

GOVT. POLYTECHNIC, NAYAGARH**5TH SEMESTER, MECHANICAL ENGINEERING (2026-27)****SUBJECT:- TH:4(B)- Advanced Manufacturing Processes****Course Code: MEPE303(B)****Semester from 01.07.26 to
05.11.26****Total Periods -45, Theory- 3P/WEEK****NAME OF FACULTY:- Sri Saurav Ranjan Pradhan**

Sl. No.	Week	Day	Topics to be covered
1	1st	1st day	Introduction to Manufacturing and Unconventional Machining Processes, need for Unconventional Machining
		2nd day	Classification of Unconventional Processes, Overview of Unconventional Machining
		3rd day	Introduction to Additive Manufacturing process, Need for Additive Manufacturing, Fundamentals of Additive Manufacturing
Sl. No.	Week	Day	Topics to be covered
2	2nd	1st day	AM Process Chain
		2nd day	Advantages and Limitations of AM Revision of CH-I
		3rd day	Mechanical Energy Based Processes:- Abrasive Jet Machining (AJM): Working principle, Equipment
Sl. No.	Week	Day	Topics to be covered
3	3rd	1st day	AJM process parameters, AJM MRR and Applications
		2nd day	Water Jet Machining (WJM): Working principle, Equipment
		3rd day	WJM process parameters, WJM MRR and Applications
Sl. No.	Week	Day	Topics to be covered
4	4th	1st day	Abrasive Water Jet Machining (AWJM): Working principle, Equipment
		2nd day	AWJM process parameters, AWJM MRR and Applications
		3rd day	Ultrasonic Machining (USM): Working principle, Equipment
Sl. No.	Week	Day	Topics to be covered
5	5th	1st day	USM process parameters, USM MRR, Applications & Revision of CH-II
		2nd day	Electrical Energy Based Processes:- Introduction to EDM, working Principle
		3rd day	EDM Equipment and electrode / Tool – Power and control Circuits
Sl. No.	Week	Day	Topics to be covered
6	6th	1st day	EDM Process Parameters
		2nd day	MRR and Surface Finish in EDM

		3rd day	Electrode Materials and Tool Wear
Sl. No.	Week	Day	Topics to be covered
7	7th	1st day	Dielectric Fluid and Flushing
		2nd day	Wire Cut EDM
		3rd day	Applications of EDM, Revision of CH-III
Sl. No.	Week	Day	Topics to be covered
8	8th	1st day	Chemical and Electro-Chemical Energy Based Processes: Chemical Machining (CHM): working principle, Etchants
		2nd day	Maskant Application Techniques
		3rd day	CHM:- process parameters
Sl. No.	Week	Day	Topics to be covered
9	9th	1st day	CHM:- Surface finish, MRR and Applications
		2nd day	Electrochemical Machining (ECM):- Working principle
		3rd day	Electrochemical Machining (ECM):- Equipment
Sl. No.	Week	Day	Topics to be covered
10	10th	1st day	ECM:- Electrical Circuit, Surface Roughness
		2nd day	ECM:- MRR
		3rd day	Process Parameters ECG
Sl. No.	Week	Day	Topics to be covered
11	11th	1st day	Process Parameters ECH
		2nd day	Applications
		3rd day	Revision of CH-IV
Sl. No.	Week	Day	Topics to be covered
12	12th	1st day	Thermal Energy Based Processes: Laser Beam machining (LBM) and drilling ,Principles
		2nd day	Laser Beam machining and drilling (LBM):-Equipment, Types
		3rd day	Laser Beam machining and drilling (LBM):- Beam control techniques, Applications
Sl. No.	Week	Day	Topics to be covered
13	13th	1st day	Plasma Arc machining (PAM),Principles
		2nd day	Plasma Arc machining (PAM):- Equipment, Types
		3rd day	Plasma Arc machining (PAM):- Beam control techniques, Applications

Sl. No.	Week	Day	Topics to be covered
14	14th	1st day	Electron Beam Machining (EBM), Principles
		2nd day	Electron Beam Machining (EBM):- Equipment, Types
		3rd day	Electron Beam Machining (EBM):- Beam control techniques, Applications
Sl. No.	Week	Day	Topics to be covered
15	15th	1st day	Introduction to manufacturing, Fundamental properties of materials including metals, polymers
		2nd day	Fundamental properties of materials including ceramics and composites
		3rd day	Revision of CH-V

REFERENCES:

1. Vijay.K. Jain "Advanced Machining Processes" Allied Publishers Pvt. Ltd., New Delhi, 2007
2. Pandey P.C. and Shan H.S. "Modern Machining Processes" Tata McGraw-Hill, New Delhi, 2007.
3. Benedict. G.F. "Non-Traditional Manufacturing Processes", Marcel Dekker Inc., New York, 1987.
4. Mc Geough, "Advanced Methods of Machining", Chapman and Hall, London, 1998.
5. Paul De Garmo, J.T.Black, and Ronald.A.Kohser, "Material and Processes in Manufacturing" Prentice Hall of India Pvt. Ltd., 8thEdition, New Delhi , 2001


22/06/24

Saurav Ranjan Pradhan
Sr. Lect., Mechanical Engg.