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 alloted: 4	Semester from Date: 10/03/22 To Date: 30/06/22 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
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

	3rd	ii) applications
	4th	i) Electron Beam Machining - principle, description of equipment
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 moulding.
	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, rods and tubes
	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 Architecture.
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 capstan and turret lathes,
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
14th	1st	i) Productivity improvement by SPM
	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

10.3.22

signature of faculty M.K. Mishra (Lect, Mech)