METU NCC Mechanical Engineering Program
Syllabus for
MECH 202 Manufacturing Technologies (3-2) 4 (MUST Course)
2025-2026 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)

MECH 113 Computer Aided Engineering Drawing I is strongly recommended

Instructor:

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Time Schedule:

Assoc. Prof. Dr. Murat Sönmez 2025- 2026 Academic Year 1st Semester

SCHEDULE					
Time	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
08:40 - 09:30	MECH 202 (S2) I-104				
09:40 - 10:30	MECH 202 (S2) I-104				
10:40 - 11:30		MECH 113 (S3) I-104			MECH 113 (S1) I-104
11:40 - 12:30		MECH 113 (S3) I-104			MECH 113 (S1) I-104
12:40 - 13:30	MECH 100 (S1) I-104				
13:40 - 14:30	MECH 100 (S1) I-104		MECH 202 (S1) I-104	MECH 113 (S2) I-104	
14:40 - 15:30		Office Hour	MECH 202 (S1) I-104	MECH 113 (S2) I-104	MECH 202 (S1) I-104
15:40 - 16:30		Office Hour		MFAK - SÖNMEZ []	
16:40 - 17:30	Office Hour			MFAK - SÖNMEZ []	MECH 202 (S2) I-104
17:40 - 18:30	Office Hour	MECH 113 (S2) I-104	MECH 113 (S1) I-104	MECH 113 (S3) I-104	
18:40 - 19:30		MECH 113 (S2) I-104	MECH 113 (S1) I-104	MECH 113 (S3) I-104	Office Hour
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.
(12) perform engineering calculations and determine shaping force and power
(13) identify fundamentals of metal casting
(14) identify shaping processes for plastics
(15) identify fundamentals of powder metallurgy
(16) know the fundamentals of bulk deformations; rolling, forging, metal extrusion
(17) identify fundamentals of sheet metalworking
(18) identify turning and related operations
(19) identify drilling and related operations
(20) identify milling and related operations
(21) identify shaping, planning and related operations
(22) identify abrasive surface finishing operations
(23) know fundamentals of welding
(24) identify nontraditional machining processes

Teaching Format

Three 50 minute lectures +2 hours machine shop training per week

Schedule for Lectures:

Sec. 1: Wednesday , 13:40 - 15:30, - Friday , 14:40 - 15:30,

Sec. 2: Monday , 08:40 - 10:30, - Friday , 16:40 - 17:30

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: Metal cutting processes
Week 3: Metal cutting processes
Week 4: Metal cutting processes
Week 5: Metal cutting processes
Week 6: Metal cutting processes
Week 7: Casting
Week 8: Casting, Powder metallurgy
Week 9: Metal working (hot and cold) processes
Week 10: Metal working (hot and cold) processes
Week 11: Metal working (hot and cold) 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:

1a: Problem Identification and Formulation: Clearly identify engineering problems and formulate well-defined problem statements using appropriate scientific principles and assumptions.
2a: Design Planning and Specification: Define design requirements and constraints based on user needs, applicable standards, and contextual factors (e.g., safety, environmental, social, economic).
2b: Conceptual Design and Selection: Generate multiple conceptual design alternatives and evaluate them systematically to select the most appropriate and effective solution.
2c: Design Implementation and Realization: Develop, evaluate, and realize design solutions—from concept generation to prototyping—ensuring they are feasible and ready for production.
3a: Technical Communication – Visual and Written: Convey technical information clearly and effectively through written reports and visual tools (e.g., drawings, graphs, models, schematics).
4a: Ethical and Professional Responsibility: Recognize and apply ethical principles and professional standards in academic and engineering contexts to make informed decisions.
4b: Contextual Awareness and Impact Analysis: Evaluate the broader impacts of engineering decisions considering economic, environmental, societal, cultural, and global factors, including contemporary issues and regulations.
5a: Team Contribution and Task Management: Contribute actively to team planning, task execution, and timely completion of shared deliverables.

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 26th, 2025