

20FM001 DESIGN OF FARM MACHINERY SYSTEM

Hours Per Week :

L	T	P	C
2	-	3	5

Total Hours :

L	T	P	W/RA	SSH/SHS	CS	SA	S	BS
-	-	-	-	-	-	-	-	-

Course Description and Objectives:

To acquaint and equip with the latest design procedures of farm power and machinery systems.

Course Outcomes:

- able to design the agricultural machines for tillage, planting/ sowing, threshing and combine harvesting etc.
- able to testing of agricultural machines for tillage, planting/ sowing, threshing and combine harvesting etc.
- mastering the methods and processes of design.
- having fundamental knowledge of theories of agricultural machinery and equipment.
- having knowledge and transfer of new technologies in the field of design and construction of agricultural machines and equipment.
- monitoring and implementation of new and contemporary solutions

SKILLS:

- ✓ Design tillage equipment
- ✓ Design weeding equipment

ACTIVITIES:

- o Design of MB Plough
- o Design of cultivator.
- o Design and prototype development of wheel hoe.

UNIT –I

Modern trends, principles, procedures, fundamentals and economic considerations for design and development of farm machinery systems. Design considerations, procedure and their applications in agricultural machines. Reliability criteria in design and its application.

UNIT –II

Mechanics of tractor chassis, Forces acting upon tillage implement, Mechanics of tillage

UNIT –III

Design of selected farm equipments: – tillage, seeding, planting, interculture, plant protection, harvesting and threshing. Design of rotary, vibrating and oscillating machines.

UNIT –IV

Tractor –Implement matching and operation, Tractor Implement performance

UNIT – V

Safety devices for tractors & farm implements. Cabs & HVAC designs- designs of ROPS and FOPS, safety locations of PTO

Practical:

Statement and formulation of design problems of

1. Mould board ploughs
2. Disc ploughs
3. Harrows
4. Cultivators
5. Rotary tiller
6. Seed drills and planters
7. Transplanters and fertilizer applicators
8. Harvesters
9. Threshers
10. Forage handling equipment

Text books:

1. Bernacki C, Haman J & Kanafajski CZ. 1972. *Agricultural Machines*. Oxford & IBH.
2. Bindra OS & Singh Harcharan 1971. *Pesticides Application Equipments*. Oxford & IBH.
3. Bosoi ES, Verniaev OV & Sultan-Shakh EG. 1990. *Theory, Construction and Calculations of Agricultural Machinery*. Vol. I. Oxonian Press.

Reference books:

1. Klenin NI, Popov IF & Sakoon VA. 1987. *Agricultural Machines. Theory of Operations, Computing and Controlling Parameters and the Condition of Operation*.
2. Lal R & Dutta PC. 1979. *Agricultural Engineering* (through solved examples). Saroj Parkashan.
3. Ralph Alcock. 1986. *Tractor Implements System*. AVI Publ.
4. Raymond N, Yong Ezzat A & Nicolas Skiadas 1984. *Vehicle Traction Mechanics*. Elsevier.
5. Sharma PC & Aggarwal DK. 1989. *A Text Book of Machine Design*. Katson Publishing House.