

**FMPE 507 : Management of Farm Power and Machinery System 2+1****Objectives:**

To understand how principles of management are applied to farm machinery systems to make them more effective and profitable.

**Unit-I**

Importance and objectives of farm mechanization in Indian agriculture, its impact, strategies, myths and future needs. Estimation of operating cost of tractors and farm machinery. Management and performance of power, operator, labour. Economic performance of machinery, field capacity, field efficiency and factors affecting field efficiency.

**Unit-II**

Tractor power performance in terms of PTO, drawbar and fuel consumption. Power requirement problems to PTO, DBHP.

**Unit-III**

Selection of farm machinery, size selection, timeliness of operation, optimum width and problem related to its power selection. Reliability of agricultural machinery. Replacement of farm machinery and inventory control of spare parts.

**Unit-IV**

Systems approach to farm machinery management and application of programming techniques to farm machinery selection and scheduling. Network Analysis: Transportation, CPM and PERT, dynamic programming, Markov chain.

**Practicals**

Study of latest development of different agricultural equipment and implements in India and other developing countries. Size selection of agricultural machinery. Experimental determination of field capacity of different farm machines. Study of farm mechanization in relation to crop yield. Determination of optimum machinery system for field crop and machine constraints. To develop computer program for the selection of power and machinery.

**Course Outcome:**

The student will be able to understand how farm machinery is selected and operated to make them economically viable.

**Teaching Schedule**

<b>Sr N</b>	<b>Topic</b>	<b>No of lectures</b>
1.	Importance and scope of farm mechanization in Indian Agriculture	1
2.	Cost analysis of Farm Machinery and tractor, Breakdown analysis, Inflation.	2
3.	Measurement of power performance (PTO power, drawbar power and fuel consumption) of tractor and power tiller	3
4.	Study of field capacity and field efficiency of different farm machinery and factor affecting them	1
5.	Selection of Farm Machinery size wrt power source and timeliness of operation	4

6.	Application of programming technique to problem of farm power and machinery selection.	4
7.	Replacement models, spare parts and inventory control	2
8.	Maintenance and scheduling of operations.	2
9.	Network analysis – transportation	2
10.	Network analysis – critical path method, PERT	2
11.	Network analysis – dynamic programming	3
12.	Network analysis – markov chain	3
13.	Linear programming, multivariable system, simplex algorithm. Theory of network.	3
	<b>Total</b>	<b>32</b>

### List of Practicals

Sr. No	Topic	No of practicals
1.	Introduction to latest development of advanced agricultural equipment's in India	3
2.	Experimental determination of field capacity of different farm machines	3
3.	Case studies on optimum size selection of agricultural machinery	3
4.	Determination of inventory of different farm machines for a farm of size 50 ha as per regional crop rotations	3
5.	To develop computer program regarding selection of farm machinery size and power requirement for a 10, 50 and 100 ha farm size	4
	<b>Total</b>	<b>16</b>

### Suggested Reading:

1. Hunt D 1979. *Farm Power and Machinery Management*. Iowa State University Press, USA
2. Kapoor V K 2012. *Operation Research: Concepts, Problems and Solutions*. Sultan Chand and Sons, India.
3. Culpin C 1996. *Profitable Farm Mechanization*. Lock Wood and Sons, London.
4. Singh, S and Verma, S R. *Farm Machinery Maintenance and Management*. DIPA, ICAR, KAB-I, New Delhi.

5. Carveille, L A 1980. *Selecting Farm Machinery*. Louisiana Cooperative Extn. ServicesPublication.
6. FAO 1990. *Agricultural Engineering in Development: Selection of Mechanization Inputs*. FAO, Agri service Bulletin
7. S.C. Jain and Grace Philip. 2003. *Farm Machinery- An Approach*. Standard Publishers. Delhi-6
8. Surendra Singh. *Farm Machinery: Principles and Applications*. DIPA-ICAR, New Delhi.