

GOVT. POLYTECHNIC KANDHAMAL, PHULBANI  
At- Salunki, PO- Phulbani, Pin- 762001, website- gpkandhmal.org  
**DEPARTMENT OF MECHANICAL ENGINEERING**  
**LESSON PLAN**

Discipline: Mechanical	Semester: 6th	Name of the Teaching faculty: Manas Kumar Mishra
Subject: Advance Manufacturing Process (TH4b)	No of Days/Week class allotted: 4	Semester from Date: 22/12/25 To Date: 18/04/26 No of weeks: 15
Week	Class Day	Topics
1st	1st	i) Introduction to unconventional machining
		ii) lesson plan, Cos, exam, class tests
		iii) Comparison with traditional machining.
	2nd	i) Ultrasonic Machining: working principle
		ii) description of equipment
	3rd	i) Advantages and limitations
		ii) Applications
	4th	i) Electric Discharge Machining: Principle
		ii) Description of equipment
2nd	1st	i) Dielectric fluid properties , examples
		ii) Tool materials
		iii) Process parameters
	2nd	i) Process characteristics
		ii) Advantages and limitations
		iii) Applications
	3rd	i) Wire cut EDM: Principle, Description of equipment
	4th	i) Controlling parameters
		ii) Applications
3rd	1st	i) Abrasive Jet Machining: principle, description of equipment
	2nd	i) Material removal rate, advantages and limitations
		ii) Application
	3rd	i) Laser Beam Machining: principle, description of equipment
	4th	i) Material removal rate, advantages and limitations
		ii) Application
4th	1st	i) Electro Chemical Machining: principle, description of equipment
	2nd	i) Material removal rate, advantages and limitations
		ii) Application
	3rd	i) Plasma Arc Machining – principle, description of equipment
	4th	i) Material removal rate, Process parameters
		ii) Performance characterization

5th	1st	i) Advantages and limitations
		ii) Applications
	2nd	i) Electron Beam Machining - principle, description of equipment
	3rd	i) Material removal rate, Process parameters ii) Performance characterization, Applications
6th	4th	i) Probable questions discussion/Quiz
	1st	i) Thermoplastic and thermosetting materials
	2nd	ii) Materials added to polymer to enhance properties
	3rd	i) Properties of plastics and processing methods
7th	4th	i) Injection moulding process, applications
	1st	i) Compression moulding process, applications
	2nd	i) Flash moulding, positive type, semi positive type moulding.
	3rd	i) Transfer moulding process
8th	4th	i) Extrusion moulding process ii) Casting iii) Calendering
	1st	i) Blow moulding; direct and indirect methods
9th	2nd	i) laminating plastics ii) High pressure laminates, manufacturing of sheets, rods and tubes
	3rd	i) low pressure laminates ii) Reinforcing, bag moulding, vaccum forming
	4th	i) Applications of plastics
	1st	Probable questions discussion/Quiz
10th	2nd	i) Introduction to additive manufacturing ii) Need of AM iii) Prototypes
	3rd	i) Fundamentals of Additive Manufacturing ii) CAD Design, STL files, slicer, 3D printers
11th	4th	i) Advantages and Limitations of AM
	1st	i) Commonly used Terms ii) Classification of AM process
	2nd	i) Distinction between AM and CNC
12th	3rd	i) other related technologies ii) Fundamental Automated Processes
	4th	i) AM Process Chain, CAD Design, STL.
	1st	i) AM Process Chain, Slicing, Building, post processing.
	2nd	i) Application in Design, Aerospace Industry
13th	3rd	i) Automotive Industry, Jewelry Industry, Arts and Architecture.
	4th	i) RP Medical and Bioengineering Applications
	1st	i) Web Based Rapid Prototyping Systems. ii) Concept of Flexible manufacturing process
14th	2nd	i) Concurrent engineering, production tools like capstan and turret lathes.

13th	3rd	i) Rapid prototyping processes.
	4th	i) Rapid prototyping processes.
	1st	i) concepts of Special Purpose Machines
	2nd	i) General elements of SPM
14th	3rd	i) General elements of SPM
	4th	i) Productivity improvement by SPM
	1st	i) Principles of SPM design
	2nd	i) Types of maintenance
15th	3rd	i) Repair cycle analysis
	4th	i) Repair complexity
	1st	i) Maintenance manual
	2nd	i) Maintenance records, Housekeeping
15th	3rd	i) Total Productive Maintenance (TPM).
	4th	Probable questions discussion, VST.

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22.12.25

signature of faculty