

## COURSE OUTCOMES (CO)

Sem ester	Course Code	Name of Course	Course Objectives
I	MBOTCC-1	Phycology, Mycology & Bryology	<p>CO1 Know the salient features, diversity and phylogeny of algae, fungi, lichen and bryophytes.</p> <p>CO 2 Outline the position of algae, fungi and bryophytes in latest classification system.</p> <p>CO 3 List the morphological and anatomical characters of the group and give examples of each group.</p> <p>CO 4 Understand the life cycles of selected genera.</p> <p>CO 5 Learn about the economic and ecological importance.</p> <p>CO 6 Understand the evolutionary tendencies in</p>

		<p>the algae, fungi and bryophytes.</p> <p>CO7 Able to arrange various taxonomic groups as per their evolutionary features.</p>
MBOTCC-2	Microbiology & Plant Pathology	<p>CO 1 Understand the biodiversity, salient and distinguishing features of microbes and Plant pathogens.</p> <p>CO 2 Know the economic importance of microbes and plant pathogens.</p> <p>CO 3 Understand the scope and importance of Plant Pathology and Microbiology.</p> <p>CO 4 Know the etiology and control measures of plant diseases.</p> <p>CO 5 Know General microbiology-techniques.</p> <p>CO 6 Get the knowledge on industrial and agricultural microbiology.</p>
MBOTCC—3	Pteridophyta, Gymnosperm & Paleobotany	<p>CO 1 Outline the position of Pteridophytes and Gymnosperms in latest classification.</p> <p>CO 2 Classify the specimens and associate them with salient features, distribution, morphology, anatomy and reproductive structures of their respective orders.</p> <p>CO 3 Examine the morphological and anatomical characters of the specimens and illustrate the life cycle strategies. Interpret evolution of pteridophytes.</p> <p>CO 4 Give an understanding of geological time scale, fossilization process, classification and nomenclature of fossil plants, techniques in studying fossils.</p>
MBOTCC—4	Practical 1 (Based on MBOTCC 1, 2 & 3)	<p>CO 1 Hands on training to students on the topics related to Paper 1, 2, 3.</p> <p>CO 2 Understand the morphological diversity of different plant forms.</p> <p>CO 3 Identify and Classify the specimens and associate them with salient features,, anatomy and reproductive structures.</p> <p>CO 4 Compare and organize fossil groups using their distinctive features</p> <p>CO 5 To learn about preparation and sterilization of various microbial culture media and inoculation.</p>
MBOTAEC-1	Environmental Sustainability & Swachchha Bharat	<p>CO 1 Students will do assignments/project work related to institutional social responsibilities</p>

SEMESTER II

	Abhiyan Activities	
MBOTCC-5	Biofertilizer Technology	<p>CO1 Isolation, purification and mass production of biofertilizer inoculants- cyanobacteria, nitrogen fixing bacteria and other microbes.</p> <p>CO2 Application of different biofertilizer inoculants.</p> <p>CO 3 Shelf life, Quality control, and marketing of various biofertilizers.</p> <p>CO4 Understand and analyse soil fertility , process and organic matter decomposition.</p> <p>CO5 Learn and understand application, production and concepts of Vermicompositing</p>
MBOTCC-6	Taxonomy & Anatomy & Embryology	<p>CO 1 Understand the status of angiosperms in plant kingdom and origin of angiosperms.</p> <p>CO 2 Study various systems of classification and angiosperm families emphasizing their morphology, distinctive features and biology and Know their economic importance.</p> <p>CO 3 Understand various branches of taxonomy like chemotaxonomy, cytotaxonomy, Numerical Txonomy etc.</p> <p>CO 4 Understand the scope of anatomy in taxonomyand phylogeny.</p> <p>CO 5 Know various types of tissue systems. Understand normal and anomalous secondary growth in plants.</p> <p>CO 6 Understand structure and development of plant reproductive organs,</p> <p>CO7 Understand microsporogenesis and megasporogenesis and, development of male and female gametophytes. Know the process of fertilization, endosperm and embryogeny.</p>
MBOTCC-7	Physiology & Biochemistry	<p>CO1. Understand detail knowledge about the physiology of flowering, senescence and abscission in plants and dormancy of seed, Phytochrome, Biological rhythm</p> <p>CO2. Understand the basic physiological relationship of Plant, water and soil and translocation of organic solutes Mechanism of stomatal transpiration.</p> <p>CO3. Understand the detail knowledge about the biochemistry and physiology of photosynthesis, c respiration i.e., breakdown of sugar: Glycolysis, Kreb’s cycle, electron transport chain, ATP formation,</p>

		<p>photorespiration.</p> <p>CO4 To gather the detail knowledge about Nitrogen metabolism and physiological role of phytohormones in the growth and development of plants</p> <p>CO5. To get detail Biochemical knowledge about carbohydrate, protein, lipids, vitamins and enzymes as well as uses of various vitamins as coenzymes</p>
	MBOTCC—8 Plant tissue culture, Ethanobotany, Biodiversity & Biometry	<p>CO 1 Understand various techniques, equipments for culturing plant tissues on aseptic media. Learn about different plant tissue- cultures.</p> <p>CO 2 Students may know the uses of unknown plants used by the tribal, ethnic people of the socieity with ethanobotanical uses.</p> <p>CO 3 To Evaluate the origin and application of traditional medicine system.</p> <p>CO 4 To Learn about biodiversity concept, use of biodiversity, conservation categories, and economic value of biodiversity.</p> <p>CO 5 To understand the importance and scope of statistical methods in experiments.</p> <p>CO 6 To learn various statistical methods, formulas to analyze different experiments as well as principles of designs of experiments.</p>
	MBOTCC-9 Practical 2 (Based on MBOTCC 5, 6, 7 & 8)	<p>CO1 Mount preparation of TS sections of anomalous stems</p> <p>CO2 Experiments and estimation of different biomolecules like Protein etc.</p> <p>CO3 Pigment and biomolecules separation and estimation by chromatography techniques.</p> <p>CO4 Media preparation for tissue culture.</p> <p>CO5 Experiments on medicinal plants.</p>
	MBOTAEC—1 /SEC- I Ability Enhancing Elective course selected from Basket	<p>CO 1 Student can opt vrom different subjects like Biofertilizer Technology, Solid Waste Management, Mushroom culcture, Yoga , environmental law etc.</p>
<b>SEMES</b>	MBOTCC—10 Cell Biology & Cytogen etics	<p>CO1 Compare the knowledge of Ultrastructure and chemicalcompositionofthe cell organelles.</p> <p>CO2. To understand basic principles of Mendelian inheritance, deviation from mendelian laws andcelldivision&amp;chromosome segregation.</p>

		<p>CO 3 To acquire the understanding on chromosome structure, chromatin organization and variation. To learn the concepts of Linkage concept of sex determination and sex linked inheritance</p> <p>CO4 To gain knowledge about the organellar inheritance, Mutations and Population Genetics</p> <p>CO 5 To attain the Concepts of microscopy..</p>
MBOTCC-11	Molecular Biology	<p>CO 1 Understand the Genome organization,</p> <p>CO 2 To develop of basic concepts in DNA/RNA structure, Replication, Repair &amp; Recombination.</p> <p>CO 3 Knowledge of transcription and translation in prokaryotic and eukaryotic system</p> <p>CO4. Development of concepts of gene control.</p>
MBOTCC-12	Recombinant DNA Technology	<p>CO-1 Explain the role of molecular tools and cloning vectors in genetic engineering</p> <p>O-2 Describe the techniques of genetic engineering.</p> <p>CO-3 Discuss the different types of blotting techniques</p> <p>CO-4 Explain the tools and techniques adopted in amplification of DNA</p> <p>CO-5 Understand different kinds of recombinant screening strategies</p> <p>CO 6 Explain gene therapy methods and its application</p>
MBOTCC-13	Plant Ecology & Environmental Science	<p>CO1. To highlight the students with some basic understandings of conservation ecology its principles, postulates and ethics. The students will also get an idea of protected area networks and their management, Biodiversity act and biodiversity action plan. Finally students will also learn about some practical case studies on conservation/management strategy in India.</p> <p>CO2. Designed to give an understanding of, what is a natural resource, types of resources, natural resources degradation and its conservation. The students will also have an understanding on shifting cultivation, coal mining and also the various environmental problems of northeast India and its ecological implication and also about sustainable development.</p> <p>CO3. It has been designed to impart an understanding on global environmental problems such as ozone depletion, global warming, greenhouse effect, different greenhouse gases, acid rain, climate change and its</p>

		<p>ecological consequences</p> <p>CO4. Deals with the understanding of phyto-geographical regions of India. Understanding on biodiversity hotspots and endemism.</p>	
MBOTCC-14	Practical 3 (Based on MBOTCC 10, 11. 12 & 13)	<p>CO1 Study of meiosis and mitosis, Karyotyping and chiasma frequency.</p> <p>CO2 To analysis by spectrophotometry.</p> <p>CO3 To study mutant analysis experiments.</p> <p>CO4 Field experiments on study of density, frequency etc of vegetation in ecological studies. Estimation of Water pollution by different experiments.</p> <p>CO5 Nucleic Acid extraction, purification and separation techniques.</p> <p>CO6 Study of adaptation strategies by various plants.</p>	
MBOTAEC-2	Human Values & Professional Ethics and Gender sensitization	<p>CO1 Project on the topic to educate student on core moral values</p> <p>CO2 Sensitize with gender equity and equality.</p> <p>CO3 Understand Human values and Professional Ethics for fair practices.</p>	
SEMESTER IV	MBOTEC-1	Cytogenetics and Crop improvement	<p>CO1 knowledge and concept development of haploid role in crop improvement and cyto genetics.</p> <p>CO2 Learn speciation, Evolution, Banding techniques, Mutation, mutagenesis and their role in crop improvement.</p> <p>CO3 Understand transposition, terminator gene and its use in genetic variation and crop improvement.</p> <p>CO4 Learn breeding, eugenics, maternal inheritance concepts and applications.</p> <p>CO5 Role of cytogenetics in crop improvement is taught in detail.</p>
	MBOTEC-2	Applied Microbiology and Plant Pathology	<p>CO1 Learn role of microorganisms in industrial processes like fermentation technology, Brewing etc.</p> <p>CO2 Understand metabolites, enzymes etc. produced by microorganism and their applications.</p> <p>CO3 Concept and understanding of microbes in bioremediation is taught.</p> <p>CO4 Basic concepts of IPM, plant pathology are provided to students.</p> <p>CO5 Learn etiology and control of important plant diseases with latest trends in technology.</p>

MBOTDSE—	I Opt a Course	CO 1 Student to choose from basket of topics like Music, Human Rights, Graphic design etc and to prepare project in the selected topics.
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