ME 3180: Machine Design, Fall 2026
Required Syllabus Information

Instructor: Dr. David Smith
Required Textbook: Budynas, R.G., and Nisbett, J.K., *Shigley's Mechanical Engineering Design, 11th Edition*, McGraw-Hill, 2020 (9780073398211).

Required Calculator: A calculator from the list approved by the NCEES for use on the Fundamentals of Engineering (FE) Exam: TI-30X, TI-36X, Casio fx-115, Casio fx-991, HP 33s, and HP 35s. While any model containing the text shown for the TI and Casio models are fine, the HP calculators must be the exact model. These are not expensive, but I have a few available.

Prerequisites: ME 2110, COE 3001

Course Description: This is the class where you learn about the pieces that go into mechanical systems and how to design them so that the device works for the required loads and lifetime. That is, the analysis, selection, and synthesis of machine components.

Course Outcomes
Following the ABET outcomes for the course, students will demonstrate the ability to:

1.1 Apply fundamentals of engineering science to make proper assumptions, perform correct analyses, and draw upon different mechanical engineering subject areas in the analysis of bolted joints, shafts, bearings, springs, gears, and other components covered.

1.2 Design mechanical components using the analyses mentioned above.

2.1 Take technical, economical, safety, quality, and other issues (such as environmental) into account when selecting and/or designing mechanical components.

3.1 Seek and learn new material outside the class topics through the completion of open-ended tasks including homework, report, term paper, computer assignment, and/or project.

Course Delivery and Attendance Policy

In accordance with the University System of Georgia (USG) rules for residential courses, this section is designated as ***in-person delivery***. That is, it is not a 'remote' or 'hybrid' class and the lectures will not necessarily be live-streamed or designed for video delivery. I do not take attendance, but absences will affect your ability to participate in in-class clicker questions.

Communication

This required USG syllabus document provides the fundamental communication of policies and required materials for the course. Its transparent purpose is so that state officials can make sure I'm not requiring you to read anything that they disagree with or that they (or you) want to pretend didn't happen and/or isn't happening now. Fortunately, none of the topics covered in this course are currently on the list of what these officials want to keep you from studying.

General communications related to this course (schedule of topics, due dates, office hours, assignment clarifications, etc.) will be provided or announced via *Canvas*. I will also set up a *Piazza* site to enable posting questions and discussions within and between sections.

Grading Policies

The maximum values for grade breaks in this class are 90%, 80%, 70%, 60%, for A, B, C, D.

The assignment grading for this course will be weighted as follows:

Participation	10
Skills Homework	20
Design Problems	20
Midterm Exam	20/30*
Final Exam	20/30*
	100

*: Lower score will be counted for 20% of the grade, higher score will be counted for 30%.

Preparation and Participation

You should expect pre-class questions for each class day, to be completed via *Canvas*. They will be due by the start of each class and may not be submitted late. While they will not be graded for accuracy, completing them will be part of your participation grade. You may miss up to three (3) of these assignments with no penalty. You should also expect questions via the (free) *PointSolutions* clicker app throughout each lecture.

Homework, Design Problems, and Doing your own work

There will be two types of homework assignments: 'Skills Homeworks' to give basic experience with the calculations, and 'Design Problems' to address more general situations. You may drop one (1) skills homework grade, but ***no Design Problems can be dropped***. Unless otherwise indicated, assignments must be submitted by 11:59 pm on Friday of the week they are due. You may discuss solution strategies with classmates. However, **all assignments are individual.** That is, **all submitted work must be your own** and **all work** for this course is governed by the **Georgia Tech Honor Code**.

Exams

There will be two exams: a Midterm, graded and returned before Drop Day, and a Final Exam. To maintain consistency, **it is not generally possible to make up an exam or take it at another time**. Remote (digitally-proctored) exams are also not allowed for this class. For cases involving Georgia Tech officially-excused absences, we will work with Academic Advising or the Wellness Center, as appropriate, to determine and document an appropriate course of action.

On exams, the only electronic device permitted is one calculator, which, as noted above, must be on the list of calculators approved by the NCEES for use on the FE Exam. Exams are **Closed Book, Closed Notes,** but I will provide a formula sheet as part of the exam.

Late Policy

Each day, or fraction thereof, that your work is late reduces your score by 10% of the maximum grade (*i.e.*, 1 point per day for a 10 point assignment). After seven (7) days, the assignment will lock and no further submissions will be accepted.

Support Resources

Mastering the material for this class while managing a full course load and maintaining your health can be challenging. Georgia Tech provides resources ranging from academic support to personal support, to health care. Some good places to start are the Center for Academic Success (success.gatech.edu), the counseling center (counseling.gatech.edu), and the health service (health.gatech.edu). However, don't hesitate to contact me or your ME academic advisor for additional ideas.

Georgia Tech Policies

Discrimination and Harassment

Georgia Tech prohibits discrimination, including discriminatory harassment, on the basis of race, ethnicity, ancestry, color, religion, sex (including pregnancy), sexual orientation, gender identity, gender expression, national origin, age, disability, genetics, or veteran status in its programs, activities, employment, and admissions. This class adheres to and supports those guidelines. Put simply, no form of harassment or discrimination is allowed in this class. In keeping with the professional nature of this course, only professional behavior is acceptable between the instructor and the students and between students. See also the GT Student-Faculty Expectations Agreement.

ADA Statement

If you have a documented disability as described by the Rehabilitation act of 1973 and the Americans with Disabilities Act (ADA) that may require you to need assistance attaining accessibility to instructional content to meet course requirements, please contact the ADAPTS staff as soon as possible to verify your disability and specify the accommodation you will need. It is then your responsibility to meet with your instructor. Please be aware that no retroactive accommodations will be provided, so you should contact me as soon as possible.

Academic Dishonesty

Georgia Tech has an honor code (*http://osi.gatech.edu/content/honor-code*), which applies to all of your academic work, and suspected violations will be reported to the Office of Student Integrity. The full text of the honor code is on that website, but it includes the following:

> *Section 3. Student Responsibilities*
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> *Students are expected to act according to the highest ethical standards. The immediate objective of an Academic Honor Code is to prevent any Students from gaining an unfair advantage over other Students through academic misconduct. The following clarification of*

academic misconduct is taken from Section XIX Student Code of Conduct, of the Rules and Regulations section of the Georgia Institute of Technology General Catalog: Academic misconduct is any act that does or could improperly distort Student grades or other Student academic records. Such acts include but need not be limited to the following:

Possessing, using or exchanging improperly acquired written or verbal information in the preparation of any essay, laboratory report, examination, or other assignment included in an academic course;

Substitution for, or unauthorized collaboration with, a Student in the commission of academic requirements;

Submission of material that is wholly or substantially identical to that created or published by another person or person, without adequate credit notations indicating authorship (plagiarism);

False claims of performance or work that has been submitted by the claimant;

Alteration or insertion of any academic grade or rating so as to obtain unearned academic credit;

Deliberate falsification of a written or verbal statement of fact to a member of the Faculty so as to obtain unearned academic credit;

Forgery, alteration or misuse of any Institute document relating to the academic status of the Student.

While these acts constitute assured instances of academic misconduct, other acts of academic misconduct may be defined by the professor. Students must sign the Academic Honor Agreement affirming their commitment to uphold the Honor Code before becoming a part of the Georgia Tech community. The Honor Agreement may reappear on exams and other assignments to remind Students of their responsibilities under the Georgia Institute of Technology Academic Honor Code.