

Course Syllabus

Course Information

Course Number/Section: BMEN2310.001.12F - Static Equilibrium and Rigid Body Dynamics

Term: Fall 2012

Days & Times: Class meets in CN 1.102 on Monday, Wednesday & Friday 10:00-10:50 am

Instructor Information

Professor: Danieli Rodrigues

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Office: ECSS 3.905

E-mail: danieli@utdallas.edu

Office hours: Monday and Wednesday: 11:30 am - 1:00 pm – Wednesday: 8:30 – 9:30 am

Teaching Assistant: Victoria Holderby

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Office hours: Thursday 4:30-7:00 pm

Recitation: Tuesday 6:00-7:30 pm

Classroom: ECSN 2.126

Classroom: ECSN 2.110

Required Textbook

Engineering Mechanics: Statics & Dynamics, 12/e, R. C. Hibbeler, Prentice Hall.

Websites

<http://www.masteringengineering.com/>

Course Title: BMEN 2310 - Static Equilibrium and Rigid Body Dynamics

Course ID: BMENROD2310

Digital textbook and online homework are on [masteringengineering.com](http://www.masteringengineering.com). Access to the website is granted with the purchase of a new textbook, which contains the access code.

Other materials (updated syllabus, solutions, handouts) will be available on eLearning.utdallas.edu.

Prerequisites/Corequisites

Prerequisite: BMEN 1208. Corequisites: ENGR 2300, MATH 2420, and PHYS 2326/2126.

Course Description

Lecture course: course material includes static equilibrium of particles, trusses and machines. Friction equivalent systems, particle dynamics in one, two and three dimensions, work, energy, angular momentum and moment of inertia, and dynamics of rigid bodies.

Course Learning Objectives

Introduce various types of force systems at rest or in motion using the classical Newtonian mechanics that governs physical systems at rest and in motion. The primary objectives of the course are:

- Apply knowledge in mathematics, science and engineering to formulate and solve engineering problems in statics and dynamics.

- Solve statics and dynamics problems for systems modeled as particles and planar rigid bodies.
- Acquire the ability to represent and manipulate forces and moments.
- Learn to interpret elementary structural and mechanical systems and their interactions.
- Understand force-acceleration, work-energy, and impulse-momentum solution methods.

Course Content/Tentative schedule

Introduction and General Principles	Week 1
Force Vectors	Week 2
Equilibrium of a Particle	Week 2
Force System Resultants	Week 3
Center of Gravity	Week 3
Distributed Forces	Week 3
Equilibrium of a Rigid Body	Week 4
Structural Analysis: Method of Joints	Week 4
Structural Analysis: Methods of Sections	Week 5
Review	Week 5
<u>Test I, Tentative Date: 09/28</u>	Week 5
Truss Analysis/Space Trusses	Week 6
Frames and Machines	Week 6
Internal Forces	Week 6
Friction	Week 7
Moment of Inertia	Week 8
Review	Week 8
<u>Test II, Tentative Date: 10/19</u>	Week 8
Kinematics of a Particle	Week 9
Kinetics of a Particle: Force and Acceleration	Week 10
Kinetics of a Particle: Work and Energy	Week 11
Kinetics of a Particle: Impulse and Momentum	Week 12
Review	Week 12
<u>Test III, Tentative Date: 11/16</u>	Week 12
Planar Kinematics of a Rigid Body	Week 14
Introduction to Planar Kinetics of a Rigid Body	Week 15-16
<u>Final Exam per UTD Schedule, 12/14, 8:00 - 10:45am</u>	

Grading Policy

The following percentages will be used in calculating final grade for the course:

- Exams: 65%
- Homework: 20%
- Rewritten class notes, Quizzes and Assigned Group Problems: 15%

Three evaluations (Test I, II and III) and a final exam will be given. The highest scores from two evaluations will be used to calculate the midterm grade. Each of these two tests will be equally weighted contributing 20% to the overall grade. The final exam will contribute 25% to the overall grade.

Course Assessment

- **Homework:**
 - Homework is due by 12PM on due date (Friday of most weeks or as announced in class).
 - All assignments will be given through [masteringengineering.com](https://www.masteringengineering.com) and solutions should be submitted electronically using the same website by the due date/time. Hard copy homework is due at the beginning of the class period on the scheduled due date.
 - Students are encouraged to take advantage of the tools available in [masteringengineering.com](https://www.masteringengineering.com) to complete their assignments. Students are also expected to seek for the TA's help for clarification on homework questions.
 - Solutions for homework problems will be available electronically.
- **Rewritten class notes:**
 - It will serve as a measure of student organization and attention to the materials presented in class, and to monitor attendance.
 - Student will summarize (up to one page, it can be both sides) what he/she learned in the past 2 weeks of lectures.
 - Once every two weeks (usually on Friday), rewritten class notes needs to be turned-in at the beginning of the class period.
 - It will be graded in a complete (10 points)/incomplete (5 points) basis.
- **Quizzes:**
 - They will be short (1 question or multiple choice questions), unannounced, and will either cover the present lecture content or one problem for which the solution is presented in the textbook or was worked in class.
 - Each quiz will be graded on a scale of 0-10.
- **Group Problems:**
 - It will serve as a measure of student ability to work in teams and to present the material learned in class.
 - The activity will be assigned one week before the scheduled tests (at the latest) and will be presented during the review sections (lecture preceding a test).
 - One short application problem will be assigned to each group and the team will work on the solution using concepts learned in class. It is highly recommended that students work as a group since the objective of this activity is to stimulate discussion and review the material. Two groups will be randomly selected to present their problem to the class. All team members are expected to turn-in the solution for the assigned problem.
 - Each activity will be graded on a scale of 0-10.

Course & Instructor Policies

Late/missed work: Late work will not be accepted without the consent of the instructor, except for unusual circumstances. It will be dealt with on a case by case basis by the instructor.

Attendance Policy: Students are expected to be present for class on time. Cellular phones and other electronic devices must be turned off when class is in session. Because the course is fast-paced, students who fall behind are encouraged to get help as soon as possible.

Academic Integrity: While discussion of class-related assignments with peers is encouraged, materials turned-in should be the reflection of individual work. Copying assignments is not a good way to learn the material and is deemed dishonest. No collaboration will be allowed during tests/exams.

How to Prepare for Success

Outside class work will dictate how well students will perform in this class. Students are highly encouraged to read the material prior to class, reviewing class notes and reworking solved examples in the book. It is recommended that students work on problems besides the ones assigned for homework.

A few useful hints:

- Understand all worked examples in the book before attempting assigned homework.
- Attempting all homework problems will enhance your chance to do well in the exams.
- Make sure all worked examples and homework problems are clear while preparing for exams.
- Bring your questions to the attention of the instructor or TA when having difficulty understanding the material.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.