

AG408 Production Technology for Agril. Machinery**Course Description & Objectives:**

To expose the student with the latest design procedures of agriculture machinery and their different components.

Course Outcomes:

On completion of the course, the students will understand:

1. the basic production techniques and criteria for the selection of raw materials
2. the basic foundry and forgery techniques used for production of machinery.
3. the coating processes used for various machinery.
4. maintenance of quality and use of various standards for quality check.

Unit 1: Application of Software in Agriculture Machinery Production:

Critical appraisal in production of Agricultural Machinery; Modelling and stress analysis of Machinery parts by using standard software;

Unit II: Materials used in Machinery:

Advances in material used for tractor & Agril. Machinery. Cutting tools including CNC tools and finishing tools. Advanced manufacturing techniques like powder metallurgy, EDM (Electro Discharge Machining), Heat Treatment of Steels.

Unit III: Coating Process of Metals:

Ferrous metallurgy, iron carbon diagram, alloying of elements, phase diagram, TTT diagram, surface treatment techniques: thermo chemical treatment including pack carburizing shot pining process, chemical vapour deposition (CVD) etc.

Unit IV: Production and Quality Control:

Limits, Fits & Tolerances, Jigs & Fixtures, Microstructure Analysis. Industrial layout Planning, Quality management, Economics of process selection. Techno economic feasibility of Project Report. Selection of Standard/ critical components.

Unit V: Manufacturing Process:

Case studies of manufacturing of Agril. Machinery. Servomotors, drives & controllers, CNC controllers for machine tools. CNC programming. Assembly and plant automation. Storage and transportation.

TEXT BOOKS:

1. Everett.E.Adam and JR.Ronald. J.Ebert. (2002).*Production and operations management concepts, models and behaviour*. Prentice Hall of India Pvt Ltd, New Delhi.
2. Martand.T.Telsang. (2005). *Production management*. S Chand and company Ltd, Ram nagar.,New Delhi.

REFERENCES:

1. Paul Degram.E, Blach.J.T and Ronald A Kosher. (2005). *Materials and process in manufacturing*.Prentice Hall of India.
2. Prabhu Dev. (2010).*Handbook of heat treatment of steel*. Tata McGraw Hill.Ltd, New Delhi.
3. Callister, W.D. (2005) *Materials science and engineering*. Wiley, New Delhi.

IV Year I - Semester

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AG413 Mechanics of Tillage and Traction**Course Description & Objectives:**

To present an overview of tillage and traction devices and systems to the students. To present fundamental concepts describing dynamic soil behavior in response to mechanical elements with methods for designing traction/transport systems.

Course Outcomes:

After the completion of this course the student will be:

1. able to measure and utilize physical and mechanical properties of soil.
2. Able to interpret and predict soil stress strain behavior.
3. able to design and implement safe and cost effective mechanical soil tillage systems
4. able to design and implement and cost effective mechanical traction/transport systems
5. able to establish systems that produce specified performance and acceptable alteration of affected soil profiles.

Unit 1: Mechanics of Tillage:

Introduction to mechanics of tillage tools, engineering properties of soil, principles and concepts, stress strain relationship,