



Department of

Mechanical Engineering

MERCER UNIVERSITY

Syllabus for MAE 320
Solid Mechanics II Section 1
Fall Semester 2016
Meeting Days TTh 9:25 – 10:40 am
Room EGC 110

Instructor: Dr. Richard Kunz, Associate Professor
Department of Mechanical Engineering

Office: Suite 105F, School of Engineering

Hours: Most afternoons 2:00 – 5:00
and by appointment

Phone: 478-301-4061

Email: kunz_rk@mercer.edu

Website: http://faculty.mercer.edu/kunz_rk/

Textbook:

Required:

Mechanics of Materials Plus MasteringEngineering with Pearson eText -- Access Card Package, R. C. Hibbeler, 10th ed., Pearson/Prentice-Hall, 2017. ISBN 978-0-134-51812-1

Catalog Description:

Stress, strain, axial deformation of statically determinate and indeterminate systems. Generalized Hooke's Law. Torsion, beam bending, shear stresses in beams, stress and strain transformation, beam deflections. Energy methods. Static and fatigue failure theories. Design of structural members: beams, columns, etc.

Course Objectives:

- Reinforce fundamental concepts of statics, stress, strain, and Hooke's Law and their application to stress and deformation under simple axial loading, torsion, beam shear and beam bending.
- Extend the elementary solutions to more complex geometries, loading, and material behaviors.
- Introduce concepts of stress and strain transformation and strain energy as precursors to consideration of combined stresses and failure theories.
- Develop a fundamental understanding of stress distributions and stress concentrations in structural components.

Prerequisites:

C or better in EGR 232, MAT 192.

Grading:

Homework/Quizzes	15%
Tests (3)	17% each
Final Exam	34%

Grade Averages: A: 90's; B: 80's; C: 70's; D: 60's; F: below 60.

Course Standards:

1. EGR 232 (Statics/Solid Mechanics) is listed as a pre-requisite to this course. You are expected to have mastered the concepts of statics and solid mechanics covered during that course. While brief reviews of certain topics from EGR 232 will be conducted from time to time, I will not be re-teaching that course here. If you are shaky on one or more key topics from the earlier course, it is your responsibility to review and refresh your understanding of the material.
2. **Homework Problems** will generally be assigned each class period and due one week later. Homework will be assigned and graded through the MasteringEngineering.com web application. Access to the website and details of its implementation are provided in a separate document (attached). Late homework will not be accepted.
3. **Reading** assignments will be posted at each class meeting. You are expected to read the listed sections before the next class to prepare for the material to be covered.
4. **Quizzes:** There will be occasional, unannounced, 10-15 minute quizzes at the beginning of class. Each quiz will count as two homework assignments.
5. **Tests:** There will be three 75-minute tests during the semester. **Tentative** test dates are listed below. Actual test dates will be confirmed no less than 1 week in advance. No make-up tests will be given without a documented excuse.
6. **Final Exam:** There will be a comprehensive three-hour final exam.
7. The final exam is scheduled for **Tuesday, 13 December, 2:00 – 5:00 p.m.**

Additional Information:

1. Please feel free to arrange a meeting with me at any point that you feel you need it. If you would like to see me, come to my office during posted office hours, catch me after class to schedule a time, call, email, or stop by my office.
2. The **honor code** provisions as outlined in the *Catalog* and in the student handbook, *The Lair*, and on the web at <http://www2.mercer.edu/HonorCouncil/default.htm> apply to everyone and to all work handed in. By turning in a paper to the instructor, each student certifies that he/she has neither given nor received unauthorized aid in its completion. Plagiarism is a violation of the honor code and is prohibited. When in doubt, please ask to avoid potentially embarrassing situations.
3. Please turn off mobile phones before entering the classroom.

4. Electronic communication is an important adjunct to face-to-face communication, including from professor to students, students to professor, and students to students. You must have regular access to your Mercer e-mail. If you do not have an active e-mail address on the first day of class, please secure one.

5. Students requiring accommodations or modifications for a disability should inform the instructor at the close of the first class meeting or as soon as possible. The instructor will refer you to the ACCESS and Accommodation Office to document your disability, determine eligibility for accommodations under the ADAAA/Section 504 and to request a Faculty Accommodation Form. Disability accommodations or status will not be indicated on academic transcripts. In order to receive accommodations in a class, students with sensory, learning, psychological, physical or medical disabilities must provide their instructor with a Faculty Accommodation Form to sign. Students must return the signed form to the ACCESS Coordinator. A new form must be requested each semester. Students with a history of a disability perceived as having a disability or with a current disability who does not wish to use academic accommodations are also strongly encouraged to register with the ACCESS and Accommodation Office and request a Faculty Accommodation Form each semester. For further information, please contact Carole Burrowbridge, Director and ADA/504 Coordinator, at 301-2778 or visit the ACCESS and Accommodation Office website at <http://www.mercer.edu/disabilityservices>

Tentative Course Coverage

	Chapter
Stress	1
Strain	2
Mechanical Properties of Materials	3
Axial Load.....	4
Torsion	5
Bending	6
Transverse Shear	7
Combined Loadings.....	8
Stress and Strain Transformation	9,10
Deflection of Beams and Shafts.....	12
Buckling of Columns.....	13

Test Dates (Tentative)

Test 1	Tuesday, Sept. 20
Test 2	Tuesday Oct. 25
Test 3	Tuesday, Nov. 22
Final	Tuesday, Dec 13 2:00 – 5:00 pm