SEMESTER S2

CROP PRODUCTION & PROTECTION TECHNOLOGIES

Course Code	**CPP205**	**CIE Marks**	40
Teaching Hours/Week (L: T:P: R)	3:1:0:0	**ESE Marks**	60
Credits	4	**Exam Hours**	2 Hrs. 30 Min.
Prerequisites (if any)	None	**Course Type**	Theory

Course Objectives:

1.	To understand the principles of agricultural crop production and protection practices of different crops
2.	To understand the role and importance of Agricultural Engineers in crop production
3.	To equip the students with the basic principles of cropping and cultivation practices of important crops of Kerala.

SYLLABUS

Module No.	Syllabus Description	Contact Hours

1	Introduction to agriculture -Importance of agricultural science for crop production - Branches of agricultural science-National and international agricultural research Institutes - Basic elements of crop production - Agricultural seasons in India and Kerala. Classification of crops based on the intensity of cultivation, uses, life span, growth habit, and climatic response and/or habitat. Factors affecting crop growth and production: genetic (internal) and environmental (external) factors. Crop management through environmental modification and adaptation of crops to the existing environment through crop cultural practices. Competition among crop plants -Selection of crops- seed rate, seed treatment, raising of nursery and production of quality planting material. Field preparation for crops including systems of tillage; Spacing and arrangement of crop plants; Establishment of an adequate crop stand and ground cover. Types and methods of harvest	**11**
2	Crop rotation, cropping systems, cropping scheme, relay cropping, mixed cropping and intercropping. Soil-water-plant relationship, crop coefficients, water requirement of crops and critical stages for irrigation; Weeds and their management in crops; Time and method of sowing of major field crops, seed rate for important crops; Methods and time of application of manures and fertilizers, fertigation; Horticulture- Branches-Scope and importance; Seed rate and seed treatment for vegetable crops; Macro and micro propagation methods; Types of plant growing structures; Pruning and training; Orchard- site selection, layout and Management of orchard.	**11**

3	Definition of soil. Different functions of soil in our eco system namely as medium of plant growth, Regulator of water supply, Recycle of raw materials, Modifier of atmosphere, Habitat for organisms, Engineering medium etc. Soil profiles and horizons: O, A, B and C. Soil as an interface of solids, water and air and their percentage composition. Formation of soils: Weathering of rocks and minerals, Physical weathering, Biogeochemical weathering, Factors influencing soil formation, soil taxonomy orders. Important soil physical properties: texture, structure, density, porosity, consistency, temperature. The concepts of soil fertility and productivity. The essential elements and their functions in plants. Soil colloids – properties – nature - types and significance. Layer silicate clays - their genesis and sources of charges. Adsorption of ions - ion exchange - CEC and AEC - factors influencing ion exchange and its significance. Concept of pH - soil acidity - brief overview of saline, sodic and calcareous soils. Soil organic matter – composition – decomposability – humus.	**11**
4	Organic and inorganic fertilizers- its Importance- soil reactions. Gypsum requirement for reclamation of sodic soils and neutralizing RSC; Liquid fertilizers and their solubility and compatibility. Major pests and diseases of field crops and horticultural crops and their management. Integrated methods of managing water, nutrients and plant protection. Crop production technology of field crops in Kerala: cereal crops, grain legumes, oil seed crops, sugarcane, and fibre crops. Cultivation practices of horticultural crops: vegetable crops, fruit crops, flower crops. Basic principles of natural farming, organic farming and sustainable agriculture	**11**

Course Assessment Method (CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination-2 (Written)	Total
5	15	10	10	40

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from eachmodule. • Total of 8 Questions, eachcarrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, outof which 1 question should be answered. • Each question can have a maximum of 3 subdivisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

	Course Outcome	Bloom's Knowledge Level (KL)
CO1	Explain the general crop production techniques of field crops and horticultural crops.	**K2**
CO2	Explain the factors affecting crop growth and explain environmental management for crop production.	**K2**
CO3	Identify different crops and understand the growing seasons of major crops of Kerala	**K3**
CO4	Describe crop water management, nutrition management and crop protection	**K4**
CO5	Explain cultivation practices of various field crops and horticultural crops commonly grown in Kerala	**K2**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1						1					3
CO2		1			2	2					1
CO3	1	2	2		1	3					
CO4	2	1				2					
CO5		2				1		1			2

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Textbook of Field Crops Production Vol 1: Foodgrain Crops (PB)	Dr. Rajendra Prasad	Indian Council of Agricultural Research, New Delhi	First Edition, 2006
2	Textbook of Field Crops Production: Commercial CropsVol. II	Dr. Rajendra Prasad	Indian Council of Agricultural Research,New Delhi	First Edition, 2006
3	Principles of Agronomy	T. Yellamanda Reddy and G.H.Sankara Reddy	Kalyani Publishers, New Delhi	First Edition, 2005
4	Fundamentals of Agronomy	Amal Saxena and Lal Singh	Write And Print Publications, New Delhi	First Edition, 2008
5	Text Book of Soil Science.	Biswas, T.D. andMukherjee, S.K.	Tata McGraw Hill Publishing Co., NewDelhi	
6	Introductory Soil Science. .	Das.D.K	Kalyani Publishers, New Delhi	

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Handbook of Agriculture.		ICAR Publications, New Delhi	6th Revised Edition, 2011.
2	Vegetable Crops of India.	Das P.C.	Kalayani Publishers, New Delhi	1993
3	Fundamentals of Agronomy.	De, G.C.	Oxford & IBH Publishing Co Pvt Ltd, New Delhi	1989
4	Introduction to Horticulture	Kumar N.	Rajalakshmi Publications, Nagarcoil	7th Edition, 2015
5	Nature and Properties of Soils.	Brady, N.C	Pearson	