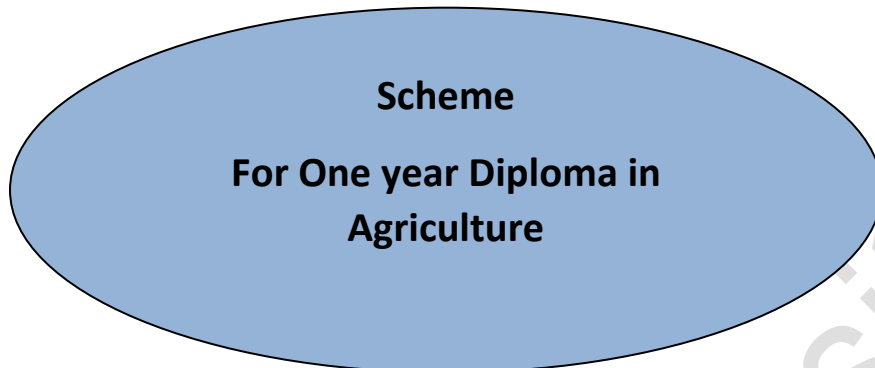




# SunRise University

Approved by Govt. of Rajasthan vide Sunrise University Act, 2011  
Recognized by UGC Act, 1956 u/s 2 (f)



**2021-2022**

**COLLEGE OF AGRICULTURE  
SUNRISE UNIVERSITY - ALWAR**



**SUNRISE UNIVERSITY - ALWAR**

**Campus: Bagad Rajput, Ramgarh, Alwar, Rajasthan 30102**

**DIPLOMA IN AGRICULTURE (1 YEAR)**

## 1<sup>st</sup> Year

PAPER CODE	PAPER NAME	Credit (T)	Credit (P)	Theory	Practical	TOTAL
AGRON111	Principles of Agronomy	2	2	50	50	100
SCHEM112	Fundamentals of Soil Science	2	2	50	50	100
PPATHO113	Plant Pathogens and Principles of Plant Pathology	2	2	50	50	100
SCHEM114	Soil fertility and Nutrient Management	2	2	50	50	100
HORT115	Principles of Horticulture	2	2	50	50	100
ENTO116	Insects-Pest and their Management	2	2	50	50	100
<b>Total</b>	-	<b>12</b>	<b>12</b>	-	-	<b>600</b>

Dean

College of Agriculture

SunRise University, Alwar

## **Principles of Agronomy**

**Credit: 2+2= 4**

**Theory:**

Agriculture: definition, meaning and its branches, Agronomy: -definition, meaning and scope of agronomy. Classification of field crops. Factors affecting on crop production, Agro-climatic zones of Gujarat. Tillage: Definition of tillage and tillage. Classification of Tillage: Influence of tillage on physical properties of soil. Planting geometry and its effect on growth and yield. Cropping systems: Definition and types of cropping systems. Difference between dry farming, dry land farming and rainfed farming. Problems of dry land agriculture.

**Practicals:**

1. Study of different hand tools
2. Acquaintance with field crops grown in crop cafeteria.
3. Identification and study of tillage implements and practice of ploughing/harrowing
4. Identification and study of seeding equipments and practice of different methods of sowing
5. Identification and calculation of manures, fertilizers and green manure crops
6. Identification of inter cultivation implements and their practice

Practice of methods of fertilizer applications

## Fundamentals of Soil Science

**Credit: 2+2= 4**

**Theory:**

Soil – Definition and components of soil . Physical properties of soil-Soil texture, soil structure,

density of soil, porosity of soil, soil colour, soil temperature and their role in soil fertility. Soil air- Definition and its importance, factors affecting the composition of soil air. Soil water- importance of soil water, physical classification of soil water and biological classification (only names). Soil pH and its effect on availability of nutrients and plant growth. Salt affected soils:- Nature and classification, characteristics, detrimental effects of soil salinity and alkalinity and their reclamation. Soils types in Gujarat. Role of organic matter in crop production.

**Practicals:**

1. Collection of representative soil sample for laboratory testing
2. Determination of particle and bulk density of soil
3. Determination of maximum water holding capacity of soil
4. Estimation of EC and pH of soil
5. Irrigation water quality analysis : EC, carbonate, bicarbonate, chloride.
6. Irrigation water quality analysis: Calcium, magnesium and sodium.

Recommendation for quality of irrigation water.

# Plant Pathogens and Principles of Plant Pathology

Credit: 2+2= 4

## Theory

Introduction: Importance of plant diseases, scope and objectives of Plant Pathology. History of Plant Pathology with special reference to Indian work. Terms and concepts in Plant Pathology. Causes and factors affecting disease development: Disease triangle and tetrahedron and classification of plant diseases. Important plant pathogenic organisms (different groups): fungi, bacteria, phytoplasma, spiroplasma, viruses, viroids, algae, protozoa and phanerogamic plant parasites with example of diseases caused by them. Diseases and symptoms due to abiotic causes. Pathogenesis, Role of enzymes, toxins and growth regulators in disease development. Defence mechanism in plants. Epidemiology: Factors affecting disease development. Fungi: General characters, definition of fungus, somatic structures, types of fungal thalli, fungal tissues, modifications of thallus, reproduction (asexual and sexual). Nomenclature, Binomial system of nomenclature, rules of nomenclature, classification of fungi. Key to divisions, sub-divisions, orders and classes. Bacteria and mollicutes: General morphological characters. Basic methods of classification and reproduction. Viruses: Nature, architecture, multiplication and transmission. Growth and reproduction of plant pathogens. Liberation, dispersal and survival of plant pathogens. Types of parasitism and variability in plant pathogens.

## Practicals

1. Acquaintance with various laboratory equipments and microscopy
2. Preparation of media, isolation and Koch's postulates
3. General study of different structures of fungi
4. Study of symptoms of various plant diseases
5. Study of representative fungal genera
6. Staining and identification of plant pathogenic bacteria
7. Transmission of plant viruses
8. Study of phanerogamic plant parasites
9. Study of fungicides and their formulations
10. Methods of pesticide application and their safe use
11. Calculation of fungicide sprays concentrations

# **Soil fertility and Nutrient Management**

**Credit: 2+2= 4**

## **Theory:**

### **Plant nutrients:-**

Soil as a source of plant nutrients. Essential and beneficial soil fertilizers elements, forms of nutrients in soil, mechanisms of nutrient transport to plants, factors affecting nutrient availability to plants. Measures to overcome deficiencies and toxicities.

### **Problematic soils**

Problematic soils- acid, salt affected and calcareous soils, characteristics, nutrient availabilities.

Reclamation of soil-mechanical, chemical and biological methods.

Soil fertility- Different approaches for soil fertility evaluation. Methods, Soil testing- Chemical methods, critical levels of different nutrients in soil. Plant analysis - DRIS methods, critical levels in plants. Rapid tissue tests. Indicator plants. Biological method of soil fertility evaluation.

### **Fertilizer recommendation**

Soil test based fertilizer recommendations to crops. Factors influencing nutrient use efficiency (NUE) in respect of N, P, K, S, Fe and Zn fertilizers.

Source, method and scheduling of nutrients for different soils and crops grown under rainfed and irrigated conditions

## **Practicals:**

1. Estimation of available nitrogen in soil
2. Determination of available phosphorus in soil using spectrophotometer (Olsen's method)
3. Determination of available potassium in soil using flame photometer
4. Determination of gypsum requirement of soil
5. Determination of EC and pH of water
6. Determination of  $\text{CO}_3$ ,  $\text{HCO}_3$  and Cl from water
7. Determination of Ca, Mg and Na from water
8. Sampling, processing and preparation of acid extract for the determination of elements from plant tissues
9. Determination of total nitrogen from plant sample by Kjeldahl method
10. Determination of phosphorus from plant using spectrophotometer

# Principles of Horticulture

Credit: 2+2= 4

## Theory:

Introduction, definition, branches of horticulture and importance of fruits and vegetables in human diet. Scope, current situation and importance of horticulture in Gujarat/India. Propagation of horticultural crops, definition, types, classification, merits and demerits. Methods of propagations. Hormones-Role of hormones in horticultural crops. Principles of pruning and training-need, objectives and scope. Choice of trees and plants

## Practicals:

1. Study of horticultural tools and different containers
2. Preparation of nursery beds and sowing
3. Study of potting and repotting
4. Study of propagation by seeds and seed treatment
5. Study of plant propagation by cutting and layering.
6. Study of propagation by budding and grafting
7. Study of different types of media and their uses in horticulture
8. Preparation of different hormone solution . Visit to commercial nurseries

# Insects-Pest and their Management

Credit: 2+2= 4

## Theory:

Details of marks of identification, host, nature of damage, life history and management of important pests of field crops Cereals- rice, maize, pearl millet, sorghum and wheat, Pulses-(pigeonpea,chickpea,greengram),Oilseeds-(groundnut,mustard,castor,soybean and sesamum),Cash crops-cotton, tobacco and Sugarcane.

Details of marks of identification, host, nature of damage, life history and management of important pests of horticultural crops-viz., Vegetables-(okra, brinjal, tomato, potato, cabbage, cauliflower, chilli, cucurbits & onion).Fruits (mango ,banana, citrus, guava, pomogranate, aonla, sapota, papaya and coconut)

## Practicals:

1. Field visit to identify damaging stages of important pest and their nature of damage
2. Pest of Field crops (cereals crops , pulses crops , oil seed crops , cash crops etc.)
3. Pest of Vegetables (okra , brinjal , tomato , potato , cabbage & cauliflower chilly, cucurbits , onion)
4. Pest of Fruits (mango , banana , citrus , guava , pomogranate , aonla , sapota , papaya and coconut)
5. Submission of properly preserved, well arranged and labeled specimens of important pests.