United States Naval Academy
Mechanical Engineering Department

EM211 Statics

Catalog Description: EM211 - Statics **Credit:** 3 (3-0-3)

An initial course in applied vector mechanics with emphasis on static equilibrium. Topics include forces, moments, couples, equivalent force-couple systems, centroids, distributed forces, and Coulomb friction. The application of the free body diagram in the analysis of static equilibrium of frames, machines and trusses is stressed.

Corequisites: Calculus III, Physics I

Textbooks: Hibbler, R.C., *Engineering Mechanics - Statics*, 8th Ed. Prentice-Hall, *Required*

Course Director: Prof. T.W. Butler

Objectives[1]**:**

1. To give the student an introduction to engineering mechanics with an emphasis on engineering problem solving and the synthesis of calculus and physics. (a,b,c)

Course Content:

#	Topic or Subtopic	# hrs.
1	Introduction	1
2	Mechanics Readiness	2
3	Forces and Vectors	6
4	Particle Equilibrium	4
5	Force Resultants	7
6	Body Equilibrium	4
7	Structural Analysis	5
8	Internal Forces	3
9	Friction	4
10	Center of Gravity	2
11	Moments of Inertia	1

Evaluation:

1. Quizzes
2. Homework
3. Exams

Acquired Abilities[2]:

1.1 Students will demonstrate the ability to describe position, forces and moments in terms of vector components in two and three dimensions (1,2,3).
1.2 Students will demonstrate the ability to select suitable reference coordinate axes, construct free-body diagrams and understand the relation between constraints imposed by supports and support forces (1,2,3)
1.3 Students will demonstrate the ability to formulate static equilibrium equations for a rigid body and evaluate member forces in plane trusses, frames and machines (1,2,3).
1.4 Students will demonstrate the ability to apply Coulomb's dry friction laws to engineering problems (1,2,3).
1.5 Students will demonstrate the ability to evaluate internal forces in rigid bodies (1,2,3).
1.6 Students will demonstrate the ability to determine centers of gravity and moments of inertia of simple and composite geometric regions (1,2,3).

Date of Latest Revision: 05 SEP 2001

[1] Letters in parenthesis refer to the Program Objectives of the Mechanical Engineering Program.
[2] Numbers in parenthesis refer to the evaluation methods used to assess student performance.