



GOVERNMENT POLYTECHNIC, NABARANGPUR
DEPARTMENT OF MECHANICAL ENGINEERING

Discipline: MECHANICAL ENGG	Semester: 6TH	Name of the Teaching Faculty: Lect. RABINDRA PRASAD RATH
Subject: ADVANCED MANUFACTURING PROCESSES	No. of days/per week class allotted: 04	Semester From date: 14.02.2023 To Date: No. of Weeks: 15
COURSE OUTCOMES	<ul style="list-style-type: none"> • Understand the working principle of modern machining processes. • Understand the Plastic Processing • Understand the additive manufacturing process • Understand the Special Purpose Machines • Understand the Maintenance of Machine Tools 	
WEEK	CLASS DAY	Theory / Practical Topics
1ST	1	1.0 Modern Machining Processes:
	2	1.0 Modern Machining Processes:
	3	1.1 Introduction – comparison with traditional machining.
	4	1.1 Introduction – comparison with traditional machining.
2ND	1	1.2 Ultrasonic Machining: principle, Description of equipment, applications.
	2	1.2 Ultrasonic Machining: principle, Description of equipment, applications.
	3	1.3 Electric Discharge Machining: Principle, Description of equipment, Dielectric fluid, tools (electrodes), Process parameters, Output characteristics, applications.
	4	QUIZ & ASSIGNMENT
3RD	1	1.4 Wire cut EDM: Principle, Description of equipment, controlling parameters; applications.
	2	1.5 Abrasive Jet Machining: principle, description of equipment, Material removal rate, application.
	3	1.5 Laser Beam Machining: principle, description of equipment, Material removal rate, application.
	4	QUIZ & ASSIGNMENT
4TH	1	1.6 Electro Chemical Machining: principle, description of equipment, Material removal rate, application.
	2	1.7 Plasma Arc Machining – principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications.
	3	1.7 Plasma Arc Machining – principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications.
	4	QUIZ & ASSIGNMENT
5TH	1	1.8 Electron Beam Machining - principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications.
	2	1.8 Electron Beam Machining - principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications.
	3	2.0 Plastic Processing: 2.1 Processing of plastics.
	4	QUIZ & ASSIGNMENT
6TH	1	2.0 Plastic Processing: 2.1 Processing of plastics
	2	2.2 Moulding processes: Injection moulding, Compression moulding,

		Transfer moulding.
	3	2.2 Moulding processes: Injection moulding, Compression moulding, Transfer moulding.
	4	QUIZ & ASSIGNMENT
7 th	1	2.3 Extruding; Casting; Calendering., Housekeeping. Introduction to Total Productive Maintenance (TPM).
	2	2.3 Extruding; Casting; Calendering., Housekeeping. Introduction to Total Productive Maintenance (TPM).
	3	2.4 Fabrication methods-Sheet forming, Blow moulding, Laminating plastics (sheets, rods & tubes), Reinforcing.
	4	QUIZ & ASSIGNMENT
8 th	1	2.4 Fabrication methods-Sheet forming, Blow moulding, Laminating plastics (sheets, rods & tubes), Reinforcing.

	2	2.5 Applications of Plastics.
	3	PROBLEM SOLVING CLASS
	4	3.0 Additive Manufacturing Process: 3.1 Introduction, Need for Additive Manufacturing
9 TH	1	3.0 Additive Manufacturing Process: 3.1 Introduction, Need for Additive Manufacturing
	2	3.2 Fundamentals of Additive Manufacturing, AM Process Chain
	3	3.2 Fundamentals of Additive Manufacturing, AM Process Chain
	4	QUIZ & ASSIGNMENT
10 TH	1	3.3 Advantages and Limitations of AM, Commonly used Terms
	2	3.4 Classification of AM process, Fundamental Automated Processes, Distinction between AM and CNC, other related technologies
	3	3.4 Classification of AM process, Fundamental Automated Processes, Distinction between AM and CNC, other related technologies
	4	QUIZ & ASSIGNMENT
11 TH	1	3.5 Application –Application in Design, Aerospace Industry, Automotive Industry, Jewelry Industry, Arts and Architecture. RP Medical and Bioengineering Applications
	2	3.5 Application –Application in Design, Aerospace Industry, Automotive Industry, Jewelry Industry, Arts and Architecture. RP Medical and Bioengineering Applications.
	3	3.6 Web Based Rapid Prototyping Systems.
	4	QUIZ & ASSIGNMENT
12 TH	1	3.6 Web Based Rapid Prototyping Systems.
	2	3.7 Concept of Flexible manufacturing process, concurrent engineering, production tools like capstan and turret lathes, rapid prototyping processes.
	3	QUIZ & ASSIGNMENT
	4	3.7 Concept of Flexible manufacturing process, concurrent engineering, production tools like capstan and turret lathes, rapid prototyping processes.
13 TH	1	4.0 Special Purpose Machines (SPM): 4.1 Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design. 5.0 Maintenance of Machine Tools: 5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records
	2	4.0 Special Purpose Machines (SPM)
	3	4.1 Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design. 5.0 Maintenance of Machine Tools: 5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records
	4	4.1 Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design.
14 TH	1	4.1 Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design.
	2	5.0 Maintenance of Machine Tools: 5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records
	3	5.0 Maintenance of Machine Tools: 5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records
	4	5.0 Maintenance of Machine Tools: 5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records
15 TH	1	5.0 Maintenance of Machine Tools: 5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records
	2	REVISION
	3	REVISION
	4	REVISION

Rambhadr Prasad Borth.
Sign. Of Faculty concerned

Arul
Sign. Of HOD

Uy...
Principal, CP/NABARANGPUR
- Principal
Government Polytechnic
Nabarangapur