Course Code	Course Name	Credits
26PH102	AGRICULTURAL PHYSICS	04

Course Objectives

- To know basic physics laws related to agriculture.
- To familiar with different types of soil and agricultural methods.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

- Understand Basics physics related to agricultural field.
- Understanding the soil compositions
- Understanding the various methods and plant Physiology, breeding in soil.

Unit 1 - Basic Physics (12 Hrs.)

Conservation of mass, energy and momentum, Force in nature, Measurement of heat, specific heat, heat transfer process, reflection, refraction, diffraction, polarization, interference, and scattering of light; Electricity and magnetism, elasticity, stress-strain, modulus of elasticity, Hooks law; Hydrostatic pressure, surface tension, capillary rise, viscosity; Law of thermodynamics, entropy, free energy.

Unit 2 – Soil Physics (12 Hrs.)

Definition of Soil, Components of Soil and their role in agriculture, Soil forming rocks and minerals, Development of Soil profile, Soil formation, factors affecting soil formation, soil forming processes, Soil reaction and its measurements and significance, Physical properties of soil, and their significance, Chemical properties of soil, cation, and anion exchange phenomenon and their importance in agriculture, etc.

Unit 3 - Agricultural methodology (12 Hrs.)

Different meteorological variables related to agriculture, Rainfall- Hydrologic cycle and its components, Types, and forms of precipitation, Humidity, definition, wind vane, Anemo-meter, Indian Agro Climatic Zones Elementary idea of weather forecasting, etc.

Unit 4 – Elementary Plant Physiology (12 Hrs.)

Role of plant physiology in agriculture, Cell structure and function, Bio-Physico-chemical phenomenon-diffusion, osmosis plasmolysis and imbibitions, Absorption of water and mineral salts, Photosynthesis - light and dark reactions, etc.

Unit 5 - Plant Breeding (12 Hrs.)

Plant Breeding-history, objectives, and scope, Mode of reproduction in crop plants in relation to breeding techniques, Plant variation kind, and causes, Genetic consequences of self and cross-pollinated crops, etc.

Reference Books:

1. Elementary plant physiology, MacDougal, Daniel Trembly, 1865-1958**,** New York, Longmans, Green, and Co, 1902.
2. SoilPhysics: An Introduction, Manoj K. Shukla

Websites and eLearning Sources:

1. https://youtu.be/8N1BxHgsoOw?si=XsVAHk6BSBki7Nj_
2. https://youtu.be/yAIb3T9DPyE?si=oeq25L-utI6ghL4-
3. https://youtu.be/tCBlt5e2jwg?si=EUnRcf7lOUnH1hPM

COs and Bloom's Taxonomy Mapping – 26PH102		
Course Outcomes	**On completing U.G. program the students will be able to**	**BTL**
CO1	Recall and list key physics concepts, laws, and equations related to conservation of mass, energy, and momentum.	K1
CO2	Explain the principles behind key physical phenomena such as thermodynamics and wave behavior (reflection, refraction, diffraction).	K2
CO3	Apply theoretical concepts and mathematical techniques to solve standard physics problems in mechanics and thermodynamics.	K3
CO4	Analyze experimental data to identify patterns, correlations, and underlying physical principles relevant to soil physics and plant physiology.	K4
CO5	Evaluate scientific literature and propose innovative solutions to physical problems in the context of agricultural methodology and plant breeding.	K5, K6

BTL K1 and K2 – remembering and understanding, K3- Applying, K4 – Analyse, K5- Evaluate and K6 - Create

Relationship Matrix – 26PH102													
Course Outcomes	**Programme Outcomes (POs)**						**Programme Specific Outcomes (PSOs)**						**Mean Score of Cos**
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**	
CO1	3	2	2	1	1	1	3	2	2	1	1	1	1.67
CO2	2	3	2	1	1	1	2	3	3	1	1	1	1.75
CO3	2	2	3	1	1	1	2	3	3	1	1	1	1.75
CO4	2	3	2	1	1	1	1	1	2	3	2	1	1.67
CO5	3	3	2	3	2	3	1	2	2	2	3	3	2.42
												Total	1.85

Mean Score: 3- High, 2- Medium/Moderate, 1-Low