



SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

Mechanical Engineering Department

Semester/Year		VIII/IV	Program			B.Tech.				
Subject Category	(E-VII) (B)	Subject Code:	ME-1881	Subject Name:		Unconventional Machining Process				
Maximum Marks Allotted							Contact Hours			Total Credits
Theory			Practical			Total Marks	L	T	P	
End Sem	Mid-Sem	Assignment/ Quiz	End Sem	Lab-Work	Quiz					
70	20	10	---	---	---	100	3	1		4

Prerequisites:(Only for open electives)

Course Objective: Students undergoing this course are expected to

- The course aims in identifying the classification of unconventional machining processes
- To understand the principle, mechanism of metal removal of various unconventional machining processes
- To study the various process parameters and their effect on the component machined on various unconventional machining processes.
- To understand the applications of different processes.

Course Outcomes:

After completion of the course, students would be able to –

1. Student should be able to understand constructional features and performance of USM, AJM and WJM.
2. Demonstrate the Chemical energy based unconventional machining processes.
3. Student should be able to understand constructional features and performance of EDM, EDWC, EBM, IBM and PAM.
4. Student should be able to understand constructional features and performance of LBM, LC, LD LM, LMM and LENS.
5. Explain various Nano abrasives based unconventional machining processes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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CO1	3	1				2	3					2
CO2	3	1				2	3					2
CO3	3	1				2	3					2
CO4	3	1				2	3					2
CO5	3	1				2	3					2
Contents:												
UNITs	Descriptions										Hrs.	CO's
I	<p>Introduction - Need for unconventional machining process, Comparison between conventional and unconventional machining, general classification Unconventional machining processes, classification based on nature of energy employed in machining, selection of unconventional machining processes, Specific advantages, limitations and applications of non-traditional machining processes.</p> <p>Classification - process economy - Mechanical machining - Types - Ultrasonic machining (USM) - Abrasive Jet Machining (AJM) - Water Jet Machining (WJM) - Operating principle - Process parameters - Applications - Limitations.</p>										10	1
II	<p>Electro chemical machining - Chemical material removal - Types - Electro chemical machining (ECM) - Electro chemical drilling (ECD) - Electro chemical grinding (ECG) - Electro chemical honing (ECH) - Shaped tube electrolytic machining - Operating principle - Process parameters - Applications - Limitations.</p>										8	2
III	<p>Thermo electrical machining - Types - Electrical discharge machining (EDM) - Electrical discharge wire cutting (EDWC) - Electron beam machining (EBM) - Ion Beam Machining (IBM)-Plasma Arc Machining (PAM) - Operating principle - Process parameters - Applications - Limitations</p>										9	3
IV	<p>Laser materials processing - Laser types - Processes - Laser beam machining (LBM) - Laser cutting (LC) - Laser drilling (LD) - Laser marking and engraving (LM) - Laser micromachining (LMM) - Laser engineered net shaping (LENS) - Applications - Limitations.</p>										9	4
V	<p>Advanced nano finishing process - Abrasive flow machining, Chemo-mechanical polishing, Magnetic abrasive finishing, Magnetic rheological finishing, Magnetic rheological abrasive flow finishing, their working principles, equipments, effect of process parameters, applications, advantages and limitations.</p>										9	5

Guest Lectures (if any)			
Total Hours		45	
Text and Reference Books- 1. Modern Machining Processes by P.C Panday and H. S Shah Tata McGraw-Hill Education, India Pvt.Ltd. 2000 2. Non Traditional Machining by Kestor Praveen Suggi publication 2018. 3. New Technology Dr. Amitabha Bhattacharyya, The Institute of Engineers 2000 4. Abdel, H. and El-Hofy, G. "Advanced Machining Processes", McGraw-Hill, USA, 2005. 5. Wellar, E.J. "Non-Traditional Machining Processes", Society of Manufacturing			
Modes of Evaluation and Rubric There will be continuous evaluation for during the semester for 30 sessional marks and 70 semester End term Marks. Out of 30 sessional marks, 20 shall be awarded for Mid semester, 10 marks to be awarded for day to day performance and Quiz/Assignments. For the 70 Marks, there will be a semester – End examination as per the norms of AICTE.			
Recommendation by Board of studies on		Date:	
Approval by Academic council on		Date:	
Compiled and designed by		Name : Jagdish Prasad Shakya	
Checked and approved by		Name :	