

AME204: Strength of Materials

Units: 3

Spring 2020

#28724: Mon./Wed. at 2:00- 3:20 PM in THH 212

#28717: Tue./Thur. at 9:30-10:50 AM in GFS 118

#28725: Tue./Thur. at 4:00- 5:20 PM in VHE 217

Instructor: Ramtin Sheikhhassani

Office: RRB 217

Office hours: MW 3:30-5:00 PM and TTH:2:00-3:30 PM

E-mail: sheikhha@usc.edu - Include AME204 in subject
I will respond to emails within 48 hours.

Web-page : [Piazza](#)

Teaching Assistants

Andrew Chavarin achavari@usc.edu

Discussion Fri.: 11-11:50 AM in THH 114

Office hours: Tues/Thurs. 1:00-2:00pm in VHE 202

Yunjian Qiu yunjianq@usc.edu

Discussion Fri. 12-12:50 PM in LVL 17

Office hours Wed/Thurs 12:30-13:30pm in VHE 202

Marzieh Marizad marizad@usc.edu

Discussion Fri. 1:00-1:50 PM in LVL 17

Office hours Mon. 5:00-7:00pm in VHE 202

Last edited: Jan/13/2020

Please note that the syllabus is subject to change based on the needs of the class. Changes, if any, will be announced in class. Students will be held responsible for all changes.

Course Description

Strength of Materials is a first course in the field of solid mechanics. Studying the properties and behaviors of materials is crucial in prediction of structural failure in any industry application. This course provides principles of mechanics and their application to analyze basic engineering problems.

Learning Objectives and Outcomes

Understanding and applying the concepts of stress and strain deflection of mechanical elements due to tension, shear, bending, or torsion; combined loads; energy methods, statically indeterminate structures; strength-based design.

Pre-requisite

Statics: AME 201 or CE 205.

Textbook

Hibbeler, R. (2017) *Mechanics of Materials*. 10th ed.+ MasteringEngineering with Pearson eText Access Card Student Value Edition. Pearson Education, ISBN: 0134326059

This ISBN is for the loose-leaf version plus the MasteringEngineering access which is required for the course. Access to MasteringEngineering can be purchased separately.

Course Notes

Copies of lecture notes, and other class information will be posted on Piazza.

Technological Proficiency and Hardware/Software Required

This course requires use of Blackboard, Piazza, and MasteringEngineering.

A scientific calculator will be required.

Communication

I want you to feel comfortable asking questions and giving me feedback on the course. If you have questions or comments, please speak to me directly after class or during my posted office hours. You can also email me (sheikhha@usc.edu). I will respond to all emails within 48 hours.

Description and Assessment of Assignments

Homework

Weekly problem assignments will be delivered through MasteringEngineering- the online teaching and learning platform associated with the text. Handwritten solutions should be scanned and submitted via Blackboard. These solutions will be randomly checked and verified.

Late Work Policy

No late homework will be accepted. Two of the lowest grades in homework assignments will be discarded.

Quizzes

Weekly quizzes will be administered. The content will be similar to problems solved in the previous lectures, study guides, homework or reading assignments. There will be no make-up quiz for any reason. Instead, two of the lowest grades will be disregarded.

Examinations

Two midterm examinations are scheduled for the regular lecture periods. The format will be similar to the assigned homework assignments; successful completion of the homework will be a good indicator of your success on the exams.

a. Midterm examinations:

i. Midterm 1: Ch. 1-4

ii. Midterm 2: Ch. 5-7

b. Final Examination :

The final examination will be comprehensive, covering all topics presented in the course. Extra emphasis will be placed on the material covered after the second midterm.

A respectable performance on quizzes and exams can be realized by all students if attention and energy are given to the timely completion of assigned homework problems.

Dates

Midterm dates are tentative and may change depending on how the class progresses. Any change will be announced two week before. The final examination date and time are set by the office of registration and cannot be changed.

Session	Lecture dates	Lecture time	MT#1	MT#2	Final Date	Final time
28717	TTH	9:30am	02/20	03/31	05/12	8-10am
28724	MW	2:00pm	02/19	03/30	05/11	2-4pm
28725	TTH	4:00pm	02/20	03/31	05/12	4:30-6:30pm

Last day to drop without a “W”: February 28.

Last day to drop with a “W”: April 3.

Grading Breakdown

Assignments	Points	%
Homework	100	10
Quiz	100	20
Max(MT#1,#2)	100	22
Min(MT#1,#2)	100	18
Final	100	30
Total	500	100

If there is any extra-credit assignment or project it will be applied to the final exam.

Grading Scale

Course final grades will be determined using the following scale.

Grade	Total
A	93-100
A-	90-92.99
B+	88-89.99
B	83-87.99
B-	80-82.99
C+	78-79.99
C	73-77.99
C-	70-71.99
D+	68-69.99
D	63-67.99
D-	60-62.99
F	59.99 and below

The overall letter grade will be assigned within three days of grading the final. The grade letters are based on a class average performance of B. If the mean falls below the grade cutoffs of B, the grades will be curved.

Grading Dispute

Grading disputes are to be resolved within two days after returning the exam.

Additional Course Policies

Class attendance is strongly encouraged. The approach to specific subjects in the lecture might be different from the text. Students will be responsible for the methods outlined in the class.

Cellphones, laptops, tablets (except for note-taking purposes) and anything else electronic are to be turned off during class.

Final grade will depend entirely on the performance on the above components and be independent of the financial support requirements (e.g., minimum grade requirement for tuition reimbursement).

Work-related travel must be scheduled outside of the mid-term and final examinations periods. Accommodation to take exams on different dates will be made only for family emergencies, religious observance and documented illness or health-related emergencies.

DSP approved students should inform the instructor at the beginning of the semester for any requested accommodation.

Course evaluation

Two surveys will gather student opinions about the course: the mid-semester evaluation and the standard USC course evaluation survey at the end of the semester. Your opinion is valued and can make a difference in how this course is conducted; please give your honest and constructive recommendations.

Table 1: Tentative Schedule : a weekly breakdown

MW*	TTh	Lecture	Principle Topics	Readings	Problem Set	Quiz
1/13	1/14	1	Introduction Statics Review	1.1-2 App.A		
1/15	1/16	2	Normal Stress	1.3-4		
Makeup	1/21	3	Shear Stress	1.5		
1/22	1/23	4	Strain	2	HW#1	Q#1
1/27	1/28	5	Stress-Strain Curve	3.1-3		
1/29	1/30	6	Stain Energy, Poisson's Ratio Shear modulus, Factor of Safety	3.4-6 1.6		
2/3	2/4	7	Axial Members	4.1-3	HW#2	Q#2
2/5	2/6	8	Axial Members	4.1-3		
2/10	2/11	9	Indeterminate structures	4.4-6	HW#3	Q#3
2/12	2/13	10	Stress Concentration Generalized Hooke's law	4.7 10.6		
Makeup	2/18		Midterm 1 Review	1-4	HW#4	
2/19	2/20		Midterm 1 Exam	1-4		
2/24	2/25	11	Torsion	5.1-2		
2/26	2/27	12	Torsional members	5.4-5		
3/2	3/3	13	Power Transmission, Thin-walled Tubes	5.3, 5.7-8	HW#5	Q#4
3/4	3/5	14	Shear and Moment diagrams	6.1-2		
3/9	3/10	15	Bending	6.3-6.4	HW#6	Q#5
3/11	3/12	16	Beam Design	6.5-6, 11.2		
3/23	3/24	17	Transverse Shear	7.1-4	HW#7	Q#6
3/25	3/26		Midterm 2 Review	5-7		
3/30	3/31		Midterm 2 Exam	5-7		
4/1	4/2	18	Thin walled members	8.1-2		
4/6	4/7	19	Stress Transformation	9.1-3		
4/8	4/9	20	Strain Transformation Theories of Failure	10.1-3 10.7		
4/13	4/14	21	Deflection of Beams	12.1-2	HW#8	Q#7
4/15	4/16	22	Deflection of Beams	12.3-7, 12.9		
4/20	4/21	23	Buckling of Columns	13.1-2	HW#9	Q#8
4/22	4/23	24	Buckling of Columns	13.3-4		
4/27	4/28	25	Energy Methods	3.4, 14.1-4	HW#10	Q#9
4/29	4/30	26	Energy Methods	14.5, 14.7-8, 14.10		
TBD	TBD		Review		HW#11	
5/11	5/12		Final	Comprehensive		

*For classes that meet on Monday, there will be no classes on Martin Luther King Jr. and Presidents' day. Two make-up classes will be offered on different days.

Table 2: Academic sanctions

Violation	USC – Recommended sanction	AME – Recommended sanction
Copying answers from other students ** on any course work	F for course	First offense: F on assignment Second offense: F for course
One person allowing another to cheat from his/her exam or assignment	F for course for both persons	If assignment: First offense: F on assignment Second offense: F for course If exam: F for course
Possessing or using material during exam (crib sheets, notes, books, etc.) which is not expressly permitted by the instructor.	F for course.	First offense: F on exam. Second offense: F for course.
Continuing to write after exam has ended.	F for course.	F on exam
Taking exam from room and later claiming that the instructor lost it.	F for course and recommendation for further disciplinary action (possible suspension)	F for course
Changing answers after exam has been returned.	F for course and recommendation for further disciplinary action (possible suspension)	F for course
Fraudulent possession of exam prior to administration.	F for course and recommendation for suspension.	F for course
Obtaining a copy of an exam or answer key prior to administration	Suspension or expulsion from the university for both students F for course.	F for course
Having someone else complete course work for oneself.	Suspension or expulsion from the university for both students; F for course.	F for course
Plagiarism — Submitting other’s work as one’s own or giving an improper citation.	F for course.	First offense: F on assignment. Second offense: F for course.
Submission of purchased term papers or papers done by others	F for course and recommendation for further disciplinary action (possible suspension).	F for course
Submission of the same assignment, to more than one instructor where no previous approval has been given	F for both courses.	F for both courses
Unauthorized collaboration on an assignment.	F for the course for both students.	First offense: F on assignment. Second offense: F for course
Falsification of information in admission applications (including supporting documentation).	Revocation of university admission without opportunity to reapply	Revocation of university admission without opportunity to reapply
Documentary falsification (e.g., petitions and supporting materials; medical documentation.)	Suspension or expulsion from the university; F for course when related to a specific course.	Suspension or expulsion from the university; F for course when related to a specific course.
Plagiarism in a graduate thesis or dissertation	Expulsion from the university when discovered prior to graduation; revocation of degree when discovered subsequent to graduation.***	Expulsion from the university when discovered prior to graduation; revocation of degree when discovered subsequent to graduation.***

*Assuming first offense

**Exam, quiz, tests, assignments or other course work.

***Applies to graduate students

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. <http://usc.edu/scampus-part-b>

Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems

Student Health Counseling Services - (213) 740-7711 – 24/7 on call

<http://engemannshc.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

<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) 740-4900 – 24/7 on call

<http://engemannshc.usc.edu/rsvp>

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

Office of Equity and Diversity (OED) — Title IX - (213) 740-5086

<http://equity.usc.edu>,

<http://titleix.usc.edu>

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

Bias Assessment Response and Support - (213) 740-2421

<http://studentaffairs.usc.edu/bias-assessment-response-support> Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

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

<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 Support and Advocacy - (213) 821-4710

<http://studentaffairs.usc.edu/ssa>

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

<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

<http://dps.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

<http://dps.usc.edu>