



MECHANICAL ENGINEERING

SEMESTER : 5th (SEC-A)

FROM :01/07/2026 TO :05/11/2026

NAME OF THE FACULTY : Er. ANANDA KUMAR DAS

SUBJECT : Advanced Manufacturing Processes

TOTAL CLASS AVAILABLE IN SEMESTER: 45 nos

NO. OF PERIODS : 03/ WEEK

Class No.	Unit	Topic/Sub-topic	Teaching Method	Learning Outcome
1	I	Course Introduction & Need for Unconventional Machining	Lecture	Understand the scope and importance of unconventional machining
2	I	Classification of Unconventional Machining Processes	Lecture	Classify different non-traditional machining processes
3	I	Introduction to Additive Manufacturing (AM)	PPT + Discussion	Explain the concept of AM
4	I	Need, Fundamentals & AM Process Chain	Lecture	Describe the AM process chain
5	I	Advantages, Limitations & Applications of AM	Video + Discussion	Evaluate AM applications
6	I	Revision & Unit Test-I	Quiz	Assess Unit-I concepts
7	II	Mechanical Energy Based Processes: Introduction	Lecture	Explain mechanical energy-based machining
8	II	Abrasive Jet Machining (AJM): Principle & Equipment	Lecture	Describe AJM working principle
9	II	AJM: Process Parameters, MRR & Applications	Numerical + Discussion	Analyze AJM performance
10	II	Water Jet Machining (WJM): Principle & Equipment	Lecture	Explain WJM process
11	II	Abrasive Water Jet Machining (AWJM): Working & Applications	Video	Differentiate AWJM from WJM
12	II	Ultrasonic Machining (USM): Principle & Equipment	Lecture	Explain USM operation



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13	II	USM: Process Parameters, MRR & Applications	Numerical	Evaluate machining performance
14	II	Comparison of AJM, WJM, AWJM & USM	Discussion	Compare mechanical energy processes
15	II	Unit Test-II	Test	Assess Unit-II learning
16	III	Electrical Energy Based Processes: Introduction	Lecture	Understand electrical machining methods
17	III	EDM: Principle & Equipment	Lecture	Explain EDM operation
18	III	EDM: Process Parameters, MRR & Surface Finish	Numerical	Analyze EDM performance
19	III	EDM Tool, Electrode, Dielectric & Flushing	Lecture	Explain EDM components
20	III	EDM Power & Control Circuits, Tool Wear	Lecture	Describe EDM control systems
21	III	Wire Cut EDM: Principle & Applications	Video	Explain Wire EDM
22	III	Comparison of EDM & Wire EDM	Discussion	Compare EDM processes
23	III	Unit Test-III	Test	Assess Unit-III learning
24	IV	Chemical & Electrochemical Machining: Introduction	Lecture	Explain chemical machining concepts
25	IV	Chemical Machining (CHM): Principle & Equipment	Lecture	Describe CHM process
26	IV	Etchants & Maskant Techniques	Demonstration	Explain masking techniques
27	IV	CHM: Process Parameters, MRR & Applications	Numerical	Evaluate CHM performance
28	IV	Electrochemical Machining (ECM): Principle & Equipment	Lecture	Explain ECM working
29	IV	ECM: Electrical Circuit & Process Parameters	Lecture	Describe ECM circuit
30	IV	ECM: Surface Roughness & MRR	Numerical	Analyze ECM output
31	IV	Electrochemical Grinding (ECG)	Lecture	Explain ECG process
32	IV	Electrochemical Honing (ECH) & Applications	Lecture	Describe ECH operation



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33	IV	Comparison of CHM, ECM, ECG & ECH	Discussion	Compare electrochemical processes
34	IV	Revision & Unit Test-IV	Test	Assess Unit-IV learning
35	V	Thermal Energy Based Processes: Introduction	Lecture	Explain thermal machining methods
36	V	Laser Beam Machining (LBM): Principle & Equipment	Lecture	Describe LBM process
37	V	LBM: Beam Control Techniques & Applications	PPT	Explain beam control methods
38	V	Plasma Arc Machining (PAM): Principle & Equipment	Lecture	Explain PAM operation
39	V	Electron Beam Machining (EBM): Principle & Equipment	Video	Describe EBM process
40	V	Comparison of LBM, PAM & EBM	Discussion	Compare thermal machining processes
41	V	Introduction to Manufacturing & Material Properties	Lecture	Explain manufacturing fundamentals
42	V	Metals, Polymers & Ceramics	Lecture	Identify engineering material properties
43	V	Composite Materials & Industrial Applications	Discussion	Explain composite materials
44	All Units	Comprehensive Revision & Problem Solving	Tutorial	Strengthen overall understanding
45	All Units	Final Model Test & Course Review	Test + Discussion	Evaluate complete course learning

Sign of Faculty

Sign of HOD

Sign of Principal

Principal

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