B.Sc. BOTANY PROGRAMME

Semester V **Open Course** **BO5D01U**

AGRIBASED MICROENTERPRISES

(72 Hours) Theory Credit 4

Course objectives

1. A basic information about the business opportunities in plant sciences.
2. Inform the student about sustainable agriculture and organic farming.
3. Inculcate an enthusiasm and awareness about ornamental gardening, nursery management and mushroom cultivation.

Module 1. 9 hours

Organic farming and composting techniques

Organic manures and fertilizers. Composition of fertilizers – NPK content of various fertilizers. Common organic manures – bone meal, cow dung, poultry waste, oil cakes, organic mixtures and compost. Preparation of compost –aerobic and anaerobic- advantages of both; vermicompost – preparation, wormiwash. Biofertilizers – definition, types – *Trichoderma, Rhizobium,* PGPR. Biopesticides – Tobacco and Neem decoction. Biological control. Sustainable agriculture.

Module 2. 18 hours

Horticulture and Nursery management.

Soil components. Preparation of potting mixture. Common Garden tools and implements. Methods of plant propagation – by seeds – advantages and disadvantages. Vegetative propagation – advantages and disadvantages. Natural methods of vegetative propagation. Artificial methods – cutting, grafting,

budding and layering. Use of growth regulators for rooting. Micropropagation by tissue culture. Gardening Types of garden ornamental, indoor garden, kitchen garden, vegetable garden for marketing. Rockery and artificial ponds. Ornamental garden designing garden components flower beds, borders, hedges, edges, drives and paths, garden adornments. Lawn - preparation by seeds, by transplanting seedling and by turfing. Annuals, Biennials, Shrubs, Trees, Cycads and Palms. Bonsai preparation. Pruning of plants. Types of Nurseries Management aspects and Maintenance. Plant growth structures advantages of green house, polyshed, fernery and orchidarium. Packaging of fruits, vegetables, nursery products and flowers.

Module 3. 9

hours

Food spoilage and preservation techniques.

Causes of spoilage. Preservation techniques asepsis, removal of microorganisms, anaerobic conditions and special methods by drying, by heat treatment, by low temperature storage and by chemicals (Food Additives). Preparation of wine, vinegar and dairy products.

Module 4. 9

hours

Mushroom cultivation and Spawn production.

Significance of Mushrooms, General outline of life cycle. Types of mushrooms - button mushroom, oyster mushroom and milky mushroom, poisonous mushroom methods of identification. Spawn isolation and preparation. Cultivation of oyster and milky mushrooms using paddy straw and saw dust by polybag. Farm design and control of pests and diseases. Value added products from mushroom pickles, candies, dried mushrooms.

Module.5. 9
hours

Plant tissue culture and micropropagation

Protoplasm- basic structure and function of plant cell

concept of totipotency- differentiation and dedifferentiation. Infra structure of a tissue culture laboratory .Solid and liquid media- composition and preparation. Sterilization- dry, wet and filter sterilization. Explant- inoculation and incubation techniques. Callus induction- organogenesis and embryogenesis. Transplanting, hardening, package and transportation of tissue cultured plantlets.

On Hand Training 18 hours

1. Prepare a chart showing the NPK composition of minimum 6 manures and fertilizers.
2. Identification and familiarization of the following organic manures- cow dung (Dry), Coconut cake, Vermicompost, neem cake, Organic mixture, Bone meal.
3. Preparation of potting mixture.
4. Make a Vermicompost pit /pot in the campus/ house of the student.
5. Familiarization of common garden tools and implements.
6. Estimation of germination percentage of seeds
7. Demonstrate the effect of a rooting hormone on stem cutting.
8. Demonstration of T budding, epicotyle grafting and air layering on live plants
9. Familiarization of garden components from photographs
10. Preparation of vinegar / dairy product (Any two) in class or home
11. Familiarization of different mushrooms and preparation of a polybag of *Pleurotus* using straw/sawdust
12. Visit to a well established tissue culture lab, nursery and mushroom cultivation unit.

References.

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