AE 333 - Mechanics of Materials

Fall 2020

Instructor:	Dr. Nicholas A Smith	**Time:**	TR 11:00 – 12:15 pm
Department:	Aerospace Engineering	**Place:**	209 Wallace Hall
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Phone:	(316) 978-5919	**Office Hours:**	TBD

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). Many University policies are summarized in this document, but a more up-to-date and complete list of University policies can be found at https://www.wichita.edu/faculty/development/syllabuspolicies.php

Academic Honesty: Students at Wichita State University are expected to uphold high academic standards. WSU will not tolerate a lack of academic integrity. 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. When the faculty member determines sanctions are warranted for violations of academic integrity, regardless of severity, the faculty member must report the infraction to the Office of Student Conduct and Community Standards. If you need more information about the process or wish to appeal a decision, please visit https://www.wichita.edu/about/student_conduct/ai.php

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: Homework (5%), Exams (3x10%), Projects (3x15%), Final (20%). Final grades follow a traditional scale of:

Score	93-100	90-93	87-90	83-87	80-83	77-80	73-77	70-73	67-70	63-67	60-63	0-60
Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
GPA	4.0	3.7	3.3	3.0	2.7	2.3	2.0	1.7	1.3	1.0	0.7	0

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

Homework: Homework will be submitted online via Blackboard, half the homework credit will be granted for completion. Homework solutions will be posted to Blackboard, and the remaining half of the homework credit will be assigned after you complete (and submit) your self-grade. You do not lose credit for incorrect answers, but your self-grade should explain the differences between your answer and the correct solution. Tentative homework due dates are given in the course schedule. Late homework will not be accepted

Exams: There will be three exams during the semester and one comprehensive final exam. Exams will be given online and in general will be automatically graded (no partial credit). The exam dates shown in the following calendar are for reference only, as class needs may necessitate moving them slightly.

Projects: In addition to traditional homework and exams (which are relatively short, in proportion to their course grade weight), three open-ended projects will be assigned throughout the semester. These projects are individual, you should submit and justify your own work. More detail on each project will be provided as it is assigned.

Hybrid Course Format: For Fall 2020 this course is being offered in a Hybrid format to facilitate reduced classroom occupancy requirements. In this format, all lecture content will be pre-recorded and available to access on Blackboard. In-class lecture time will be dedicated to answering questions and working example problems, so you will get the most out of in-person class time if you have already viewed the recorded lectures for the week before attending.

Important Academic Dates: Classes begin August 18, there are official University holidays on Sep 7 (Labor Day), Nov 23-29 (Thanksgiving Recess), note that the traditional Fall Break has been canceled and there will be no in-class activities after Thanksgiving, but lecture, exams, and assignments will continue online.

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

Tentative Course Schedule:

Week	Date	Topics	Assignment/Exam	Reading
Week 1	Aug 18, 20	Equilibrium, Stress, Strain		1.1-1.7
Week 2	Aug 25, 27	Mechanical Properties	HW 1 Due	2.1-2.2, 3.1-8
Week 3	Sep 1, 3	Exam 1 (Ch. 1-3)	HW 2 Due	4.1-2
Week 4	Sep 8, 10	Axial Load, Torsion		4.3-6, 5.1-3
Week 5	Sep 15, 17	Torsion	HW 3 Due	5.4-7
Week 6	Sep 22, 24	Bending	HW 4 Due	6.1-4
Week 7	Sep 29, Oct 1	Transverse Shear	HW 5 Due	7.1-7.3
Week 8	Oct 6, 8	Exam 2 (Ch. 4-7), Combined Loading		8.1-2
Week 9	Oct 13, 15	Stress Transformation		9.1-9.5
Week 10	Oct 20, 22	Strain Transformation	HW 6 Due	10.1-3, 5-6
Week 11	Oct 27, 31	Deflection of Beams and Shafts	HW 7 Due	12.1-5
Week 11	Nov 3, 5	Deflection of Beams and Shafts	HW 8 Due	12.6-9
Week 12	Nov 10, 12	Stress Concentrations, Exam 3 (Ch 8-10,12)	HW 9 Due	4.7, 5.8, 6.9
Week 13	Nov 17, 19	Buckling		13.1-2
	(Nov 24, 26)	(Thanksgiving)	No Class	
Week 14	Dec 1, 3	Final Review, Problem Solving		

& 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 affects the campus. Sign up at www.wichita.edu/alert.

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