**SRI VENKATESWARA UNIVRRSITY:TIRUPATI**

**B.VOC , in HORTICULTURE**

**Under CBCS W.E.F.2021-2022**

**COURSE STRUCTURE**

**SEMESTER-IV**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S..NO | **Skill / general education** | **Courses** | **Title of the paper/course and code** | **Credits per course** | **Hours/week** | **Total hours/ course** |  **Marks** |
| **Internal** | **External** | **Total** |
| 1 | **Domain Skill Component** | **CORE-I** | **Organic Forming** | **04** | **04** | **60** | **25** | **75** | **100** |
| 2 | **PRACTICAL-1** | **Organic Forming** | **02** | **03** | **30** | --- | **50** | **50** |
| 3 | **CORE-II** | **Production Technology of flowers, medicinal and Aromatic plants** | **04** | **04** | **60** | **25** | **75** | **100** |
| 4 | **PRACTICAL-II** | **Production Technology of flowers, medicinal and Aromatic plants** | **02** | **03** | **30** | -- | **50** | **50** |
| 5 | **CORE-III** | **Pests of Horticulture crops and their management** | **04** | **04** | **60** | **25** | **75** | **100** |
| 6 | **PRACTICAL-III** | **Pests of Horticulture crops and their management** | **02** | **03** | **30** | --- | **50** | **50** |
| 7 | **CORE-IV** | **Production Technology of spices and plantation crops** |  **04** | **04** |  **60** |  **25** |  **75** | **100** |
| 8 | **PRACTICAL-IV** | **Production Technology of spices and plantation crops** |  **02** | **03** |  **30** |  **-----** |  **50** |  **50** |
| 9 | **CORE-V** | **Manures, Fertilizers and soil fertility management** |  **04** | **04** |  **60** |  **25** |  **75** | **100** |
| 10 | **PRACTICAL-V** | **Manures, Fertilizers and soil fertility management** | **02** | **03** |  **30** |  **-----** |  **50** | **50** |
| 11 | **CORE-VI** | **Mushroom Culture and Technology** | **04** | **04** |  **60** |  **25** |  **75** | **100** |
| 12 | **PRACTICAL-VI** | **Mushroom Culture and Technology** | **02** | **03** |  **30** |  **-----** |  **50** | **50** |
|  | **TOTAL** | **36** |  |  |  **900** |

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**SECOND YEAR – FOURTH SEMESTER**

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**SKILL COMPONENT**

**Core Paper-I**: **ORGANIC FARMING**

**(Credits:4+2=6)**

**UNIT-I**

Organic Farming - Detrimental effects of currently chemical dependent farming.- Reduction of crop production due to depletion of soil Health - Pesticide contamination and human health hazard - Contamination of food products by pesticides & chemicals - Environmental (soil, water, air) pollution - Reduction of natural enemies of crop pests - Threat to Bio diversity - Historical development of Organic Agriculture in India - Present status of Organic farming in Andhra Pradesh.

**UNIT-II**

Types of Farming (Advantage & disadvantage of each system) - Pure Organic Farming – Definition, Concept & Benefits - Integrated Farming system (Combination of Organic and Inorganic) - Mixed Farming - Inter cropping - Organic Farming (Process): - Concept of farming system - Developing organic farms - Important steps & methods

**UNIT-III**

Sources of nutrients for Organic farming - Organic Manure - FYM/Rural compost, City compost, Oil cakes, - Animal wastes, Vermi composts, etc - Characterization and Nutrients content of the above sources - Green Manure - Liquid Manure - Bio fertilizers

**UNIT-IV**

Plant Protection Measures: - Integrated pest & disease managements - Organic pesticides, bio-pesticides - Inorganic pesticides, disadvantages of their use - Seed, seedling and soil Treatment measures - Feasibility of complete dependence on organic sources

**UNIT-V**

Organic Agri-Horticulture in Urban & Semi urban areas - Quality Control and certification procedures of Organic products - Marketing and export potential of Organic products – National Economy

**PRACTRICAL SYLLABUS:**

1. Selection of soil and soil conditioners

2. Preparation of FYM / Rural compost / Vermi compost

3. Preparation of seed bed & raising of seedlings

4. Land preparation

5. Raising of seedlings in pots or seed pans

6. Undertaking pot / container culture of flowers, vegetables, fruit plants

7. Practice training on inter culture operations

8. Visit to near Organic Farming at farmer fields

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**SKILL COMPONENT**

**Core Paper-II**: **PRODUCTION TECHNOLOGY OF FLOWERS MEDICINAL AND AROMAIC PLANTS**

**(Credits:4+2=6)**

**UNIT I:**

Scope and importance of commercial floriculture in India – present status, future prospects and - strategies needed for improvement - Features, types and styles of ornamental gardens.

**UNIT II:**

Floriculture: Climate, Soil, varieties, propagation, training & pruning, irrigation, harvest and yields production - techniques of flowering plants such as Rose, Marigold, Chrysanthemum, Carnation, Gladiolus, Jasmine, Tuberose, Crossandra, Antherium, Gerbera, Orchirds.

**UNIT III:**

Medicinal plants – importance of medicinal plants –production technology of - Diosorea, phyllanthus, prewinkle, Solanum, Aloe, Coleus, Asparagus, Belladona, Costus , Aswagandha.

**UNIT IV:**

Aromatic plants –Importance – essential oil industry in india – properties of essential oils –

production techniology of – Mint, Palmorosa, Ocimum, Geranium, Lemongrass, Vettivar,

Citronella, Patchoul.

**UNIT V:**

Post harvest techniques of cut flowers - dehydration techniques for drying of flowers.

**PRACTRICAL SYLLABUS:**

1. Planning and layout of ornamental gardens training and pruning in flower crops lily, rose,

 chrysanthemum.

2. Harvest, packaging and storage methods of flowers.

3. Vase life determination in cut flowers

4. Nursery bed preparation and sowing of flower crops

5. Visit to ornamental gardens/ parks and flower gardens

6. Propagation methods in aromatic & medicinal plants

7. Harvesting and processing methods of aromatic and medicinal plants

8. Visit to herbal gardens

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**SKILL COMPONENT**

**Core Paper-III**: **PESTS OF HORTICULTURAL CROPS AND THEIR MANAGEMENT**

**(Credits:4+2=6)**

**UNIT I - INTRODUCTION, ECONOMIC CLASSIFICATION OF INSECTS**

Study of insect pests(Distribution, host range, biology, Nature of damage and management) in horticultural crops - Tropical fruits - Mango: Hopers, red banded caterpillar, nut weevil, stem borer, leaf webber, mealy bug - oriental fruit fly, leaf gall midges, thrips - Guava: Tea mosquito bug, fruit fly, fruit borer, mealy bug, bark eating cater piller - Banana: Rhizome weevil, pseudostem borer, aphid. Papaya: mealy bug, spiraling white fly - Pomegranate : Pomegranate butterfly, fruit borer, fruit sucking moths

**UNIT -II PESTS OF SUB-TROPICAL FRUITS**

Grapevine: Flea beetle, thrips, stem girdler, mealy bug, stem borer, spotted spidermite - Citrus: Citrus butterfly, fruit sucking moths, citrus leaf miner, psylla, white fly, blck fly, mangu mite - Temperate fruits - Apple: Sanjose scale, woolly aphid, cottony cushion scale, codling moth , tent caterpillar, gypsy moth, European red mite.

**UNIT III- PESTS OF PLANTATION CROPS**

Cashew: Cashew shoot and root borer, shoot and blossom webber, tea mosquito bug, thrips, leaf miner, fruit borer - Coconut & Oil Palm: Black header caterpillar, rhinoceros beetle, red palm weevil,Eriophid mite, coconut scale - Tea: Tea mosquito bug, thrips, mite complex(red spider mite, yellow mite, pink mite,purple mite, scarlet mite) - Coffee: Green scales, white borer, red borer, shot borer, berry borer.

**UNIT-IV- PESTS OF MEDICINAL & AROMATIC PLANTS**

Neem : Root grub, slug caterpillar, mired bug, mealy bug, tea mosquito bug - Cinnamon: leaf eating caterpillar, jumping bug - Mint: leaf roller, hairy caterpillars, termites - Datura: spotted borer, thrips - Bellodona: Cut worm, potato beetle, flea beetle - Dioscorea: aphids, red spider mites.

**UNIT-V- PESTS OF STORED PRODUCTS**

Tamarind beetle, cigarette beetle, Lesser grain borer, Kapra beetle - Drug store beetle, Dried fruit moth, sweet potato tuber moth, red flour beetle, rice moth, Indian meal moth - Dried current moth, Tobacco moth, dried fruit beetle, saw toothed beetle - Insecticide residues problem in fruit, plantation, medicinal and aromatic plants and their tolerance limits.

**PRACTRICAL SYLLABUS:**

1. Sampling techniques for estimation of insect damage

2. Identification of insects and damage symptoms of pests of mango

3. Identification of insects and damage symptoms of pests of guava

4. Identification of insects and damage symptoms of pests of banana, papaya

5. Identification of insects and damage symptoms of pests of pomegranate

6. Identification of insects and damage symptoms of pests of grapevine and citrus

7. Identification of insects and damage symptoms of pests of cashew

8. Identification of insects and damage symptoms of pests of coconut, oil palm

9. Identification of insects and damage symptoms of pests of tea, coffee and rubber

10. Identification of insects and damage symptoms of pests of medicinal and aromatic plants

11. Identification of insects and damage symptoms of pests of stored products

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**SKILL COMPONENT**

**Core Paper-IV**: **PRODUCTION TECHNOLOGY OF SPICES AND PLANTATION CROPS**

**(Credits:4+2=6)**

**UNIT-I**

History, scope and importance, present status, area and production, uses, export potential and role in Indian economy, Classification of spices.

**UNIT-II**

History and development, Scope and importance, area and production, export and import potential of plantation crops, role in national and state economy.

**UNIT-III**

Spices- Production Technology of

1. Cardamom

2. Black pepper

3. Betel vine

4. Ginger

5. Turmeric

6. Clove

7. Nutmeg

**UNIT-IV**

Spices- Production Technology of

1. Cinnamon

2. Curry leaf

3. Coriander

4. Fenugreek

5. Fennel

6. Cumin

7. Saffron

**UNIT-V**

Plantation- Production technology of

1. Coconut

2. Arecanut

3. Oil palm

4. Cocoa

5. Cashew nut

6. Coffee

7. Tea

**PRACTRICAL SYLLABUS:**

1. Identification of spices seeds

2. Preparation and submission of specimens of spices and condiments

3. Seed treatment, Sowing layout and planting methods of Spices and condiments

4. Intercultural operations, Harvesting and processing, grading of Spices and condiments.

5. Different methods of tapping of rubber

6. Raising of nursery and nursery management in cocoa

7. Layout and planting of coconut, Areca nut and oil palm, cashew nut, cocoa.

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**SKILL COMPONENT**

**Core Paper-V**: **MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT**

**(Credits:4+2=6)**

**UNIT–I**

Essential nutrients – functions, deficiency and toxicities.Concepts and methods of soil fertility evaluation -Nutrient Dynamics - Nutrients – sources, forms, mobility, transformations, fixation, losses and availability of nitrogen - phosphorus, potassium, calcium, magnesium, sulphur, iron, manganese, zinc, copper, boron - molybdenum, nickel, chloride in soils – Beneficial elements – Nutrient interactions.

**UNIT–II** :

Classification of Fertilizers - Fertilizers – Definition and classification, sources, properties and reactions of primary, secondary and micro nutrient fertilizers in soil – Manufacture of urea, ammonium sulphate, SSP, DAP,MOP and SOP. Complex, mixed fertilizers, customized/Speciality fertilizers – Water soluble fertilizers, liquid fertilizers. Micro nutrient mixtures and chelated micronutrients – Preparation – Fertilizer Control Order (FCO). Manures – classification, nutrient contents. Composting techniques.

**UNIT–III**

Application Methods - Methods of fertilizer application – Seed coating, pelletization, seedling dipping – Soil Application – Foliar spray – Fertigation – water soluble fertilizers, fertigation scheduling

(Fertilizer – water interaction, fertilizer solubility, comparison of fertilizer application methods).

**UNIT–IV**

Nutrient Management - Nutrient management concepts – INM, STCR, IPNS, SSNM and RTNM. Nutrient use efficiencies of major and micronutrients and enhancement techniques (Soil, Cultural and Fertilizer strategies).Soil health – Quality indices and their management – Long term effect of fertilization on soil.

**UNIT–V**

Compost and composting- Green manures- Definitions of penning -Introduction and importance

of organic manures- Bulky organic manures- Different methods of composting including the

starters and raw materials

**PRACTRICAL SYLLABUS:**

1. Introduction to analytical instruments an principles-spectrometry and flame photometry

2. Estimation of available N in soils

3. Estimation of available P in soils

4. Estimation of available K in soils

5. Estimation of available S in soils

6. Estimation of available Ca and Mg in soils

7. Estimation of available Zn in soils

8. Identification acid radicals in fertilizers / salts

9. Identification of basic radicals in fertilizers / salts

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**SKILL COMPONENT**

**Core Paper-VI**: **MUSHROOM CULTURE AND TECHNOLOGY**

**(Credits:4+2=6)**

**UNIT I: INTRODUCTION, HISTORY**: (12HRS)

Introduction - history - scope of edible mushroom cultivation, Types of edible mushrooms available in India–*Volvariellavolvacea*, *Pleurotuscitrinopileatus*, *Agaricusbisporus.* Nutritional and medicinal value of edible - mushrooms; Poisonous mushrooms.

**UNIT II:PURE CULTURE-SPAWN PREPARATION: (12HRS)**

Pure culture - preparation of medium (PDA and Oatmeal agar medium)sterilization - preparation of test tube - slants to store mother culture – culturingof*Pleurotus* mycelium on Petriplates, preparation of mother spawn - in salinebottle and polypropylene bag and their multiplication.

**UNIT III: CULTIVATION TECHNOLOGY**: **(12HRS)**

Infrastructure: Substrates (locally available) Polythene bags, vessels, Inoculation hook, inoculation loop, low-cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag.Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation - Low cost technology, composting technology in mushroom production.

**UNIT IV:STORAGE AND NUTRITION : (12HRS)**

Short-term storage (Refrigeration - up to 24 hours) Long term Storage (canning, pickels, papads), drying, storage in saltsolutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content – Vitamins.

**UNIT V:FOODPREPARATION: (12HRS)**

Types of foods prepared from mushrooms; soup, cutlet, omlette, samosa, pickles and curr. Research Centres - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value.

**PRACTRICAL SYLLABUS:**

1. Identification of different edible and poisonous mushrooms.

2. Microscopic and anatomical observations of different mushroom species.

3. Types of Compost preparation and sterilization.

4. Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana

 leaves/waste.

5. Inoculation and spawning of compost.

6. Incubation and harvesting of mushrooms (collection, drying and preservation).

7. Diseases of mushrooms (photographs).

8. Post-harvest technology steps (photographs).

9. Study tour to mushroom cultivation farms

10. Project work – cultivation of paddy straw/ oyster/white button mushrooms.