12: The students will be able to understand the host parasite interaction.</p> <p>CO13: Understand about pathotoxin and phytoalexin.</p> <p>CO14: Get information about different types of plant disease management.</p>
<p>MYCOLOGY AND PHYTO-PATHOLOGY Practical BOT-A-CC-1-2-P</p>	<p>CO1: Make temporary slide preparation of fungi.</p> <p>CO2: Recognize different identifying characters of micro and macro fungi.</p> <p>CO3: Identify different micro-fungi from permanent slides and macro fungi and lichens.</p> <p>CO3: Demonstrate a grasp of the sterilisation process, isolation of fungal pathogen from diseased leaf.</p> <p>CO4: Inoculate fruit with fungal pathogen and subculture the inoculated fruit.CO5: Develop an understanding of the different phases of life cycle among fungal pathogens of important crop diseases.</p> <p>CO6: Recognize the diversity of different macrofungi in their natural habitat.</p>

	<p>CO7: Collect macro-fungi from their natural habitat.</p> <p>CO8: Prepare a field report regarding their observation during excursion.</p>
<p>PLANT ANATOMY Theory</p> <p>BOT-A-CC-2-3-TH</p>	<p>CO1: Develop knowledge of different types of plant tissue and their function.</p> <p>CO2: Analyze different adaptations acquired by plants in different condition.</p> <p>CO3: Develop knowledge to explore the field of anatomy.</p> <p>CO4: Develop a grasp on the Plant Cell wall; Ultrastructure &amp; Chemical constituents; Plasmodesmata ultrastructure; Concept of Apoplast and Symplast; Growth and Thickening of cell wall.</p> <p>CO5: Learn anatomical structure and functions of various types of Stomata according to a) Metcalfe and Chalk, b)Stebbins and Khush.</p> <p>CO6: Differentiate between different types of Stele along with their evolutionary significance with the help of Leaf trace and leaf-gap concept.</p> <p>CO7: Develop a broad understanding of a) Primary structure of Monocot and Dicot stem and root-. b) Facts and information acquired through learning the Dorsiventral and isobilateral leaf structure.</p>
<p>PLANT ANATOMY Practical</p> <p>BOT-A-CC-2-3-P</p>	<p>CO1: Explore different staining techniques to differentiate the tissues present in plants.</p> <p>CO2: Identify different types of plant tissues</p> <p>CO3: Develop lucid information about secondary anomalous growth in different plants.</p> <p>CO4: Easily differentiate dicot and monocot root, stem and leaf from anatomical sections.</p> <p>CO5: Will be able to identify different microscopic anatomical structures.</p>

	<p>CO6: Develop an understanding of adaptive anatomical features.</p>
<p>ARCHAEGONIATE Theory  BOT-A-CC-2-4-TH</p>	<p>CO1: Understand the criteria and basis of the classification of bryophytes, pteridophytes and gymnosperms</p> <p>CO2: Understand the life histories of some bryophyte, pteridophyte and gymnosperm genera as per syllabus.</p> <p>CO3: Understand the importance of bryophytes, pteridophytes and gymnosperms</p> <p>CO4: Understand the general characteristics and adaptations to land habit.</p> <p>CO5: Understand about the colonisation of early land vascular plants and its implications.CO6: Get an idea of the origin of Alternation of Generations.</p> <p>CO7: Understand about the evolution of Sporophytes.</p> <p>CO8: Understand the Telome concept and its significance in the origin of different groups of Pteridophytes</p> <p>CO9: Know about Heterospory and Origin of Seed habit</p> <p>CO10: Understand the diagnostic features of Progymnosperms</p>
<p>ARCHAEGONIATE Practical  BOT-A-CC-2-4-P</p>	<p>CO1: Will to distinguish between different genera of bryophytes, pteridophytes and gymnosperms based on their morphological study.</p> <p>CO2: Study various features of bryophytes, pteridophytes and gymnosperms from macro and micro specimens.</p> <p>CO3: Prepare sections of different bryophyte and pteridophyte genera in the syllabus and make slides.</p>

	<p>CO4: Work out the reproductive structures of select Bryophytes and Pteridopytes</p> <p>CO5: Use the slides for study of the genera,</p> <p>CO6: Explore and identify different archaegoniate in their natural habitat and prepare report on it.</p>
<p>PALAEOBOTANY AND PALYNOLOGY Theory</p> <p>BOT-A-CC-3-5-TH</p>	<p>CO1: Develop knowledge about the Geological time scale and the dominant plants groups through ages</p> <p>CO2: Differentiate between different types of fossils</p> <p>CO3: Develop a broad understanding about the different modes of preservation</p> <p>CO4: Develop a broad understanding of different conditions for fossilization</p> <p>CO5: Know different principles of fossil nomenclatures and reconstructions</p> <p>CO6: Develop knowledge about the dating of fossils</p> <p>CO7: Understand the importance of fossil study</p> <p>CO8: Learn about the structural features, geological distribution and evolutionary significance of different groups of fossil pteridophytes</p> <p>CO9: Learn about the structural features, geological distribution of different groups of fossil gymnosperm</p> <p>CO10: Develop knowledge about the Indian Gondwana system and the index fossils</p> <p>CO11: Differentiate between spores and pollens</p> <p>CO12: Know about different types of pollen aperture and ornamentation types</p> <p>CO13: Understand NPC system of pollens classification</p> <p>CO14: Learn about the sporopollenin contents of</p>

	<p>pollen wall</p> <p>CO15: Develop concepts on different applied branches of palynology viz. Palaeopalynology, Aeropalynology, Forensic Palynology and Melissopalynology</p>
<p>PALAEOBOTANY AND PALYNOLOGY Practical</p> <p>BOT-A-CC-3-5-P</p>	<p>CO1: Identify different type of Index fossils viz. Glossopteris and Ptilophyllum</p> <p>CO2: Differentiate the anatomical parts (TS of Stem) of different groups of fossil plants viz. Rhynia, Lepidodendron, Calamites, Lyginopteris and Cordaites.</p> <p>CO3: Recognize the major types of living pollens viz. colpate, colporate and porate types</p>
<p>REPRODUCTIVE BIOLOGY OF ANGIOSPERMS Theory</p> <p>BOT-A-CC-3-6-TH</p>	<p>CO 1: To gain a detailed knowledge on reproductive biology of angiosperms</p> <p>CO 2: To understand the molecular mechanism of flowering.</p> <p>CO 3: Recognize the different types of inflorescence.</p> <p>CO 4: Recognize the different types of fruit.</p> <p>CO 5: Understand the pre and post fertilization process</p> <p>CO 6: Understand the fertilization process in angiosperms.</p> <p>CO 7: Understand apomixis and polyembryony</p> <p>CO8: Understand the scope &amp; importance of Embryology</p>
<p>REPRODUCTIVE BIOLOGY OF ANGIOSPERMS Practical</p> <p>BOT-A-CC-3-6-P</p>	<p>CO 1: Recognise different types of inflorescence, flowers and fruits.</p> <p>CO 2: Study and understand different types of ovules.</p> <p>CO 3: Get an comprehensive idea of angiosperm reproductive units in their natural habitat during field</p>

	study
<p>PLANT SYSTEMATICS Theory</p> <p>BOT-A-CC-3-7-TH</p>	<p>CO 1: Understand the comparative account among the families of angiosperms.CO 2: Understand the distinguishing features of angiosperm families.</p> <p>CO 3: Understand rules and applications of ICN.</p> <p>CO 4: Have an understanding of Phenetics and Cladistics</p> <p>CO 5: Have an understanding about the data sources in Taxonomy</p> <p>CO 6: Get an comprehensive idea of Herbaria and Botanical garden</p> <p>CO7: Understand the different systems of taxonomic classification of plants proposed by different renowned taxonomist</p>
<p>PLANT SYSTEMATICS Practical</p> <p>BOT-A-CC-3-7-P</p>	<p>CO1: Work out, draw, describe plants belonging to different angiospermic families in the syllabus.</p> <p>CO2: Able to draw the floral diagram and write floral formula.</p> <p>CO3: Identify upto genus with the help of suitable literature of wild plants for plants belonging to different angiospermic families in the practical syllabus.</p> <p>CO4: Identify common wild plants from families included in theoretical syllabus.</p> <p>CO5: Visit the AJCBIBG during excursion and get an idea of plant diversity.</p> <p>CO6: Participate in excursions and collect plant specimens.</p> <p>CO7: Make herbarium specimens.</p> <p>CO8: Learn how to arrange herbarium specimens</p>

	<p>according to Bentham &amp; Hooker's system of classification.</p> <p>CO9: Maintain a field diary and write a field report CO10: Learn how to find out author citations.</p>
<p>PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION Theory</p> <p>BOT-A-CC-4-8-TH</p>	<p>CO1: Know about the Phytogeographical regions of India.</p> <p>CO2: Get an idea on the dominant flora of Eastern and Western Himalaya &amp; Sunderban.</p> <p>CO3: Understand Endemism and its theories.</p> <p>CO4: Develop understanding on Population and Community ecology</p> <p>CO5: Get an idea on plant indicators.</p> <p>CO6: Understand phytoremediation.</p> <p>CO7: Understand different levels of biodiversity and conservation measures.</p> <p>CO8: Comprehend about biological hotspots</p> <p>CO9: Understand the different theories of evolution</p> <p>CO10: Know about speciation and co-evolution.</p> <p>CO11: Understand the simplified phylogeny of bacteria, algae, fungi, bryophyte, pteridophyte and gymnosperms.</p>
<p>PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION Practical</p> <p>BOT-A-CC-4-8-P</p>	<p>CO1: Study of community structure by quadrat method and determine minial size. Be able to calculate frequency, density and abundance.</p> <p>CO2: Be able to do a comparative anatomical studies of leaves form polluted and less polluted areas.</p> <p>CO3: Study of local flora during local excursion.CO4: During long excursion visit a different phytogeographical region.</p>

	<p>CO5: Make a submission of a project report highlighting phytogeographical characteristics of the region visited during excursion.</p> <p>CO6: Measure dissolved O<sub>2</sub> by azide modification of Winkler's method.</p> <p>CO7: Compare free CO<sub>2</sub> from different sources.</p>
<p>ECONOMIC BOTANY Theory  BOT-A-CC-4-9-TH</p>	<p>CO 1: Understand the role plants in human welfare</p> <p>CO 2: Know importance of plants &amp; plant products</p> <p>CO 3: Know about Vaivov's Centres of crop origin</p> <p>CO 4: Understanding of different aspects of Tea including its morphology, processing and uses</p> <p>CO 5: Knowledge on Classification, extraction and processing of different fatty oil and how they are different from essential oils</p> <p>CO 6: Develop a significant grasp on processing techniques with respect to Cotton and Jute</p> <p>CO 7: : Develop a lucid knowledge on origin, morphology, processing and uses of Rice, Wheat, Jute and some legumes</p> <p>CO 8: Explore the gram and mung bean and their relationship with man.</p> <p>CO9: Study fibre following maceration technique.</p>
<p>ECONOMIC BOTANY Practical  BOT-A-CC-4-9-P</p>	<p>CO 1: Perform microchemical tests</p> <p>CO 2: Have comprehensive knowledge on diversified characteristics of therapeutic drugs with special reference to Cinchona, Digitalis, Papavar, Cannabis and Tobacco</p> <p>CO 3: Gain knowledge of different biochemical test such as tannin, lignin, fat and other micro-chemical tests</p>

<p>Genetics Theory</p> <p>BOT-A-CC-4-10-TH</p>	<p>CO1: Have conceptual understanding of Mendelian genetics and its extension.</p> <p>CO2: To understand the different types of Linkage, detection and molecular mechanism of crossing over, gene mapping methods with problems. Understand Molecular mapping – ISH, FISH.</p> <p>CO3: Gain knowledge about epistasis and polygenic inheritance.</p> <p>CO4: Understand the fundamentals of Aneuploidy and Polyploidy.</p> <p>CO5: Comprehend the effect of chromosomal abnormalities/aberration in numerical as well as structural changes.</p> <p>CO6: Get a detailed understanding of mutations.</p> <p>CO7: Develop critical understanding of Structural organisation of Gene.</p> <p>CO8: Understand Homoeotic gene in plants with reference to ABCE Quartet model of flowering.</p>
<p>Genetics Practical</p> <p>BOT-A-CC-4-10-P</p>	<p>CO1: Gain knowledge on chromosome preparation, Pre-treatment, fixation, staining, squash and smear preparation, preparation of permanent cytology slides.</p> <p>CO2: Determine mitotic index and frequency of different mitotic stages in pre-fixed root of <i>Allium cepa</i>.</p> <p>CO3: Study of mitotic chromosome specimens from root tips: <i>Allium cepa</i>, <i>Aloe vera</i>, <i>Lens esculenta</i></p> <p>CO4: Study of chromosomal aberrations developed due to exposure to pollutants and pesticides.</p> <p>CO5: Perform hands on experiments of meiotic chromosome using flower buds of <i>Allium cepa</i> and <i>Setcreasea sp</i></p> <p>CO6: Identify different mototic &amp; meiotic stages from</p>

	permanent slides
CELL AND MOLECULAR BIOLOGY Theory BOT-A-CC-5-11-TH	<p>CO1: Develop a thorough understanding of the evolution of nucleic acid, RNA world, ribozymes, first cell, origin of eukaryotic cell, small RNA- riboswitch, RNA interference, siRNA, mi RNA, Organellar DNA.</p> <p>CO2: Develop thorough knowledge of nuclear envelope, nuclear lamina and nuclear pore complex, nucleolus-ultrastructure, ribosome biogenesis, chromatin ultrastructure, DNA packaging in eukaryotic chromosome, centromere in details.</p> <p>CO3: They develop a strong fundamentals basics for Cell cycle in detail followed by its regulation and checkpoints involved, Apoptosis.</p> <p>CO4: Gain an understanding of central dogma, DNA Replication, transcription, translation both in Prokaryotes &amp; Eukaryotes.</p> <p>CO5: Understand the concept of Lac-operon, positive and negative control in gene regulation.</p> <p>CO6: Have knowledge about Genetic code properties, evidence, exceptions, decipher of genetic code (Binding technique).</p> <p>CO7: Understand the world of Recombinant DNA technology, restriction endonuclease, Vector (plasmid pBR 322),marker gene, cloning technique, PCR and its application, Genomic DNA and cDNA library.</p> <p>CO8: Develop critical understanding of development and causes of Cancer, tumor suppressor gene and oncogene.</p>
CELL BIOLOGY Practical BOT-A-CC-5-11-P	<p>CO1. Study of plant cell structure with the help of epidermal peel mount of using Allium cepa, Rhoeo, Crinum.</p> <p>CO2. Measurement of cell size by the technique of micrometry.</p> <p>CO3. Counting cells per unit volume with the help of</p>

	<p>haemocytometer (Yeast, pollen grains)</p> <p>CO4. Cytochemical staining of DNA- Pyronine-methyl green staining.</p> <p>CO5. Estimation of DNA content through DPA staining.</p> <p>CO6. Estimation of RNA through orcinol method.</p> <p>CO7. Study of nucleolus through hematoxylin and orcin staining and determination of nucleolar frequency using <i>Allium cepa</i>.</p> <p>CO8. Preparation of models, charts on rolling circle, theta replication, semi-discontinuous replication, prokaryotic RNA polymerase and eukaryotic RNA polymerase II, assembly of spliceosome machinery, splicing mechanism in group I and group II introns, ribozyme and alternative splicing.</p>
<p>BIOCHEMISTRY Theory</p> <p>BOT-A-CC-5-12-TH</p>	<p>CO1: Understand different Biochemical Foundations.</p> <p>CO2: Gain knowledge about the Molecules of life viz. DNA, RNA and proteins.</p> <p>CO3: Comprehend Energy flow and enzymology.</p> <p>CO4: Understand Membrane chemistry</p> <p>CO5: Understand Phosphorylation</p>
<p>BIOCHEMISTRY Practical</p> <p>BOT-A-CC-5-12-P</p>	<p>CO 1: Learn to detect protein &amp; carbohydrate from plant samples, different elements from plant ash samples</p> <p>CO2: Learn to detect organic acids: citric, tartaric, oxalic and malic from laboratory samples</p> <p>CO3: Learn to detect the nature of carbohydrate – glucose, fructose, sucrose and starch from laboratory samples.</p>

	<p>CO4: Learn to estimate quantitatively Glucose, amino nitrogen &amp; protein.</p> <p>CO5: Estimate of titratable acidity from lemon.</p> <p>CO6: Estimate of urease activity in plant samples</p> <p>CO7: Perform the Colorimetric estimation of protein by Folin phenol reagent</p> <p>CO8: Prepare solutions and buffers</p>
<p>PLANT PHYSIOLOGY Theory</p> <p>BOT-A-CC-6-13-TH</p>	<p>CO1: Understand Plant-water relations</p> <p>CO2: Get an idea about Mineral nutrition</p> <p>CO3: Understand Organic Translocation</p> <p>CO4: Get a comprehensive account of Plant Growth Regulators</p> <p>CO5: Photomorphogenesis</p> <p>CO6: Understand Seed dormancy, Senescence and Ageing</p>
<p>PLANT PHYSIOLOGY Practical</p> <p>BOT-A-CC-6-13-P</p>	<p>CO1: Determination of loss of water per stoma per hour.</p> <p>CO2: Know the Relationship between transpiration and evaporation.</p> <p>CO3: Measure osmotic pressure of storage tissue by weighing method.</p> <p>CO4: Measure osmotic pressure of Rhoeo leaf by plasmolytic method.</p> <p>CO5: Study the Effect of temperature on absorption of water by storage tissue and determination of Q10.</p> <p>CO6: Find out the Rate of imbibition of water by starchy, proteinaceous and fatty seeds and effect of seed coat.</p> <p>CO7: To study the phenomenon of seed germination</p> <p>CO8: To study the induction of amylase activity in</p>

	<p>germinating grains.</p> <p>CO9: To study the effect of different concentrations of IAA on Avena coleoptile (IAA Bioassay).</p>
<p>PLANT METABOLISM Theory</p> <p>BOT-A-CC-6-14-TH</p>	<p>CO1: Understand the Concept of metabolism.</p> <p>CO2: Understand in depth Photosynthesis</p> <p>CO3: Understand in depth Respiration</p> <p>CO4: Understand Nitrogen Metabolism</p> <p>CO5: Understand Lipid metabolism</p>
<p>PLANT METABOLISM Practical</p> <p>BOT-A-CC-6-14-P</p>	<p>CO1: Understand different types of chromatography.</p> <p>CO2: Separation of plastidial pigments by solvent and paper chromatog</p> <p>CO3: Perform Measurement of oxygen uptake by respiring tissue</p> <p>CO4: Determination of the RQ of germinating seeds.</p>
<p>APPLIED PHYCOLOGY, MYCOLOGY AND MICROBIOLOGY</p> <p>BOT-A-SEC-A-3-1</p>	<p>CO1: They learn different applied aspects of Phycology, Mycology &amp; Microbiology.</p> <p>CO2: Learn about industrial production of SCP, algal biodiesel, microbial enzymes, vinegar. They will also get an idea about the job potential in these fields.</p>
<p>MUSHROOM CULTURE TECHNOLOGY</p> <p>BOT-A-SEC-B-4-4</p>	<p>CO1: Understand the nutritional and medicinal value of edible mushrooms.</p> <p>CO2: Study about the cultivation and storage of different mushroom species.</p> <p>CO3: Understand the food preparation process.</p>
<p>Biostatistics Theory</p> <p>BOT-A-DSE-A-5-1-TH</p>	<p>CO1: Understand statistical methods, basic principles and variables.</p>

	<p>CO2: Understand Data, Sample, Population, Random sampling, Frequency distribution.</p> <p>CO3: Calculate Arithmetic Mean, Mode and Median from data.</p> <p>CO4: Understand multiplicative and additive rules of probability along with the application and importance of probability.</p> <p>CO5: Measure gene frequency with Hardy-Weinberg equilibrium</p>
<p>Biostatistics Practical</p> <p>BOT-A-DSE-A-5-1-P</p>	<p>CO1: Do Univariate analysis of statistical data</p> <p>CO2: Calculate correlation coefficient values and finding out the probability</p> <p>CO3: Determine goodness of fit in Mendellian and modified mono-and dihybrid ratios</p> <p>CO4: Calculation of 'F' value and finding out the probability value for the F value</p> <p>CO5: Develop a basic idea of computer programme for statistical analysis.</p>
<p>MEDICINAL AND ETHNOBOTANY Theory</p> <p>BOT-A-DSE-A-6-3-TH</p>	<p>CO1: Get a general idea of Medicinal botany.</p> <p>CO2: Get a comprehensive idea about Pharmacognosy.</p> <p>CO3: Understand the Interrelationship of basic metabolic pathways with secondary metabolite biosynthesis.</p> <p>CO4: Get information on Pharmacologically active constituents with the Source plants, parts used and uses.</p> <p>CO5: Get information on Ethnobotany and folk medicine</p>
MEDICINAL AND	CO1: Perform Chemical tests for tannin and alkaloid.

<p>ETHNOBOTANY Practical</p> <p>BOT-A-DSE-A-6-3-P</p>	<p>CO2: Do Powder microscopy</p> <p>CO3: Perform Histochemical tests</p>
<p>PLANT BIOTECHNOLOGY Theory</p> <p>BOT-A-DSE-B-5-5-TH</p>	<p>CO1: Get information on different tissue culture techniques.</p> <p>CO2: Get a Brief concept of different gene transfer methods</p>
<p>PLANT BIOTECHNOLOGY Practical</p> <p>BOT-A-DSE-B-5-5-TH</p>	<p>CO1: Familiarization of basic equipment in plant tissue culture</p> <p>CO2: Preparation of basal media. Sterilization techniques.</p>
<p>Natural resource management Theory</p> <p>BOT-A-DSE-B-6-8-TH</p>	<p>CO1: Develop a brief idea about our natural resources.</p> <p>CO2: Understand the threats and management strategies of different types of natural resources.</p> <p>CO3: Get a brief idea on contemporary practices in resource management.</p> <p>CO4: Get information on National and international efforts in resource management and conservation</p>
<p>Natural resource management Practical</p> <p>BOT-A-DSE-B-6-8-TH</p>	<p>CO1: Estimation of solid waste generated by a domestic system(biodegradable and nonbiodegradable) and its impact on land degradation.</p> <p>CO2: Estimate foliar dust deposition</p> <p>CO3: Determine total solid in water (TDS)</p> <p>CO4: Determine chemical properties of soil by rapid spot test (carbonate, iron, nitrate).</p> <p>CO5: Estimate organic carbon percentage present in soil sample.</p> <p>CO6: Collect data on forest cover of specific area.</p>

Botany General Course Outcomes	
PLANT DIVERSITY I (PHYCOLOGY, MYCOLOGY, PHYTOPATHOLOGY, BRYOPHYTES AND ANATOMY) Theory  BOT-G-CC-1-1-TH	CO1: Get an introduction to different plant groups  CO2: Understand Phytopathology  CO3: Learn about plant anatomy.
PLANT DIVERSITY I (PHYCOLOGY, MYCOLOGY, PHYTOPATHOLOGY, BRYOPHYTES AND ANATOMY) BOT-G-CC-1-1-P	CO1: Work out: Microscopic preparation, drawing and labelling of Chlamydomonas, Chara, Ectocarpus, Rhizopus and Ascobolus ANATOMY) CO2: Perform Anatomical slides following double staining method.
PLANT DIVERSITY II (PTERIDOPHYTES, GYMNOSPERMS, PALAEOBOTANY, MORPHOLOGY AND TAXONOMY) Theory  BOT-G-CC-2-2-TH	CO1: Understand the diagnostic characters of different groups  CO2: Understand the life cycle of different genera in syllabus.  CO3: Understand the fossilization process and factors of fossilization  CO4: Get an idea about Angiosperm Morphology  CO5: Understand the Diagnostic features of some angiosperm families
PLANT DIVERSITY II (PTERIDOPHYTES, GYMNOSPERMS, PALAEOBOTANY, MORPHOLOGY AND TAXONOMY) Practical  BOT-G-CC-2-2-P	CO1: Dissect, drawing, label and describe angiospermic plants mentioned in syllabus.  CO2: Identify Anatomical slides  CO3: Learn to spot identify plants.  CO4: Participate in excursion and get to know all groups of plants in their natural habitats.
CELL BIOLOGY, GENETICS AND	CO1: Understand the Ultrastructure of nuclear envelope, nucleolus and their functions

<p>MICROBIOLOGY Theory</p> <p>BOT-G-CC-3-3-TH</p>	<p>CO2: Understand Chromosomal aberrations</p> <p>CO3: Learn about central dogma, genetic code, linkage groups</p> <p>CO 4: Learn about mutations.</p> <p>CO5: Understand about split genes and transposons.</p> <p>CO6: Know about the discovery, general structure, replication of virus.</p>
<p>CELL BIOLOGY, GENETICS AND MICROBIOLOGY Practical</p> <p>BOT-G-CC-3-3-P</p>	<p>CO1: Stain (Aceto-orcein) and squash preparation of onion root tip for study of mitotic stages and mitotic index.</p> <p>CO2: Gram staining with curd.</p> <p>CO 3: Identification of Cytological slides of different mitotic and meiotic stages</p>
<p>PLANT PHYSIOLOGY AND METABOLISM Theory</p> <p>BOT-G-CC-4-4-TH</p>	<p>CO1: Understand the Primary, secondary and tertiary structure of protein.</p> <p>CO2: Understand structure of Nucleic acid</p> <p>CO3: Understand Transport in plants, Transpiration, photosynthesis, Respiration, nitrogen metabolism, Plant Growth regulators, Photoperiodism and Senescence</p>
<p>PLANT PHYSIOLOGY AND METABOLISM Practical</p> <p>BOT-G-CC-4-4-P</p>	<p>CO1: Determine of transpiration rate per unit</p> <p>CO2: Do experiment on Plasmolysis</p> <p>CO3: Perform Imbibition of water by dry seeds – proteinaceous and fatty seeds.</p> <p>CO 4: Evolution of O<sub>2</sub> during photosynthesis (using graduated tube).</p> <p>CO 5: Evolution of CO<sub>2</sub> during aerobic respiration and measurement of volume.</p>

<p>SEC BIOFERTILIZERS BOT-G-SEC-A-3/5-2</p>	<p>CO1: Get an comprehensive idea about different biofertilizers.</p> <p>CO2: Understand Mycorrhizal association.</p> <p>CO3: Get detailed information on Organic farming.</p>
<p>DSE PHYTOCHEMISTRY AND MEDICINAL BOTANY Theory BOT-G-DSE-A-5-1-TH</p>	<p>CO1: Get a general idea of Medicinal botany.</p> <p>CO2: Get a comprehensive idea about Pharmacognosy.</p> <p>CO3: Understand Organoleptic evaluation of crude drugs.</p> <p>CO4: Know about Pharmcologically active constituents with their Source plants</p> <p>CO5: Get an idea about Ethnobotany and folk medicine</p>
<p>PHYTOCHEMISTRY AND MEDICINAL BOTANY Practical BOT-G-DSE-A-5-1-P</p>	<p>CO1: Identification of medicinal plants</p> <p>CO2: Perform Qualitative test for proteins and carbohydrates, reducing and non reducing sugars.</p> <p>CO3: Make an Acquaintance with laboratory instruments.</p> <p>CO4: Participate in excursion and make a list of medicinal plants found locally.</p>
<p>DSE A NATURAL RESOURCE MANagements Theory BOT-G-DSE-A-5-2-TH</p>	<p>CO1: Brief idea about our natural resources.</p> <p>CO2: Understand the threats and management strategies of different types of natural resources.</p> <p>CO 3: Learn about EIA and waste management</p>
<p>NATURAL RESOURCE MANagements Practical BOT-G-DSE-A-5-2-P</p>	<p>CO1: Estimation of solid waste generated by a domestic system.</p> <p>CO2: Measure dominant woody species by DBH (diameter at breast height).</p>

	<p>CO3: Study of community structure by Quadrat method and determination of minimal size of quadrat, frequency density and abundance of components</p> <p>CO4: Measurement of dissolved O<sub>2</sub> by azide modification of Winkler's method.</p> <p>CO5: Determination of chemical properties of soil by rapid spot test.</p>
<p>DSE B ECONOMIC BOTANY Theory  BOT-G-DSE-B-6-3-TH</p>	<p>CO 1: Understand the Origin of cultivated plants:</p> <p>CO2: Understand the origin, morphology and uses of rice, legume and beverage.</p> <p>CO3: Study of the following economically important plants (Scientific names, families, parts used and importance)</p>
<p>ECONOMIC BOTANY Practical By  BOT-G-DSE-B-6-3-P</p>	<p>CO1: Study of economically important plants (rice/jute/ tea) through herbarium specimens and field study.</p> <p>CO 2: Study of cultivation practices in field and submission of report.</p> <p>CO 3: Study of local economically important plants and submission of report with photographs.</p>