

USC Viterbi School of Engineering

AME 201 Statics

Units: 3

Term: Spring 2017 Jan 9th (Mon) – May 8th (Wed)

Location: Lecture MW 2:00 pm – 3:20 pm VPD LL101
Check the course Blackboard page for updates

Instructor: **Dr. Wilson Chan**

Office: PHE 332

Office Hours: T 11a-1p; W 4-5p; Th 11-noon

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Office: VHE 202

Office Hours: *Check Blackboard page for updated hours*

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Course Description

The subject of *Statics* deals with forces and moments 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.

Learning Objectives

Throughout the semester, students will develop an understanding of, and demonstrate their proficiency in the following concepts and principles pertaining to the *Statics* branch of vector mechanics:

1. Components of a force and the resultant force for a system 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

Prerequisite(s): MATH 125

Co-Requisite (s): Not applicable

Concurrent Enrollment: Not applicable

Recommended Preparation: AME 101, PHYS 151L

Required Course Materials

The **textbook** listed below is required. For all quizzes and exams, a **basic scientific calculator** is required. Programmable calculators and wireless devices (e.g., cell phones, iPod/Pad, etc.) are not permitted.

Vector Mechanics for Engineers – Statics by F. P. Beer, E. R. Johnston Jr. & D. F. Mazurek,
10th or 11th Edition, McGraw-Hill Education.

Course Webpage

AME 201 will rely on the USC Blackboard webpage for all course communications. Use the Discussion Forums to ask questions related to homework assignments, or to ask general questions pertaining to the class. You can create new forums as needed, and it is recommended that you enable Blackboard notifications to alert you of any new Discussion Forum activity. Before the semester begins, students should verify they have access to this webpage.

Course Schedule

Week	Day	Topics/Daily Activities	Assigned Homework	Quiz/Exam topics
1	M 01/09	(1) Introduction & Review of Vector Algebra	HW 1	
	W 01/11	(2) Statics of Particles		
2	M 01/16	<i>No classes – Martin Luther King’s Birthday</i>	HW 2	Quiz 1 (HW 1)
	W 01/18	(3) Equivalent System of Forces		
3	M 01/23	(4)	HW 3	Quiz 2 (HW 2)
	W 01/25	(5)		
4	M 01/30	(6)	HW 4	Quiz 3 (HW 3)
	W 02/01	(7) Equilibrium of Rigid Bodies		
5	M 02/06	(8)	HW 5	Quiz 4 (HW 4)
	W 02/08	(9)		
6	M 02/13	(10)	HW 6	
	W 02/15	(11) Centroids and Centers of Gravity		
7	M 02/20	<i>No classes – President’s Day</i>		MT 1 (HWs 1-5)
	W 02/22	Mid-term Exam 1		
8	M 02/27	(12)		
	W 03/01	(13)		
9	M 03/06	(14) Moments of Inertia	HW 7	Quiz 5 (HW 6)
	W 03/08	(15)		
10	M 03/13	<i>No classes – Spring Break</i>		
11	M 03/20	(16) Analysis of Structures, Trusses	HW 8	Quiz 6 (HW 7)
	W 03/22	(17)		
12	M 03/27	(18)	HW 9	Quiz 7 (HW 8)
	W 03/29	(19)		
13	M 04/03	Mid-term Exam 2	HW 10	MT 2 (HWs 6-9)
	W 04/05	(20) Beams: Shear & Bending Moment Diagrams		
14	M 04/10	(21)	HW 11	Quiz 8 (HW 10)
	W 04/12	(22)		
15	M 04/17	(23)	HW 12	Quiz 9 (HW 11)
	W 04/19	(24) Forces in Cables		
16	M 04/24	(25)		Quiz 10 (HW 12)
	W 04/26	(26) Course Review & Summary		
	M 05/08	Final Exam (2-4pm)		Final Exam

Description and Assessment of Assignments

There will be two mid-term exams held during the regular lecture time: **Feb 22nd (Wed)** and **April 3rd (Mon)**. The final exam will be held on **May 8th (Mon)** from **2-4pm** at same room where lectures have been held for the entire semester. All quizzes are administered either on Mondays or Wednesdays at the start of each lecture session, unless otherwise noted. Mid-term exams will utilize the entire lecture session duration; quizzes will be much shorter, and the remaining time will be used for a standard lecture session. All written exams and quizzes will be closed book and closed notes. Homework sets will be assigned weekly.

Homework will not be collected; however, a weekly quiz that covers the material from the assigned homework set will be given. Thus, it is your responsibility to complete the problem set before each week's quiz or the mid-term exam.

In order to receive credit for your work, all 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 are encouraged to study the assigned homework sets together; however, each individual must ensure they obtain an understanding of the material. There are office hours to help you through the course; this time is best utilized when students come prepared with an attempt at a solution, thus allowing us to help you through your thought process.

All quizzes, the mid-term and final exam are to be completed as an individual. 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://www.usc.edu/student-affairs/SJACS/forms/sjacs_appa.pdf).

Grading Breakdown (*subject to change*)

There will be **no makeup quizzes or makeup exams**. Missing an exam or a quiz will result in a score of 0. However, **note that your lowest scoring quiz will be dropped from the final grade calculation**. All exams count towards the final grade.

Assessment Task	% of Grade
Quizzes (10 in total)	20
Mid-term Exam 1	25
Mid-term Exam 2	25
Final Exam	30
TOTAL	100

Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions>. All forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu> or to the *Department of Public Safety* <http://adminopsnet.usc.edu/department/department-public-safety>. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm> provides 24/7 confidential support, and the sexual assault resource center webpage <http://sarc.usc.edu> describes reporting options and other resources.

Support Systems for Students

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* provides certification for students with disabilities and helps arrange the relevant accommodations http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.