

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: 14/02/23 To Date: 23/05/23 No of weeks: 16
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		
2nd	1st	i) Electric Discharge Machining: Principle
		ii) Description of equipment
	2nd	i) dielectric fluid properties , examples
		ii) tool materials
		iii) process parameters
	3rd	i) process characteristics
		ii) advantages and limitations
		iii) applications
	4th	i) Wire cut EDM: Principle, Description of equipment
	3rd	1st
ii) applications		
2nd		i) Abrasive Jet Machining: principle, description of equipment
3rd		i) Material removal rate, advantages and limitations
	ii) application	
4th	i) Laser Beam Machining: principle, description of equipment	
4th	1st	i) Material removal rate, advantages and limitations
		ii) application
	2nd	i) Electro Chemical Machining: principle, description of equipment
	3rd	i) Material removal rate, advantages and limitations
ii) application		
4th	i) Plasma Arc Machining – principle, description of equipment	

5th	1st	i) Material removal rate, Process parameters
		ii) performance characterization
	2nd	i) advantages and limitations
		ii) applications
3rd	i) Electron Beam Machining - principle, description of equipment	
4th	i) Material removal rate, Process parameters	
6th	1st	i) performance characterization, Applications
		CLASS TEST 1, probable questions discussion
	2nd	i) thermoplastic and thermosetting materials
		ii) materials added to polymer to enhance properties
3rd	i) properties of plastics and processing methods	
4th	i) Injection moulding process, applications	
7th	1st	i) Compression moulding process, applications
	2nd	i) flash moulding, positive type, semi positive type moulding.
	3rd	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
	3rd	i) low pressure laminates
ii) reinforcing, bag moulding, vaccum forming		
4th	i) applications of plastics	
9th	1st	Probable questions discussion/Quiz
	2nd	i) introduction to additive manufacturing
		ii) need of AM
		iii) prototypes
3rd	i) Fundamentals of Additive Manufacturing	
4th	ii) CAD Design, STL files, slicer, 3D printers	
10th	1st	i) Advantages and Limitations of AM
		ii) Classification of AM process
	2nd	i) Distinction between AM and CNC
	3rd	i) other related technologies
ii) Fundamental Automated Processes		
4th	i) AM Process Chain	
11th	1st	i) AM Process Chain
	2nd	i) Application in Design, Aerospace Industry
	3rd	i) Automotive Industry, Jewelry Industry, Arts and Architecture.
	4th	i) RP Medical and Bioengineering Applications

12th	1st	i) Web Based Rapid Prototyping Systems.
	2nd	i) Concept of Flexible manufacturing process
	3rd	i) concurrent engineering, production tools like capstan and turret lathes.
	4th	i) rapid prototyping processes, CLASS TEST-2
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	i) Total Productive Maintenance (TPM).
16th	1st	Probable questions discussion

Mishra
12.02.20

signature of faculty

M.K. Mishra
(lect, mech)