

North Carolina Agricultural and Technical State University

Aggie Digital Collections and Scholarship

Open Educational Resources Syllabus Review

Distance Education and Extended Learning

2020

Engineering Solid Mechanics I

North Carolina Agricultural and Technical State University

Follow this and additional works at: <https://digital.library.ncat.edu/oerrs>

Recommended Citation

North Carolina Agricultural and Technical State University, "Engineering Solid Mechanics I" (2020). *Open Educational Resources Syllabus Review*. 29.
<https://digital.library.ncat.edu/oerrs/29>

This Book is brought to you for free and open access by the Distance Education and Extended Learning at Aggie Digital Collections and Scholarship. It has been accepted for inclusion in Open Educational Resources Syllabus Review by an authorized administrator of Aggie Digital Collections and Scholarship. For more information, please contact iyanna@ncat.edu, snstewa1@ncat.edu.



NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

COURSE SYLLABUS

College Name: College of Engineering
Department Name: Department of Civil, Architecture and Environmental Engineering
Course Name: Solid Mechanics

COURSE INFORMATION

- Course Number/Section: CAEE 232
- Term:
- Semester Credit Hours: 3
- Times and Days:
- Class Location:

INSTRUCTOR CONTACT INFORMATION

- Instructor:
- Office Location:
- Office Phone:
- Email Address:

Faculty must notify students of the approximate time and method they can expect to receive an answer to all communications (e.g., email, phone, course messages). Excluding holidays, the response should be provided within 48 hours.

If there's a graduate teaching assistant assigned to work with this course, please include their names also.

STUDENT HOURS

These are times students may visit the professor without an appointment to request the assistance they need.

NOTE: Students are responsible for reading, understanding, and following the syllabus.

: AM ☐ / PM ☐ – : AM ☐ / PM ☐

Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐

COURSE PREREQUISITES

CAAE 231

COURSE DESCRIPTION

This Course covers stress and strain; axial, torsional, bending, and combined stress analysis; deformation and deflection of shafts and beams; transformation of stress and strain; column buckling; statically indeterminate beams; and simple connections. Credits 3.

STUDENT LEARNING OBJECTIVES/OUTCOMES (SLO)

Learning outcomes should be specific, measurable, and focused on the content knowledge the students are expected to master and not what the faculty will teach.

If the course is a General Education Course, the SLO should be listed and labeled as "General Education."

SLO 1: Define different stress types: axial normal stress, shearing stress and bearing stress.

SLO 2: Understand the relationships among, stresses, strains and material properties

SLO 3: Define shearing stresses and strains in a circular shaft subject to torsion. Define angle of twist in terms of the applied torque, geometry of the shaft, and material, Use torsional deformations to solve indeterminate problems.

SLO 4: Define the deformations, strains, and normal stresses in beams subject to pure bending.

SLO 5: Develop shear force and bending moment diagrams, and identify the critical section

SLO 6: Determine shearing stresses and shear flow on a horizontal section in a beam, Determine the shearing stresses in a thin-walled beam.

SLO 7: Create a stress element of a member, and evaluate principle stresses.

SLO 8: Evaluate deformations, deflections and strains in a member.

SLO 9: analysis of eccentrically loaded columns

REQUIRED TEXTBOOKS AND MATERIALS

Any course-level subscriptions and tools linked in Blackboard Learn learning management system (LMS) should be listed here. The Blackboard LMS must have links to their student data privacy statement.

REQUIRED TEXTS:

Beer, & DeWolf, J. T. (2004). *Mechanics of materials (In SI units)*. Tata McGraw-Hill Education.

REQUIRED MATERIALS:

National Council of Examiners for Engineering and Surveying. (2003). *Fundamentals of engineering: Supplied-reference handbook*. Kaplan AEC Engineering.

SUGGESTED COURSE MATERIALS

SUGGESTED READINGS/TEXTS:

SUGGESTED MATERIALS:

GRADING POLICY

ASSIGNMENTS AND GRADING POLICY

94% and above	A		76% - 74%	C
93% - 90%	A-		73% - 70%	C-
89% - 87%	B+		69% - 67%	D+
86% - 84%	B		66% - 64%	D
83% - 80%	B-		63% - 60%	F
79% - 77%	C+			

For GRADUATE COURSES: See 2019-2020 Graduate Catalog p.38 for graduate grading scale and Non-Graded Courses

GRADING ALLOCATION

Course grades are based on a weighted grading scale of 100%. The breakdown for the course is as follows: *[Faculty, please adjust according to your course.]*

Category	# of Activities	Percentage Grade Weight
Discussion Board	5	5%
Tests	2	30%
Quizzes	5	25%
Homework	9	20%
Final Exam Comprehensive	1	20%
Total	22	100%

COURSE POLICIES

USE OF BLACKBOARD AS THE LEARNING MANAGEMENT SYSTEM

Blackboard is the primary online instructional and course communications platform. Students can access the course syllabus, assignments, grades, and learner support resources. Students are encouraged to protect their login credentials, complete a Blackboard orientation, and log in daily to the course.

Note: Uploading assignments through Blackboard presents a challenge for Chromebook users in locating the files for submission. If you use a Chromebook, please be sure you also have access to a Mac computer or Windows computer so you can fully participate in your Blackboard class. For more information about student computer recommendations, please visit

<https://hub.ncat.edu/administration/its/computer-recommendations.php>.

MAKE-UP EXAMS

See << Update Academic Year >> *Undergraduate Bulletin*:

<https://www.ncat.edu/provost/academic-affairs/bulletins/index.php>

**For GRADUATE STUDENTS: See 2019-20 Graduate Catalog p. 54
EXTRA CREDIT**

LATE WORK

SPECIAL ASSIGNMENTS

For GRADUATE STUDENTS: FAILING TO MEET COURSE REQUIREMENTS (Graduate Catalog p.40)

For GRADUATE STUDENTS: CLASS ATTENDANCE (see 2019-20 Graduate Catalog p. 53-54)

Students are expected to attend class and participate on a regular basis in order to successfully achieve course learning outcomes and meet federal financial aid requirements ([34 CFR 668.22](#)). Class attendance in online courses is defined as active participation in academically-related course activities. Active participation may consist of course interactions with the content, classmates, and/or the instructor. Examples of academically-related course activities include, but are not limited to:

- Completing and submitting assignments, quizzes, exams, and other activities within Blackboard or through Blackboard (3rd-party products).
- Participating in course-related synchronous online chats, discussions, or meeting platforms such as Blackboard Collaborate in which participation is tracked.

CLASSROOM CITIZENSHIP

Courtesy, civility, and respect must be the hallmark of your interactions.

COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT

North Carolina A&T State University is committed to following the requirements of the Americans with Disabilities Act Amendments Act (ADAAA) and Section 504 of the Rehabilitation Act. If you need an academic accommodation based on the impact of a disability, you must initiate the request with the Office of Accessibility Resources (OARS) and provide documentation in accordance with the Documentation Guidelines at N.C. A&T. Once documentation is received, it will be reviewed. Once approved, you must attend a comprehensive meeting to receive appropriate and reasonable accommodations. If you are a student registered with OARS, you must complete the Accommodation Request Form to have accommodations sent to faculty.

OARS is located in Murphy Hall, Suite 01 and can be reached at 336-334-7765, or by email at accessibilityresources@ncat.edu. Additional information and forms can be found on the internet at <https://www.ncat.edu/provost/academic-affairs/accessibility-resources/index.php>.

Please note: Accommodations are not retroactive and begin once the Disability Verification Form is provided to faculty.

TITLE IX

North Carolina A&T State University is committed to providing a safe learning environment for all students—free of all forms of discrimination and harassment. Sexual misconduct and relationship violence in any form are inconsistent with the university’s mission and core values, violates university policies, and may also violate federal and state law. Faculty members are considered “Responsible Employees” and are required to report incidents of sexual misconduct and relationship violence to the Title IX Coordinator. If you or someone you know has been impacted by sexual harassment, sexual assault, dating or domestic violence, or stalking, please visit the Title IX website to access information about university support and resources. If you would like to speak with someone confidentially, please contact Counseling Services at 336-334-7727 or the Student Health Center at 336-334-7880.

TECHNICAL SUPPORT

If you experience any problems with your A&T account, you may call Client Technology Services (formerly Aggie Tech Support and Help Desk) at 336-334-7195, or visit <https://hub.ncat.edu/administration/its/dept/ats/index.php>.

FIELD TRIP POLICIES / OFF-CAMPUS INSTRUCTION AND COURSE ACTIVITIES

If applicable:

Off-campus, out-of-state, foreign instruction, and activities are subject to state law and university policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at <https://www.ncat.edu/campus-life/student-affairs/index.php>.

STUDENT HANDBOOK

<https://www.ncat.edu/campus-life/student-affairs/departments/dean-of-students/student-handbook.php>

STUDENT TRAVEL PROCEDURES AND STUDENT TRAVEL ACTIVITY WAIVER

https://hub.ncat.edu/administration/student-affairs/staff-resources/studen_activity_travel_waiver.pdf

OTHER POLICIES (e.g., Copyright Guidelines, Confidentiality, etc.)

STUDENT HANDBOOK

<https://www.ncat.edu/campus-life/student-affairs/departments/dean-of-students/student-handbook.php>

[Graduate Catalog](#)

SEXUAL MISCONDUCT POLICY

<https://www.ncat.edu/legal/title-ix/sexual-harassment-and-misconduct-policies/index.php>

FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT (FERPA)

<https://www.ncat.edu/registrar/ferpa.php>

STUDENT COMPLAINT PROCEDURES

<https://www.ncat.edu/current-students/student-complaint-form.php>

STUDENT CONDUCT AND DISCIPLINE

North Carolina A&T State University has rules and regulations that govern student conduct and discipline meant to ensure the orderly and efficient conduct of the educational enterprise. It is the responsibility of each student to be knowledgeable about these rules and regulations.

Please consult the following about specific policies such as academic dishonesty, cell phones, change of grade, disability services, disruptive behavior, general class attendance, grade appeal, incomplete grades, make-up work, student grievance procedures, withdrawal, etc.:

- Undergraduate Bulletin
<https://www.ncat.edu/provost/academic-affairs/bulletins/index.php>
- Graduate Catalog
<https://www.ncat.edu/tgc/graduate-catalog/index.php>
- Student Handbook
<https://www.ncat.edu/campus-life/student-affairs/departments/dean-of-students/student-handbook.php>

ACADEMIC DISHONESTY POLICY

Academic dishonesty includes but is not limited to the following:

1. Cheating or knowingly assisting another student in committing an act of cheating or other academic dishonesty;
2. Plagiarism (unauthorized use of another's words or ideas as one's own), which includes but is not limited to submitting exams, theses, reports, drawings, laboratory notes or other materials as one's own work when such work has been prepared by or copied from another person;
3. Unauthorized possession of exams or reserved library materials; destroying or hiding source, library or laboratory materials or experiments or any other similar actions;
4. Unauthorized changing of grades, or marking on an exam or in an instructor's grade book or such change of any grade record;
5. Aiding or abetting in the infraction of any of the provisions anticipated under the general standards of student conduct;
6. Hacking into a computer and gaining access to a test or answer key prior to the test being given. N.C. A&T reserves the right to search the emails and computers of any student suspected of such computer hacking (if a police report of the suspected hacking was submitted prior to the search); and
7. Assisting another student in violating any of the above rules.

A student who has committed an act of academic dishonesty has failed to meet a basic requirement of satisfactory academic performance. Thus, academic dishonesty is not only a basis for disciplinary action, but may also affect the evaluation of a student's level of performance. Any student who commits an act of academic dishonesty is subject to disciplinary action.

In instances where a student has clearly been identified as having committed an act of academic dishonesty, an instructor may take appropriate disciplinary action, including loss of credit for an assignment, exam, or project; or awarding a grade of "F" for the course, **subject to review and endorsement by the chairperson and dean.**

For GRADUATE STUDENTS: Reference for academic dishonesty – 2010-2020 Graduate Catalog, p.58-59

For GRADUATE STUDENTS: STUDENT RELIGIOUS OBSERVANCE (see Graduate Catalog, p.55)

ASSIGNMENTS AND ACADEMIC CALENDAR

Include topics, reading assignments, due dates, exam dates, withdrawal dates, pre-registration and registration dates, all holidays, and convocations.*

THE WEEK OF MM/DD/YY	SUBJECT	UNIT LEARNING OUTCOMES (ULO)	READING IN TEXT, ACTIVITY, HOMEWORK, EXAM
	Module 1: Concept of Stress, Axial Loading, and Torsion	ULO 1: Define different stress types: axial normal stress, shearing stress and bearing stress. (SLO 1-2) ULO 2: Understand the relationships among, stresses, strains and material properties. (SLO 1-2)	1. Read: Lecture-1 CH 1-1 2. Read: Lecture-2-CH1-2 3. Read: Lecture-3-CH2-1 4. Read: Lecture-4- CH2-2 5. Read: Lecture-5-CH3-1 6. Read: Lecture-6-CH3-2 7. Complete: Homework #1 (ULO 1-2) 8. Complete: Homework #2 (ULO 1-2) 9. Complete: Quiz #1 (ULO 1-2) 10. Complete: Discussion Board #1 (ULO 1-2)
	Module 2: Pure Bending	ULO 1: Define the deformations, strains, and normal stresses in beams subject to pure bending. (SLO 3-4)	1. Read: Lecture 7-CH4-1 2. Read: Lecture 8-CH4-2 3. Read: Lecture 9-CH4-3 4. Complete: Homework #3 (ULO 1) 5. Complete: Homework #4 (ULO 1) 6. Complete: Quiz #2 (ULO 1) 7. Complete: Exam #1 (ULO 1) 8. Discussion Board #2 (ULO 1)
	Module 3: Design and Shearing Stress of Beams	ULO 1: Develop shear force and bending moment	1. Read: Lecture 10-CH5-1 2. Read: Lecture 11-CH5-2 3. Read: Lecture 12-CH6

	and Thin-Walled Members	diagrams, and identify the critical section. (SLO 5-6) ULO 2: Determine shearing stresses and shear flow on a horizontal section in a beam. (SLO 5-6) ULO 3: Determine the shearing stresses in a thin-walled beam. (SLO 5-6)	4. Complete: Homework #5 (ULO 1-3) 5. Complete: Homework #6 (ULO 1-3) 6. Complete: Quiz #3 (ULO 1-3) 7. Discussion Board #3 (ULO 1-3)
	Module 4: Transformations of Stress and Strain & Deflection of Beams	ULO 1: Create a stress element of a member, and evaluate principle stresses. (SLO 7-8) ULO 2: Evaluate deformations, deflections and strains in a member. (SLO 7-8)	1. Read: Lecture13-CH7-1 2. Read: Lecture14-CH7-2 3. Read: Lecture15-CH9 4. Complete: Homework #7 (ULO 1-2) 5. Complete: Homework #8 (ULO 1-2) 6. Complete: Quiz 4 (ULO 1-2) 7. Complete: Exam 2 (ULO 1-2) 8. Discussion Board #4 (ULO 1-2)
	Module 5: Design of Columns	ULO 1: Analyze eccentrically loaded columns. (SLO 9)	1. Read: Lecture16-CH10 2. Complete: Homework #9 (ULO 1) 3. Complete: Quiz #5 (ULO 1) 4. Complete: Final Exam (ULO 1) 5. Discussion Board #5 (ULO 1)

** These descriptions and timelines are subject to change at the discretion of the instructor.*