

Course Syllabus
College of Engineering

MCHE 3300 – Machine Design I

Fall 2021

MWF – 8:00-8:50 AM, Driftmier Engineering Center, Room 1453 – CRN **42706**

MWF – 9:10-10:00 AM, Driftmier Engineering Center, Room 1453 – CRN **42707**

Instructor

Ben Wagner, Ph.D., P.E.

Fall 2021 – No Office at UGA due to Driftmier Renovation

wagner@uga.edu

Zoom - <https://zoom.us/j/9192721011>

The Course Syllabus is a general plan for the course. Deviations announced to the class by the instructor may be necessary.

UGA Bulletin Course Description

Basic mechanical parts, kinematic analysis of mechanisms, application of static and fatigue failure theories, dimensioning and tolerancing, material selection, basic manufacturing processes.

Office Hours: As posted and by appointment.

Required Text: Budynas, R.G. and Nisbett, J.K. (2020), Shigley's Mechanical Engineering Design, 11th Edition, McGraw Hill, with CONNECT access. *(This text, without CONNECT access, is also required for ENGR 4300)*

Most tests in MCH 3300 (and ENGR 4300) will be open book. Starting in Fall 2017, only these two formats will be allowed on the test:

- A textbook (any edition.....think savings here.....)
- The loose-leaf copy of the text purchased from the publisher and *spiral bound* by a third party (Kinko's, etc.).

Student-printed versions of the text are not allowed during the test. Publisher's loose-leaf copies in three-ring binders are not allowed during the test.

Fall 2019 prices: About \$100 for CONNECT and e-book. About \$178 for loose-leaf printed version and CONNECT. – Per McGraw-Hill Higher Education web page.

Do not purchase the *International* or *SI-only* edition. We will work in English and SI units.

Required Software: CONNECT access for the required text.

Course Prerequisites

ENGR 2140 Strength of Materials

Courses that Require this Course as a Prerequisite

ENGR 4300 Mechanical Systems

Method of Grading

Three In-class Tests 75%

(I will replace the lowest test grade with the middle test grade.)

CONNECT & LearnSmart 15%

Final Exam 10%

Grading Scale*

A	90 to 100	C+	76 to 79
A-	89 to 90	C	70 to 76
B+	86 to 89	C-	69 to 70
B	80 to 86	D	60 to 69
B-	79 to 80	F	0 to 60

*(Rounding up using **the first** digit to the right of the decimal.)

General

Attendance

Class attendance is not mandatory. (The **exceptions** to this are the days of the three announced in-class tests.) If you miss a class, it is your responsibility to determine the assignment and learn the material covered in class. It is not the responsibility of the instructor to provide you with missed materials.

Disputed Grades

Any grading disputes should be described in a letter addressed to Dr. Wagner. The letter should indicate the specific points of the dispute and justify why you believe the grade is incorrect. The entire graded work which is the subject of the dispute must accompany the letter. (For example, the entire test is to accompany the letter even if only one problem is under dispute). You must submit your dispute within 1 week of the graded material being returned to the class.

Homework

- Homework problems will be assigned via McGraw-Hill CONNECT. All problems in each assignment will be submitted electronically and graded. I will not reopen the assignment after the due date. Do not ask me.
- LearnSmart readings will be assigned via McGraw-Hill CONNECT. All assignments will be submitted electronically and graded. I will not reopen the assignment after the due date. Do not ask me.
- Practice problems will also be assigned for each chapter. Solutions will be provided and the problems will not be turned in for a grade. Be able to show evidence that you have made a significant attempt at a problem before seeking assistance.

Tests

- **Three in-class tests will be given.** The dates will be announced in class. Two

to three class periods prior to the test, the instructor will announce in class whether students will be allowed to use books and/or notes during the test.

- No make-up tests will be given. This applies to both excused and unexcused absences. If you miss a test and have a valid excused absence, the points associated with the missed test will be shifted to the final exam. If you do not have a valid excused absence, a grade of zero (0) will be recorded for the test.

Final Exam

The final exam will not be given back to the student. You may review the exam in my office, but you may not remove it from my office or make a copy of it. The final exam is the property of Dr. Wagner.

Extra Credit

No individual extra credit assignments will be given. Do not ask me.

Classroom Conduct

- Wearing of any type of hat during class is not allowed.
- UGA is a tobacco-free environment.
- Students (and the instructor) are expected to act in a professional manner at all times.
- No cell phones are allowed in class. You may not use your cell phone as a timer on the test or as a calculator.
- Arrive prior to the beginning of class. Depart when dismissed.
- Comply with the most recent UGA requirements for masks / face coverings.
- Follow UGA social distancing guidelines, including specific attendance schedule.

“Should I drop the course?”

- I frequently have this discussion with students who have not done as well as they would like on Test 1. In past years I would tell the students that if they did well on the remaining tests and the final, I would give those grades more weight, on a case by case basis. With increased teaching loads (over 430 students in Fall 2018, for example), I no longer have the time to follow this policy in a manner that is fair to all students. Consequently, the grades earned will be the grades used in the calculation of the final course grade. Period.

Withdrawal from Course

- If a student wishes to withdraw from the course, the student must provide evidence of significant effort toward meeting the course requirements before a grade of *W* will be issued. In the absence of such evidence, a grade of *WF* will be issued.
- Students disrupting the class will be removed from the course using an administrative withdrawal, and a grade of *WF* will be issued. Some examples of disruptions are arriving late, “packing up” to leave early, talking during class, and reading newspapers during class.

HOPE and Zell Miller Scholarship Recipients

Now is the time for you to be concerned with what you can do to keep the HOPE or Zell Miller Scholarship. You have all semester to work hard to make sure you get whatever grade you need. I understand the high cost of a college education. I am currently saving / investing to provide college funds for my two children. Do NOT ask me near the end of the semester if I can give you a certain grade so that you can maintain your scholarship. I will not do it.

University and Departmental Policies

ACADEMIC HONESTY

As a University of Georgia student, you have agreed to abide by the University's academic honesty policy, "A Culture of Honesty", and the Student Honor Code. All academic work must meet the standards described in "A Culture of Honesty" found at: www.uga.edu/honesty. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor. All cases of suspected violation of the UGA Academic Honesty Policy **will be reported**.

ENGINEERING PROFESSIONALISM POLICY

The engineering profession is governed by a code of ethics that has developed alongside the rigors of the practice and its many contributions to society. Engineering students at UGA are responsible for maintaining the highest standards of professionalism and professional practice. Engineering faculty at UGA expect students to act in a professional manner at all times.

Course Content

Part I: Introduction and Concepts (Chapter 1, Chapter 2)

- Introduction to design
- Statistical Considerations
- Materials and processes

Part II: Loading and Stress Analysis (Chapter 3)

- Load analysis in 2-D and 3-D
- Beam loading
- Torsion loading
- Stresses in pressurized cylinders rotating rings and temperature effects

Part III: Deflections and Stiffness (Chapter 4)

- Springs
- Torsion
- Beams
- Strain energy
- Columns

Part IV: Failure Resulting from Static and Variable Loading (Chapter 5, Chapter 6)

- Ductile and brittle materials
- Fracture mechanics
- Fatigue failure theory

ABET information is on the following pages.....

How this Course Supports Student Preparation Relationship to the ABET Criterion 3 Program Outcomes

ABET has established the following guidelines for how engineering programs should assess the progress of students during the academic career as well as the success of that engineering program in preparing engineers to become success practicing professionals in the field.

ABET Criterion 3 Student Outcomes – Revised for 2019

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions [*formerly outcome (b)*]
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

This course is designed to help you develop in 5 of the 11 program outcomes (1, 2, and 4). To accomplish this, the course has the following set of 'Course Learning Objectives' that establish set goals for the course and how we will assess the effectiveness of this course in meeting program outcomes.

Course Learning Objectives and Assessment Method Matrix

Course Learning Objectives	Assessment Methods*
Understand the Factor of Safety concept and how it relates to statistical variation and reliability.	A,B
Understand tolerances.	A,B
Understand computation and combination of stresses arising from tensile forces, bending, shear, and torsion.	A,B
Understand computation of deflections resulting from stresses.	A,B
Understand basic materials and how to assess their properties	A,B,C
Understand basic modes of failure in static and variable loadings.	A,B

* Course Assessment Methods:

A – Homework and In-class Exercise; B – Exams; C – Lab/Project Group Activities