

# USC Viterbi School of Engineering

## AME 201 Statics

**Units** 3  
**Term** Fall 2021      **M Aug 23<sup>rd</sup> – F Dec 3<sup>rd</sup>**  
**Section** 28709R

**Location** Lecture M/W 3:30 – 4:50pm SOS B46  
See the course Blackboard page for updates

**Instructor** Quan Nguyen  
**Office** OHE 500G  
**Office Hours** T 9-10am, Th 9-10am.  
**Contact Info** quann@usc.edu

**Teaching Assistant** TBA  
**Office** TBA  
**Office Hours** TBA  
**Contact Info** TBA

### Course Description

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 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 vector mechanics, statics:

1. Components of a force and the resultant force for a system of forces
2. The 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):** n/a

**Concurrent Enrollment:** n/a

**Recommended Preparation:** AME 101, PHYS 151L

### Course Content and Discussion Forum

This course will use Piazza for all class discussions. Refrain from emailing questions related to assignments, midterms, etc., and instead **use Piazza**. The TA, myself and even you can answer questions as they arise, thus providing an efficient means for communication. If you have issues accessing the Piazza, contact [team@piazza.com](mailto:team@piazza.com) directly. Before the semester begins, verify that you have access to these websites; Piazza is accessed from within the Blackboard page. **Recommended download:** Piazza App for phones. It works!

## Tentative Course Schedule

Lecture	TOPIC	Practice Problems	Quiz/Exam (Topic)
1	Review of Vector Algebra, Systems of Units		
2	Statics of Particles	HW1	
3	Rigid Bodies: Equivalent System of Forces		
4		HW2	Q1 (HW1)
5			
6			
7	Equilibrium of Rigid Bodies	HW3	Q2 (HW2)
8			
9		HW4	Q3 (HW3)
10			
11		HW5	Q4 (HW4)
12	<b>Midterm Exam 1</b>		MT1 (HW1-4)
13			
14	Centroids and Centers of Gravity		
15		HW6	Q5 (HW5)
16			
17	Moments of Inertia	HW7	Q6 (HW6)
18			
19		HW8	Q7 (HW7)
20	Analysis of Structures: Trusses		
21	<b>Midterm Exam 2</b>	HW9	MT2 (HW5-8)
22			
23	Analysis of Structures: Frames, Machines	HW10	Q8 (HW9)
24			
25	Internal Forces, Shear and Bending Moment	HW11	Q9 (HW10)
26	Final Review/Course Summary		Q10 (HW11)
<b>TBA</b>	<b>Final Exam (cumulative)</b>		<b>FINAL EXAM</b>

### Required Materials

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

F. P. Beer, E. R. Johnston Jr. & D. F. Mazurek. Vector Mechanics for Engineers – Statics, 11<sup>th</sup> Edition, McGraw-Hill Publications (2015) ISBN-10: 0077687302; ISBN-13: 978-0077687304

### Description and Assessment of Assignments

There will be two Midterm Exams held during the regular lecture time. 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 will be given that covers the material from the assigned homework set. Thus, it is your responsibility to complete the problem set before each week's quiz or midterm exam. Midterms will utilize the entire section-time; quizzes will be much shorter, and the remaining time will be used for a standard lecture session.

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 HW sets

together; however, each individual must ensure they obtain an understanding of the material. Between the instructor and the Teaching Assistant, there are office hours throughout the week 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 midterm 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. Read the section titled **Academic Conduct** below.

### Grading Breakdown

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

Assignment	% of Grade
Quizzes (10)	25
Midterms (2)	40
Final Exam	30
Participation	5
<b>Total</b>	<b>100</b>

### Statement on Academic Conduct and Support Systems

#### 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 Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

#### Support Systems:

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*  
[studenthealth.usc.edu/counseling](http://studenthealth.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*  
[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call*  
[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298*  
[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*  
[usc-advocate.symplicity.com/care\\_report](http://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](http://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Campus Support and Intervention - (213) 821-4710*

[campussupport.usc.edu](http://campussupport.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.

*Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)*

[ombuds.usc.edu](http://ombuds.usc.edu)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.