Course Number and name: ET 240 Applied Statics

Credits and Contact Hours: 3 cr. 46 contact hours -- lecture

Instructor's name: Ruinian Jiang

Textbook: Bedford, A. and Fowler, W., 2007, Engineering Mechanics: Statics, 5th Ed., Prentice Hall, Upper Saddle River, NJ. ISBN: 0136129153

Specific Course Information:
Course Description: Fundamental principles and their application in the analysis of forces acting on rigid bodies at rest. The use of vectors, equilibrium conditions and equations, concentrated and distributed force systems, free body diagrams, the methods of joints and sections, the centroid, moments of area and inertia, and shear and moment diagrams as prerequisites to the analysis and design of static structures. Important aspects of surface friction and virtual work.

Prerequisites: Math 190 (180) and 121 (185) and Physics 211, Co-requisite: Math 235 (236)

Course Goals/ Objectives:

- to introduce the physical concepts and basic principles of applied statics
- to acquaint students with problem solving methods in applied statics
- to provide students with practice in applying fundamental, systematic approaches to solving applied statics problems.

Contribution of Course to Meeting the Professional Component:

With respect to the Program Outcomes for graduates of the Engineering Technology Department, this course contributes directly to mastery of the knowledge, techniques, skills, and modern tools of the disciplines for students in the mechanical and civil options. The course provides students with practice in developing the ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology. It also helps them not only develop the ability to identify, analyze, and solve technical problems, but also adopt a commitment to quality, timeliness, and continuous improvement.

Week	Topics	Chapters
1	Introduction: course overview, fundamental concepts	1
2	Vector definitions and operations, cartesian components, vector products	2
3	Types of forces, free body diagrams, 2-D and 3-D force systems	3

4	Systems of forces and moments, equivalent systems, Review	4
5	Exam I, Rigid body equilibrium: equations	1-4
6	Rigid body equilibrium: equations, support reactions, static indeterminancy	5
7	Analysis of trusses: methods of joints and sections; frames, and machines	6
8	Centroids of areas and centers of mass, Review	7
9	Exam II, Moments of area and mass moments of inertia, parallel axis theorems	5-7, 8
10	Moments of area and mass moments of inertia, parallel axis theorems	8
11	Frictional forces on wedges, threads, bearings, belts, and ropes, Internal loads	9
12	Review, Exam III, Axial force, shear force, and bending moment; shear and moment diagrams	8-9
13	Axial force, shear force, and bending moment; shear and moment diagrams, Distributed loads	10
14	Distributed loads, pressure, center of pressure, and hydrostatic loads, Review	10
15	Thanksgiving Holiday 	
16	Review and cover necessary topics	1-10
18	**Final Exam (8:00 – 10:00 am)**	

Prepared by Ruinian Jiang, December 2010