

CEE 204 - Statics
Syllabus
Spring 2014

Institution: Old Dominion University

Class Location: 1055 Constant Hall

Class Days: Tuesdays and Thursdays

Class Hours: 8:00 am - 9:15 am

Credits: 3

Instructor: Dr. Reza Moradi

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Office Hours: Tuesdays 9:30 am-11:30 am (Other times by appointments)

Text Book: Engineering Mechanics - Statics

Author: Russell C. Hibbeler

Edition: 13th

ISBN-10: 0132915480

ISBN-13: 978-0132915480

Publisher: Prentice Hall

Catalog Course Description:

Introduction to engineering problems and their solutions through a study of the statics of particles and rigid bodies.

Corequisite:

PHYS 231N

Prerequisite:

MATH 211 with a C or higher

Course Outcomes:

Students who successfully complete the course will demonstrate the following outcomes by tests and homework:

1. An ability to construct free-body diagrams and to calculate the reactions necessary to ensure static equilibrium.
2. An understanding of the analysis of distributed loads.
3. A knowledge of internal forces and moments in members.
4. An ability to solve static equilibrium problems involving friction.
5. An ability to calculate centroids and moments of inertia.

Course Outlines:

1. Vector Algebra

In this section, vector operations are reviewed and vectors are expressed in terms of components, and examples of engineering applications of vectors are presented.

2. Moment of a Force

The effects of forces can depend not only on their magnitudes and directions but also on the moments, or torques, they exert. This section explains how to calculate moments and introduce the concept of equivalent systems of forces and moments.

3. Equilibrium of a Particle and a Rigid Body

In this section, forces are discussed in more detail and two of the most important concepts in mechanics, equilibrium and the free-body diagram are introduced. The free-body diagrams will be used to identify the forces on a particle and a rigid bodies and equilibrium is used to determine unknown forces.

4. Structural Analysis: Truss, Frame and Machines

The internal forces acting in several types of structures, namely, trusses, frames, and machines are analyzed in this section. In this treatment, only statically determinate structures, which do not have more supporting constraints than are necessary to maintain an equilibrium configuration, are considered.

5. Internal Force

In this section it is shown how to use the method of sections to determine the internal loadings in a beam and plot the internal shear and moment throughout a member.

6. Friction

Friction forces have many important effects, both desirable and undesirable, in engineering applications. In this section the concept of dry friction is introduced and it is shown how to analyze the equilibrium of rigid bodies subjected to this force.

7. Center of Gravity and Centroid

In this section, the center of mass is defined and it is shown how it is determined for various kinds of objects.

8. Moment of Inertia

The moment of inertia is defined in this section and it is shown how to determine moment of inertia for various kinds of objects.

9. Virtual Work

In this section the principle of virtual work is introduced and it is shown how it applies to finding the equilibrium configuration of a system of pin-connected members.

Course Schedule:

Date		Subject
Tuesday	1/14	Introduction
Thursday	1/16	General Principal in Mechanics & Vector Algebra
Tuesday	1/21	Vector Algebra
Thursday	1/23	Moment of a Force
Tuesday	1/28	Moment of a Force
Thursday	1/30	Equilibrium of a Particle
Tuesday	2/4	Equilibrium of a Rigid Body
Thursday	2/6	Equilibrium of a Rigid Body
Tuesday	2/11	Structural Analysis - Truss
Thursday	2/13	Structural Analysis - Truss
Tuesday	2/18	Structural Analysis - Truss
Thursday	2/20	Structural Analysis - Frame & Machine
Tuesday	2/25	Structural Analysis - Frame & Machine
Thursday	2/27	Structural Analysis - Frame & Machine
Tuesday	3/4	Review
Thursday	3/6	MidTerm Exam
<i>Tuesday</i>	<i>3/11</i>	<i>Holiday-Spring Break</i>
<i>Thursday</i>	<i>3/13</i>	<i>Holiday-Spring Break</i>
Tuesday	3/18	Internal Forces
Thursday	3/20	Internal Forces
Tuesday	3/25	Internal Forces
Thursday	3/27	Internal Forces
Tuesday	4/1	Friction
Thursday	4/3	Friction
Tuesday	4/8	Center of Gravity and Centriod
Thursday	4/10	Center of Gravity and Centriod
Tuesday	4/15	Moment of Inertia
Thursday	4/17	Moment of Inertia
Tuesday	4/22	Virtual Work
Thursday	4/24	Review
Tuesday	4/29	Review

Course Grading:

Homework	20%
Quizzes	15%
Mid Term Exam	25%
Final Exam	35%
Class Participation	5%
Total	100%

Grading Scale Percentages:

92.51 - 100 =	A
90 - 92.5 =	A-
88.5 - 89.99 =	B+
82.51 - 88.49 =	B
80 - 82.5 =	B-
78.5 - 79.99 =	C+
72.51 - 78.49 =	C
70 - 72.5 =	C-
68.5 - 69.99 =	D+
62.51 - 68.49 =	D
60 - 62.5 =	D-
59.99 & below =	F

Lecture Session:

The presentation in each session includes combination of slide show and writing on the board. The slide shows are given to students as the hand out. The pdf version of the handout will be posted on blackboard one day before the session, so you can review them before the class. You should bring your engineering calculator for each session.

Attendance:

Attendance is required. Please do not come to the class if you are more than **15 minutes** late. The limit for absences in this class is **three** missed classes.

Homework:

Homework should follow the format, which has been defined by CEE department (attachment). Homework will be posted on blackboard and due one week after assigned. Homework should be scanned, converted to pdf and posted on black board on due date before midnight. Late problems will not be accepted. Zeros will be recorded for all assignments not turned in on time.

Quizzes:

There are totally 4 quizzes: two quizzes before midterm and two quizzes after midterm exam. The date of the quiz session will be announced through blackboard (by Email) three days before the quiz session. There would be no make-up quiz, so zero would be recorded if you do not take the quiz.

Mid Term and Final Exam:

Mid term and final exams are 2hour exams. **They are closed books and notes. You can bring a one-page, double-sided, crib sheet to exam with any kind of calculator.** You cannot use your cell phone during exam.