

Department of botany

B.sc Botany

Paper-1: Microbiology and phycology

Course outcomes(Cos)

On completion of the course students will be able

CO1: To understand the key concept of the microbial world and their nutrition, growth and metabolism.

CO2: To understand the discovery, nature, reproduction and beneficial roles of bacteria, cyanobacteria and pathological role of virus

CO3- To give an outline on general features, reproduction, evolutionary classification of algae and familiarize it

CO4- To recognize the different division of algae with particular emphasis on their morphology and life cycle.

CO5- To identify important microbes including bacteria, cyanobacteria and algae and understand their beneficial roles for human society.

Core2: Biomolecules and Cell biology

On completion of the course students will be able

CO1: To understand the concepts of bioenergetics and role of enzymes in cellular process.

CO2: To give an outline about structure, classification and function of various macromolecules (Carbohydrate, protein, Nucleic acid) in the cell

CO3: To develop a concept on prokaryotic and eukaryotic cells along with its various cell organelles

CO4: To analyze how cells undergo mitosis and meiosis cell division.

CO5: To apply their knowledge of cell biology and bioenergetics for identification of changes in cellular function and physiology.

Core3; Mycology and phytopathology

On completion of the course students will be able

CO1: To explain about general characters, life cycles of commonly occurring fungal genera and their pathogenicity

CO2: To understand classification, life cycle and ecology with special reference to Zygomycota, Basidiomycota and Ascomycota, allied fungi, Oomycota.

CO3: To understand beneficial fungal interactions(Lichen, Mycorrhiza) and their economic importance

CO4:To explain about beneficial applications of fungi in different fields such as agriculture, biotechnology, medicine and develop a skill on applications for human welfare

CO5:To Understand the host-pathogen relationship and disease cycle of virus, bacteria, fungus in plants and their control measures.

Core4: Archegoniate

On completion of the course students will be able

CO1: To understand unifying features of archegoniate and their origin, adaptation to land habit

CO2: To develop knowledge on diversity, distribution and reproduction of bryophyte, pteridophyte, gymnosperm.

CO3: To give an outline of ecological and economic importance of bryophyte, pteridophyte, gymnosperm.

CO4:To Understand the significance of paleobotany and its applications

CO5:To develop proficiency in differentiation of genera on the basis of their morphology and anatomy.

Core4: Anatomy of angiosperm

On completion of the course students will able

CO 1 To develop an understanding of concepts, fundamentals and scope of plant anatomy

CO 2 To develop critical understanding on tissues and evolution of concept of organization of Shoot and root apex

CO 3 To analyze the composition of different parts of plants (Stem, Leaf, Root, Wood, Periderm)

CO 4 To evaluate adaptive, secretory, protective systems of plants and Mechanical tissue system

CO 5 To simplify the activity of meristem for primary and secondary growth of plants.

Core 6 Economy Botany

On successful completion of this module the students will be able

CO 1 To understand core concept of origin of cultivated plants and their domestication, evolution of new crops and importance of germplasm diversity

CO 2 To develop basic knowledge of important families of plants such as cereals, legumes, sugarcane with reference to their morphology, cultivation and uses

CO 3 To listing of plants as source of food, beverages, spices and drugs.

CO 4 To build a concept of extraction method, uses and health implications with special reference to oils and fats, natural rubber and timber plants

CO 5 To evaluate economically benefitted plant and plant products encountered in everyday uses

Core 7 Genetics

On successful completion of this module the students will be able

CO 1 To understand the basic mechanism of inheritance and their relationship with expression of morphological traits.

CO 2 To understand the phenomenon of inheritance along with deviations

CO 3 To explain the inheritance pattern of nuclear and extra nuclear genes.

CO 4 To analyze mechanism of gene mutations, chromosomal aberration and skilled to solve the numerical problems related to it

CO 5 To develop Critical understanding on molecular concepts of genes, population genetics and solved the numerical questions based on it.

Core 8 Molecular Biology

On successful completion of this module the students will be able

CO 1 To understand the most significant discoveries and theories through the historical progress and the impact on the development of molecular biology

CO 2 To understand biochemical nature of nucleic acids and describe processes of DNA replication.

CO 3 To illustrate the importance of central dogma and various molecular events for living cell

CO 4 To illustrate molecular events of transcription and processing of transcripts, RNA editing .

CO 5 To illustrate molecular events of translation leading to protein synthesis and post translational modifications in prokaryotes and eukaryotes

Core 9 Plant ecology and Phylogeography

On successful completion of this module the students will be able

CO 1 To understand basic concepts of ecology, inter-relationship between living world and environment

CO 2 To understand the importance of various components of environment for existence of population and

CO 3 To illustrate the concept of biotic interaction and dynamics of population and community characteristics.

CO 4 To understand the process of soil formation and hydrological cycle

CO 5 To illustrate the principles of phylogeography and to know about functional aspects of ecosystem

Core 10 Plant Systematics

On successful completion of this module the students will be able

CO 1 To understand the concept of taxa, taxonomic hierarchy and relationships among various hierarchical levels

CO2 To understand key rules, regulations and codes of governing principles of botanical nomenclature

CO 3 To identify plants using various taxonomic literature, flora, herbaria and keys

CO 3 To develop an idea on artificial, natural and phylogenetic system of classification and systematics relationships in plant kingdom

CO 4 To observe and describe taxonomic characteristics of some angiosperm families

CO 5 To describe and identify genus and species level of plant materials after observation of morphology.

Core 11 Reproductive biology of angiosperm

On successful completion of this module the students will be able

CO 1 To understand history and scope of reproductive biology

CO 2 To understand the basic concepts on structure and functions of male reproductive organ and its development

CO 3 To understand the structure and functions of female reproductive organ, its development

CO 4 To explain the processes of pollination, fertilization, self-incompatibility, embryogenesis and development of seed

CO 5 Comprehend the causes of polyembryony and apomixes with its classification and application

CO 6 Illustrate various methods of germline transformation

Core 12 Plant Physiology

On successful completion of this module the students will be able

CO 1 To understand different aspects of plant water relations and physiological processes in plants

CO 2 To explain the mechanism of nutrient uptake methods adopted by plants and translocation to different plant parts

CO 3 To explain about essential mineral elements necessary for plant growth and deficiency symptoms

CO 4 To summarize nature and physiological role of various phytohormones on plant growth

CO 5 To summarize the physiological requirements on flowering, vernalization and seed dormancy of plants

DSE 1 Analytical Techniques in Plant Science

On successful completion of this module the students will be able

CO 1 To develop conceptual understanding of the microscopy and make use of this principle analyze plant samples

CO 2 To make use of centrifugation and cell fractionation methods for separation of biomolecules and cell organelle.

CO 3 To Classify different types of chromatographic techniques for separation of pigments, amino acids.

CO 4 To understand the principle of spectrophotometry and explain its uses

CO 5 To Explain the uses of radioisotopes in biological research

CO 6 To identify various techniques used in characterization of proteins and nucleic acids

CO 7 To apply suitable strategies in data collection and analysis of research findings

DSE 2 Natural Resource Management

On successful completion of this module the students will be able

CO 1 To understand the concept of different natural resources and their sustainable utilization

CO 2 To Critically analyze the suitable utilization and conservation of land, water, forest and energy resources

CO 3 To evaluate the management strategies of different natural resources

CO 4 To explain the different national and international efforts in resource management and their conservation

Core 13 Plant Metabolism

On successful completion of this module the students will be able

CO 1 To understand the concept of metabolic pathways and their regulatory mechanism.

CO 2 To illustrate the process of signaling pathways in plants

CO 3 To give an outline of mechanism of carbon fixation pathways and give their significance

CO 4 To explain the processes of carbon oxidation and ATP synthesis

CO 5 To explain the pathways of synthesis, oxidation of lipids and fatty acids

CO6 To analyze the nitrogen assimilation pathways

CORE 14 Plant biotechnology

On successful completion of this module the students will be able

CO 1 To understand the methods of plant tissue culture and its application.

- CO 2 To describe somatic embryogenesis, embryo culture and embryo rescue
- CO 3 To summarize the tools and techniques of recombinant technology and its application
- CO 4 To explain methods of protoplast isolation, culture and selection of hybrid from normal protoplast
- CO 5 To explain construction of genomic DNA and c DNA libraries, selection methods of recombinants and illustrate various methods of gene transfer techniques
- CO 6 To apply the knowledge to create plants resistant to pests and diseases, tolerant to herbicides and abiotic factors and to develop products for human use.

DSE 3 Horticulture Practices and Post Harvest Technology

On successful completion of this module the students will be able

- CO 1 To Explain the scope and importance of different branches of horticulture in human welfare
- CO 2 To classify ornamental, vegetable, fruit and flower plants and agroclimatic requirements of horticulture crops
- CO 3 To evaluate methods of harvesting and handling of fruits, vegetables
- CO 4 To critically evaluate different cultivation practices and disease management
- CO 5 To Critically evaluate different conservation strategies for horticultural crops
- CO 6 To understand the various intellectual property right issues associated with horticulture
- CO 7 To explain the various national, international and professional societies associated with horticulture and the sources of information

DSE 4 Project Work

On successful completion of this module the students will be able

- CO 1 To understand the concept of research and different types of research in biology
- CO 2 To develop laboratory experiment related skills

CO 3 To develop competence on data collection and process of scientific documentation

CO 4 To analyze ethical aspects of research

CO 5 To evaluate the different methods of scientific writing and reporting

GE 1 Biodiversity

On successful completion of this module the students will be able

CO 1 To understand the fundamental concepts related to microbes, algae, fungi and archegoniate

CO 2 To analyze the general structure, reproduction and economic importance of viruses and bacteria

CO 3 To explain general characters of algae, fungi and illustrate the reproduction cycles through figures

CO 4 To analyze morphology, anatomy and reproduction of bryophytes, pteridophytes, gymnosperm

CO 5 To list out ecological and economic importance of algae, fungi and archegoniate.

GE 2 Plant Physiology and Metabolism

On successful completion of this module the students will be able

CO 1 To understand water relation of plants, mineral nutrition, translocation in phloem with respect to various physiological processes

CO 2 To build a concept on photosynthesis, respiration and simplify the concept through different cycles, pathways.

CO 3 To analyze mechanism of enzyme catalysis, their structure, properties and nitrogen metabolism

CO 4 To develop critical understanding of physiological roles of plant growth regulator and plant response to light and temperature

CO 5 To simplify different physiological, metabolic processes and their practical implications

Program Outcomes

PO 1: Understanding of plant diversity and its importance in the maintenance of ecological balance.

PO 2: Interpret plant morphological and anatomical data and use it for plant Identification and vegetation studies.

PO 3: Students learn to carry out practical work in the field as well as in the laboratory and how to interpret and represent research data and findings.

PO 4: Apply the knowledge of life science and fundamental processes of plants in research work

PO 5: Apply modern techniques and instruments for biochemical estimation, molecular biology, biotechnology, plant tissue culture experiments for societal benefits

PO 6: Apply the whole knowledge of botany for the upliftment of the society by addressing different problems faced by environment

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