



Philadelphia University

Faculty of Engineering and Technology - Department of
Mechatronics Engineering

Course Information

- Title:** Statics and Mechanics of materials (640234)
- Prerequisite:** General Physics (1) (0211101)
- Credit Hours:** 3 credit hours (16 weeks per semester, approximately 44 contact hours)
- Textbook:** Statics and Mechanics of Materials -5th edition by R. C. Hibbeler
- References:**
- Engineering Mechanics-Statics-12th edition by R. C. Hibbeler
 - Mechanics of Materials- 10th edition by R. C. Hibbeler
 - Mechanics of Materials- 10th edition by R. C. Hibbeler
 - Mechanics of Materials- 2nd edition by Ferdinand Beer , E. Johnston , John DeWolf and David Mazurek
- Description:** The course is a core course for engineers and is a prerequisite for many later course. In this course, the effects of loads on bodies is under investigating when these bodies experience a static equilibrium. These effects are represented in form of stress and strain.

Course Topics:

Week	Topic
1	General Principles
2	Force Vectors
3,4	Force System Resultants
5,6	Equilibrium of a Rigid Body
7	Center of Gravity Centroid, and Moment of Inertia
8,9	Stress and Strain
10	Mechanical Properties of Materials
11	Axial loading
12	Torsion
13	Bending
14	Transverse shear
15	Combined Loadings
16	Review, and final exam

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should be able to:

1	Free-body diagram for a particle and a rigid body.	[1]
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2	Understand and apply the basic concepts of force, vectors, moment.	[1]
3	Introduction and Basic Concepts of Solid Mechanics, Stress and strain.	[1]
4	Mechanical properties of materials, Axial loading.	[1]
5	Torsion, analysis and design of beam for bending.	[1]
6	Transverse shear, transformation of stress and strain, Deflection of beams, Columns, energy methods	[1]

Assessment Instruments:

Evaluation of students' performance (final grade) will be based on the following categories:

Exams: Two written exams will be given. Each will cover about 3-weeks of lectures

Quizzes: 10-minute quizzes will be given to the students during the semester. These quizzes will cover material discussed during the previous lecture(s).

Homework: Problem sets will be given to students. Homework should be solved individually and submitted before the due date.

Copying homework is forbidden, any student caught copying the homework or any part of the homework will receive zero mark for that homework

Participation: Questions will be asked during lecture and the student is assessed based on his/her response

Final Exam: The final exam will cover all the class material.

Grading policy:

First Exam	20%
Second Exam	20%
Home works, Quizzes and participation	20%
Final Exam	40%
Total:	100%

Attendance policy:

Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse, acceptable to and approved by the Dean of the relevant college/faculty, shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.