

**GOVERNMENT POLYTECHNIC, MALKANGIRI**  
**DEPARTMENT OF MECHANICAL ENGINEERING**

**LESSON PLAN**

Discipline: <b>Mechanical Engineering</b>	Semester: 6th	Name of the Teaching Faculty: <b>BIBHASH MANDAL</b>	
Subject: <b>ADVANCE MANUFACTURING PROCESSES</b>	No. of days/week class allotted 4	Semester From date: <b>22.12.2025</b> No. of Week: <b>15</b>	To date: <b>18.04.2026</b>
<b>PRE-REQUISITE</b>	Basic knowledge about Manufacturing process.		
<b>Course Outcomes</b>	CO1:- Understand the working principle of modern machining processes. CO2:- Understand the Plastic Processing. CO3:- Understand the additive manufacturing process.CO4:- Understand the Special Purpose Machines. CO5:-Understand the Maintenance of Machine Tools.		
<b>Week</b>	<b>Class Day</b>	<b>Theory/Practical Topics</b>	
1st	1st	Introduction- comparison with traditional machining	
	2nd	Ultrasonic Machining:- Principle, Description of equipment	
	3rd	Ultrasonic Machining:- Advantages, Disadvantages applications	
	4th	Electric Discharge Machining:-Principle, Description of equipment	
2nd	1st	Electric Discharge Machining:- Dielectric fluid, tools (electrodes)	
	2nd	Electric Discharge Machining:- Process parameters, Output characteristics, application	
	3rd	Wire cut EDM:- Principle, Description of equipment	
	4th	Wire cut EDM:- Controlling parameters, applications	
3rd	1st	Abrasive et Machining:- Principle, description of equipment	
	2nd	Abrasive Jet Machining:- Material removal rate, application	
	3rd	Abrasive Jet Machining:- Advantages, Dis advantagesapplication	
	4th	Laser Beam Machining:- principle, description of equipment	
4th	1st	Laser Beam Machining:- Material removal rate, application	
	2nd	Electro Chemical Machining:-principle, description of equipment	
	3rd	Electro Chemical Machining:-Material removal rate, application	
	4th	Plasma Arc Machining :- Principle, description of equipment, Material removal rate.	
5th	1st	Plasma Arc Machining :-Process parameters, performance characterization,application	
	2nd	Electron Beam Machining:- Principle, description of equipment, Material removal rate	
	3rd	Electron Beam Machining :- Process parameters, performance characterization, Applications	
	4th	REVISION CH-1/QUIZ & ASSIGNMENT-1	
6th	1st	Processing of plastics	
	2nd	Moulding processes: Injection moulding	
	3rd	Moulding processes:Compression moulding	
	4th	Moulding processes:Transfer moulding.	
7th	1st	Extruding; Casting; Calendering.	
	2nd	Fabrication methods-Sheet forming	
	3rd	Fabrication methods-Blow moulding	
	4th	Fabrication methods- Laminating plastics (sheets, rods & tubes), Reinforcing	
8th	1st	Applications of Plastics	
	2nd	REVISION CH-2/QUIZ & ASSIGNMENT-2	
	3rd	Introduction, Need for Additive Manufacturing	
	4th	Fundamentals of Additive Manufacturing, AM Process Chain	
9th	1st	Advantages and Limitations of AM, Commonly used Terms	
	2nd	Classification of AM process, Fundamental Automated Processes	
	3rd	Distinction between AM and CNC, other related technologies	
	4th	Application -Application in Design, Aerospace Industry	
10th	1st	Application - Automotive Industry, Jewelry Industry	
	2nd	Application - Arts and Architecture.	

	3rd	RP Medical and Bioengineering Applications
	4th	Web Based Rapid Prototyping Systems
11th	1st	Concept of Flexible manufacturing process
	2nd	Concurrent engineering
	3rd	Production tools like capstan and turret lathes
	4th	Rapid prototyping processes
12th	1st	REVISION CH-3/QUIZ & ASSIGNMENT-3
	2nd	Special Purpose Machines (SPM), Concept
	3rd	General elements of SPM
	4th	Productivity improvement by SPM
13th	1st	Productivity improvement by SPM
	2nd	Principles of SPM design
	3rd	Principles of SPM design
	4th	REVISION CH-4/QUIZ & ASSIGNMENT-4
14th	1st	Types of maintenance
	2nd	Repair cycle analysis
	3rd	Repair complexity
	4th	Maintenance manual
15th	1st	Maintenance records
	2nd	Housekeeping
	3rd	Introduction to Total Productive Maintenance (TPM)
	4th	REVISION CH-5/QUIZ & ASSIGNMENT-5

**Learning Resources:**

01:- Production technology -Vol-II, O.P.KHANNA

02:-Workshop Technology, Vol-I,B.S. Raghuwanshi

03:- Production Technology , HMT, Bangalore

04:- Rapid prototyping: Principles and Applications, Chua C.K., Leong K.F. and LIM C.S,

  
Signature  
of Faculty

  
Signature of HOD/

  
Signature of Academic  
Coordinator

  
Signature of Principal