**MIDDLE EAST TECHNICAL UNIVERSITY NORTHERN CYPRUS CAMPUS**

**MECH205 STATICS**

**Syllabus for MECH-205 (3-0)3 Statics**
**2023-2024 Academic Year Summer Semester**

**Instructor:**
Assoc. Prof. Dr. Murat SÖNMEZ
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**Course Schedule:**

Assoc. Prof. Dr. Murat Sönmez- 2024 Summer

| SCHEDULE | | | | | |
|---|---|---|---|---|---|
| Time | Monday | Tuesday | Wednesday | Thursday | Friday |
| 08:40 - 09:30 | | | | | |
| 09:40 - 10:30 | MECH 113 (S1) [RZ-11] | MECH 113 (S1) [RZ-11] | | | |
| 10:40 - 11:30 | MECH 113 (S1) [RZ-11] | MECH 113 (S1) [RZ-11] | | | |
| 11:40 - 12:30 | MECH 113 (S1) [RZ-11] | MECH 205 (S1) [RZ-11] | | | |
| 12:40 - 13:30 | | MECH 205 (S1) [RZ-11] | | | |
| 13:40 - 14:30 | | | MECH 113 (S1) [RZ-11] | MECH 113 (S1) [RZ-11] | |
| 14:40 - 15:30 | | | MECH 113 (S1) [RZ-11] | MECH 113 (S1) [RZ-11] | |
| 15:40 - 16:30 | | | MECH 205 (S1) [RZ-11] | MECH 113 (S1) [RZ-11] | |
| 16:40 - 17:30 | | | MECH 205 (S1) [RZ-11] | MECH 205 (S1) [RZ-11] | |
| 17:40 - 18:30 | | | MECH 205 (S1) [RZ-11] | MECH 205 (S1) [RZ-11] | |
| 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:

Use vectors and vector operations to analyze systems of forces and moments in two and three-dimensions.

Draw free body diagrams of particles and rigid bodies in a plane and in space.

Apply the equations of equilibrium to analyze the equilibrium of a particle and a rigid body.

Analyze forces acting on the members of trusses, frames and machines in static equilibrium.

Analyze internal forces of a beam using shear force and bending moment diagrams.

Identify dry friction and analyze the equilibrium of rigid bodies subjected to friction force.

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.

# Program Outcomes Matrix

Undergraduate

| | | Level of Contribution | | | |
|---|---|---|---|---|---|
| | **Program Outcomes** | **0** | **1** | **2** | **3** |
| 1 | Ability to establish the relationship between mathematics, basic sciences and engineering sciences with engineering applications | | | | X |

| | Program Outcomes | Level of Contribution | | | |
|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 |
| 2 | Ability to find and interpret information | | X | | |
| 3 | Ability to follow the literature and technology related to his/her topic of interest | X | | | |
| 4 | Recognition of the need to keep oneself up to date in his/her profession | | X | | |
| 5 | Possession of written and oral communication skills | | X | | |
| 6 | Ability to conduct team work (within the discipline, inter-disciplinary, multi-disciplinary) | X | | | |
| 7 | Ability to produce original solutions | | X | | |
| 8 | Use of scientific methodology in approaching and producing solutions to engineering problems and needs | | | | X |
| 9 | Openness to all that is new | | X | | |
| 10 | Ability to conduct experiments | X | | | |
| 11 | Ability to do engineering design | X | | | |
| 12 | Awareness of engineering ethics, knowledge and adoption of its fundamental elements | | X | | |
| 13 | Ability to take societal, environmental and economic considerations into account in professional activities | X | | | |

| | Program Outcomes | Level of Contribution | | | |
|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 |
| 14 | Possession of pioneering and leadership characteristics in areas related to the profession | X | | | |

**0:** No Contribution **1:** Little Contribution **2:** Partial Contribution **3:** Full Contribution

**Reference Books:**

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

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

**Grading:**

Mid-Term Exam : 30%

Quizzes& Pop Quizzes' : 30%

Final : 40%

*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)