

21AENG251 FARM MACHINERY AND POWER

Hours Per Week :

L	T	P	C
1	-	2	2

Total Hours :

L	T	P
15	-	30

COURSE DESCRIPTION AND OBJECTIVES:

This course imparts the students required skills to identify suitable implements to conduct tillage, sowing, and plant protection operations on different crops and soils and to operate and maintain tractor, power tiller, sprayer, reaper and multi-crop threshers

COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes
1	Understand the requirement of farm mechanization in crop production
2	Understand the principles of construction and working of the machinery used for crop production
3	Evaluate to determine the cost economics of the crop production machineries

SKILLS:

- ✓ Operate tillage implements
- ✓ Operate sowing and plant protection implements
- ✓ Compute the cost of operation of farm machinery
- ✓ Select material of construction for tillage implements



Source :

<https://www.indiafilings.com/learn/national-agricultural-market-nam/>

ACTIVITIES:

- o *Demonstrate different components of I.C. engine*
- o *Drive a tractor*
- o *Practice different types of primary and secondary tillage implements - Mould plough - Disc plough and disc harrow etc*
- o *Practical knowledge on Seed cum-fertilizer drills and calibration*
- o *Demonstrate pesticide calculation and application methods by using different sprayer's and dusters under field conditions*

UNIT - 1

Farm Power: Status of farm power in India - Sources of farm power – I.C. engines – Working principles of I C engines - Comparison of two stroke and four stroke cycle engines - Study of different components of I.C. engine - I.C. engine terminology and solved problems - Familiarization with different systems of I.C. engines

UNIT - 2

Air cleaning – Cooling- Lubrication - Fuel supply and hydraulic control system of a tractor

UNIT - 3

Power transmission: Familiarization with power transmission system – Clutch - Gear box – Differential and final drive of a tractor - Tractor types - Cost analysis of tractor power and attached implement

UNIT - 4

Implements: Familiarization with primary and secondary tillage implements -Implements for hill agriculture - Implements for intercultural operations - Familiarization with sowing and planting equipment

UNIT - 5

Calibration: Calibration of a seed drill and solved examples –Familiarization with plant protection equipment - Familiarization with harvesting and threshing equipment

LABORATORY EXPERIMENTS**LIST OF EXPERIMENTS**

1. Showing the difference between EC engine and constructional details of IC engine
2. Dismantling the IC engine and explaining the functional aspects of components
3. Air cleaning and maintenance - Engine cooling and maintenance
4. Familiarizing with lubrication and fuel supply system of an engine
5. Familiarizing with clutch – Gearbox - Differential and final drive along with brake steering hydraulic control of tractor
6. Tractor driving
7. Power tiller operation
8. Attachment of an implement by using 3 point hitch system of a tractor
9. Familiarization with primary tillage implements like M. B. Plough, disc plough and its adjustments
10. Study of secondary tillage implements and its constructional details –Emphasis on disc harrow, spike tooth harrow, blade harrow, rotavator, power harrow
11. Familiarization with seed metering mechanism and its calibration
12. Study on planters and transplanters
13. Practicing with plant protection equipment, different sprayers and dusters
14. Familiarization with inter-cultural equipment and different types available in the market
15. Exposure on harvesting equipment and combine harvesters.

REFERENCES:

1. Jagadishwar Sahay - Elements of Agricultural Engineering
2. S.C. Jain and C.R. Rai. Farm Tractor – Maintenance and Repair. Standard Publishers, 1705-B, Nai Sarak, Delhi – 110006
3. Jagadishwar Sahay - Elements of Agricultural Engineering
4. Surendra Singh. Farm Machinery - Principles and Applications. ICAR Publication
5. S.C. Jain and C.R. Rai. Farm Tractor – Maintenance and Repair. Standard Publishers, 1705-B, Nai Sarak, Delhi – 110006
6. Ojha, T. P. and Michael, A.M. Principles of Agricultural Engineering. Vol. I, Jain Brothers, 16/893, East Park Road, Karol Bagh, New Delhi – 110005

