

22ELCT304 FARM MACHINERY DESIGN AND PRODUCTION

Hours Per Week :

L	T	P	C
2	0	2	3



PREREQUISITE KNOWLEDGE: Design – Parameters, Procedure and Research Aspects, Power transmission design, Machinery production, Advance cutting techniques, Geometric Dimensions and tolerances, Industrial layouts, Quality production and Reliability.

COURSE DESCRIPTION AND OBJECTIVES:

To familiarize and orient the students in theory, planning, designing, technological development, modification and exploitation of small & medium scale farm machinery.

MODULE-1

UNIT-1

8L+0T+8P=16 Hours

DESIGN – PARAMETERS, PROCEDURE AND RESEARCH ASPECTS:

Introduction to design parameters of agricultural machines and design procedure: Characteristics of farm machinery design. Research and development aspects of farm machinery.

UNIT-2

8L+0T+8P=16 Hours

POWER TRANSMISSION DESIGN – COMPONENTS, SAFETY AND APPLICATION:

Design of standard power transmission components used in agricultural machines: Mechanical & hydraulic units. Introduction to safety in power transmission. Application of design principles to the systems of selected farm machines.

PRACTICES:

- Familiarization with different design aspects of farm machinery and selected components.
- Solving design problems on farm machines & equipment
- Visit to Agricultural machinery manufacturing industry.

MODULE-2

UNIT-1

8L+0T+8P=16 Hours

MACHINERY PRODUCTION, MATERIAL SELECTION, PREPARATION OF PROJECT REPORTS AND ADVANCE CUTTING TECHNIQUES:

Introduction to design parameters of agricultural machines and design procedure: Characteristics of farm machinery design. Research and development aspects of farm machinery.

UNIT-2

8L+0T+8P=16 Hours

HEAT TREATMENT OF STEELS, GEOMETRIC DIMENSIONS AND TOLERANCES, INDUSTRIAL LAYOUTS, QUALITY PRODUCTION AND RELIABILITY:

Heat Treatment of steels including pack carburizing: Shot pining process, etc. Limits, Fits & Tolerances, Jigs & Fixtures. Industrial lay-out planning. Quality production management. Reliability.

Source: https://lh3.googleusercontent.com/KN_tu9MmVAL_-DGqSiPzFR5G9XMqdb6suT3hc4kVI7N_FrjUBhWw5hQvHxkm2OVjrUem=s170

SKILLS:

- ✓ *Design of farm implements.*
- ✓ *Planning of a small scale industry.*

PRACTICES:

- Tractor manufacturing industry Jigs and Fixtures study in relation to agricultural machinery.
- Fits, tolerances and limits
- Layout planning of a small scale industry
- Problems on Economics of process selection
- Preparation of a project report
- Case study for manufacturing of simple agricultural machinery.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply to design standard power transmission components, mechanical & hydraulic units used in agricultural machines.	Apply	1	1, 3, 5
2	Apply principles to the systems of selected farm machines.	Apply	1	1, 3, 5, 6
3	Apply material substitution in agricultural machinery production.	Apply	2	4, 6, 9, 11
4	Analyze and operate various production tools.	Analyze	2	3, 5, 9, 10, 11

TEXT BOOKS:

1. Sharma PC and DK Aggarwal, "Machine Design" 2008.
2. Richey, C.B, "Agricultural Engineering Handbook" 2012.
3. Adinath M and AB Gupta, "Manufacturing Technology, 2003.
4. Narula V, "Manufacturing process" 2011.

REFERENCE BOOKS:

1. Singh S, "Mechanical Engineer's Handbook" 2005.
2. Chakraborty NR, "Data book for Machine Design" 2003.