

## DEPARTMENT OF AGRONOMY

Course Code	Course Title	Credit Hours
AG-101	Fundamentals of Agronomy	3(2+1)
AG-205	Principle of Organic Farming	2(1+1)
AG-301	Crop Production Technology-I ( <i>Kharif</i> Crops)	2(1+1)
AG-302	Practical Crop Production-I ( <i>Kharif</i> Crops)	2(0+2)
AG-401	Crop Production Technology-II ( <i>Rabi</i> Crops)	2(1+1)
AG-402	Practical Crop Production-II ( <i>Rabi</i> Crops)	2(0+2)
AG-501	Rain Fed and Dryland Agriculture	2(1+1)
AG-601	Farming System, Precision Fanning and Sustainable Agriculture	2(1+1)
<b>ELECTIVE COURSE</b>		
AGE-63	Weed Management	3(2+1)

### Detailed Syllabus

#### AGRONOMY

1. **Fundamentals of Agronomy** **3(2+1) AG-101**

**Theory**

Agronomy and its scope. seeds and sowing, tillage and tilth, crop density and geometry, Crop nutrition, manures and fertilizers, nutrient use efficiency, water resources, soil-plant- water relationship, crop water requirement, water use efficiency, irrigation- scheduling, criteria and methods, quality of irrigation water. Weeds- importance. classification, crop weed competition, concepts of weed management- principles and methods, herbicides- classification, selectivity and resistance, allelopathy. Growth and development of crops, factors affecting growth and development, plant ideotypes, crop rotation and its principles, adaptation and distribution of crops, harvesting and threshing of crops.

**Practical**

Identification of crops, seeds, fertilizers, pesticides and tillage implements. Identification of weeds in crops, Methods of herbicide and fertilizer application. Study of yield contributing characters and yield estimation. Numerical exercises on fertilizer requirement, plant population. herbicides and water requirement, Study of soil moisture measuring devices, Measurement of irrigation water.

**2. Crop Production Technology-I (*Kharif Crops*) 2(1+1) AG-301****Theory**

Origin geographical distribution, economic importance. soil and climatic requirements. varieties, cultural practices and yield of *Kharif* crops, Cereals - rice, maize, sorghum, pearl millet and finger millet, pulses-pigeonpea, mungbean and urdbean; oilseeds- til, groundnut. and soybean; fibre crops- cotton & jute; forage crops-sorghum. cowpea, cluster bean.

**Practical**

Rice nursery preparation. transplanting of rice, sowing of soybean, pigeonpea and mungbean. Maize, groundnut and cotton, effect of seed size on germination. Effect of sowing depth on germination of kharif crops, identification of weeds in kharif season crops. top dressing and foliar feeding of nutrients, study of yield contributing characters and yield calculation of kharif season crops, study of crop varieties and important agronomic experiments at experimental farm. Visit to research centres related to crops.

**3. Crop Production Technology-II (*Rabi crops*) 2(1+1) AG-401****Theory**

Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of *Rabi* crops; cereals - wheat, barley and oat, pulses- chickpea, lentil, peas. oilseeds- rapeseed, mustard, linseed and sunflower; sugar crop- sugarcane; other crops- potato and tobacco. Forage crops-berseem, lucerne and oat.

**Practical**

Sowing methods of wheat and sugarcane, identification of weeds in rabi season crops. Numerical problems on seed requirement of rabi crop. Study of yield contributing characters of rabi season crops, study of important

agronomic experiments of rabi crops at experimental farms. Study of rabi forage experiments, visit to research stations of related crops.

**4. Farming System, Precision Farming and Sustainable Agriculture 2(1+1) AG-601**

**Theory**

Farming System-scope, importance, and concept, Types and systems of farming system and factors affecting types of farming, Farming system components and their maintenance, Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation, Sustainable agriculture-problems and its impact on agriculture. conservation agriculture strategies. HEIA, LELA and LEISA and its techniques for sustainability, Integrated farming system components of IFS and its advantages, farming system and environment.

**Practical**

- Tools for determining productions & efficiencies in cropping and farming systems.
- Indicators of sustainability of cropping & Farming systems
- Site specific development of IFS models for different agro-climatic zones.
- Visit of IFS models in different agro climatic zones of nearby state Universities/Institutes and farmer fields.

**5. Practical Crop Production-I (Kharif Crops) 2(0+2) AG-302**

**Practical**

Crop planning, raising field crops in multiple cropping systems: Field preparation, seed, treatment, nursery raising. sowing. nutrient, water and weed management and management of insect-pests diseases of crops, harvesting, threshing, drying winnowing, storage and marketing of produce. The emphasis will be given to seed production. mechanization, resource conservation and integrated nutrient, insect-pest and disease management technologies. Preparation of balance sheet including cost of cultivation. net returns per student as well as per team of 8-10 students.

**6. Practical Crop Production-II (Rabi Crops) 2(0+2) AG-402**

**Practical**

Crop planning, raising field crops in multiple cropping systems: Field preparation, seed, treatment, nursery raising. sowing, nutrient, water and weed management and management of insect-pests diseases of crops, harvesting, threshing, drying winnowing, storage and marketing of produce. The emphasis will be given to seed production, mechanization, resource

conservation and integrated nutrient, insect-pest and disease management technologies. Preparation of balance sheet including cost of cultivation. net returns per student as well as per team of 8-10 students.

**7. Principles of Organic Farming** **2(1+1) AG-205**

**Theory**

Organic farming, principles and its scope in India; Initiatives taken by Government (central/state), NGOs and other organizations for promotion of organic agriculture. Organic nutrient resources and its fortification; Restrictions to nutrient use in organic farming; Choice of crops and varieties in organic farming; Fundamentals of insect, pest, disease and weed management under organic mode of production: Certification process and standards Of organic farming.

**Practical**

Visit of organic farms to study the various components and their utilization: Preparation of enrich compost, vermicompost, Indigenous technology knowledge (ITK) for nutrient, insect, pest disease and weed management; Cost of organic production system; Quality aspect, grading, packaging and handling.

**8. Rain fed and Dryland Agriculture:** **2(1+1) AG-501**

**Theory**

Rainfed and dryland agriculture-Introduction. types and history. Problems & prospects of rainfed agriculture in India. Soil and climatic conditions prevalent in rainfed areas. Drought: types, effect of water deficit on physio-morphological characteristics of the plants. Mechanism of crop adoption under moisture deficit conditions. Efficient utilization of water through soil and crop management practices, management of crops in rainfed areas. Contingent crop planning for aberrant weather conditions. Precision agriculture; concepts and techniques: their issues and concerns for Indian agriculture.

**Practical**

Studies on climatic classifications, studies on rainfall pattern in rainfed areas of the country. Studies on cropping pattern of different dryland areas in the country and demarcation of dryland area on map of India. Interpretation of metrological data and scheduling of supplemental irrigations on the basis of evapo-transpiration demand of crops effective rainfall and its calculations. Visit to rainfed research stations/watersheds.

## **ELECTIVE COURSE**

### **Weed Management**

**3(2+1) AGE-63**

#### **Theory**

Introduction to weeds, characteristics of weeds their harmful and beneficial effects on ecosystem. Classification, reproduction and dissemination of weeds. Herbicide classification. concept of adjuvant, surfactant, herbicide formulation and their use. Introduction to mode of action of herbicides and selectivity. Allelopathy and its application for weed management. Bio- herbicides and their application in agriculture. Concept of herbicide mixture and utility in agriculture. Herbicide compatibility with agro-chemicals and their application. Integration of herbicides with non chemical methods of weed management. Herbicide Resistance and its management.

#### **Practical**

Techniques of weed preservation. Weed identification and their losses study. Biology of important weeds. Study of herbicide formulations and mixture of herbicide. Herbicide and agro- chemicals study. Shift of weed flora study in long term experiments. Study of methods of herbicide application, spraying equipments. Calculations of herbicide doses and weed control efficiency and weed index.