

MOHAMED SATHAK A.J. COLLEGE OF ENGINEERING

Siruseri IT park, OMR, Chennai - 603103

LESSON PLAN							
Department of Mechanical Engineering							
Name of the Subject	UNCONVENTIONAL MACHINING PROCESSES			Name of the handling Faculty	Mr. SAKTHIVEL D		
Subject Code	ME8073			Year / Sem	IV/VII		
Acad Year	2022-2023			Batch	2019-2023		
Course Objective							
To learn about various unconventional machining processes, the various process parameters and their influence on performance and their applications							
Course Outcome							
CO1 Explain the need for unconventional machining processes and its classification							
CO2 Compare various thermal energy and electrical energy based unconventional machining processes.							
CO3 Summarize various chemical and electro-chemical energy based unconventional machining processes.							
CO4 Explain various nano abrasives based unconventional machining processes.							
CO5 Distinguish various recent trends based unconventional machining processes.							
Lesson Plan							
Sl. No.	Topic(s)	T / R*	Periods Required	Mode of Teaching (BB / PPT / NPTEL /	Blooms Level (L1, L2, L3, L4, L5, L6)	CO	PO
		Book					
UNIT I-INTRODUCTION AND MECHANICAL ENERGY BASED PROCESSES							
1	Unconventional machining Process- Need and classification, merits, demerits and applications.	T2	1	BB	L1	CO1	PO1
2	Abrasive Jet Machining - Working Principles and equipment used	T2	1	PPT	L2	CO1	PO1,PO5
3	Abrasive Jet Machining - Process parameters, MRR & Applications.	T2	1	PPT	L3	CO1	PO1,PO5
4	Water Jet Machining - Working Principles and equipment used	T2	1	PPT	L2	CO1	PO1,PO5
5	Water Jet Machining- Process parameters ,MRR and Applications.	T2	1	PPT	L3	CO1	PO1,PO5
6	Abrasive Water Jet Machining - Working Principles and equipment used	T2	1	PPT	L2	CO1	PO1,PO5
7	Abrasive Water Jet Machining - Process parameters ,MRR- and Applications.	T2	1	PPT	L3	CO1	PO1,PO5
8	Ultrasonic Machining -Working Principles and equipment used	T2	1	PPT	L2	CO1	PO1,PO5
9	Ultrasonic Machining - Process parameters ,MRR and Applications.	T2	1	PPT	L3	CO1	PO1, PO2
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
* Assignment given to the students							
Evaluation method							
* assignments are evaluated and marks were given based on the students answer to the question.							

UNIT II-THERMAL AND ELECTRICAL ENERGY BASED PROCESSES

10	Electric Discharge Machining (EDM)	T2	1	PPT	L2	CO2	PO1
11	Wire cut EDM-Working Principle-equipments-Process Parameters and Surface Finish and MRR	T2	1	PPT	L2	CO2	PO1, PO2
12	Wire cut EDM - electrode and Tool and Power and control Circuits and Tool Wear and Dielectric and Flushing and Applications.	T2	1	PPT	L3	CO2	PO1, PO2,PO5
13	Laser Beam machining and drilling, (LBM)-Principles and Equipment	T2	1	PPT	L2	CO2	PO1,PO5
14	LBM-Beam control techniques and Applications.	T2	1	PPT	L3	CO2	PO1,PO5
15	plasma, Arc machining (PAM)-Principles and Equipment	T2	1	PPT	L2	CO2	PO1,PO5
16	plasma, Arc machining (PAM) - control techniques and Applications.	T2	1	PPT	L3	CO2	PO1,PO5
17	Electron Beam Machining (EBM)- Principles and Equipment	T2	1	PPT	L2	CO2	PO1,PO5
18	Electron Beam Machining (EBM)- control techniques and Applications	T2	1	PPT	L3	CO2	PO1,PO5

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

* Quiz given to the students

Evaluation method

* Quiz marks were given based on the students answer to the question.

UNIT III-CHEMICAL AND ELECTRO-CHEMICAL ENERGY BASED PROCESSES

19	Chemical machining	T2	1	PPT	L1	CO3	PO1
20	Electro-Chemical machining	T2	1	PPT	L2	CO3	PO1
21	Etchants and Maskant and techniques of applying maskants	T2	1	PPT	L2	CO3	PO1
22	ECM- Process Parameters Surface,finish and MRR-Applications	T2	1	PPT	L3	CO3	PO1, PO2
23	ECM-working Principles	T2	1	PPT	L2	CO3	PO1
24	ECM - equipments-Surface Roughness	T2	1	PPT	L2	CO3	PO1
25	ECM - MRR Electrical circuit	T2	1	BB	L2	CO3	PO1
26	Electro chemical grinding -application	T2	1	PPT	L3	CO3	PO1
27	Electro chemical honing - applications	T2	1	PPT	L3	CO3	PO1

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

* Assignment given to the students

Evaluation method

*** assignments are evaluated and marks were given based on the students answer to the question.**

UNIT IV-ADVANCED NANO FINISHING PROCESSES

28	Abrasive flow machining- working principles, equipments	T2	1	PPT	L2	CO4	PO1,PO5
29	Abrasive flow machining- process effect,process parameters, applications, advantages and limitations.	T2	1	PPT	L2	CO5	PO1,PO6
30	chemo-mechanical polishing- working principles, equipments	T2	1	PPT	L2	CO4	PO1,PO5
31	chemo-mechanical polishing - effect of process parameters, applications, advantages and limitations.	T2	1	PPT	L2	CO4	PO1,PO5
32	magnetic abrasive finishing -working principles, equipments,	T2	1	PPT	L2	CO4	PO1,PO5
33	magnetic abrasive finishing - effect of process parameters, applications, advantages and limitations.	T2	1	PPT	L2	CO4	PO1,PO5
34	magneto rheological finishing- working principles,	T2	1	PPT	L2	CO4	PO1,PO5
35	magneto rheological finishing equipments	T2	1	PPT	L2	CO4	PO1,PO5
36	magneto rheological finishing - effect of process parameters, applications, advantages and limitations.	T2	1	PPT	L3	CO4	PO1,PO5

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

*** Case Stuides given to the students**

Evaluation method

*** Case studies are evaluated marks were given based on the students answer to the question.**

UNIT V-NON-TRADITIONAL MACHINING PROCESSES

37	Recent developments in non-traditional machining processes	T2	1	PPT	L2	CO5	PO1
38	non-traditional machining processes - their working principles	T2	2	PPT	L2	CO5	PO1,PO5
39	non-traditional machining processes - equipments,	T2	2	PPT	L2	CO5	PO1,PO5
40	non-traditional machining processes - effect of process parameters	T2	2	PPT	L2	CO5	PO1,PO5
41	non-traditional machining processes - applications, advantages and limitations	T2	1	PPT	L3	CO5	PO1,PO5

CO3	3	1											3	2
CO4	3				3								3	2
CO5	3				3								3	2
Avg	3	1			3								3	2
Justification for CO-PO mapping														
CO1	PO1: Basic engineering knowledge is required PO2: Problem analysis is required and PO5: Modern Engineering tools is been used for the machining process													
CO2	PO1: Basic engineering knowledge is required PO2: Problem analysis is required and PO5: Modern Engineering tools is been used for the machining process													
CO3	PO1: Basic engineering knowledge is required & PO2: Problem analysis is required													
CO4	PO1: Basic engineering knowledge is required PO2: Problem analysis is required and PO5: Modern Engineering tools is been used for the machining process													
CO5	PO1: Basic engineering knowledge is required PO2: Problem analysis is required and PO5: Modern Engineering tools is been used for the machining process													
3		High level			2			Moderate level			1		Low level	
Name & Sign of Faculty Incharge : SAKTHIVEL D														
Name & Sign of Subject Expert :														
Head of the Department :														

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