

## MECH 5312: Solid Mechanics II

Class Reference Number:	28826
Required Textbook:	Advanced Mechanics of Materials, R. Solecki, R. J. Conant Advanced Mechanics of Materials, A.P. Boresi, R. J. Schmidt
References:	Applied Mechanics of Solids, Allan F. Bower ( <a href="http://solidmechanics.org">http://solidmechanics.org</a> ) Mechanics of Materials, R.C. Hibbeler Mechanics of Materials, F.P. Beer, E.R. Johnston
Class/Lab Meeting:	TR, 3:00 pm to 4:20 pm
Class Room:	Liberal Arts Building 304
Prerequisite:	MECH 5302 Solid Mechanics I MECH 3334 Mechanical Design MECH 2322 Mechanics of Materials
Instructor:	Dr. Calvin M. Stewart, Ph.D. Department of Mechanical Engineering E-mail: <a href="mailto:cmstewart@utep.edu">cmstewart@utep.edu</a> Phone : 407-747-6179 Office: ENG A117 Office Hours: TR, 1:20pm to 2:40pm, only

### Catalog Description

Advanced topics in solid mechanics; inelastic material response; continuum mechanics; fracture mechanics; computational mechanics; finite elasticity; micro-mechanics.

### Course Objective

To educate students on the three-dimensional mechanics of materials. By the end of the course, students will have developed the mathematical skills necessary to solve advanced mechanics of materials problems beyond the scope of typical undergraduate knowledge.

### Topics Covered

1. Stress and equilibrium equations
2. Displacement and strain
3. Relationships between stress and strain
4. Energy concepts

- 6. Stress Concentrations
- 7. Fracture Mechanics
- 8. Fatigue
- 9. Creep

## Grades

Assignments	Percentage
Homework (12)	30%
Midterms (3)	45%
Technical Report	25%
<b>Total</b>	<b>100%</b>

Grade Scale	
100-90%	A
89-80%	B
79-70%	C
69-60%	D
<60%	F

The instructor reserves the right to revise this grading plan.

## Homework

Homework is a tool to learning through practice. ☺ It is not a good assessment tool. ☹ In this class, homework is your FREE EXTRA credit!! DO NOT cheat on your HW. DO use your resources and work with your peers to learn and solve the homework problems. Homework will be assigned periodically and collected. It will be graded for the honest attempt (not for correctness, ☺) and the solutions to the homework will be posted online after the due date. The solutions are provided so that you learn the correct way to solve the HW and get better at the topics. If you have further questions concerning the solutions visit my office hours and we can go over the solutions together in detail.

Homework is due one week after assigned. Homework is submitted in-class. Homework is not accepted via email. Late HW is accepted up to a week after the deadline for 30% reduced credit. After one week, you receive a zero.

## Exams

Exam dates are listed in the course schedule; however, dates are subject to change. All exams will be closed book. You will be allowed a **one-page, single sided formula sheet**. The formula sheet must be handwritten. No solution to a problem may be listed upon it. It must be stapled to your exam when you turn it in. Electronic devices (e.g. laptops, tablets, cell phones, etc.) are not permitted. Hoodies must be down. Hats must be turned backwards. **To receive full credit** on the exam, the exam problem solution must conform to the following structure:

1. Knowns/Unknowns: List the given parameters. List the parameters you must find.

2. Free Body Diagram: Draw a neat FBD that includes arrows with arrowheads, dimensions, and all the parameters needed to solve the problem. (When appropriate).
3. Assumptions: List any assumptions made, and the equations you will need.
4. Steps: Give necessary details so that people can easily follow your calculations. Answers without the steps will receive a zero.
5. Equations: label each equation with a number (1), (2), (3), etc.
6. Answer: Include units and box your final answers.
7. Neatness: Disorganized, incomplete, and/or copied work will be penalized.

## Technical Report

Students will write a technical report on a topic related to the advanced mechanics of materials. The report can be a literature review concerning the topic or ongoing research related to mechanics. Detailed instructions will be provided at a later date.

- Topic Selection (0%)
- Proposal – Abstract and Outline (5%)
- Final Draft (20%)

## Calculators

Graphing calculators are allowed. Answers without the fully worked out steps will receive a zero.

## Study Guide

Read the text to be discussed prior to the scheduled class and review the subject thoroughly after class. Read the textbook carefully. Work on all examples given in the text and solve as many unassigned problems as you can. Expect to spend 10 to 15 after-class hours each week on the subject. Establish a good studying habit and you will do very well in the class.

## Academic Honesty

During exams and quizzes, you are not allowed to use any form of wifi enabled electronic device, including cell phones or other electronic communication devices or methods (wrist watches, earbuds, etc.). No wrist watch or other electronic device may be worn.

No electronic version of the book, loose paper print-outs of the book or extra sheets of paper of any kind are allowed unless explicitly mentioned in writing by the instructor. As a part of the zero-tolerance policy, if you have a cellphone or other electronic device capable of communication on your person; or if any proctor sees or hears any electronic device during the exam or if you share your work with someone else, you will be reported to the proper authorities and you may receive a zero on the exam and an F in the class. Other actions including suspension may also be perused.

If you have a disability that requires the use of an electronic device during exams you must have a letter of accommodation from the Center for Accommodations and Support Services (CASS). This accommodation

must be coordinated in advance with the instructor.

During exams, you will not be allowed to leave the examination room until you complete the exam. This includes restroom breaks. Students with disabilities must have a letter of accommodation and coordinate this in advance with the instructor.

Instructors and/or proctors may record and/or use their personal cell phones to document activity during the exam. Recording devices may also be located at various locations in the room and may be out of sight of the students. These recordings will be managed according to the UTEP approved regulations for such media.

Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts (Regents= Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22). Scholastic dishonesty harms the individual, all students, and the integrity of the university; policies on scholastic dishonesty will be strictly enforced.

If you are suspected of scholastic dishonesty you may not be directly confronted about your conduct by the instructor or proctor. You will however, be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) with the **recommendation of Expulsion** from the University. To preserve confidentiality, DO NOT attempt to communicate with the Instructor if you have been contacted by OSCCR. Your grade in the class may not be available until OSCCR makes a final ruling, this may adversely impact your ability to enroll in other classes.

If you arrive more than 15 minutes late to an exam, you will not be allowed to enter the examination room.

There will be no makeup exams administered. If you have a university approved excuse, your instructor will have a process for determining how to handle the missing grade outlined in the syllabus. However, no makeup exams will be given.

If you miss more than one exam, the instructor may choose to administratively drop you from the class. This may adversely impact a visa and financial aid.

No food or drinks will be allowed in the examination room.

Departmental policy allows for the use of assigned seats. All students must present their UTEP issued ID prior to and during every exam and may be required to sign in. Not having a UTEP issued ID when asked will result in forfeiture of the exam.

Scholastic dishonesty on homework, lab assignments and all other class assignments will be held to the same standards and requirements of academic honesty as quizzes and exams.

## **Class Attendance Policy**

Attendance is mandatory. Anyone with 5 or more absences will be dropped from the class. A drop for not attending will count toward the State Allowed Six Drop Limit. If you are failing the class at the time of the drop you may also be given a WF designation. Be advised that a drop could adversely impact visa status, financial aid and other programs.

As per UTEP rules, you may be asked to show a UTEP ID at any time during class.

If a student is absent or misses an assignment due to university related duty, serious illness, or family emergency an excused absence/makeup may be arranged. For university related duty, the faculty advisor of the student organization must send notification to the professor before the planned absence. For serious illness or family emergency, the staff in the Office of Student Life can send notification to the professor of the absence. The student must visit the Office of Student Life and provide supporting documentation (e.g., a doctor's note, letter from primary care provider) to verify illness or injury.

The instructor **MUST** be notified **PRIOR** to any absence.

## Harassment Policy

The department has a zero-tolerance policy for harassment. Engagement in any behavior considered harassment will be reported to the proper authorities. In addition to generally understood forms of harassment, the department also treats the following behavior as harassment:

- Repeated emails and/or calls regarding subjects that have already been addressed. Once a decision has been made or a question answered, a student who continues to ask the same question will be given a warning by the recipient of the email/call. If the student continues, the behavior will be reported. Questions that seek understanding of course material are not harassment; but repeated questions about a grade or an administrative decision are.
- Grades are NOT negotiable, ever. If you believe a grading mistake has been made, you must follow the process described in the UTEP catalog. Any request for a grade elevation that is NOT based on a mistake is considered harassment and will be reported immediately.
- Remaining in an office after the occupant requests you leave is considered harassment and potentially threatening. You will be reported immediately without warning and depending on the severity, may be reported to law enforcement.
- Similar behavior towards department staff, and student advisors will also be treated as harassment, including persistent phone calls, emails, and badgering. Department staff and student advisors are there to help students, and should be treated with due respect.

## Course Drop

It is the student's responsibility to officially drop a course that s/he no longer wishes to take before the course drop deadline. Failure to do so WILL result in a grade of "F" on the student's academic record. If you fall behind, do not give up and quit attending without dropping the course first. Athletes must receive permission from the Miner Athletic Advising Center before dropping a course. International students with F or J visas must receive permission from the Office of International Programs before dropping a course.

## **Disability and Accommodations**

If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass).

## **Class Schedule**

See Excel File

**The above schedule, policies, and assignments in this course are subject to change in the event of extenuating circumstances or by mutual agreement between the instructor and the students.**