AME-201 Statics
Spring 2011

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Lecture T Th 2:00 pm – 3:20 PM, VKC 152

Office Hours Tue. 3:30 – 5 pm, Wed. 4:30 – 5:30 pm, also by appointment – **RRB 202**

Textbook Beer, F. and E. Johnston. Vector Mechanics for Engineers: Statics, 9th Edition. McGraw-Hill, Boston, 2009. ISBN-10: 007727556X; ISBN-13: 978-0077275563.

Course Description

AME-201 STATICS
Units: 3 *Prerequisite***:** MATH-125 *Recommended preparation*: AME-101, PHYS-151

Analysis of forces acting on particles and rigid bodies in static equilibrium; equivalent systems of forces; friction; centroids and moments of inertia; introduction to energy methods. (*from the USC Course Catalogue*)

The subject of Statics deals with forces acting on rigid bodies at rest covering coplanar and non-coplanar forces, concurrent and non-concurrent forces, friction forces, centroid and moments of inertia. Much time will be spent finding resultant forces for a variety of force systems, as well as analyzing forces acting on bodies to find the reacting forces supporting those bodies. Students will develop critical thinking skills necessary to formulate appropriate approaches to problem solutions.

Course Objectives

Throughout the semester students will develop an understanding of, and demonstrate their proficiency in the following concepts and principles pertaining to vector mechanics, statics.

1. Components of a force and the resultant force for a systems of forces
2. Moment caused by a force acting on a rigid body
3. Principle of transmissibility and the line of action
4. Moment due to several concurrent forces
5. Force and moment reactions at the supports and connections of a rigid body
6. Force in members of a truss using the Method of Joints and the Method of Sections
7. Centroid and center of gravity for an area and a rigid body
8. Moment of inertia and radius of gyration of a composite area

Instructor Objectives

1. Provide the best learning environment and concepts and technical education needed to achieve the above indicated student objectives and for a career in engineering
2. Emphasize the understanding of societal implications of engineering decisions
3. Encourage class participation, questions and class related discussions
4. Incite critical analysis in the solution of a problem and application to engineering
5. Keep students informed of their progress during the semester
6. Provide support inside and outside the classroom.
7. Demonstrate fairness in grading.

Grading

HW Assignments	12%	14 assignments, 4 graded
Quizzes	24%	8 quizzes, all graded
2 Midterm (17% each)	34%	Tuesday, Feb. 22nd –and– Thursday, Mar. 24th
Final Exam	30%	Thursday, May 5th, 2-4 PM, location tbd
Total	100%	

In order to receive credit for your work, all homework, quiz and exam problems **must** be presented in a clear, organized manner. Solutions **must** show evidence of work; "magic" answers will not be accepted. Partial credit may be given if the solution is presented in a logical fashion. Students may study the assigned HW sets together; however, each person must submit their own assignment. All quizzes, the midterm and final exam are to be completed **individually**. Failure to comply with this requirement will result in a failing grade for the course. All students should read and understand the USC Student Code of Conduct, in particular, **Appendix A: Academic Dishonesty Sanction Guidelines** (http://web-app.usc.edu/scampus/wp-content/uploads/2009/08/appendix_a.pdf).

HW Assignments: A total of fourteen (14) homework sets will be assigned throughout the semester. Unless stated otherwise, assignments will be announced during the Thursday lecture and are "due" one week later, ***before*** the start of class (*i.e.*, before 2 PM). Only four (4) assignments will be collected and graded (notified beforehand). Late submissions will be penalized **-10%/day (including weekends)** and can be no later than five (5) days late. A hard copy of your work must be submitted in order to receive credit; scanned/faxed/emailed submissions will not be accepted. ***You are expected to complete all assignments within the time allotted since the problems contained within the assignments will be closely related to the quiz given that week.***

Quizzes: There will be eight (8) closed note/book quizzes, each starting promptly at 2 PM during the lecture period. *The material for each quiz will reflect the homework set "due" on that day*. Not taking a quiz will result in a zero (0) if your absence is not supported, documented *and* excused (*i.e.*, medical, court, etc.). If you miss a quiz due to an acceptable, documented reason the percentage of your final grade corresponding to the missed quiz (*i.e.*, 3% per quiz) will be added to the Final Exam. **No Makeup Tests Will Be Performed.**

Midterms: There will be two (2) midterm exams; one on **Tuesday, February 22nd** and one on **Thursday, March 24th**. For these exams, you may compile and use a single 8.5" x 11" note sheet and a standard scientific calculator (see guidelines below). With exception to the note sheet, consider these exams "closed book;" *i.e.*, class notes, textbooks, homework assignments, quizzes and solution sets are not permitted.

Final Exam: A cumulative Final Exam will be given on **Thursday, May 5th** from 2 – 4 PM. The location of this exam is to be determined. The Final Exam will be an "open note" test; however, textbooks (or photocopies) are not permitted.

Calculators: Standard scientific calculators are allowed for use during all quizzes, midterms and the final exam. Programmable calculators and wireless devices (*e.g.*, cell phone, iPod/Pad, etc.) are not permitted.

Class Schedule

Topics are indicated as a general guide. Coverage and schedule may change in accordance with the class progress. Students are expected to read the chapters listed below before each lecture period.

DATE	TOPIC	READING
11-Jan	*Class Introduction, Review, Statics of Particles*	2.1-8
13-Jan		2.9-15
18-Jan	*Rigid Bodies: Equivalent System of Forces*	3.1-8
20-Jan		3.9-11
25-Jan		3.12-16
27-Jan		3.17-20
1-Feb	*Equilibrium of Rigid Bodies*	4.1-4
3-Feb		4.5
8-Feb		4.6-7
10-Feb		4.8-9
15-Feb		4.8-9
17-Feb		4.1-9
22-Feb	**MIDTERM 1 (Chapters 2 – 4)**	
24-Feb	*Centroids and Centers of Gravity*	5.1-5
1-Mar		5.6-7
3-Mar		5.10-12
8-Mar	*Moments of Inertia*	9.1-3, 5-7
10-Mar		9.11-15
15-Mar	*Spring Break*	
17-Mar		
22-Mar	*Analysis of Structures*	6.1-4
24-Mar	**MIDTERM 2 (Chapters 5 and 9)**	
29-Mar		6.7
31-Mar		6.9-11
5-Apr		6.12
7-Apr		6.1-12
12-Apr	*Forces in Beams*	7.1-2
14-Apr		7.3-5
19-Apr		7.6
21-Apr	*Friction*	8.1-4
26-Apr		8.5, 10
28-Apr		8.5, 10
5-May	**FINAL EXAM (Cumulative)**	