

CE 2017
ENGINEERING MECHANICS: STATICS and MECHANICS of MATERIALS
COURSE SYLLABUS

Class Meeting Times

SECTION 1: 11:00 - 11:50, Engineering Building 290, M T W Th F

Instructor: Darrin Johnson (djohns30@d.umn.edu)
 Office: MWAH 354
 Phone: 726-7210
 Office Hours: 8-8:50 a.m. MW, 12-2:00 pm TTh, or by appointment

COURSE DESCRIPTION:

This course deals with rigid-body mechanics and the study of the mechanics of deformable bodies. Statics develops the equations of equilibrium for structures in equilibrium and applies them to the analysis of statically determinate framed structures, trusses, and machines. Specific subjects include the analysis of frictional forces and topics relating to the center of gravity and mass moments of inertia. The mechanics of deformable bodies includes an introductory treatment of stress and strain at a point and their relationship in two dimensions. Other topics include axial loading, torsion, shear and bending moment diagrams, bending stresses, deflection of beams, and stress and strain transformations.

Course Performance Criteria: Students should be able to:

- Apply equilibrium to solve engineering problems.
- Calculate stress and strain in engineering materials.
- Understand bending, torsion, and axial effects.
- Calculate the effects of combined loadings and the transformation of stress and strain with respect to rotation.

Program Outcomes Mapped to this course:

- An ability to apply knowledge of mathematics, science, and engineering
- An ability to identify, formulate, and solve engineering problems

To successfully complete this course, the student will be required to learn, develop, and demonstrate these two outcomes.

Text: Statics and Mechanics of Materials by R.C. Hibbeler, 5th Edition

Prerequisites: Math 1297, Physics 2013

Web Page: This course has a Canvas page for CE 2017. The syllabus and course assignments will be posted on this site. Check your email daily for announcements, changes, and additions to the course.

Assignments: The due dates for problem sets will be collected in class on the day they are due. Late assignments will be penalized. All assignments must be on engineering paper using the format discussed in class. You will lose points for improper format and/or lack of neatness. Engineering calculations must be read by many people, and neatness and organization are very important.

Grades: Grades will be posted on egradebook throughout the semester. Please check your scores as they are posted and email Mr. Kohn if you think any grades are in error. The final course grade will be weighted as follows:

Exams including Final	80%
Problem Sets	20%

A standard grading scale will be used to determine your final grade:

A = 93-100	A- = 90-92	B+ = 87-89	B = 83-86	B- = 80-82		
C+ = 77-79	C = 73-76	C- = 70-72	D+ = 67-69	D- = 60-66	F = <60	

This course will follow UMD policies:

- **Student Conduct Code**: Appropriate classroom conduct promotes an environment of academic achievement and integrity. Disruptive classroom behavior that substantially or repeatedly interrupts either the instructor's ability to teach, or student learning, is prohibited. Student are expected adhere to Board of Regents Policy: *Student Conduct Code*: http://www1.umn.edu/regents/policies/academic/Student_Conduct_Code.pdf
- **Teaching & Learning: Instructor and Student Responsibilities**: UMD is committed to providing a positive, safe, and inclusive place for all who study and work here. Instructors and students have mutual responsibility to insure that the environment in all of these settings supports teaching and learning, is respectful of the rights and freedoms of all members, and promotes a civil and open exchange of ideas. To reference the full policy please see: <http://www.d.umn.edu/vcaa/TeachingLearning.html>
- **Academic Integrity**: Academic dishonesty tarnishes UMD's reputation and discredits the accomplishments of students. Academic dishonesty is regarded as a serious offense by all members of the academic community. UMD's Student Academic Integrity Policy can be found at: <http://www.d.umn.edu/conduct/integrity/>
- **Final Exams**: All 1xxx-5xxx courses offered for undergraduate credit should include a final graded component or end of term evaluation that assesses the level of student achievement of one or more course objectives. All final graded components are to be administered or due at the time and place according to the final exam schedule and not during the last week of class. To reference the full policy please see: <http://www.d.umn.edu/vcaa/FinalExams.html>
- **Excused Absences**: Students are expected to attend all scheduled class meetings. It is the responsibility of students to plan their schedules to avoid excessive conflict with course requirements. However, there are legitimate and verifiable circumstances that lead to excused student absence from the classroom. These are subpoenas, jury duty, military duty, religious observances, illness, bereavement for immediate family, and NCAA varsity intercollegiate athletics. For complete information, please see: <http://www.d.umn.edu/vcaa/ExcusedAbsence.html>
- **Appropriate Student Use of Class Notes and Course Materials**: Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. For additional information, please see: <http://www.d.umn.edu/vcaa/ClassNotesAppropriateUseof.html>

Students with disabilities:

It is the policy and practice of the University of Minnesota Duluth to create inclusive learning environments for all students, including students with disabilities. If there are aspects of this course that result in barriers to your inclusion or your ability to meet course requirements – such as time limited exams, inaccessible web content, or the use of non-captioned videos – please notify the instructor as soon as possible. You are also encouraged to contact the Office of Disability Resources to discuss and arrange reasonable accommodations. Please call 218-726-6130 or visit the Disability Resources website at www.d.umn.edu/access for more information.

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COURSE SCHEDULE

Text:

Engineering Mechanics: Statics and Mechanics of Materials by R.C. Hibbeler, 5th Edition

	Topic	
PART 1.	Weeks 1 - 4	
	General Principles	Chap 1
	Statics of Particles	Chap 2
	Rigid Bodies: Equivalent Systems of Forces	Chap 3
	Exam #1 – 5/6 Feb	
PART 2.	Weeks 5-7	
	Equilibrium of a Rigid Body	Chap 4
	Distributed Forces: Centroid and Centers of Gravity	Chap 5
	Analysis of Structures	Chap 6
	Exam #2 – 26/27 Feb	
PART 3.	Weeks 8-9	
	Distributed Forces: Moments of Inertia and Areas	Chap 7
	Concept of Stress	Chap 8
	Axial Loadings	Chap 9
	Exam #3 – 24/25 Mar	
PART 4	Weeks 10-12	
	Torsion	Chap 10
	Pure Bending	Chap 11
	Analysis and Design of Beams and Bending	Chap 12
	Exam #4 – 14/15 Apr	
PART 5	Weeks 13-15	
	Shearing Stresses in Beams	Chap 13
	Transformation of Stress, Combined Loadings, and Thin-Walled Pressure Vessels	Chap 14
	Final Exam - To Be Determined	
