

Course Type	Course Code	Name of the Course	L	T	P	Credit
DE	OMED602	Production Technology: Theory and Practice	3	0	0	3

Prerequisites

Bachelor/Master/PhD students having background in Mechanical Engineering/Production Engineering/Manufacturing Technology

Course Objectives

At the end of the course, the students will be able to:

1. Understand the fundamental principles of various manufacturing processes such as casting, forming, machining, welding, and additive manufacturing.
2. Identify the appropriate manufacturing process based on material properties, product geometry, and required tolerances.
3. Analyze the influence of process parameters on productivity, surface finish, dimensional accuracy, and tool life.
4. Familiarize with different types of machine tools, cutting tools, jigs, fixtures, and measuring instruments used in manufacturing.
5. Understand the basics of automation, computer-aided manufacturing, and recent trends like CNC, robotics, and Industry 4.0 in production systems.
6. Apply safety standards, quality control measures, and sustainable practices in manufacturing operations.

Learning Outcome

On successful completion of this course, students will be able to:

1. Understand the principles of fundamental manufacturing processes such as casting, forming, machining, welding, and additive manufacturing.
2. Identify suitable manufacturing methods based on product geometry, material properties, and functional requirements.
3. Analyze the influence of process parameters on material removal rate, surface finish, tool wear, and product quality.
4. Describe various types of machine tools, cutting tools, jigs, and fixtures used in production.
5. Apply concepts of dimensional accuracy, tolerances, and surface roughness in manufacturing scenarios.
6. Understand inspection techniques, metrology instruments, and quality assurance in production environments.
7. Familiarize with modern manufacturing practices, including automation, CNC technology, and Industry 4.0 integration.
8. Evaluate the environmental impact and safety considerations associated with different production techniques.

Unit No.	Topics to be covered	No. of lecture videos	Video time (Minutes)	Learning Outcomes
1	Introduction to the course on Production Technology	2	119	On successful completion of this unit students will be able to know the basics of Production Technology with examples.
2	Metal machining	3	180	On successful completion of this unit students will be able to know the basics of metal machining with examples.

3	Machining (continued)	2	120	On successful completion of this unit students will be able to know different components and their structure for Machining system.
4	Friction in metal cutting	3	178	On successful completion of this unit students will be able to understand the concept of friction in metal cutting
5	Cantilever beam, ring structure, octagon, extended octagon	3	183	On successful completion of this unit students will be able to understand the concept of Cantilever beam, ring structure, octagon, extended octagon
6	Milling operations, broaching operation	2	119	On successful completion of this unit students will be able to understand the applications of Milling operations, broaching operation
7	Grinding wheel wear (continued)	2	121	On successful completion of this unit students will be able to understand the concept of Grinding wheel wear
8	Abrasive Jet Machining	3	178	On successful completion of this unit students will be able to understand the applications of Abrasive Jet Machining
9	Major components related to CNC machine tools	2	119	On successful completion of this unit students will be able to understand the Major components related to CNC machine tools
10	Laboratory Hands-on Training: Introduction to the Power transmission (PPTs)	3	220	On successful completion of this unit students will be able to understand the concept of Power transmission
11	CNC part programming exercises in PPT – turning, grooving, threading (Continued)	4	245	On successful completion of this unit students will be able to understand the CNC part programming
12	Various milling cutters, end milling cutter	4	242	On successful completion of this unit students will be able to understand Various milling cutters, end milling cutter
Total No. of Video lectures & Video time		33	2024	

Text Books:

1. G Boothroyd-Fundamentals of Metal Machining and Machine tools
2. A.Ghosh and Asok Mallik- Machining Science

Reference Books:

1. G.K.Lal and S.K.Choudhury-Fundamental of Manufacturing Processes
2. M.C.Shaw-Metal Cutting Principles