

# Vidyasagar University

## Curriculum for Agro - Service (Major) [Choice Based Credit System]

### Semester-IV

Course	Course Code	Name of the Subjects	Course Type/ Nature	Teaching Scheme in hour per week			Credit	Marks
				L	T	P		
CC-8		C8T: Post-Harvest Management, Food Processing and Preservation	Core Course-8	4	0	0	6	75
		C8P: Practical		0	0	4		
CC-9		C9T: Agricultural Machinery and Implements - Field works and Laboratory works	Core Course-9	4	0	0	6	75
		C9P: Practical		0	0	4		
CC-10		C10T: Agricultural Meteorology	Core Course-10	4	0	0	6	75
		C10P: Practical		0	0	4		
GE-4		TBD	Generic Elective-4				4/5	75
							2/1	
SEC-2		TBD	Skill Enhancement Course-2	1	1	0	2/1	50
							2	
Semester Total							26	350

L=Lecture, T=Tutorial, P=Practical, CC=Core Course, TBD =To be decided, AECC=Ability Enhancement Compulsory Course.

**Generic Elective (GE)** (Interdisciplinary) from other Department [Paper will be of 6 credits]. Papers are to be taken from following discipline: **Botany/Chemistry/ Physics/Zoology/ Economics.**

**Modalities of selection of Generic Electives (GE):** A student shall have to choose **04** Generic Elective (**GE1 to GE4**) strictly from **02** subjects / disciplines of choice taking exactly **02** courses from each subjects of disciplines. Such a student shall have to study the curriculum of Generic Elective (**GE**) of a subject or discipline specified for the relevant semester.

## SEMESTER-IV

**CORE COURSE (CC)**

**CC-8:Post-Harvest Management, Food Processing and Preservation    Credit 06**

**C8T:Post-Harvest Management, Food Processing and Preservation** **Credit 04**

### Course Contents:

1. Importance and present status of post harvest technology in horticultural crops in India. Maturity, harvesting and handling in relation to extended shelf-life and storage quality of fruits, vegetables and flowers. Maturity and harvesting indices of fruits, vegetables and flowers. Factors responsible for maturity, ripening and deterioration of horticultural produce. Methods used for harvesting and post-harvest treatment for delaying ripening. Sources of post-harvest losses of food grains, management practices to minimize them.
2. Post-harvest operations – threshing, cleaning, drying, milling, separation, packaging. Drying and Dehydration of vegetables & fruits – Pasterisation, sterilization and blanching.
3. Food grain storage structure. Problems associated with storage of products and their remedies – marketing of preserved products.
4. Food preservation and processing principles and methods. Importance and scope of food preservation industry. Storage and marketing of preserved products. Importance and scope of fruits and vegetable preservation. Selection of site for fruit and vegetable preservation unit.
5. Different types of storage of fresh fruit and vegetables. Knowledge of short-term storage and cold storage and its applications in food preservation
6. Principles of preparation of juices, syrups, squashes, jams, jellies, marmalades, juices, crystallized fruits, chutney, pickle and ketchups. Preparation of tomato products.
7. Preservation with sugar – Jam, Jelly, Marmalade. Preservation with salt & vinegar – Pickles, Chutney and Sauce. Requirement of equipment and machinery for a small food processing unit. Spoilage in processed foods - canned foods, pickles and jams.
8. Mushroom – fresh & processed. Mushroom cultivation techniques.
9. Post harvest management of cut flowers. Control of post harvest diseases of important fruits and vegetables.
10. Study of bakery products – bread, biscuits.

**List of Practical:**

1. Studies on Maturity indices, harvesting of various fruits and vegetables.
2. Drying, dehydration, canning, bleaching of fruit and vegetables.
3. Harvesting, packaging, storage and marketing of cut flowers.
4. Identification of different equipments used in processing of fruits and vegetables.
5. Preparation of jam ,jelly, pickles, chutneys and sauces. Selection of different fruits for these preparations.
6. Preparation of various food processing items.
7. Study of spoilage of different processed products.
8. Production of mushroom.
9. Visit to food processing industries.
10. Visit to different storage structures and assessment of losses.
11. Visit to Bakery to study of its product, bread, biscuit.
12. Visits to fruits and vegetables preservation units.

**CC-9: Agricultural Machinery and Implements - Field works and Laboratory works****Credits 06****C9T: Agricultural Machinery and Implements - Field works and Laboratory works****Credits 04****Course Contents:**

1. Principle and working of indigenous and improved plough - mould board plough and disc plough. Working of Harrows-spike tooth harrows.
2. Principle of functioning and parts of different appliances : Seed- cum- fertilizer drill. Cultivator, harvesting equipments, thresher, chaff-cutter. Planter, rice transplanter, sugarcane transplanter, indigenous and improved harvesting equipments.
3. Working principles and different parts of dusters and springers. Manual and power-operated sprayer and dusters.
4. Principles of irrigation systems (Drip and Sprinkler).
5. Engine: function of diesel and petrol engines, study of their various systems; working and maintenance of tractor and power-sprayer; operation of water lifting pumps.
6. Repair and maintenance of above implements.
7. Equipments – Basic principles, working knowledge and significances of Seed Blower, Germinator, Germination Box, Seed & grain sieves, Divider, Universal Moisture tester. pH

meter, Conductivity Bridge, Nitrogen Digestion set, Spectro-Photometer, Flame Photometer, Soil Testing Kit, Fertilizer Testing Kit.

### **C9P: Practical**

**Credits 02**

#### **List of Practical:**

1. Study of different indigenous and improved ploughs-mould board and disc ploughs with its operation
2. Study of harrows, cultivators, seed drills, planters, transplanters and threshers with its operation.
3. Operation of power tillers, dusters and sprayers
4. Operation of pump set and Engines
5. Measurement of irrigation water through 'V' notch, meter gate.
6. Operation of sprinkler and Drip system
7. Methods for testing quality of irrigation water use of water testing kit.
8. Visit to machinery workshop
9. Visit to irrigation command area.

### **CC-10: Agricultural Meteorology**

**Credits 06**

#### **C10T: Agricultural Meteorology**

**Credits 04**

#### **Course Contents:**

**Unit-I: Meteorology and Agricultural Meteorology:** introduction to Meteorology and Agricultural Meteorology. Scope and importance of Agricultural Meteorology. Different meteorological variables related to agriculture. Crop weather relationship.

**Unit-II: Earths' atmosphere** - Definition, composition and structure, climate and weather, micro-meso-macro climate, weather- concept, weather elements, Climate change - causes, effect on ecosystem, crop production, remedial measures and global warming. Atmospheric pressure-concepts, factors affecting and measurement, air pressure variations. Nature and properties of solar radiation, soil temperature and its variations.

**Unit-III: Rainfall and Run - off:** Rainfall- Hydrological cycle and it's components. Rainfall and its mechanisms .Types and forms of precipitation. Storms, occurrence, variation and measurement of rainfall. Rain guage, computation and analysis of data. Plotting of mass curve and rainfall intensity curve. Rainfall over India. Run-off - Definition, types, factors affecting, estimation and measurement.

**Unit-IV: Temperature and Humidity:** Elementary idea of insulation. Temperature – kinds, measuring instruments of temperature and evaporation. Factors affecting and measurement of temperature and evaporation. Humidity- definition, kind and importance. Atmospheric humidity, relative humidity and dew point temperature. Role of humidity on agriculture.

**Unit-V: Weather forecasting and Remote Sensing:** Weather forecasting- concept. Importance of weather forecasting in Agriculture. Weather service to farmers. Agricultural seasons - crop weather diagrams and calendars - crop weather relationships - Role of weather on insect pest and diseases. Introduction to remote sensing and their application in forestry and agriculture.

**Unit-VI:** Agro climatic Zones of India. Meteorological and Agro- Meteorological stations - concept and role. Types of agro meteorological Stations.

## **C10P: Agricultural Meteorology**

**Credits 02**

### **List Practical:**

1. Measurement of Rainfall, Computation of average rainfall. Plotting Bar graph for rainfall data and Rainfall intensity curve.
2. Measurement of Atmospheric pressure and Relative Humidity.
3. Measurement of wind direction and speed.
4. Installation of soil thermometers and measurement and recording of soil temperature.
5. Measurement of open pan evaporation.
6. Preparation of crop weather calendars.
7. Sunshine Recorder and Measurement of sunshine duration.
8. Selection of site and layout of Agro - Meteorological stations and meteorological instruments.
9. Visit to Meteorological observatory and Agro- Meteorological Observatory.

## **Skill Enhancement Courses (SEC)**

### **SEC-2: Nursery and Gardening**

**Credits 02**

### **SEC2T: Nursery and Gardening**

**Credits 01**

### **Course Contents:**

**Unit 1:** Nursery: definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants. Configuration and uses of green house, mist chambers, shade house and glass house.

**Unit 2:** Seed: Structure and types – Orthodox and recalcitrant; Seed dormancy; causes and methods of breaking dormancy - Seed storage: Seed banks, factors affecting seed viability, genetic erosion – Seed production technology - seed testing and certification.

**Unit 3:** Vegetative propagation: air-layering, grafting, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants. Use of root trainer – hykopot

**Unit 4:** Gardening: definition, objectives and scope - different types of gardening - landscape and home gardening - parks and its components - plant materials and design - computer applications in landscaping - Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting.

**Unit 5:** Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures.

### **SEC2P: Nursery and Gardening (Practical)**

**Credits 01**

#### **List Practical:**

1. Visit of glass house, mist chamber, shade house, shade nets ( of different position), green house.
2. Knowing of orthodox and recalcitrant seeds.
3. Germination test of seeds.
4. Viability test of seeds.
5. Performing air layering, grafting of different types.
6. Cutting and induction of roots of hart wood and softwood plants.

**Or**

### **SEC-2: Floriculture**

**Credits 02**

#### **SEC2T: Floriculture**

**Credits 01**

#### **Course Contents:**

**Unit 1:** Introduction: History of gardening; Importance and scope of floriculture and landscape gardening.

**Unit 2:** Nursery Management and Routine Garden Operations: Sexual and vegetative methods of propagation; Soil sterilization; Seed sowing; Pricking; Planting and transplanting; Shading; Stopping or pinching; Defoliation; Wintering; Mulching; Topiary; Role of plant growth regulators.

**Unit 3:** Ornamental Plants: Flowering annuals; Herbaceous perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms and Cycads; Ferns and Selaginellas; Cultivation of plants in pots; Indoor gardening; Bonsai.

**Unit 4:** Principles of Garden Designs: English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds, Shrubbery, Borders, Water garden. Some Famous gardens of India.

**Unit 5:** Landscaping Places of Public Importance: Landscaping highways and Educational institutions.

**Unit 6:** Commercial Floriculture: Factors affecting flower production; Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life; Cultivation of Important cut flowers (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Lily, Orchids, Tuberose).

**Unit 7:** Diseases and Pests of Ornamental Plants (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Lily, Orchids, Tuberose).

**SEC2P: Floriculture (Practical)**

**Credits 01**

**List Practical:**

1. Practicing pricking (Thinning or culling), pinching and topiary.
2. Knowing vines, lianas, twiners, annual and perennial ornamental species, cormatous, tuberoses and bulbous ornamentals.
3. Creation of Bonsai, grafting of cacti.
4. Laying of garden designs.

**Or**

**SEC-2: Principles of Management and Agribusiness**

**Credits 02**

**SEC2T: Principles of Management and Agribusiness**

**Credits 01**

**Course Contents:**

1. Agri-business: Definition, history and scope of agri-business (Input, Farm Product Sectors). Importance of agri-business in the indian economy. Changing dimension of agricultural business. Agri-business Management-distinctive features, nature and components.
2. Management of Agro business: - Definition of management, role of management. Management functions -Management levels, Managerial roles, Management skills, Elements,

Levels, Process & Functions of Management, a) Planning: Definition, Characteristics, Steps in planning ,types of planning, Nature , Purpose, importance and limitations of planning.

b) Organizing: Definition, importance, Characteristics/Nature of organization. Principles & Process of organization. c). Directing-definition, functions, techniques, qualities of good supervisor. d). Controlling –Definition, Elements, Process of control, Techniques/ Tools of control.

**3. Farm business analysis** - Farm efficiency measures, financial & cash accounts of farm, Net worth statement, systems of book keeping.

Information and communication management, Fundamentals of information and

Communication - solving agricultural problems with information systems.

Information - characteristics, Information Vs Knowledge, ABC nature of information, Information as a crucial resource, Different channels of information - communication- Radio, TV, Video, E-mail, Network connecting devices-intranet, internet, Photography, basics -its use in ICM, Digital Photography -its advantages. Agricultural Information System - Agricultural databases - Definition and objectives, Decision Support system, Expert system, Remote Sensing - Geographic data and maps, Geographical information system.

## **SEC2P: Principles of Management and Agribusiness (Practical)**

**Credits 01**

### **List Practical:**

1. Study of various business models in agri-business.
2. Study of farm records.
3. Study of Systems of book keeping.
4. Study of measures of farm income.
5. Study of measures of farm efficiency.
6. Study of farm planning techniques & situations.
7. Study of farm budgeting techniques & types.
8. Study of farm inventory.
9. Study of cost ratios, capital ratio.
10. Study of balance sheet financial ratio analysis.