METU NCC Mechanical Engineering Program
Syllabus for
MECH 202 Manufacturing Technologies (3-2) 4 (MUST Course)
2024-2025 Academic Year Fall Semester

Course ECTS Credit : 6.0

Catalog Description

Introduction. Casting. Powder metallurgy. Metal working; hot working and cold working processes. Chip removal processes. Non-traditional machining processes. Welding. Manufacturing systems and automation. Machine shop practices.

Prerequisite(s)

None.

Instructor:

Assoc. Prof. Dr. Murat SÖNMEZ
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Time Schedule:

Assoc. Prof. Dr Murat SÖNMEZ 2024-25 Academic Year 1st Semester

SCHEDULE							
Time	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
08:40 - 09:30				**MECH 202 (S2) [I-104]**	**MECH 113 (S2) [I-104]**		
09:40 - 10:30				**MECH 202 (S1) [I-104]**	**MECH 113 (S2) [I-104]**		
10:40 - 11:30		Office Hour			MECH 113 (S3) [I-104]		
11:40 - 12:30		Office Hour			MECH 113 (S3) [I-104]		
12:40 - 13:30							
13:40 - 14:30	**MECH 202 (S1) [I-104]**			**MECH 113 (S1) [I-104]**			
14:40 - 15:30	**MECH 202 (S1) [I-104]**			**MECH 113 (S1) [I-104]**			
15:40 - 16:30	Office Hour	**MECH 202 (S2) [I-104]**		MFAK - SÖNMEZ []	**MECH 113 (S1) [I-104]**		
16:40 - 17:30	Office Hour	**MECH 202 (S2) [I-104]**		MFAK - SÖNMEZ []	**MECH 113 (S1) [I-104]**		
17:40 - 18:30		**MECH 113 (S2) [I-104]**		MECH 113 (S3) [I-104]	Office Hour		
18:40 - 19:30		**MECH 113 (S2) [I-104]**		MECH 113 (S3) [I-104]			
19:40 - 20:30							

Textbooks

- DeGarmo, P., Black, J. T., Kohser, R. A., *Materials and Processes in Manufacturing*, Wiley, 10th Edition, 2008.

Reference Books and other Supplementary Materials:

G. Tlusty, "Manufacturing Process and Equipment", Prentice Hall Inc., 2000.

M. P. Groover, "Fundamentals of Modern Manufacturing", Prentice Hall, 1996.

S. Kalpakjian, S. R. Schmid, Manufacturing Engineering and Technology?, Prentice Hall, 7th Ed., 2013.

P. F. Ostwald, J. Munoz, ?Manufacturing Processes and Systems?, Wiley, 9th Ed., 1997.

L. E. Doyle, "Manufacturing Processes and Materials for Engineers", Prentice-Hall. 3rd Ed

Course Learning Outcomes

Having successfully completed this course, the student will be able to:

(1) identify manufacturing processes.
(2) compare the manufacturing processes.
(3) decide on the most appropriate manufacturing processes for a specific task.
(4) identify the manufacturing equipment.
(5) compare the manufacturing equipment.
(6) decide on the most appropriate manufacturing equipment for a specific task.
(7) identify manufacturing systems.
(8) compare the manufacturing systems.
(9) decide on the most appropriate manufacturing systems for a specific task.
(10) manufacture parts by using basic manufacturing processes.
(11) use basic manufacturing equipment and machine tools.

Teaching Format

Three 50 minute lectures per week

Schedule:

Sec. 1: Monday , 13:40 - 15:30, - Thursday , 09:40 - 10:30,

Sec. 2: Tuesday , 15:40 - 17:30, - Thursday , 08:40 - 09:30

Computer Usage

Not essential.

Category Content

Mathematics and Basic Sciences	0%
Engineering Sciences	20%
Humanities and Social Sciences	0 %
Departmental	80%
Engineering Design	0%

Weekly Class Schedule

Week 1: Introduction
Week 2: Casting

Week 3: Casting, Powder metallurgy
Week 4: Metal working (hot and cold) processes
Week 5: Metal working (hot and cold) processes
Week 6: Metal working (hot and cold) processes
Week 7: Metal cutting processes
Week 8: Metal cutting processes
Week 9: Metal cutting processes
Week 10: Metal cutting processes
Week 11: Metal cutting processes
Week 12: Non-traditional machining processes
Week 13: Welding processes
Week 14: Manufacturing systems and automation

Relationship to Student Outcomes:

This course contributes to fulfilment of the following student outcomes:

a. An ability to apply knowledge of mathematics, science and engineering

c. An ability to design mechanical and thermal systems, components, or processes to meet the desired needs within realistic constraints

d. An ability to function on multidisciplinary teams

f. An understanding of professional and ethical responsibility

g. An ability to communicate effectively

h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social context

k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Course Grading:

Midterm Examination: 30%

Quizzes: 20%

CAD for Machine Shop Practice: 5%

Machine Shop Practices: 15%

Final Exam: 30%

Attendance: 80% attendance is mandatory. If attendance is below 80%, student will not be allowed to take the midterm and the final exams.

Academic Honesty:

The METU Honor Code is as follows: "Every member of METU community adopts the following honor code as one of the core principles of academic life and strives to develop an academic environment where continuous adherence to this code is promoted. The members of the METU community are reliable, responsible and honorable people who embrace only the success and recognition they deserve, and act with integrity in their use, evaluation and presentation of facts, data and documents."

IMPORTANT: All students are strictly expected to comply with the METU NCC Academic Code of Ethics; and refrain from academic dishonesty (cheating, plagiarism, deception, etc.). If any

act as such is detected, student will fail the course straight away with an FF, and may face disciplinary action.

Prepared by: Assoc. Prof. Dr. Murat Sönmez **Date:** September 20th, 2024