

Course Description

Module*	Language*
Non-Traditional Manufacturing Process	English
Academic Year	Semester:
2024-2025	Fall
ECTS:	Prerequisite:
5	-
Course Outcome	
<ol style="list-style-type: none"> 1. Identify and Differentiate between conventional and unconventional machining 2. Analyze Traditional manufacturing process 3. Apply Knowledge of many non traditional processes 4. Knowing the influence of difference process parameters on the performance and their applications. 5. Explore CNC and adaptive control systems. 6. Learning about STATISTICAL PROCESS CONTROL (SPC), Inspections, GROUP TECHNOLOGY, Micro-Manufacturing, Nano manufacturing techniques, micro electro mechanical systems (MEMS), and Economics of Machining. 	
Course Content: *	
<p>Unconventional Machining Processes(Ultrasonic Machining, Abrasive Jet Machining, ; Electron Beam Machining; Laser Beam Machining, electric discharge wire cutting; electro chemical machining, electro chemical grinding, equipment's, applications, advantages and limitations),NC– DNC – CNC and adaptive control systems, Computer Aided Process Planning, Micro-Manufacturing, MEMS, Economics of machining.</p>	
References: *	
<ul style="list-style-type: none"> - M. P. Groover, “Fundamentals of Modern Manufacturing: Materials, Processes, and Systems”, Third edition. Wiley India Private Limited, (2009). - S. Kalpakjian, “Manufacturing Processes for Engineering Materials”, Fifth edition. Pearson Education, (2009). 	
Type of Teaching: *	
<p>3 hrs in lectures(Face to Face learning) 2 hrs laboratory working.</p>	
Requirements For Credit Points: *	
Modules Course Requirements:	
<ol style="list-style-type: none"> 1. Students Attendance in class is important. 2. Discussion in class is required 3. H.W and assignments for each lecture 4. Midterm exam 	

5. Report
6. quiz
7. Site Visit

Grade Distribution: *

The Grade Requirements

For the award of credit points it is necessary to pass the module exam.

The module exam contains:

[25% quizzes + 15% weekly reports and discussions and seminars]=40% continuous exam

[50% final Exam + 10% Final discussion]=60% final grade

Weekly Plan

Module*

Non-Traditional Manufacturing Process

Academic Year

2024-2025

Semester:

Fall

ECTS:	Prerequisite:
5	-
Detail	
Week	Detail
1	Course description, Introduction to non-traditional manufacturing process (NTMP), material removal processes, importance, advantages disadvantages of NTM process.
2	Classifications of NTM process, ULTRASONIC MACHINING important parameters, advantages, disadvantages.
3	Water jet cutting (WJC), Abrasive Water Jet Cutting, Abrasive Jet Machining.
4	Parameters of Abrasive Jet Machining. Quiz, Abrasive Flow Machining, ELECTROCHEMICAL MACHINING PROCESSES (ECM), example
5	ELECTROCHEMICAL DEBURRING, ELECTROCHEMICAL GRINDING.
6	ELECTRIC DISCHARGE PROCESSES (Spark erosion), Electric Discharge Wire Cutting, quiz
7	Mid-Term Exam
8	ELECTRON BEAM MACHINING (EBM), Laser BEAM Machining.
9	Plasma Arc Cutting, Air Carbon Arc Cutting, OXYFUEL-CUTTING PROCESSES.
10	Chemical machining, Masking method, Chemical Blanking. Chemical Engraving, Photochemical Machining.
11	Computer Integrated manufacturing (CIM), NUMERICAL CONTROL.
12	Coordinate System and Motion Control, Motion Control, CAD, CAM/DNC/CNC.
13	Adaptive control system, COMPUTER-AIDED PROCESS PLANNING (CAPP), QUALITY CONTROL AND INSPECTION, part programming, quiz.
14	STATISTICAL PROCESS CONTROL (SPC), Inspections, GROUP TECHNOLOGY, Micro-Manufacturing, Nano manufacturing techniques, micro electro mechanical systems (MEMS), Economics of Machining.

Workload

				Module*
				Non-Traditional Manufacturing Process
Academic Year		Semester:		
2024-2025		Fall		
ECTS:		Total number of credit hour		
5		5*27 = 135		
				Prerequisite:
				-
				Detail
Type	Number	Time Factor	Total	
Attendance	18	4hr	18 *5 = 90	
Report	1	4hr	1*5 = 5	
Mid Term Exam	1	4hr	1*5 = 5	
Seminar	2	4hr	2*5 = 10	
Class work	5	2hr	5*1 = 5	
Discussion	5	2hr	5*1 = 5	
Quiz	5	1hr	5*1 = 5	
Site visit	1	4hr	1*5 = 5	
Project	1	4hr	1*5 = 5	
			135 hr.	