



NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY  
SERGARH-756060, BALASORE (ODISHA)  
(Approved by AICTE& affiliated to SCTE&VT, Odisha)



## LESSON PLAN

**SUBJECT: Th-4b ( ADVANCE MANUFACTURING PROCESSES )**

### CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Modern Machining Processes	20	20
2	Plastic Processing	10	10
3	Additive Manufacturing Process	15	15
4	Special Purpose Machines	7	7
5	Maintenance of Machine Tools	8	8
6	Total Period:	60	60

Discipline: MECHANICAL ENGINEERING	Semester: 6th	Name of the Teaching Faculty: Er.Pradyumna Kumar Khilar
Week	Class Day	Theory / Practical Topics
1 <sup>st</sup>	1 <sup>st</sup>	1.0 Modern Machining Processes
	2 <sup>nd</sup>	1.1 Introduction – comparison with traditional machining.
	3 <sup>rd</sup>	1.2 Ultrasonic Machining: principle, Description of equipment, applications.
	4 <sup>th</sup>	1.2 Ultrasonic Machining: principle, Description of equipment, applications.
2 <sup>nd</sup>	1 <sup>st</sup>	1.3 Electric Discharge Machining: Principle, Description of equipment, Dielectric fluid, tools (electrodes), Process parameters, Output characteristics, applications.
	2 <sup>nd</sup>	1.3 Electric Discharge Machining: Principle, Description of equipment, Dielectric fluid, tools (electrodes), Process parameters, Output characteristics, applications.
	3 <sup>rd</sup>	1.4 Wire cut EDM: Principle, Description of equipment, controlling parameters; applications.
	4 <sup>th</sup>	1.4 Wire cut EDM: Principle, Description of equipment, controlling parameters; applications.
3 <sup>rd</sup>	1 <sup>st</sup>	1.5 Abrasive Jet Machining: principle, description of equipment, Material removal rate, application.
	2 <sup>nd</sup>	1.5 Abrasive Jet Machining: principle, description of equipment, Material removal rate, application.
	3 <sup>rd</sup>	1.5 Laser Beam Machining: principle, description of equipment, Material removal rate, application.

3 <sup>rd</sup>	4 <sup>th</sup>	1.5 Laser Beam Machining: principle, description of equipment, Material removal rate, application.
4 <sup>th</sup>	1 <sup>st</sup>	1.6 Electro Chemical Machining: principle, description of equipment, Material removal rate, application.
	2 <sup>nd</sup>	1.6 Electro Chemical Machining: principle, description of equipment, Material removal rate, application.
	3 <sup>rd</sup>	1.7 Plasma Arc Machining – principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications.
	4 <sup>th</sup>	1.7 Plasma Arc Machining – principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications.
5 <sup>th</sup>	1 <sup>st</sup>	1.7 Plasma Arc Machining – principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications.
	2 <sup>nd</sup>	1.8 Electron Beam Machining - principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications.
	3 <sup>rd</sup>	1.8 Electron Beam Machining - principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications.
	4 <sup>th</sup>	1.8 Electron Beam Machining - principle, description of equipment, Material removal rate, Process parameters, performance characterization, Applications.
6 <sup>th</sup>	1 <sup>st</sup>	2.0 Plastic Processing
	2 <sup>nd</sup>	2.1 Processing of plastics
	3 <sup>rd</sup>	2.1 Processing of plastics.
	4 <sup>th</sup>	2.2 Moulding processes: Injection moulding, Compression moulding, Transfer moulding.
7 <sup>th</sup>	1 <sup>st</sup>	2.2 Moulding processes: Injection moulding, Compression moulding, Transfer moulding.

7 <sup>th</sup>	2 <sup>nd</sup>	2.2 Moulding processes: Injection moulding, Compression moulding, Transfer moulding.
	3 <sup>rd</sup>	2.3 Extruding; Casting; Calendering.
	4 <sup>th</sup>	2.3 Extruding; Casting; Calendering.
8 <sup>th</sup>	1 <sup>st</sup>	2.4 Fabrication methods-Sheet forming, Blow moulding, Laminating plastics (sheets, rods & tubes), Reinforcing.
	2 <sup>nd</sup>	2.4 Fabrication methods-Sheet forming, Blow moulding, Laminating plastics (sheets, rods & tubes), Reinforcing.
	3 <sup>rd</sup>	3.0 Additive Manufacturing Process
	4 <sup>th</sup>	3.1 Introduction, Need for Additive Manufacturing
9 <sup>th</sup>	1 <sup>st</sup>	3.1 Introduction, Need for Additive Manufacturing
	2 <sup>nd</sup>	3.2 Fundamentals of Additive Manufacturing, AM Process Chain
	3 <sup>rd</sup>	3.3 Advantages and Limitations of AM, Commonly used Terms
	4 <sup>th</sup>	3.4 Classification of AM process, Fundamental Automated Processes, Distinction between AM and CNC, other related technologies.
10 <sup>th</sup>	1 <sup>st</sup>	3.4 Classification of AM process, Fundamental Automated Processes, Distinction between AM and CNC, other related technologies.
	2 <sup>nd</sup>	3.4 Classification of AM process, Fundamental Automated Processes, Distinction between AM and CNC, other related technologies.
	3 <sup>rd</sup>	3.5 Application –Application in Design, Aerospace Industry, Automotive Industry, Jewelry Industry, Arts and Architecture. RP Medical and Bioengineering Applications.

10 <sup>th</sup>	4 <sup>th</sup>	3.5 Application –Application in Design, Aerospace Industry, Automotive Industry, Jewelry Industry, Arts and Architecture. RP Medical and Bioengineering Applications.
11 <sup>th</sup>	1 <sup>st</sup>	3.6 Web Based Rapid Prototyping Systems.
	2 <sup>nd</sup>	3.6 Web Based Rapid Prototyping Systems.
	3 <sup>rd</sup>	3.7 Concept of Flexible manufacturing process, concurrent engineering, production tools like capstan and turret lathes, rapid prototyping processes.
	4 <sup>th</sup>	3.7 Concept of Flexible manufacturing process, concurrent engineering, production tools like capstan and turret lathes, rapid prototyping processes.
12 <sup>th</sup>	1 <sup>st</sup>	3.7 Concept of Flexible manufacturing process, concurrent engineering, production tools like capstan and turret lathes, rapid prototyping processes.
	2 <sup>nd</sup>	4.0 Special Purpose Machines (SPM)
	3 <sup>rd</sup>	4.0 Special Purpose Machines (SPM)
	4 <sup>th</sup>	4.0 Special Purpose Machines (SPM)
13 <sup>th</sup>	1 <sup>st</sup>	4.1 Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design.
	2 <sup>nd</sup>	4.1 Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design.
	3 <sup>rd</sup>	4.1 Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design.
	4 <sup>th</sup>	4.1 Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design.
14 <sup>th</sup>	1 <sup>st</sup>	5.0 Maintenance of Machine Tools

14 <sup>th</sup>	2 <sup>nd</sup>	5.0 Maintenance of Machine Tools
	3 <sup>rd</sup>	5.0 Maintenance of Machine Tools
	4 <sup>th</sup>	5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records, Housekeeping. Introduction to Total Productive Maintenance (TPM)
15 <sup>th</sup>	1 <sup>st</sup>	5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records, Housekeeping. Introduction to Total Productive Maintenance (TPM)
	2 <sup>nd</sup>	5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records, Housekeeping. Introduction to Total Productive Maintenance (TPM)
	3 <sup>rd</sup>	5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records, Housekeeping. Introduction to Total Productive Maintenance (TPM)
	4 <sup>th</sup>	5.1 Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records, Housekeeping. Introduction to Total Productive Maintenance (TPM)