AE 333 - Mechanics of Materials

Spring 2020

Instructor:	Dr. Nicholas A Smith	**Time:**	MWF 12:30 – 1:20 pm
Department:	Aerospace Engineering	**Place:**	219 Hubbard Hall
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Web-site:	http://ndaman.github.io/mechanicsofmaterials		

How to use this syllabus: This syllabus provides you with information specific to this course, and it also provides information about important university policies. This document should be viewed as a course overview; it is not a contract and is subject to change as the semester evolves. Any changes to the syllabus will be uploaded to Blackboard and e-mailed to all students (at their e-mail address listed on Blackboard, make sure this is up-to-date).

Academic Honesty: Students are responsible for knowing and following the Student Code of Conduct http://webs.wichita.edu/inaudit/ch8_05.htm and the Student Academic Honesty policy http://webs.wichita.edu/inaudit/ch2_17.htm.

Course Description: The prerequisite course (Statics) studied the condition of equilibrium of rigid bodies under the action of forces. In Mechanics of Materials, we study the internal forces and deformations resulting from applied forces. We will both develop a relationship between applied force and internal stress and strain as well as develop an understanding of material properties to relate stress and strain. The material in this course is foundational to courses such as Flight Structures (AE525), Manufacturing Methods and Materials (IE 558), and Mechanical Engineering Design I (ME 439).

Definition of a Credit Hour: Success in this 3 credit hour course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction and preparation/studying or course related activities for a total of 135 hours.

Measurable Student Learning Outcomes: Upon successful completion of this course, students will be able to

- Compute stress and strain from external forces
- Relate stress and strain using material properties
- Transform stress and strain into another coordinate system
- Find the deflection of beams and shafts

Course Textbook: This is the textbook we will use for this course.

- R.C. Hibbeler, *Mechanics of Materials*, Tenth Edition, Pearson Education Inc., 2016.

Prerequisites: Prerequisite: AE 223 Statics (C or better). Corequisite: MATH 344 Calculus III.

Grading Policy: Assessment Test (2%), Class Participation (3%), Homework (10%), Exams (3x20%), Final (25%). Final grades follow a traditional scale of:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
93-100	90-93	87-90	83-87	80-83	77-80	73-77	70-73	67-70	63-67	60-63	0-60

Per department policy, final course grades will not be disclosed before the official notifications by the University.

Homework: Homework will be submitted online using MasteringEngineering. Be very careful while submitting your answers, they should be in the correct units, to the specified number of significant figures. Sometimes you will have solved a problem correctly, but due to some input error, it will be marked incorrect. I will NOT re-evaluate your work to give credit for MasteringEngineering errors, instead I allow 5 re-submissions per homework problem (for an increasing penalty, -3%, with each incorrect submission).

Exams: There will be three exams during the semester and one comprehensive final exam. The final exam is scheduled for Wednesday, May 13 from 11:00 am - 12:50 pm. You must take the final exam at this time, so do not make any travel plans that will prevent you from attending the final exam. The exam dates shown in the following calendar are for reference only, as class needs may necessitate moving them slightly.

Important Academic Dates: Classes begin January 21, there are official University holidays on March 23-27 (Spring Break).

Disabilities: If you have a physical, psychiatric/emotional, or learning disability that may impact on your ability to carry out assigned course work, I encourage you to contact the Office of Disability Services (DS). The office is located in Grace Wilkie Annex, room 150, (316) 978-3309 (voice/tty) (316-854-3032 videophone). DS will review your concerns and determine, with you, what academic accommodations are necessary and appropriate for you. All information and documentation of your disability is confidential and will not be released by DS without your written permission.

Counseling & Testing: The WSU Counseling & Testing Center provides professional counseling services to students, faculty and staff; administers tests and offers test preparation workshops; and presents programs on topics promoting personal and professional growth. Services are low cost and confidential. They are located in room 320 of Grace Wilkie Hall, and their phone number is (316) 978-3440. The Counseling & Testing Center is open on all days that the University is officially open. If you have a mental health emergency during the times that the Counseling & Testing Center is not open, please call COMCARE Crisis Services at (316) 660-7500.

Diversity and Inclusive: Wichita State University is committed to being an inclusive campus that reflects the evolving diversity of society. To further this goal, WSU does not discriminate in its programs and activities on the basis of race, religion, color, national origin, gender, age, sexual orientation, gender identity, gender expression, marital status, political affiliation, status as a veteran, genetic information or disability. The following person has been designated to handle inquiries regarding nondiscrimination policies: Executive Director, Office of Equal Opportunity, Wichita State University, 1845 Fairmount, Wichita KS 67260-0138; telephone (316) 978-3186.

Intellectual Property: Wichita State University students are subject to Board of Regents and University policies (see http://webs.wichita.edu/inaudit/ch9_10.htm) regarding intellectual property rights. Any questions regarding these rights and any disputes that arise under these policies will be resolved by the President of the University, or the President's designee, and such decision will constitute the final decision.

Shocker Alert System: Get the emergency information you need instantly and effortlessly! With the Shocker Alert System, we will contact you by email the moment there is an emergency or weather alert that

Tentative Course Schedule:

Week	Date	Topics	Assignment/Exam	Reading
Week 1	Jan 22, 24	Equilibrium, Stress, Strain		1.1-1.7
Week 2	Jan 27, 29, 31	Assessment Test, Mechanical Properties	HW 1 Due	2.1-2.2, 3.1-8
Week 3	Feb 3, 5, 7	Exam 1 (Ch. 1-3)	HW 2 Due	4.1-2
Week 4	Feb 10, 12, 14	Axial Load, Torsion		4.3-6, 5.1-3
Week 5	Feb 17, 19, 21	Torsion	HW 3 Due	5.4-7
Week 6	Feb 24, 26, 28	Bending	HW 4 Due	6.1-4
Week 7	Mar 2, 4, 6	Transverse Shear, Exam 2	HW 5 Due	7.1-7.3
Week 8	Mar 9, 11, 13	Combined Loading, Stress Transformation		8.1-2, 9.1-9.5
Week 9	Mar 16, 18, 20	Strain Transformation	HW 6 Due	10.1-3, 5-6
Week 10	Mar (23), (25), (27)	Spring Break		
Week 11	Mar 30, Apr 1, 3	Deflection of Beams and Shafts	HW 7 Due	12.1-5
Week 11	Apr 6, 8, 10	Deflection of Beams and Shafts	HW 8 Due	12.6-9
Week 12	Apr 13, 15, 17	Stress Concentrations, Exam 3 (Ch 8-10,12)	HW 9 Due	4.7, 5.8, 6.9
Week 13	Apr 20, 22, 24	Buckling		13.1-2
Week 14	Apr 27, 29, May 1	Buckling	HW 10 Due	13.1-2
Week 15	May 4, 6	Final Review, Problem Solving		

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Title IX: Title IX of the Educational Amendments of 1972 prohibits discrimination based on sex in any educational institution that receives federal funding. Wichita State University does not tolerate sex discrimination of any kind including: sexual misconduct; sexual harassment; relationship/sexual violence and stalking. These incidents may interfere with or limit an individual's ability to benefit from or participate in the University's educational programs or activities. Students are asked to immediately report incidents to the University Police Department, (316) 978- 3450 or the Title IX Coordinator (316) 978-5177. Students may also report incidents to an instructor, faculty or staff member, who are required by law to notify the Title IX Coordinator. If a student wishes to keep the information confidential, the student may speak with staff members of the Counseling and Testing Center (316) 978-3440 or Student Health Services (316) 978-3620. For more information about Title IX, go to: http://www.wichita.edu/thisis/home/?u=titleixf