Lecture Plan

Name of Institute : Ambala College of Engineering and Applied Research
Name of the Faculty member : Er.Raman Kumar (Assistant Professor)
Discipline : Mechanical Engineering
Semester : 8th
Subject : Non-Conventional Machining (MEP-402A)
Lesson Plan Duration : 16 weeks (from Jan 2026 to May 2026)
Work Load : L-3 T-0 P-0

Week	Theory		Practical	
	Lecture day	Topic (including assignment/test)	Practical day	Topic
1st	1st	**UNIT I Introduction to non-conventional machining**: Introduction to non-conventional machining (NCM) processes, characteristics of conventional machining processes.	NA	NA
	2nd	Characteristics of non-conventional machining processes, need for development of non-conventional machining processes.		
	3rd	Comparison of conventional and non-conventional machining processes, classification of non-conventional machining processes.		
2nd	4th	History of non-conventional processes, advantages of non-conventional machining processes.	NA	NA
	5th	Disadvantages of non-conventional machining processes.		
	6th	Applications of non-conventional machining processes.		
3rd	7th	**Ultrasonic machining (USM):** process principle, equipment.	NA	NA
	8th	Design consideration for tool, tool feed mechanism.		
	9th	Abrasive slurry, Liquid media, operation of USM, process parameters, process capabilities.		
4th	10th	Mechanics of cutting in USM, applications of USM, advantages of USM, disadvantages of USM.	NA	NA
	11th	Mechanics of cutting in USM.		
	12th	Ultrasonic welding.		
5th	13th	**UNIT II Abrasive jet machining (AJM)**: process principle, equipment.	NA	NA
	14th	Process parameters, process capabilities.		
	15th	Applications of AJM, advantages of AJM, disadvantages of AJM.		
6th	16th	Mechanics of cutting in AJM.	NA	NA
	17th	**Water jet machining (WJM):** process principle, equipment.		
	18th	Process parameters, process capabilities.		
7th	19th	Metal removal rate, applications of WJM.	NA	NA
	20th	Advantages of WJM, disadvantages of WJM.		
	21th	**Abrasive water jet machining (AWJM)**: process principle, equipment.		
8th	22nd	Process parameters, process capabilities.	NA	NA
	23rd	Metal removal rate, applications of AWJM.		
	24th	Advantages of AWJM, disadvantages of AWJM.		

9th	25th	**UNIT III Electrochemical machining (ECM):** classification of ECM processes, fundamental principles of ECM, elements of ECM process.	NA	NA
	26th	Electro-chemistry of ECM process, process parameters, process characteristics.		
	27th	Tool design, determination of metal removal rate, evaluation of metal removal rate of an alloy.		
10th	28th	Accuracy, surface finish and work material characteristics, economic consideration, advantage, limitation and application.	NA	NA
	29th	Basics of electrochemical grinding.		
	30th	Deburring and honing.		
11th	31st	**Chemical machining:** Introduction, process principle, five steps of chemical machining, elements of process.	NA	NA
	32nd	Influence of etchant medium, selection of maskant and etchants.		
	33rd	Chemical blanking, accuracy of chemical blanking.		
12th	34th	Applications of chemical machining, advantages of chemical machining, disadvantages of chemical machining.	NA	NA
	35th	Chemical milling.		
	36th	Photochemical machining.		
13th	37th	**UNIT IV Electric discharge machining (EDM)**: Principal and metal removal mechanism	NA	NA
	38th	Electrode material, tool electrode tool design.		
	39th	Electrode feed control, generators, surface finish, accuracy and application.		
14th	40th	EDM wire cutting.	NA	NA
	41st	**Laser beam machining (LBM):** Introduction, generation of LASER.		
	42nd	Equipment and mechanism of metal removal.		
15th	43rd	LBM parameters and characteristics.	NA	NA
	44th	Applications, Advantages & limitations.		
	45th	**Electron beam machining (EBM):** Introduction, Principle.		
16th	46th	Equipment and mechanism of metal removal.	NA	NA
	47th	Applications.		
	48th	Advantages and limitations.		

(Signature of the teacher concerned with date)