

## MIDDLE EAST TECHNICAL UNIVERSITY NORTHERN CYPRUS CAMPUS

### Syllabus for MECH-100 (0-2)1 Introduction to Mechanical Engineering 2023-2024 Academic Year 2nd Semester

#### Instructor:

Assoc. Prof. Dr. Murat SÖNMEZ

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#### Course Schedule:

Assoc. Prof. Dr. Murat SÖNMEZ 2023-2024 Academic Year Spring Semester							
SCHEDULE							
Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
08:40 - 09:30				MECH 100 (S1) [I-104]			
09:40 - 10:30				MECH 100 (S1) [I-104]	MECH 533 (S1) [I-104]		
10:40 - 11:30	MECH 113 (S1) [I-104]	MECH 114 (S1) [I-104]		MECH 205 (S1) [I-104]	MECH 533 (S1) [I-104]		
11:40 - 12:30	MECH 113 (S1) [I-104]	MECH 114 (S1) [I-104]		MECH 205 (S1) [I-104]	MECH 533 (S1) [I-104]		
12:40 - 13:30							
13:40 - 14:30							
14:40 - 15:30							
15:40 - 16:30				MFAK - SÖNMEZ []			
16:40 - 17:30	MECH 205 (S1) [I-104]			MFAK - SÖNMEZ []			
17:40 - 18:30		ASE 492 (S1) [I-104]	MECH 114 (S1) [I-104]	MECH 113 (S1) [I-104]	ASE 492 (S1) [I-104]		
18:40 - 19:30		ASE 492 (S1) [I-104]	MECH 114 (S1) [I-104]	MECH 113 (S1) [I-104]	ASE 492 (S1) [I-104]		
19:40 - 20:30							

#### Catalog Description

Overview of the major fields of mechanical engineering: design, production, theory of machines, solid mechanics, fluid mechanics and thermal and energy systems. Systems approach, project planning, engineering ethics. Team work and design process.

#### Reference Books and other Supplementary Materials:

\* Wickert, J. "An Introduction to Mechanical Engineering", 4th Ed. 2017, Thomson

\* Eide, A., Jenison, R., Northup, L., Mickelson, S., "Engineering Fundamentals and Problem Solving", 6<sup>th</sup> Ed. 2012, Mc. Graw Hill.

\*Lecture Notes at the web page of MECH100

<http://users.metu.edu.tr/sonmez/MECH%20100/MECH%20100home.htm> and also in METU Class

<https://odtuclass.metu.edu.tr/>

#### Grading:

Mid-Term Exam : 30%

Pop-Quizzes/ Quizzes : 30%

CW (using Autodesk Fusion 360) : 5% Bonus

Final : 40%

**Important Note for Attendance:** 70% attendance is mandatory. If your attendance is below 70%, you will not be allowed to take the midterm and the final exams.

**NOTE:** Without taking the permission of the instructor, course materials; lecture notes, video records, work-sheets, exam questions, and their solutions are not allowed to share

## Course Objectives

The main objective of the course is to prepare the students to mechanical engineering profession at an early stage. The course aims to provide the students:

- A general understanding of major fields of mechanical engineering.
- Knowledge about mechanical engineering curriculum and the content of engineering courses
- Appreciation for engineering ethics.
- Awareness of social concerns in engineering practices.
- Knowledge about professional engineering organizations.
- Review on SI and Customary American Unit Systems, unit consistency, Basic units, Generated units
- How mechanical advantage and efficiency are defined and determined
- Basic principles of scientific computation and engineering solution. How the engineering calculations are output and represented.
- Introduction to Statics
- Introduction to manufacturing technology
- Introduction to dynamics
- Introduction to strength of materials
- Introduction to thermodynamics
- Introduction to fluid mechanics
- Introduction to heat transfer
- A preliminary step to engineering design in a team environment.
- Introduce CAD/ CAM using the tools of Autodesk Fusion 360

## Teaching Format

One 50-minutes lecture, one 50 minutes classwork activity per week.

## Weekly Class and Tutorial Schedule

Week 1	Introduction; mechanical engineering profession, mechanical engineering curriculum
Week 2	Business Etiquette, Morals, Ethics, Engineering Ethics, Research and Publication ethics committee of METU NCC
Week 3-4	Unit Systems, Unit Conversion, Dimensional Consistency. Corrections on some basic and derived concepts
Week 5-6	Estimation in engineering, Problem solving and communication skills, Presenting engineering calculations
Week 7-8	Principles of statics and dynamics; force, moment, torque, equilibrium of forces and moments, free-body diagram
Week 9	Overview on manufacturing and materials, common machine elements; fasteners, gears, pulley-belt mechanisms, chain-sprocket mechanisms
Week 10	Introduction to Mechanics of Materials
Week 11	Introduction to Fluid Mechanics
Week 12	Introduction to thermodynamics; energy, work, power, heating value, specific heat, transfer of heat, heat engine, thermal efficiency. Introduction to heat transfer
Week 13-14	Introduction to Autodesk Fusion 360; model creation, engineering calculations in Fusion, manufacturing tools of Fusion. Class-Work