

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

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

Wadhvi 22.12.25
22.12.25

signature of faculty