

**PRINCIPLES OF SEED TECHNOLOGY****Unit I**

History and importance of seed technology. Classes of seeds. Characteristics of quality seeds and its importance.

**Unit II**

General technique of seed production in important agricultural crops:

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|----------------------|---|---|
| (i) Cereals          | - | wheat, rice, barley   |
| (ii) Millets         | - | maize, sorghum and bajra  |
| (iii) Pulses         | - | chickpea, pigeonpea, fieldpea, urdbean, mung bean and lentil          |
| (iv) Oil Seeds       | - | rape seed, mustard, groundnut, sesamum, castor, sunflower and soybean |
| (v) Commercial crops | - | sugarcane, jute and coconut   |

**Unit III**

Factors affecting seed longevity and quality. Causes of seed deterioration with reference to genetic quality and storage.

**Unit IV**

Seed testing - importance, procedures, purity, viability and germination. Certification procedure for important field crops.

**Practical**

1. Maintenance of seed purity in the field.
2. Field inspection procedure in important crops.
3. Demonstration of seed processing of important crops.
4. Viability and vigour test
5. Analysis of purity, moisture and germination of seed samples and communication of results.

Semester VI

Course II

2+1=3

## **DAIRY PRODUCTS TECHNOLOGY**

### **Unit I**

Definition, composition and method of manufacture of cream, butter, Dahi and Ghee.

### **Unit II**

Definition, composition and method of manufacture of icecream, chhana, khoa condensed milk, milk powder, cheddar and cottage cheese.

### **Unit III**

Common adulterants of Ghee and khoa and their detection, Cleaning and sanitization of dairy equipments. Nutritive value to milk and milk products.

### **Unit IV**

Basic principles of refrigeration and cold storage of milk products. Principles of cooling and heating Heat transfer equipments.

### **Practical**

1. Demonstration of cream separation
2. Demonstration of preparation of butter, Ghee, khoa, Chhena, ice cream and daN
3. Calculation on ice cream mix.
4. Calculation on standardization, and Neutralization of cream, over run of butter and ice cream.
3. Comparative study of cost of different milk products.

**POST HARVEST ENGINEERING**

**Unit I**

Importance and advantages of processing of agricultural produce.

**Unit II**

Study of process and equipments involved in cleaning, drying, storage of farm produce.

**Unit III**

Rice milling, Pulse-milling, wheat milling, oilseed milling, soybean processing, cane-crushing, Chaff cutting and animal feed grinding. Utilization of agricultural by products such as rice husk and straws, rice bran and Arhar Stalk.

**Unit IV**

Processing and Preservation of foods and seeds. Biomethanation of agricultural and municipal wastes.

**Practical**

1. Determination of moisture content of grains.
2. Sieve analysis of ground materials.
3. Study of construction, operation, care and maintenance of different processing equipments.
4. Study of Biogas plants.
5. Visits of places related to processing of farm produce.

**CROP PLANNING FARM MANAGEMENT AND SUSTAINABLE AGRICULTURE**

**Unit I**

Farming systems - Definition, types and methods of farming.

**Unit II**

Definition, scope and advantages of sustainable agriculture. Modern agriculture in relation to sustainability.

**Unit III**

Sustainable agriculture in relation to tillage, fertilizer, irrigation, weed management and Plant protection measures.

**Unit IV**

Important cropping systems for sustainable agriculture.

**Practical**

Numerical problem on fertilizers, seed rate and yield estimation. Quality standards, inspection, certification and labeling and accreditation procedures for farm produce from organic farms. Techniques of growing green manure crops, vermicompost, F.Y.M and Compost. Visit to National Centre for Organic Farming (NCOF). Visit to blue- green algae centre vermicompost and biofertilizers production unit. Visit to biopesticide production units, Centre for Protected Crop Production, organic crop production farm. Determination of LD value of herbicides and insecticide. Calculations of herbicide and insecticide requirements for different crops, and non-crop terrestrial and aquatic situations.

## Course V

Semester VI

2+1=3

### **AGRICULTURAL FINANCE, BUSINESS MANAGEMENT AND TRADE**

#### **Unit I**

Credit, Meaning, importance and credit control. Definition, need for finance in agriculture, characteristics of good agricultural finance (credit). Decision on the use of credit, Principles of farm credit (Equity or Increasing Risk, Added Cost and Added Return, Cost of Credit and no loss no profit goal of farming and opportunity cost Principle). Types of loans and classification of agricultural credit. Qualifications of a borrower, Analysis and three R's and credit (Return, Repayment Capacity and Risk-bearing Capacity). Analysis of three C's of credit (character, capacity and capital).

#### **Unit II**

Types of Loan, according to liquidity, budgeted loan, loan amortization, Even payment method, Decreasing method. Crop index reflecting use and farm finance. Role and Rural Credit Institutions (Recommendations of the Banking Commission Integrated Scheme of Rural Finance (Credit), Institutional Agencies, Taccan. Sources of agricultural finance (Commercial banks, RRB, Lead Bank, NABARD, Cooperative Credit (PACs, Land Development Banks, National Cooperative Federation, Farmers Service Cooperatives).

#### **Unit III**

Meaning of management, functions of management, role of managers and scope of management in agricultural business. Role and objectives in management references. Decision making by individuals as also by groups. Functional areas of management and their relationship with agriculture production, finance, marketing and human resources as coordination thereof Importance and nature of planning, useful generalization of planning forecasting technique with the help of a planning model, components of strategic management. Budgeting in A basic planning technique. Time management, a technique for planning use of manager's own time. Leadership in Management, Types and Leadership for production, planning and control activities (inventory control quality control, cost control) and financial management, financial forecasting and planning acquisition of funds. Acquaintance of book-keeping and cash account(s). Knowledge of business environment for operation of bank account, cheques, bank draft etc.

#### **Unit IV**

Objectives, importance features and implications. The concept, management of Products. Movement of factors of production, Movement of money capital.

#### **Practical**

1. Numerical Exercises on - (a) Equity or Increasing Risk, (b) Added Cost -added return, cost of borrowed capital and profit with varying rates and earnings, cost of credit and cost of borrowing. Budgeted loans. Working out credit needs of a farmer. Computing various financial test ratios.
2. Visit to atleast two financial institutions providing loans to farmers for studying their organisation, structure and functions including managerial aspects.
3. Estimation of overtime growth of agricultural trade.
4. Preparation of a report on 2 and 3 supra.

**HISTORY AND DEVELOPMENT OF AGRICULTURE RESEARCH AND  
COMMUNICATION AND DIFFUSION OF AGRICULTURE INNOVATION**

**Unit I**

Meaning and definition of communication. Communication process, elements and models of communication process. Types of communication. Key communicator. Audio visual aids, their use and effectiveness.

**Unit II**

Extension teaching methods - classification, merits and demerits, factors affecting selection and use of extension teaching methods. Mass Media in Extension.

**Unit III**

Meaning and definition of diffusion, adoption diffusion effect and rate of adoption, stages of adoption, Factors affecting adoption, Elementals of diffusion, difference between diffusion and communication.

**Unit IV**

Meaning and definition of innovation, Innovation decision process, categories of adopters, characteristics of innovations.

**Practical**

1. Preparation, procurement and handling of aids.
- 2: Organizing group discussion, campaign, seminar, exhibition and demonstration.
3. Practices in writing news letter, circular letter, radio and television scripts on different farm practices.
4. Identification of farmers and their categories them into different adopters categories.
5. Collection of information from farmers regarding different characteristics of innovations.
6. Collection of data regarding rate of adoption for the adoption of different farm practices in different years.

**MUSHROOM CULTURE AND ELEMENTARY PLANT NEMATOLOGY**

**Unit I**

History, scope and importance of Mushrooms. Morphology of edible mushrooms and their classification.

**Unit II**

Preparations of mushroom compost and its method. Mushroom Spawn and its preparation. Methods of Cultivation of different types of edible Mushrooms.

**Unit III**

Mushroom diseases (Bacterial, Viral, Fungal and Mushroom abnormalities. Insect and pests of Mushroom. Mushroom recipes.

**Unit IV**

Nematode History, classification, morphology and structure of nematode, Nematode diseases and management ó Root knot diseases of vegetable, ear cockle of wheat, molya disease of barley.

**Practical**

Identification of different type of Mushroom, Collection of Mushroom disease, insect and pest, Preparation method of Mushroom recipes. Collection and preservation of nematode disease. *In vitro* screening of synthetic chemicals and plant products for nematocidal activity, and their application methods; methods for screening of crop germplasm for resistance against nematodes, laboratory exercises on biocontrol potential of fungal, bacterial parasites, and predacious fungi and nematodes.

**ORNAMENTAL HORTICULTURE**

**Unit I**

Importance and scope of ornamental horticulture in India.

**Unit II**

Cultivation of annuals and canna, Commercial cultivation of rose, chrysanthemum, marigold and gladiolus.

**Unit III**

Making and maintenance of Lawn; Making and maintenance of Hedge and edging.  
Elementary knowledge of common shrubs, climbers and trees and their various uses.  
Indoor gardening

**Unit IV**

Styles of gardens with special reference to Moghul and Japanese gardens; Flower arrangement and techniques to prolong vase life of flowers.

**Practical**

Identification of ornamental plants; Preparation of herbaceous border; Practice of making garlands, Bouquet and arrangements in vases; Propagation of ornamental plants; Practice of potting and repotting of plants. Visit to ornamental gardens and research station.