

Date:	Examination No.:	Version:30/6/2022	Start: 1/9/2022
Module Name - Code	Non-Traditional Manufacturing process -3127		
Module Language:	English		
Responsible:	Dr.Gawhar Ibraheem Khidhir		
Lecture (s):	Dr.Gawhar Ibraheem Khidhir		
College:	College of Engineering – Salahaddin University		
Duration:	15 week – 5 semester		
Course outcomes:	Upon completion of this course, the students can able to demonstrate different unconventional machining processes and know the influence of difference process parameters on the performance and their applications.		
Course Content:	Unconventional Machining Processes(Ultrasonic Machining, Abrasive Jet Machining, ; Electron Beam Machining; Laser Beam Machining, electric discharge wire cutting; electro chemical machining, electro chemical grinding, equipments, applications, advantages and limitations),NC– DNC – CNC and adaptive control systems, Computer Aided Process Planning, Micro-Manufacturing, MEMS, Economics of machining,		
Literature:	M. P. Groover, “Fundamentals of Modern Manufacturing: Materials, Processes, and Systems”, Third edition. Wiley India Private Limited, (20010). S. Kalpakjian, “Manufacturing Processes for Engineering Materials”, Fifth edition. Pearson Education, (2009).		
Type of Teaching:	3 hrs in lectures(Face to Face learning) 2 hrs laboratory working.		
Pre-requisites:	Background in production and material science is recommended		
Frequency:	Yearly in fall semester		
Requirements for credit points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: 20% quizzes + 50% final Exam + 5% assignments] 15% weekly reports and discussions and seminars + 10% Final discussion]. Student's attendance is required in all classes. Students with more than 10% absence and/or less than 20% effort in continuous exams are NOT allowed to attend the final exam		
Credit point:	5		
Grade Distribution:	The Grade is generated from the examination result(s) with the following Theoretical Part "w": 75% [20% quizzes + 50% final Exam + 5% assignments] Practical Part "w": 25% [15% weekly reports and discussions and seminars + 10% Final discussion]		
Work load:	The workload is 135hrs. It is the result of 90hrs attendance and 45hrs self studies.		

Weekly lectures and their date of Non-traditional manufacturing process subject.	
Dates start from 13/9/2022	subjects
Week 1	Course description, Introduction to non-traditional manufacturing process (NTMP), material removal processes, importance, advantages disadvantages of NTM process.
Week 2	Classifications of NTM process, ULTRASONIC MACHINING important parameters, advantages, disadvantages.
Week 3	Water jet cutting (WJC), Abrasive Water Jet Cutting, Abrasive Jet Machining.
Week 4	Parameters of Abrasive Jet Machining. Quiz.
Week 5	Abrasive Flow Machining, ELECTROCHEMICAL MACHINING PROCESSES (ECM), example.
Week6	ELECTROCHEMICAL DEBURRING, ELECTROCHEMICAL GRINDING.
Week7	ELECTRIC DISCHARGE PROCESSES (Spark erosion), Electric Discharge Wire Cutting, quiz
Week 8	ELECTRON BEAM MACHINING (EBM), Laser BEAM Machining.
Week 9	Plasma Arc Cutting, Air Carbon Arc Cutting, OXYFUEL-CUTTING PROCESSES.
Week10	Chemical machining, Masking method, Chemical Blanking.
Week 11	Chemical Engraving, Photochemical Machining.
Week 12	Computer Integrated manufacturing (CIM), NUMERICAL CONTROL.
Week 13	Coordinate System and Motion Control, Motion Control, CAD, CAM/DNC/CNC.
Week 14	Adaptive control system, COMPUTER-AIDED PROCESS PLANNING (CAPP), QUALITY CONTROL AND INSPECTION, part programming, quiz.
Week15	STATISTICAL PROCESS CONTROL (SPC), Inspections, GROUP TECHNOLOGY, Micro-Manufacturing, Nano manufacturing techniques, micro electro mechanical systems (MEMS), Economics of Machining.

