

GOVERNMENT POLYTECHNIC JAJPUR

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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: 10/03/22 To Date: 30/06/22	
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			
2nd	1st	i) advantages and limitations	
		ii) applications	
	2nd	i) Electric Discharge Machining: Principle	
		ii) Description of equipment	
	3rd	i) dielectric fluid properties , examples	
		ii) tool materials	
		iii) process parameters	
	4th	i) process characteristics	
		ii) advantages and limitations	
		iii) applications	
	3rd	1st	i) Wire cut EDM: Principle, Description of equipment
		2nd	i) controlling parameters
ii) applications			
3rd		i) Abrasive Jet Machining: principle, description of equipment	
4th	i) Material removal rate, advantages and limitations		
	ii) application		
4th	1st	i) Laser Beam Machining: principle, description of equipment	
	2nd	i) Material removal rate, advantages and limitations	
		ii) application	
	3rd	i) Electro Chemical Machining: principle, description of equipment	
4th	i) Material removal rate, advantages and limitations		
	ii) application		
5th	1st	i) Plasma Arc Machining – principle, description of equipment	
	2nd	i) Material removal rate, Process parameters	
		ii) performance characterization	
3rd	i) advantages and limitations		
	ii) applications		

	4th	i) Electron Beam Machining - principle, description o
6th	1st	i) Material removal rate, Process parameters
	2nd	i) performance characterization, Applications CLASS TEST 1, probable questions discussion
	3rd	i) thermoplastic and thermosetting materials
		ii) materials added to polymer to enhance properties
4th	i) properties of plastics and processing methods	
7th	1st	i) Injection moulding process, applications
	2nd	i) Compression moulding process, applications
	3rd	i) flash moulding, positive type, semi positive type m
	4th	i) transfer moulding process
8th	1st	i) extrusion moulding process
		ii) casting
		iii) calendering
	2nd	i) blow moulding; direct and indirect methods
3rd	i) laminating plastics	
	ii) high pressure laminates, manufacturing of sheets, r	
4th	i) low pressure laminates	
	ii) reinforcing, bag moulding, vaccum forming	
9th	1st	i) applications of plastics
	2nd	Probable questions discussion/Quiz
	3rd	i) introduction to additive manufacturing
		ii) need of AM iii) prototypes
4th	i) Fundamentals of Additive Manufacturing ii) CAD Design, STL files, slicer, 3D printers	
10th	1st	i) Advantages and Limitations of AM
	2nd	i) Commonly used Terms
		ii) Classification of AM process
	3rd	i) Distinction between AM and CNC
4th	i) other related technologies	
	ii) Fundamental Automated Processes	
11th	1st	i) AM Process Chain
	2nd	i) AM Process Chain
	3rd	i) Application in Design, Aerospace Industry
	4th	i) Automotive Industry, Jewelry Industry, Arts and Ar
12th	1st	i) RP Medical and Bioengineering Applications
	2nd	i) Web Based Rapid Prototyping Systems.
	3rd	i) Concept of Flexible manufacturing process
	4th	i) concurrent engineering, production tools like capsta
13th	1st	i) rapid prototyping processes, CLASS TEST-2
	2nd	i) concepts of Special Purpose Machines
	3rd	i) General elements of SPM
	4th	i) General elements of SPM
	1st	i) Productivity improvement by SPM

14th	2nd	i) Principles of SPM design
	3rd	i) Types of maintenance
	4th	i) Repair cycle analysis
15th	1st	i) Repair complexity
	2nd	i) Maintenance manual
	3rd	i) Maintenance records, Housekeeping
	4th	i) Total Productive Maintenance (TPM).
16th	1st	i) Total Productive Maintenance (TPM).
	2nd	CLASS TEST 3, Probable questions discussion






signature of faculty