EML 3301C | Mechanics of Materials Laboratory

Instructor Information

Shannon Ridgeway

Course Details

Catalog Description: Experimental characterization of the mechanical properties of engineering materials, precision instruments, computer-based data acquisition, statistical uncertainty analysis, preparation of engineering reports.
Pre- and Co-Requisites: Prereq: EMA 3010 and (EGM 3520 with a minimum grade of C) and COP 2271 and (ENC 2210 or ENC 3254 or ENC 3246).
Credit Hours: 3
Course Fees: $269.00

Required Materials

MECHANICS OF MATERIALS LABORATORY COURSE
ISBN: 9781681733333
Authors: SUBHASH AND RIDGEWAY
Publisher: MORGAN & CLAYPOOL
Edition: 1
All Access: This course does not use UF All Access

A Note on Materials

Any format and publisher is acceptable.

Writing Requirement

This course fullfills 6000 Words of the Writing Requirement.

- The Writing Requirement (WR) ensures students both maintain their fluency in writing and use writing as a tool to facilitate learning.
- Course grades have two components. To receive writing requirement credit, a student must receive a grade of C or higher and a satisfactory completion of the writing component of the course.
- The instructor will evaluate and provide feedback on all of the student's written assignments with respect to grammar, punctuation, clarity, coherence, and organization.
- University's Writing Studio: http://www.writing.ufl.edu/

Course Goals and Objectives

In this course you will develop a working knowledge of experimental techniques and equipment commonly used in engineering practice. You will become familiar with the design and implementation of various sensors, statistical data analysis, experimental planning, uncertainty analysis, and computer-based data acquisition. You will develop and refine your report writing skills.

Expectations and Student Learning Outcomes

At the end of this course, you will be able to:

- Develop the random uncertainty in a direct measurement via reference or statistical process.
- Propagate random uncertainty for typical engineering results based on the Root Sum Square Method.
- Estimate random uncertainty via the use of Monte Carlo Simulations.
- Effectively convey experimental results in written form.
- Select appropriate data acquisition devices to allow desired accuracy and precision in experiments.
- Utilize strain gauges to estimate strain in simply loaded cases.
- Quantitatively support conclusions developed using experimental process and uncertainty analysis.

Methods of Evaluation

Evaluation

Assignment	Total Points	Percentage of Final Grade
Homework, Prelabs, and in-class quizzes	Varies By Assignment	20%
Lab Reports (Lab 1-3)	Varies By Assignment	60%
Final Project Report	100	20%
		100%

Homework/Quiz/Pre-lab: The Homework/Quiz/Pre-lab grade will be used to address issues as they arise. Any pre-labs assigned must be completed before lab work starts (you may not be allowed to enter the lab if the work is not finished). Pacing quizzes may be used to ensure students are keeping up with lectures/assignments.

Laboratory Reports: A laboratory report is associated with most laboratory class meetings. Each assignment will be posted on the Canvas course website before the laboratory class dealing with the material topic occurs. Assignments will also be submitted via the course website and will be due according to the date shown on the website. Assignment format will be covered in class and a template will be provided. The format is to follow published formatting rules available on the class website. A maximum word length may be set in the lab report assignment. Discussion items detailed in the lab assignment are to be covered in the report. An overall grade will be assigned to the report work, and the average of the overall lab report grade makes up 60% of the course grade.

A lab report will not be graded (grade of 0 assigned) if it is not reviewed by "Turn It In"(this may include instances where tables or equations are images and cannot be checked). Work submitted that is not readable will receive a zero. In the case where a submission is not readable and/or not readable by "Turn it In", the student may attempt to provide a copy of the work that has not been modified since the assigned due date. It is left to the student to provide convincing evidence to the instructor.

A grade reduction up to and including assigning a 0 grade is possible based on un-original content found by turn-it-in.

Final Project report: A report will be submitted detailing the work done for the final project. The report is to follow published formatting rules available on the class website, and cover instructions provided in the final project assignment posted on the class website. Failure to submit a final project report will result in failure of the class.

It is the student's responsibility to honor and respect the given deadlines and meeting times.

Canvas submission late policy (does not apply to quizzes), Unless otherwise noted in the assignment:
If you do not submit your assignment when it is due, you can still submit it via Canvas for two more days (unless the assignment restricts/modifies this policy). Unless you have prior written (email is appropriate) permission to submit a late assignment, the penalties for late submission will be as follows:

- Late submissions within one hour of the deadline: 5% of your earned grade.
- Late submissions past one hour but within 24 hours of the deadline: 15% of your assessed grade.
- Late submissions past 24 hours but within 48 hours of the deadline: 30% of your assessed grade.
- Last 48 hours, your assignment will not be graded.

Grading Scale

Grading Scale

Grading Scale	
A	90 - 100%
B +	87 - 89.99%
B	80 - 86.99%
C +	77 - 79.99%
C	70 - 76.99%
D +	67 - 69.99%
D	60 - 66.99%
E	59% and below

Minimum Grade Required

A minimum grade of C is required to earn General Education, Quest, and/or Writing Requirement credit. Courses used to satisfy these requirements may not be taken S/U.

University Policies and Resources

Information about grading policies, support for students with disabilities, course evaluations, the Honor Code, and other course policies and campus resources can be found on the Syllabus Policies page.

Attendance Policy

Excused and Unexcused Absences

Students may only participate in classes if they are registered officially or approved to audit with evidence of having paid audit fees. The Office of the University Registrar provides official class rolls to instructors.

Students are responsible for satisfying all academic objectives as defined by the instructor. Absences count from the first-class meeting.

Acceptable reasons for absence from or failure to engage in class include illness; Title IX-related situations; serious accidents or emergencies affecting the student, their roommates, or their family; special curricular requirements (e.g., judging trips, field trips, professional conferences); military obligation; severe weather conditions that prevent class participation; religious holidays; participation in official university activities (e.g., music performances, athletic competition, debate); and court-imposed legal obligations (e.g., jury duty or subpoena). Other reasons (e.g., a job interview or club activity) may be deemed acceptable if approved by the instructor.

For all planned absences, a student in a situation that allows an excused absence from a class, or any required class activity must inform the instructor as early as possible prior to the class. For all unplanned absences because of accidents or emergency situations, students should contact their instructor as soon as conditions permit.

Students shall be permitted a reasonable amount of time to make up the material or activities covered during absence from class or inability to engage in class activities because of the reasons outlined above.

If a student does not participate in at least one of the first two class meetings of a course or laboratory in which they are registered, and they have not contacted the department to indicate their intent, the student can be dropped from the course. Students must not assume that they will be dropped, however. The department will notify students if they have been dropped from a course or laboratory.

The university recognizes the right of the instructor to make attendance mandatory and require documentation for absences (except for religious holidays), missed work, or inability to fully engage in class. After due warning, an instructor can prohibit further attendance and subsequently assign a failing grade for excessive absences.

Religious Holidays Guidelines

At the University of Florida, students and faculty work together to allow students the opportunity to observe the holy days of their faith. A student should inform the faculty member of the religious observances of their faith that will conflict with class attendance, with tests or examinations, or with other class activities prior to the class or occurrence of that test or activity. The faculty member is then obligated to accommodate that particular student's religious observances. Because students represent a myriad of cultures and many faiths, the University of Florida is not able to assure that scheduled academic activities do not conflict with the holy days of all religious groups. Accordingly, individual students should make their need for an excused absence known in advance of the scheduled activities.

The Florida Board of Education and state law govern university policy regarding observance of religious holidays.

Guidelines

- Students, upon prior notification to their instructors, shall be excused from class or other scheduled academic activity to observe a religious holy day of their faith.
- Students shall be permitted a reasonable amount of time to make up the material or activities covered in their absence.
- Students shall not be penalized due to absence from class or other scheduled academic activity because of religious observances.

If a faculty member is informed of or is aware that a significant number of students are likely to be absent from class because of a religious observance, the faculty member should not schedule a major exam or other academic event at that time.

A student who is to be excused from class for a religious observance is not required to provide a second party certification of the reason for the absence. Furthermore, a student who believes that they have been unreasonably denied an education benefit due to religious beliefs or practices may seek redress through the student grievance procedure.

Absence due to Illness

A student who is absent from class or any required class-related activity because of illness should contact their instructor, if feasible, as early as possible prior to the missed class or activity.

Students shall be permitted a reasonable amount of time to make up the material or activities covered during an excused absence.

Students should contact their college by the deadline to drop a course for medical reasons. Students can petition the Dean of Students Office to drop a course for medical reasons. The university's policy regarding medical excuse from classes is maintained by the Student Health Care Center.

Twelve-Day Rule

Students who participate in university-sponsored athletic or scholarly activities are permitted to be absent 12 scholastic days per semester without penalty. A scholastic day is any day on which regular class work is scheduled as defined in the approved university calendar.More Info

The student or student's advisor must notify the instructor as early as possible prior to the anticipated absence to allow ample time for accommodations. Instructors must be flexible and not penalize students when re-scheduling during-term and final exams, class assignments, and other required activities and must follow the UF Attendance Policy herein and UF Examination Policies. As noted in the UF Examination Policies, during-term exams should be re-scheduled no later than before the end of the semester, while final exams no later than 90 days after the originally scheduled exam time. However, instructors are encouraged to re-schedule final and during-term exams, assignments, and other activities as soon as possible after the last day of the absence and must not penalize the student in any way.More Info

A group's schedule that requires absence of more than 12 scholastic days should be adjusted so that no student is absent from campus more than 12 scholastic days. Students who previously have been warned in writing by their instructor about the impact of absences on their individual class performance should not incur additional absences, even if they have not been absent 12 scholastic days. The student is responsible to maintain satisfactory academic performance and attendance.

Technology in the Classroom

Required Computer:

- Computer Requirements: https://www.eng.ufl.edu/undergraduate/programs-and-partnerships/advising-center-for-student-excellence/newly-admitted-students/computer-requirements/
- The student's computer must support 32 bit labVIEW and a 32 bit dll associated with an FTDI USB-serial converter (D2XX). Windows on an X86 architecture generally meet these requirements. The most recent Apple (ARM architecture) can support via emulation on a virtual install of Windows but does not always support (left to the student to implement VM and configure). Windows on Arm does not currently work with lab hardware.

Professional Component (ABET)

This course prepares graduates to apply knowledge of mathematics, science, and engineering, with a focus on experimental design, uncertainty, data acquisition, and technical reporting of results.

Relation to Program Outcomes (ABET):

ABET outcomes addressed in course	
Outcome	Coverage*
SO1: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
SO2: 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	Low
SO3: an ability to communicate effectively with a range of audiences	High

ABET outcomes addressed in course	
SO4: 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	High
SO5: 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	High
SO6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	High
SO7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not significantly addressed by this course.