

Ministry of Higher Education and Scientific research



Department of Mechanical Engineering

College of Engineering

University of Salahaddin

Subject: Non-Traditional Manufacturing process

Course Book – Year 4

Lecturer's name: Dr.Gawhar Ibraheem Khidhir

Academic Year: 2023-2024

Course Book

1. Course name	Non-Traditional Manufacturing process
2. Lecturer in charge	Dr.Gawhar Ibraheem Khidhir
3. Department/ College	Mechanical / Engineering
4. Contact	E-mail : gawhar_eng@yahoo.com , gawhar.khidhir@su.edu.krd Mob. 009647504811655
5. Time (in hours) per week	Four
6. Office hours	six
7. Course code	
8. Teacher's academic profile	<p>*B.Sc. of Mechanical engineering from university of Salahaddin _Erbil –Iraq at July 1996.</p> <p>* M Sc. In manufacturing processes from University of Salahaddin –Erbil –Iraq at Aprilr 2007.</p> <p>* PhD. In production from University of Salahaddin –Erbil –Iraq at July 2020.</p> <p>Research Interest:</p> <p>1. Efficiency of Dissimilar Friction Welded SAF 2205 Duplex Stainless Steel and 1045 Medium Carbon Steel Joints.</p> <p>2. Efficiency of dissimilar friction welded 1045 medium carbon steel and 316L austenitic stainless steel joints.</p>

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9. Keywords	Non-Traditional Manufacturing process, Metals
10. Course overview: 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,	
11. Course objective: 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.	
12. Student's obligation Student must attend lectures, For the award of credit points it is necessary to pass the module exam. The module exam contains: [20% Midterm +5% quizzes + 15% weekly reports and discussions and seminars]=40% continuous exam [50% final Exam + 10% Final discussion]=60% final grade 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.	
13. The essence of the teaching program is prepared on MS power point presentation .Elaborations of the details are done verbally and when needed on white board .For student to achieve a level of excellence in this subject, the following point should be given utmost consideration: * Active participation in class discussions. *Reviewing the lecture notes and topics weekly basis, noting the ambiguous points, if any, and requesting clarification during during lecturer office hours. .	

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14. Assessment scheme: In this system the maximum mark is 100% .The grading system is based on the summation of two categories of evaluation.

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

The module exam contains:

[20% Midterm +5% quizzes + 15% weekly reports and discussions and seminars]=40% continuous exam

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

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

15. Student learning outcome:

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

16. Course Reading List and References:

▪ Key references:

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

▪ Useful references:

1.P J Shah, Engineering Graphics.

2. Bertoline, Fundamentals of Graphics communication.

17. The Topics:

Week No.	Subject detail;
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Week 1 Feb. 24, 2022	- subjects : 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
Week 6 and7	ELECTROCHEMICAL DEBURRING, ELECTROCHEMICAL GRINDING.
Week 8 and 9	. ELECTRIC DISCHARGE PROCESSES (Spark erosion), Electric Discharge Wire Cutting, quiz
Week 10 and 11	Chemical machining, Masking method, Chemical Blanking.
Week 12	Chemical Engraving, Photochemical Machining
Week 13	. Computer Integrated manufacturing (CIM), NUMERICAL CONTROL
Week 14	Coordinate System and Motion Control, Motion Control, CAD,

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	CAM/DNC/CNC.
Week 15	Adaptive control system, COMPUTER-AIDED PROCESS PLANNING (CAPP), QUALITY CONTROL AND INSPECTION, part programming, quiz
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19. Examinations:	
20. Extra notes:	
21. Peer review :	