Mechanic of Materials Laboratory
EML 3301C All Sections

Lecture Class Periods: Synchronous In person, Tuesday/Thursday, 2nd period, 8:30 am-9:20 am
Lecture Location: Pugh 170
Laboratory Class Periods: Tu/W/Th according to your assigned section
Lab Location: NSC 316, ZOOM, see canvas for instructions/schedule
Academic Term: Fall 2021

It may become necessary to modify this syllabus during the semester.
In this event, students will be notified, and the revised syllabus will be posted on the course web site.

Instructors:

Nagaraj Arakere
NEB 139
Email: nagaraj@ufl.edu
352-392-7303
Office Hours: TBD

Shannon Ridgeway
scer@ufl.edu
Office Hours: Tu/W/Th Various, during lab times

Teaching Assistants:
Please contact through the Canvas website
TBD

Course Description
Experimental characterization of the mechanical properties of engineering materials, precision instruments, computer-based data acquisition, statistical uncertainty analysis, preparation of engineering reports. Credits: 3

Course Pre-Requisites / Co-Requisites
EGM3520, EGM3344, ENC2210 or ENC 3254

Course 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 and computer-based data acquisition. You will also refine your report writing skills.

Materials and Supply Fees
See course catalog/UF registrar

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):

Outcome	Coverage*
1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
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	Low
3) an ability to communicate effectively with a range of audiences	High
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	High
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	High
6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	High
7) 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.

Required Textbooks and Software

- Mechanics of Materials Laboratory Course, Subhash and Ridgeway. ISBN: 9781681733333

- We will use LabVIEW extensively. We will provide a LabVIEW license key to you that is paid for through the course lab fee.

Additional Recommended Materials

Statics textbook, Mechanics of Materials textbook

Course Schedule

See table at end of syllabus.

Class Implementation: Attendance Policy, Class Expectations, and Make-Up Policy

Lectures:

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Lectures will be Synchronous-recorded, or pre-recorded. Some lab sessions will be synchronously delivered and recorded. A schedule will be maintained on Canvas AND IT IS THE STUDENT'S RESPONSIBILITY TO BE AWARE OF IN PERSON, F2F, EVENTS. Office hour access to instructors and ta's will sometimes be held in place of conventional lab sections, with duration based on utilization.

It is the student's responsibility to utilize the provided lectures and attend/observe the recorded in lab zoom sessions. Exercises will be assigned that require the utilization of the background and knowledge presented.

The course web site, accessible through Canvas (elearning.ufl.edu) via your Gatorlink login, will be the primary point of contact and support for the students. Course announcements, class discussions, laboratory assignments, and grades will be posted on the course website.

Lab Work:

The course will utilize a lab kit to be distributed in the first and second weeks of class to perform several experiments. Instructor generated experimental results will also be utilized with synchronous video of lab work for other experiments. It is the student's responsibility to ensure the lab kit functions in a timely manner, to allow sufficient time to address deficiencies.

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 an example will be provided. Work submitted that is not readable will receive a zero. The format is to follow published formatting rules available on the class website. A maximum 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 40% of the course grade. Each lab report will be weighted equally.

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).

Exams: One exam will be administered. No makeup exams will be given. DSR students have accommodation made if appropriate documentation is provided.

Final design 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 design report will result in failure of the class.

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Assignments submitted outside the posted times will not be accepted for any reason. In addition, there will be NO scheduled make-up laboratories. It is the student's responsibility to honor and respect the given deadlines and meeting times.

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 this policy). Unless you have prior written (email is fine) 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: 20% of your earned grade.
- Late submissions past 24 hours but within 48 hours of the deadline: 50% of your earned grade.
- Past 48 hours, your assignment will not be graded.

Excused absences must be consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation.

Writing Requirement:

The writing assignments/student products for this course are designed to meet the minimum requirements of the University Writing Requirement credit of **6,000 words**. To satisfy this requirement, at least three of the individual lab report assignments (4 minimum to be assigned) must meet minimum word count and be marked Satisfactory based on the Writing Rubric. Submitted assignments short of the minimum word count will receive zero credit for the writing component grade.
The writing requirement 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 credit, a student must receive a grade of "C-" or higher on 3 lab reports and have a satisfactory completion of the writing component of the course.

The instructor will evaluate and provide feedback on the student's written assignment in accordance with both the UF writing rubric and the course content rubric for that particular assignment, including, but not limited to, grammar, punctuation, usage of standard written English, clarity, coherence, and organization. Below is the writing rubric which will be used to judge mechanics and flow of the written student product. Each student product will also carry a content based rubric. The student products carry two grades, one for the writing mechanics, and one for the content mechanics. Students must satisfactorily meet both rubrics for a passing assignment.

	SATISFACTORY (Y)	**UNSATISFACTORY (N)**
CONTENT	Papers exhibit at least some evidence of ideas that respond to the topic with complexity, critically evaluating and synthesizing sources, and provide at least an adequate discussion with basic understanding of sources.	Papers either include a central idea(s) that is unclear or off- topic or provide only minimal or inadequate discussion of ideas. Papers may also lack sufficient or appropriate sources.
ORGANIZATION AND COHERENCE	Documents and paragraphs exhibit at least some identifiable structure for topics, including a clear thesis statement but may require readers to work to follow progression of ideas.	Documents and paragraphs lack clearly identifiable organization, may lack any coherent sense of logic in associating and organizing ideas, and may also lack transitions and coherence to guide the reader.

ARGUMENT AND SUPPORT	Documents use persuasive and confident presentation of ideas, strongly supported with evidence. At the weak end of the Satisfactory range, documents may provide only generalized discussion of ideas or may provide adequate discussion but rely on weak support for arguments.	Documents make only weak generalizations, providing little or no support, as in summaries or narratives that fail to provide critical analysis.
STYLE	Documents use a writing style with word choice appropriate to the context, genre, and discipline. Sentences should display complexity and logical sentence structure. At a minimum, documents will display a less precise use of vocabulary and an uneven use of sentence structure or a writing style that occasionally veers away from word choice or tone appropriate to the context, genre, and discipline.	Documents rely on word usage that is inappropriate for the context, genre, or discipline. Sentences may be overly long or short with awkward construction. Documents may also use words incorrectly.
MECHANICS	Papers will feature correct or error-free presentation of ideas. At the weak end of the Satisfactory range, papers may contain some spelling, punctuation, or grammatical errors that remain unobtrusive so they do not muddy the paper's argument or points.	Papers contain so many mechanical or grammatical errors that they impede the reader's understanding or severely undermine the writer's credibility.

Writing Resources, Style, and Format:

- Reports for this course will follow the format posted on the class website.
- The writing style manual by Alley is recommended for student use:

  The Craft of Scientific Writing by Michael Alley, 3rd Edition, Springer, 1998.
  This writing reference may also be accessed online at http://www.writing.engr.psu.edu/csw.html.

- Students are also encouraged to utilize the university's Writing Studio for assistance as needed. More information on the Writing Studio is available at this link: www.writing.ufl.edu.

Evaluation

Assignment	Total Points	Percentage of Final Grade
Homework, Prelabs and in-class quizzes	Varies By Assignment	20%
Lab Reports (3-4)	100 each	40%
Midterm Exam (2)	100	20%
Final Project Report	100	20%
		100%

Grading Policy

Percent	Grade	Grade Points
93 - 100	A	4.00
90.0 - 93	A-	3.67
87 - 89.9	B+	3.33
83 - 86.9	B	3.00
80.0 – 82.9	B-	2.67
77 - 79.9	C+	2.33
73 – 76.9	C	2.00
70.0 – 72.9	C-	1.67
67 - 69.9	D+	1.33
63 – 66.9	D	1.00
60.0 – 62.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Questions regarding grades must be brought to your grader within 7 days after return of the grades to the class. A typed note explaining your concern/issue must be submitted when a grading issue is brought for reconsideration. The note may be in the form of an email to the grader (preferred, emails on Canvas) or scer@ufl.edu (Shannon Ridgeway, Lab instructor).

Students Requiring Accommodations
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

In-Class Recording
Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Conduct Code (https://sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate Program Coordinator
• Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@ufl.edu
• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: https://counseling.ufl.edu, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

COVID-19

- You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated.
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus.
- If you are withheld from campus by the Department of Health through Screen, Test & Protect, you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the UF Health Screen, Test & Protect website for more information.
- Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling; https://career.ufl.edu.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall*,* 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/;https://care.dso.ufl.edu.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.

Schedule: As posted on Canvas. Follow all due dates as noted on Canvas. Below is a draft:

EML 3301C: MECHANICS OF MATERIALS LAB COURSE SCHEDULE (Fall 2021)				
Week	**Lecture**	**Lab**	**Lab Reports**	**Due***
1 23-Aug	Drop-Add, Intro to MoM lab, data acquisition LabVIEW programing and SADI DAQ	LabVIEW installation		
2 30-Aug	Digital Data Acquisition, LabVIEW for Lab 1 and Uncertainty	Pick up SADI	Lab-1 Report (LR 1)	
3 6-Sep	Load Based Tensie testing of a Wire L1 Lab report format, Uncertainty	Load Based Tensile testing of a wire, LVDT based measurment		
4 13-Sep	Strain gages (I), L2 intro	Lab 1 Draft Review Zoom		
5 20-Sep	Strain gages (II) Tensile test theory (MoM review)	L2 Implementation of Beam Scale	Lab-2 Report (LR 2)	LR-1
6 27-Sep	Strain gages (II), Wheatstone Bridge	Lab 2 Continued/Zoom		
7 4-Oct	Exam-1 Review **Exam-1 (10/7 tbd)**	No lab		
8 11-Oct	Tensile test theory (MoM review)	Tensile/ compression testing of metals, ceramics and composites, adhesive specimens		LR 2
9 18-Oct	Tensile test theory	Lab 3 Continued/Zoom	Lab-3 Report	
10 25-Oct	Adhesive shear strength	Adhesive Shear strength testing		
11 1-Nov	Adhesive	Lab 4 Continued/Zoom	Lab-4 Report	LR-3
12 8-Nov	Final Project	In Lab Strain Rosette application and pressure evaluation in a beverage can, Group Project	Final Project Reprot (FPR)	LR-4
13 15-Nov	**Exam-2 (11/18 tbd)**	continued		
14 22-Nov	Final Project/Thanksgiving	continued		
15 29-Nov	Final Project	continued		
6-Dec	**Final Project Report due on 12/6 5 pm**			FRP

Lab is open for kit pickup this week, kits must be picked up before first in lab session.

In Lab attendance Required for Lab

Final Project, the group must attend at their schedule. The work may take more than one week