

Department of Botany

Programme Specific Outcomes, Programme Outcomes and Course Outcomes

Programme Specific Outcomes

- ❖ **PSO1**- Develop a broad fundamental knowledge of the plant diversity especially habit, habitat, morphology, adaptations and classification of plant kingdom.
- ❖ **PSO2** - Analyse the relationship between plants, animals, microbes and deal with the local national global environment issues by realizing the right of the individuals and also need to conserve our biosphere.
- ❖ **PSO3** - Understand how organisms function at the level of gene, genome, cell tissue, thallus, plant body drawing upon this knowledge, they are able to give specific examples of the physiological adaptations developed, reproduction and behaviour of different forms of life.
- ❖ **PSO4** - Gain knowledge about the application of biological sciences in mushroom cultivation, Azolla cultivation, nursery management, herbal garden management, pest management, there by impart skill as well a source of income and self-employment.
- ❖ **PSO5** - Generate innovative ideas for performing experiments in the areas of biochemistry, physiology, genetics, microbiology, developmental biology, anatomy, taxonomy, economic botany, and ecology.
- ❖ **PSO6** - Explain the recent developments in genetic engineering, biotechnology, microbiology, for research activities in the department or in collaboration with other research institutions.
- ❖ **PSO7** - Organize and deliver relevant applications of knowledge through effective written verbal, graphical/virtual communications and interact with people from diverse back ground.

Programme Outcomes

- ❖ **PO1:** Acquiring a broad fundamental knowledge of the plant diversity from lower to higher plants.
- ❖ **PO2:** Exploration of diverse plant life-forms and to nature the conservation of biodiversity.

- ❖ **PO3:** Ensuring the basic techniques in understanding the scope and significance of botany
- ❖ **PO4:** Gaining knowledge on various applications such as mushroom cultivation, azolla cultivation, nursery management, herbal garden management etc.,
- ❖ **PO5:** Enhancing innovative ideas in the areas of biochemistry, physiology, genetics, microbiology, developmental biology, anatomy, taxonomy, economic botany, and ecology
- ❖ **PO6:** Designing and executing experiments in academia and industries.
- ❖ **PO7:** Adapting themselves within the human community

Course Outcomes

Description of CO's

MUBC1: Algae and Bryophytes

Description of COs	Blooms' Taxonomy Level
CO1: Understanding about general characters, classification and economic importance of algae	Knowledge (Level K1)
CO2: Augmenting the detailed structure of some algal forms	Comprehension (Level K2)
CO3: Gaining knowledge about various algal species	Analysis (Level K3)
CO4: Acquiring knowledge about morphology, structure, reproduction and life cycle of bryophytes	Synthesis (Level K6)
CO5: Synthesizing fundamental knowledge about evolution and economic importance of bryophytes.	Synthesis (Level K6)

MUBC2: Fungi and Plant Pathology

Description of COs	Blooms' Taxonomy Level
CO1: Understanding about general characters, classification and economic importance of fungi	Knowledge (Level K1)
CO2: Augmenting the detailed structure of some fungi forms	Comprehension (Level K2)

CO3: Gaining knowledge about various fungal species	Analysis (Level K3)
CO4: Acquiring knowledge about morphology, structure, reproduction and life cycle of lichens	Synthesis (Level K6)
CO5: Gaining knowledge about the Causes , Symptoms and - Control measures of Plant diseases	Synthesis (Level K6)

MUBA1: Ancillary Botany paper I

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about classification, structures and life cycle of different forms of algae.	Knowledge (Level K1)
CO2: Students gaining fundamental knowledge of fungi and its various forms.	Comprehension (Level K2)
CO3: Understanding the classification and life cycle of Bryophytes and Pteridophytes	Analysis (Level K3)
CO4: Developing interest in understanding the classification of Gymnosperms	Synthesis (Level K6)
CO5: Studying the anatomical structures of dicot and monocot plants	Synthesis (Level K6)

MUBBF1: Bio fertilizers (SBC)

Description of COs	Blooms' Taxonomy Level
CO1: Gaining knowledge for the students to understand the scope, importance and applications of symbiotic bacteria.	Knowledge (Level K1)
CO2: Comprehending knowledge about Non- symbiotic bacteria	Comprehension (Level K2)
CO3: Understanding about the mass cultivation and field applications of Blue green algae	Application (Level K3)

CO4: Understanding the mass cultivation and field applications of VAM fungi	Analysis (Level K4)
CO5: Acquiring knowledge about the role of Mycorrhizae in agriculture	Application (Level K3)

MUBC3: Pteridophytes, Gymnosperms and Paleobotany

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about classification, structures and lifecycle of different forms of fossil Pteridophytes.	Knowledge (Level K1)
CO2: Gaining fundamental knowledge of structure, reproduction and lifecycle of Pteridophytes.	Comprehension (Level K2)
CO3: Understanding the morphology and reproduction of Equisetum and Marsilea.	Application (Level K3)
CO4: Classifying the Gymnosperm, morphology and reproduction of Williamsonia, Pinus, Cupressus and Gnetum.	Analysis (Level K4)
CO5: Comprehending the geological time scale, kinds of fossils and Radio carbon dating	Application (Level K3)

MUBP1: Core Practical Paper – I

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about structures and different forms of Plant diversities through microscope	Knowledge (Level K1)
CO2: . Gaining knowledge about the spotters and identify the specimens.	Comprehension (Level K2)
CO3: Understanding the morphology and taking sections	Application (Level K3)
CO4: Developing skills to identify the different species.	Analysis (Level K4)
CO5: Developing drawing sketches of the structures of the	Application (Level K3)

specimens.	
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MUBA2: Ancillary Botany Theory Paper - II

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge in classifying Algae and Fungi.	Knowledge (Level K1)
CO2: Students gaining knowledge in identifying Bryophytes and Pteridophytes	Comprehension (Level K2)
CO3: Understanding the classification of Gymnosperms.	Application (Level K3)
CO4: Developing knowledge in identify the anatomy of shoot and root of plants	Analysis (Level K4)

MUBAP: Ancillary Botany Practical Paper I

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about structures and different forms of Plant diversities through microscope	Knowledge (Level K1)
CO2: Students gaining knowledge about the spotters and identify the specimens	Comprehension (Level K2)
CO3: Understanding the morphology and taking sections.	Application (Level K3)
CO4: Developing skills to identify the different species	Analysis (Level K4)
CO5: Developing drawing sketches of the structures of the specimens	Application (Level K3)

MUBHC2: Herbal Cosmetics

Description of COs	Blooms' Taxonomy Level
CO1: Enabling the students to understand the need and advantages of herbal cosmetics	Knowledge (Level K1)

CO2: Gaining knowledge to prepare face pack using herbs.	Comprehension (Level K2)
CO3: Understanding the preparations of herbal powder and soaps	Application (Level K3)
CO4: Studying the preparations of different types of hair oils.	Analysis (Level K4)
CO5: Developing an interest to study the preparations of foot cream and mehendi decorations	Application (Level K3)

MUBC4: Biochemistry, Biophysics and Biotechniques

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about atoms, bonds, pH, buffer and properties of water	Knowledge (Level K1)
CO2: Students gaining fundamental knowledge of structure, classification and properties of biomolecules.	Comprehension (Level K2)
CO3: Understanding the mechanism of enzyme action, and also study the structure, properties, nomenclature and classification of enzymes.	Application (Level K3)
CO4: Developing knowledge in concepts of biophysics	Analysis (Level K4)
CO5: Developing skills in studying and using instruments of biotechniques	Application (Level K3)

MUBBB3: Basic Bioinformatics (SBC)

Description of COs	Blooms' Taxonomy Level
CO1: Enabling the students to understand the components of computers	Knowledge (Level K1)
CO2: Gaining knowledge about computer languages, internet and email.	Comprehension (Level K2)

CO3: Understanding the windows, ms office, excel and powerpoint	Application (Level K3)
CO4: Studying the basics of bioinformatics and phylogenetic analysis	Analysis (Level K4)
CO5: Developing an interest to study the biomolecular visualization and computer aided drug designing.	Application (Level K3)

MUBN1: Gardening and Nursery Management (NME)

Description of COs	Blooms' Taxonomy Level
CO1: Enabling the students to understand the cropping pattern of garden	Knowledge (Level K1)
CO2: Gaining knowledge about components of garden.	Comprehension (Level K2)
CO3: Understanding the methods of cultivating indoor garden and flower arrangement	Application (Level K3)
CO4: Studying the cultivation of vegetables and extraction of jasmine.	Analysis (Level K4)
CO5: Developing an interest to study the cultivation of orchards and intercropping.	Application (Level K3)

MUBC5: Plant Anatomy and Plant Ecology

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about meristems and its various theories.	Knowledge (Level K1)
CO2: Students gaining fundamental knowledge of structure and classification of simple and complex tissues	Comprehension (Level K2)
CO3: Understanding the primary and secondary structure of Dicot and Monocot plants.	Application (Level K3)

CO4: Developing knowledge in studying nodal anatomy.	Analysis (Level K4)
CO5: Developing skills in identifying morphological, physiological and anatomical adaptations of plants.	Application (Level K3)

MUBC6: Cell Biology and Embryology

Description of COs	Blooms' Taxonomy Level
CO1: Gaining knowledge about prokaryotic and eukaryotic cell, different microscopes	Knowledge (Level K1)
CO2: Students understanding the structure and functions of cell organelles like mitochondria, nucleus and chromosomes	Comprehension (Level K2)
CO3: Understanding the structure and functions of golgi complex and cell division.	Application (Level K3)
CO4: Developing knowledge in studying the development of male and female gametophyte and types of ovule.	Analysis (Level K4)
CO5: Understanding the types of endosperm, double fertilization and triple fusion	Application (Level K3)

MUBP2: Core Practical Paper II

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge in doing biochemistry experiments	Knowledge (Level K1)
CO2: Students gaining knowledge about the spotters and identify the specimens	Comprehension (Level K2)
CO3: Understanding the morphology and taking sections.	Application (Level K3)
CO4: Developing skills to identify the different species.	Analysis (Level K4)
CO5: Developing drawing sketches of the structures of the specimens	Application (Level K3)

MUBML4: Mushroom for Livelihood (SBC)

Description of COs	Blooms' Taxonomy Level
CO1: Gaining knowledge about the nutritional and medicinal value of mushrooms.	Knowledge (Level K1)
CO2: Understanding the structure and characteristics of edible mushrooms.	Comprehension (Level K2)
CO3: Understanding the cultivation methods, spawn production techniques and harvesting of mushroom	Application (Level K3)
CO4: Developing knowledge in studying the problems in mushroom cultivation.	Analysis (Level K4)
CO5: Understanding the preparation of mushroom recipes	Application (Level K3)

MUBC7: Taxonomy of Angiosperms and Economic Botany

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about the morphological structures of angiosperms	Knowledge (Level K1)
CO2: Students understanding the binomial nomenclature, herbarium technique and classification of angiosperms	Comprehension (Level K2)
CO3: Understanding the morphology and economic importance of families	Application (Level K3)
CO4: Developing knowledge in identifying different families	Analysis (Level K4)
CO5: Understanding the extraction, chemical constituents and uses of rubber and coffee.	Application (Level K3)

MUBC8: General Microbiology

Description of COs	Blooms' Taxonomy Level
CO1: Acquiring knowledge about the characteristics, multiplication and control of viruses	Knowledge (Level K1)
CO2: Understanding the food poisoning, industrial manufacture of ethanol, penicillin, etc.	Comprehension (Level K2)
CO3: Understanding the decomposition, functions of humus and microbial degradation of cellulose.	Application (Level K3)
CO4: Developing knowledge in sewage treatment and control of microorganisms.	Analysis (Level K4)
CO5: Understanding the structure of antigen and antibody, their reaction and types of immune systems.	Application (Level K3)

MUBE1: Plant Biotechnology

Description of COs	Blooms' Taxonomy Level
CO1: Acquiring knowledge about the techniques used in biotechnology	Knowledge (Level K1)
CO2: Students understanding the recombinant DNA technology and human health care products.	Comprehension (Level K2)
CO3: Understanding the plant tissue culture techniques and its role in crop improvement	Application (Level K3)
CO4: Developing knowledge in transgenic plants and biological control of pathogens.	Analysis (Level K4)
CO5: Understanding the composition of biomass and intellectual property right	Application (Level K3)

MUBE1: Habitat Ecology

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about the uniqueness of the varying habitats in the biosphere	Knowledge (Level K1)
CO2: Students acquiring knowledge about the structure and functions of different ecosystem.	Comprehension (Level K2)
CO3: Understanding the ecology of various habitats.	Application (Level K3)
CO4: Developing knowledge in understanding the environmental legislations	Analysis (Level K4)
CO5: Understanding the inventory of habitats.	Application (Level K3)

MUBE2: Horticulture and Landscaping

Description of COs	Blooms' Taxonomy Level
CO1: Enriching knowledge about the techniques of orchard cultivation, soil management practices and pruning techniques.	Knowledge (Level K1)
CO2: Students understanding the vegetative propagation methods and systems of irrigation	Comprehension (Level K2)
CO3: Understanding the different methods of gardening and flower arrangement	Application (Level K3)
CO4 : Developing knowledge in cultivation of vegetables, fruits and flowers and extraction of jasmine	Analysis (Level K4)
CO5: Understanding the uses of kitchen garden and its necessity	Application (Level K3)

MUBE2: Plant Tissue Culture

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about culture media and aseptic techniques	Knowledge (Level K1)
CO2: Understanding the micropropagation.	Comprehension (Level K2)

CO3: Understanding the anther culture, pollen culture, ovary culture, etc.	Application (Level K3)
CO4 : Developing knowledge in artificial seed production	Analysis (Level K4)
CO5: Understanding the secondary metabolites and cryopreservation.	Application (Level K3)

MUBFP5: Food Preservation (SBC)

Description of COs	Blooms' Taxonomy Level
CO1: Enrich knowledge about the various process of food preservation.	Knowledge (Level K1)
CO2: Students understand the process of canning of apples and carrot.	Comprehension (Level K2)
CO3: Understand the different methods of preservation process of fruit juices.	Application (Level K3)
CO4 : Develop knowledge in understanding the preparation of jelly and jam.	Analysis (Level K4)
CO5: Understand the preparation of different sauces and different kinds of pickles.	Application (Level K3)

MUBC9: Plant Physiology

Description of COs	Blooms' Taxonomy Level
CO 1: Impart knowledge about absorption of water, ascent of sap and transpiration.	Knowledge (Level K1)
CO 2: Students understand the importance of mineral nutrition and photosynthesis	Comprehension (Level K2)
CO 3: Understand the various aspects of respiration, photorespiration and mechanism of respiration.	Application (Level K3)
CO 4: Develop knowledge in nitrogen metabolism.	Analysis (Level K4)
CO5: Understand the physiology of flowering, seed dormancy and biological clock.	Application (Level K3)

MUBC10: Genetics and Molecular Biology

Description of COs	Blooms' Taxonomy Level
CO1: Impart knowledge about gene interaction and multiple alleles	Knowledge (Level K1)

CO2: Students understand the theories of crossing over and mutations	Comprehension (Level K2)
CO3: Understand the mechanism of sex determination in plants.	Application (Level K3)
CO4 : Develop knowledge in DNA and RNA structure, replication and types .	Analysis (Level K4)
CO5: Understand the gene regulation in prokaryotes and operon concepts.	Application (Level K3)

MUBE3: Herbal Medicine and Human Welfare (Elective - III)

Description of COs	Blooms' Taxonomy Level
CO1: Impart knowledge about different systems of medicines.	Knowledge (Level K1)
CO2: Students understand the systematic study of crude drugs.	Comprehension (Level K2)
CO3: Understand the drugs obtained from flowers, fruits, seeds and all parts of plants.	Application (Level K3)
CO4 : Develop knowledge in understanding cardio vascular drugs and anticancer drugs.	Analysis (Level K4)
CO5: Understand the medicinal properties of Ricinus and Citrus.	Application (Level K3)

MUBE3: Plant Breeding, Evolution, Seed Technology and Biostatistics (Elective - III)

Description of COs	Blooms' Taxonomy Level
CO1: Impart knowledge about Hybridization.	Knowledge (Level K1)
CO2: Students understand the evolution.	Comprehension (Level K2)
CO3: Understand the Seed Technology.	Application (Level K3)
CO4 : Develop knowledge in understanding the seed processing and certification.	Analysis (Level K4)
CO5: Understand the Biostatistics - mean, median and mode.	Application (Level K3)

MUBP3: Core Practical Paper – III

Description of COs	Blooms' Taxonomy Level
CO1: Impart knowledge in doing streaking and staining techniques.	Knowledge (Level K1)
CO2: Students gain knowledge about the spotters and identify the specimens.	Comprehension (Level K2)
CO3: Understand the morphology and taking sections.	Application (Level K3)
CO4 : Develop skills to identify the different species.	Analysis (Level K4)
CO5: Develop drawing sketches of the structures of the specimens.	Application (Level K3)

MUBP4: Core Practical Paper – IV

Description of COs	Blooms' Taxonomy Level
CO1: Impart knowledge in doing physiology experiments.	Knowledge (Level K1)
CO2: Students gain knowledge about the spotters and identify the specimens.	Comprehension (Level K2)
CO3: Understand the morphology and taking sections.	Application (Level K3)
CO4 : Develop skills to identify the different species.	Analysis (Level K4)
CO5: Develop drawing sketches of the structures of the specimens.	Application (Level K3)

MUBN2: Herbal Therapeutics (NME)

Description of COs	Blooms' Taxonomy Level
CO1: Impart knowledge about different systems of medicines.	Knowledge (Level K1)
CO2: Students understand the systematic study of crude drugs.	Comprehension (Level K2)
CO3: Understand the drugs obtained from flowers.	Application (Level K3)
CO4 : Develop knowledge in understanding drugs obtained from fruits, seeds and all parts of plants.	Analysis (Level K4)

CO5: Understand the medicinal properties of <i>Vinca</i> and <i>Gloriosa</i> .	Application (Level K3)
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MUES6: Environmental Studies

Description of COs	Blooms' Taxonomy Level
CO1: Impart knowledge about environment.	Knowledge (Level K1)
CO2: Students understand the natural resources	Comprehension (Level K2)
CO3: Understand the ecosystem, ecological succession and ecological pyramids.	Application (Level K3)
CO4 : Develop knowledge in understanding biodiversity and its conservation.	Analysis (Level K4)
CO5: Understand the environment, its pollution and the human population and environment.	Application (Level K3)

UGEDFV: Dietary and Nutritional Value of Fruits and Vegetables

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about balanced diet.	Knowledge (Level K1)
CO2: Students understanding the functions of food.	Comprehension (Level K2)
CO3: Understanding the nutritional classification of foods	Application (Level K3)
CO4: Developing knowledge in understanding the diet for various deficiencies.	Analysis (Level K4)
CO5: Understanding the allergic and non allergic foods.	Application (Level K3)

UGECP: Commercial Plant Products

Description of COs	Blooms' Taxonomy Level
CO1: Imparting knowledge about balanced diet.	Knowledge (Level K1)
CO2: Students understanding the functions of food.	Comprehension (Level K2)
CO3: Understanding the nutritional classification of foods.	Application (Level K3)
CO4: Developing knowledge in understanding the diet for various deficiencies	Analysis (Level K4)

CO5: Understanding the allergic and non allergic foods	Application (Level K3)
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UGEBCM: Biodiversity Conservation and Management (Extra Credit Paper)

Description of COs	Blooms' Taxonomy Level
CO1: Impart knowledge about environment.	Knowledge (Level K1)
CO2: Understand the natural resources.	Comprehension (Level K2)
CO3: Understand the threats and natural calamities.	Application (Level K3)
CO4: Develop knowledge in understanding biodiversity and its conservation.	Analysis (Level K4)
CO5: Understand the environment, In situ and Ex situ Conservation.	Application (Level K3)