

North Carolina State University
Department of Mechanical & Aerospace Engineering
MAE 316 Strength of Mechanical Components

Course MAE 316
Semester Summer Session I, 2025

Instructor A. Mazzoleni
Office Hours TBA
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Course Prerequisites/Co-requisites

Preq: C- or better in MAE 214
Coreq: MA 341

Textbook

Shigley's Mechanical Engineering Design, Budynas and Nisbett, McGraw Hill

Grading

Homework
Tests
Final Exam

Course Topics

Review of solid mechanics
2D and 3D stresses
Curved beams
Beams with skew loads and non-symmetric cross sections
Thick-walled cylinders
Press and shrink fits
Contact Stress
Beam deflection: Review
Beam deflection: Castigliano's Theorem
Matrix methods
Column design (buckling)
Failure theories
Stress concentrations
Fracture mechanics
Fatigue

Homework Policy

Students are responsible for turning in homework on time (dates, procedure TBA). No late HW will be accepted. To accommodate illness, emergency, etc., one HW grade will be dropped without need of a doctor's note. Any further accommodations will require a doctor's note.

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Tests and Final Exam

Students must take tests, quizzes, and the final exam on the designated dates. **No make-up tests or final exam will be granted under any circumstance.**

Policy on Absences

Attendance is mandatory. The instructor will not provide in-class material (such as example problems) or course-related information to a student who has missed class, unless the absence was due to illness or an emergency. For all other cases, please obtain the missed material from a classmate.

Permitted Calculators (FE Approved)

Casio

All fx-115 models. Any Casio calculator must contain fx-115 in its model name.

Hewlett Packard

The HP 33s and HP 35s models, but no others.

Texas Instruments

All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name.

Academic Integrity

Students are expected to adhere to the Code of Student Conduct: http://www.ncsu.edu/policies/student_services/student_discipline/POL11.35.1.php

Anyone found in violation of the code will be reported to the Office of Student Conduct.

- Your work must conform to the “CODE OF STUDENT CONDUCT” adopted by the Board of Trustees on Feb. 17, 1990. You should read and understand this document, particularly part 1, “Academic Integrity”. Copies of this document are available at the Office of Student Conduct. (http://www.ncsu.edu/policies/student_services/student_discipline/POL11.35.1.php).

7.1 The free exchange of ideas depends on the participants' trust that they will be given credit for their work. Everyone in an academic community must be responsible for acknowledging their use of others' words, research results, and ideas, using the methods accepted by the appropriate academic disciplines. Since intellectual workers' words and ideas constitute a kind of property, plagiarism is like theft.

- 7.2 Furthermore, as a reader you may want to follow other writers' paths of research in order to make your own judgments about their evidence and arguments. You will depend on those writers' accuracy and honesty in reporting their sources. In turn, your readers will depend on yours.
- 7.3 The free exchange of ideas also depends on the participants' trust that others' work is their own and that it was done and is being reported honestly. Intellectual progress in all the disciplines demands the truthfulness of all participants.
- 7.4 Plagiarism and cheating are attacks on the very foundation of academic life, and cannot be tolerated within universities. Section eight (8) of the Code defines academic

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dishonesty and provides information on potential sanctions for violators of academic integrity.

Personal Communication Devices

All personal communication devices must be turned off upon entering the classroom.

Students with Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with:
<http://www.ncsu.edu/dso>

Disability Services Office
Campus Box 7509
919-515-7653

Location: Student Health Services Center
2815 Cates Ave, Ste 1900

For more information on NC State's policy on working with students with disabilities, please see:
http://www.ncsu.edu/provost/hat/current/appendix/appen_k.html