

GOVT. POLYTECHNIC, NAYAGARH
LESSON PLAN
6th SEMESTER MECHANICAL ENGINEERING (2023-24)
(w.e.f 16/01/2024)

SUBJECT-ADVANCED MANUFACTURING PROCESSES
BRANCH- MECHANICAL ENGINEERING
NAME- PRAFULLA KUMAR MALLICK, Lecturer (GF)

TOTAL PERIODS-60
THEORY-4P/WEEK

Sl No.	week	Day	Topics to be covered
1	1st	1st day	Introduction to modern manufacturing process
		2nd day	comparison with traditional machining
		3rd day	Ultrasonic Machining: principle, Description of equipment, applications.
		4th day	Advantages, disadvantages and area of application of USM.
2	2nd	1st day	Electric Discharge Machining: Principle, Description of equipment, Dielectric fluid.
		2nd day	Tools(electrodes), Process parameters, Output characteristics, applications.
		3rd day	Wire cut EDM: Principle, Description of equipment, controlling parameters
		4th day	Advantages, disadvantages and area of application of wire cut EDM.
3	3rd	1st day	Abrasive Jet Machining: principle, description of equipment, Material removal rate.
		2nd day	Advantages, disadvantages and area of application of abrasive jet machining.
		3rd day	Laser Beam Machining: principle, description of equipment, Material removal rate.
		4th day	Advantages, disadvantages and area of application of laser beam machining.
4	4th	1st day	Electro Chemical Machining: principle, description of equipment, Material removal rate.
		2nd day	Advantages, disadvantages and area of application of electro chemical machining.
		3rd day	Plasma Arc Machining – principle, description of equipment, Material removal rate.
		4th day	Process parameters, performance characterization, Application.
5	5th	1st day	Electron Beam Machining - principle, description of equipment, Material removal rate.
		2nd day	Working process of Electron beam machining.
		3rd day	Material removal rate.
		4th day	Process parameters, performance characterization, Applications.
6	6th	1st day	Processing of plastics.

		2nd day	Moulding processes: Injection moulding.
		3rd day	Compression moulding, transfer moulding.
		4th day	Extruding
7	7th	1st day	Casting
		2nd day	Calendering
		3rd day	Fabrication methods-Sheet forming, Blow moulding.
		4th day	Laminating plastics (sheets, rods, tubes)
8	8th	1st day	Reinforcing
		2nd day	Applications of Plastics.
		3rd day	Introduction, Need for Additive Manufacturing.
		4th day	Fundamentals of Additive Manufacturing.
9	9th	1st day	AM processing chain.
		2nd day	Advantages of AM, Commonly used Terms
		3rd day	Limitations of additive manufacturing.
		4th day	Classification of AM process
10	10th	1st day	Fundamental Automated Processes.
		2nd day	Distinction between AM and CNC, other related technologies.
		3rd day	Application—Application in Design, Aerospace Industry, Automotive Industry, Jewelry Industry, Arts and Architecture.
		4th day	RP Medical and Bioengineering Applications.
11	11th	1st day	Web Based Rapid Prototyping Systems.
		2nd day	Concept of Flexible manufacturing process.
		3rd day	concurrent engineering.
		4th day	Use of FMS in production tools like capstan and turret lathes.
12	12th	1st day	Rapid prototyping processes.
		2nd day	Concept of special purpose machining.
		3rd day	3D printing
		4th day	Productivity improvement by SPM.

13	13th	1st day	Principles of SPM design.
		2nd day	Importance of special purpose machining.
		3rd day	Advantages and disadvantages.
		4th day	Area of application.
14	14th	1st day	Types of maintenance.
		2nd day	Description of weekly, daily and yearly maintenance.
		3rd day	Need of maintenance and Repair cycle analysis,
		4th day	Repair complexity.
15	15th	1st day	Maintenance manual.
		2nd day	Maintenance records, Housekeeping.
		3rd day	Introduction to Total Productive Maintenance (TPM).
		4th day	Need of productive maintenance.

Pratulla Kumar Mallik *SR*

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