

AGPC2006 FARM MACHINERY AND EQUIPMENT - II (3-0-0)

Course Objectives:

To equip students with knowledge of advanced farm machinery and equipment for operations such as spraying, weeding, harvesting, threshing, and crop digging. The course emphasizes the principles, design, and functioning of machinery, fostering skills for operational efficiency, troubleshooting, and effective application in agricultural practices.

Module I

Introduction to plant protection equipment – sprayers and dusters. Classification of sprayers and sprays. Types of nozzles. Calculations for calibration of sprayers and chemical application rates. Introduction to interculture equipment. Use of weeders – manual and powered. Study of functional requirements of weeders and main components. Familiarization of fertilizer application equipment.

Module II

Study of harvesting operation – harvesting methods, harvesting terminology. Study of mowers – types, constructional details, working and adjustments. Study of shear type harvesting devices – cutter bar, inertial forces, counter balancing, terminology, cutting pattern. Study of reapers, binders and windrowers – principle of operation and constructional details. Importance of hay conditioning, methods of hay conditioning, and calculation of moisture content of hay.

Module III

Introduction to threshing systems – manual and mechanical systems. Types of threshing drums and their applications. Types of threshers- tangential and axial, their constructional details and cleaning systems. Study of factors affecting thresher performance. Study of grain combines, combine terminology, classification of grain combines, study of material flow in combines. Computation of combine losses, study of combine troubles and troubleshooting. Study of chaff cutters and capacity calculations. Study of straw combines – working principle and constructional details.

Module IV

Study of root crop diggers – principle of operation, blade adjustment and approach angle, and calculation of material handled. Study of potato and groundnut diggers. Study of Cotton harvesting – Cotton harvesting mechanisms, study of cotton pickers and strippers, functional components. Study of maize harvesting combines. Introduction to vegetables and fruit harvesting equipment and tools.

Course Outcomes:

- CO1: Understand the classification, functioning, and calibration of plant protection and intercultural equipment like sprayers, dusters, and weeders.
- CO2: Analyze the working principles and components of harvesting equipment, including mowers, reapers, and hay conditioners.
- CO3: Evaluate the performance of threshing systems, including threshers and grain combines, and identify troubleshooting techniques.
- CO4: Demonstrate knowledge of root crop harvesting equipment, including diggers for potatoes, groundnuts, and cotton harvesters.

CO5: Familiarize with vegetable and fruit harvesting tools and machinery, emphasizing design, functionality, and efficiency.

Suggested Readings :

1. Kepner RA, Roy Barger & EL Barger. Principles of Farm Machinery.
2. Smith HP and LH Wilkey. Farm Machinery and Equipment.
3. Culpin Claude. Farm Machinery. y Srivastava AC. Elements of Farm Machinery.
4. Lal Radhey and AC Datta. Agricultural Engineering Principles of Farm Machinery