

# MIDDLE EAST TECHNICAL UNIVERSITY NORTHERN CYPRUS CAMPUS

## MECH205 STATICS

### Syllabus for MECH-205 (3-0)3 Statics 2024-2025 Academic Year Summer Semester

**Instructor:**

Assoc. Prof. Dr. Murat SÖNMEZ

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**Course Schedule:**

Summer 2025- Assoc. Prof. Dr. Murat Sönmez							
SCHEDULE							
Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
08:40 - 09:30				MECH 113 (S1) [I-104]	MECH 113 (S1) [I-104]		
09:40 - 10:30				MECH 113 (S1) [I-104]	MECH 113 (S1) [I-104]		
10:40 - 11:30				MECH 113 (S1) [I-104]	MECH 113 (S1) [I-104]		
11:40 - 12:30				MECH 113 (S1) [I-104]	MECH 113 (S1) [I-104]		
12:40 - 13:30				MECH 113 (S1) [I-104]			
13:40 - 14:30		MECH 113 (S1) [I-104]					
14:40 - 15:30		MECH 113 (S1) [I-104]					
15:40 - 16:30		MECH 113 (S1) [I-104]		MECH 205 (S1) [I-104]	MECH 205 (S1) [I-104]		
16:40 - 17:30		MECH 205 (S1) [I-104]		MECH 205 (S1) [I-104]	MECH 205 (S1) [I-104]		
17:40 - 18:30		MECH 205 (S1) [I-104]			MECH 205 (S1) [I-104]		
18:40 - 19:30							
19:40 - 20:30							

**Course Code:** 3650205

**METU Credit** (Theoretical-Laboratory hours/week): 3(3-0)

**ECTS Credit:** 5.0

**Department:** Mechanical Engineering

**Language of Instruction:** English

**Level of Study:** Undergraduate

**Course Coordinator:** Assoc. Prof. Dr. Murat Sönmez

**Regular Semester:** Fall Semesters.

**Prerequisite:** Set 1: 3570119 , 3580105

The course set above should be completed before taking MECH205 STATICS .

**Course Objectives**

To identify force and couple systems acting on particles or rigid bodies by drawing free body diagrams

To analyze static equilibrium of particles and rigid bodies.

To analyze internal forces in structures and beams.

To identify and analyze the effects of dry friction on rigid bodies in static equilibrium.

To compute the geometric and mass properties of surfaces and solids

### **Course Content**

Idealizations and principles of mechanics. Important vector quantities, classification and equivalence of force systems. State of equilibrium. Elements of structures; trusses, beams, cables and chains. Friction. Elements of statics of fluids. Variational methods.

### **Course Learning Outcomes**

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

1. Use vectors and vector operations to analyze systems of forces and moments in two and three-dimensions.
2. Draw free body diagrams of particles and rigid bodies in a plane and in space.
3. Apply the equations of equilibrium to analyze the equilibrium of a particle and a rigid body.
4. Analyze forces acting on the members of trusses, frames and machines in static equilibrium.
5. Analyze internal forces of a beam using shear force and bending moment diagrams.
6. Identify dry friction and analyze the equilibrium of rigid bodies subjected to friction force.
7. Apply first and second moment equations to calculate the center of gravity, center of mass, centroid, mass and area moments of inertia of single and composite bodies.

### **Reference Books:**

Engineering Mechanics-STATICS, Author: Russell C. Hibbeler, Prentice Hall

Vector Mechanics for Engineers- STATICS, Authors: Ferdinand P. Beer, E. Russell Johnston Jr., McGraw-Hill

### **Grading:**

Mid-Term Exam : 30%

Quizzes & Pop Quizzes : 30%

Final : 40%

### **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.

1b: Mathematical Modeling and Analysis: Develop and solve mathematical models of engineering

problems using appropriate methods, including calculus, linear algebra, and numerical techniques.

*Important Note for Attendance:* Attend all the class sessions. The course topics are strongly related to each other. If you miss a session, make sure that you study the covered topic before you come to class for the following session. Do not wait until the main examinations. 70% attendance is mandatory. If your attendance is below 70%, you will not be allowed to take the midterm and the final exams.

(Attendance is optional for the ones who repeat the course for increasing the grade from BB if they accept that PQ grade will be substituted by the previous PQ grade)

**Prepared by:** Assoc. Prof. Dr. Murat Sönmez

**Date:** January, 2024

**1<sup>st</sup> Modification Date:** June, 2024

**2<sup>nd</sup> Modification Date:** July, 2025