Materials Laboratory 1

EMA3080C Sections 04G8, 2329, 2694, 8811,9922, 9933

Class Periods: Labs: Section 04G8 – M 7-9, 2329 M 3-5, 2694 W 3-5, 9922 W 7-9, 8811 F 3-5, 9933 F 7-9

Lecture: TBD times

Location: B06 Labs – Lecture TBD

Academic Term: Fall 2020

Instructor:

Nancy Ruzycki
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MAE 317 C
Office Hours: TBD

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact through the Canvas website
TBD

Course Description

First part of the general undergraduate materials laboratory. (WR)

Course Pre-Requisites / Co-Requisites

Prerequisite: EMA 3010 and EMA 3800.
Attributes: Satisfies 4000 Words of Writing Requirement

Course Objectives

See Course Outline Below

Materials and Supply Fees

See OneUF for listing of materials and supply fees for the course

Professional Component (ABET):

This course contributes components towards meeting the professional components of the ABET-accredited degree.

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	
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	Medium
3. An ability to communicate effectively with a range of audiences	Medium

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	medium
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 covered or assessed in the course.

Required Textbooks and Software

- • No required text book, Course Materials Developed by Instructor
- • Software: Matlab, Minitab, SolidWorks, Jupyter Notebook/Lab, ThermoCalc, Granta CES, ImageJ. All software available through UF Apps, Department or Freeware.

Recommended Materials

- • Materials Science and Engineering: An Introduction, 10th Edition (or text used in 3010 course)
- • Calister & Rethwisch
- • January 2018, 10th Ed
- • 978-1-119-40549-8
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Course Outline:

There may be changes/substitutions to the laboratories listed below, depending upon available equipment, and student progress.

Students are expected to dress properly for laboratory class. Closed toed shoes are required for class. Pants are preferred. There is no food or drink of any kind in the laboratory. You are expected to follow all laboratory guidelines. Students are expected to follow CDC and University guidelines for safe interactions in a FTF environment. *If a student who is withheld from campus attends class, the student should be asked to leave the classroom and be reported to the Dean of Students Office.*

Weeks	Topic	Learning Outcomes	Student Deliverables
1-4	Additive manufacturing and	Additive manufacturing Glass transition temperature	Student notebook(s) entries

	polymer properties and performance	Thermal melt and flow Co -polymers Types of polymers Polymer properties Polymer thermal degradation (DSC) Polymer strength (Tensile, compression, Charpy Testing) Polymer orientation versus Strength Reading and using ASTM standard Regulations for Medical devices	Laboratory data Analysis Background reading & questions Granta CES analysis Skills Tests Solidworks Dogbone Design/FEA analysis White Paper on polymer application and additive manufacturing (2500 words)
5-8	Heat Transfer in Materials	Types and mechanisms of heat transfer Heat Equation Diffusion in materials	Student notebook(s) entries Laboratory data Analysis Background reading & questions Jupyter notebook/lab modeling heat flow Jupyter notebook/materials project data mining Thermocalc modeling Technical Report (1000 words)
9-11	Polymer Synthesis, Biomaterials applications of polymers	Polymer synthesis Polymer properties Effect of MW on Polymer properties Polymer characterization (DSC, Melt Flow, Rheometry) Biopolymers and biopolymer properties Polymer crystallization kinetics and growth rate	Student Notebook(s) Laboratory Data Analysis
12-15	Heat Treatment of metals and effect on microstructure and properties	Microstructure of metals Metal crystallization and kinetics Heat treatment of metals (relaxation, crystallization, grain growth) Temperature profiles and simulation of microstructure Nucleation and growth of grains Metal property characterization (Tensile, Hardness, Charpy, Miscrostruture) Metallographic preparation of samples	Student notebooks Experimental proposal (1000 words) Laboratory data analysis MiniTab experimental design Thermocalc simulations Statistical Analysis of data Characterization reports Professional poster drafts (1, 2) Professional poster reviews of peers

			Final Professional Poster (this is held during exam week and is in lieu of an exam)

Online Course Recording

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 for the lecture portion only.

Health and Wellness:

- *You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated. Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.*
- *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. 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.*

Writing Requirement: Each Topic listed above will have a student product which will be graded as a formal assessment. There will be a rubric for each product. Student products may include, but are not limited to; lab reports, posters, abstracts, research proposals, users manuals, program codes, technical letters, oral presentations.

The writing assignments/student products for this course are designed to meet the minimum requirements of the University Writing Requirement credit of **4,000 words**. To satisfy this requirement, every assignment's word count must be fulfilled (see Table below).

Assignment	Draft Due Date	Draft Revision Date	Final Due Date
White Paper on polymer application and additive manufacturing (2500 words)	September 13, 2021	September 20, 2021	September 27, 2021
Heat Transfer Technical Report (1000 words)	October 11, 2021	October 18, 2021	October 25, 2021

Heat Treatment Experimental proposal (1000 words)	November 8, 2021	November 16, 2021	November 19, 2021
Student professional poster (poster 500 words)	November 15, 2021	November 19, 2021	November 23, 2021

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. Students who do not meet minimum requirements for the written assignment will have 1 week from the return of the assignment to make changes, meet the rubric requirements and hand the assignment back in for regarding. Students will receive some loss of points for the re-grade. All feedback on writing assignments will be provided prior to the last class meeting.
Resources for Writing include:
Recommended Writing Manual: Alley, Michael "The Craft of Scientific Writing", 3rd Edition, Springer ISBN-10 0387947663
University's Writing Studio (www.writing.ufl.edu (Links to an external site.)
Recommended style manual is: IEEE Editorial Style Manual.
http://www.ieee.org/conferences_events/conferences/publishing/style_references_manual.pdf

All written assignments must be turned in early to receive feedback on the draft version. These dates will appear on the course website and will be approximately 1 week before main assignment due date. All writing assignments will be turned in through the class web portal and will be subjected to anti-plagiarism detection. Students found to have plagiarized will be subject to university policies.
Below is the UF 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.

Attendance Policy, Class Expectations, and Make-Up Policy

Course Format

This course uses a team-based learning approach that uses pre-class preparation materials and active learning activities during class time. Your completion and involvement in all these aspects of the course is critical to success. You are required to attend class unless you have an excused absence owing to a documented illness or a University related function.

Pre-Class Preparation Materials

a) Reading assignments will be your first exposure to the course topics, will engage you in social learning, and will be a key pre-class activity helping you prepare for both the in-class activities. You are expected to have these complete prior to attending lab.

Attendance

In-Class Expectations and General Make-Up Policy

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.

Syllabus Changes

The instructor reserves the right to make changes to the syllabus as needed. Any changes will be clearly announced on CANVAS and in class Course Communication E-Learning will be the primary avenue for communication and course management. All announcements for the course will be made using the announcement system on the E-Learning site. Make sure and change your E-Learning settings so that you get notifications about announcements, assignments, exams, changes, etc. in a timely manner. If you are sending e-mails to the instructor, please use CANVAS mail and be sure to include a meaningful subject phrase, and please begin your e-mail with a salutation. [I know that personal e-mails and texts are often sent without even a name to address the recipient at the opening of the communication, but professionally that is unacceptable]. Close your e-mails by typing your name. Check your e-mail for grammar and spelling. Be concise. All of these guidelines are to promote professionalism

Evaluation of Grades

Assignment	**Total Points**	**Percentage of Final Grade**
Formative Assessments (Pre-readings, pre-work Pre-tests, in class formative, skills tests)	varies	20%
Lab notebooks	varies	15%
Written assignments and summative assessments	varies	65%
		100%

Grading Policy

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Percent	**Grade**	**Grade Points**
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33

73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	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

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/.

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 Honor Code (https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. 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

• Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.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: http://www.counseling.ufl.edu/cwc, 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/.

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://www.crc.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://care.dso.ufl.edu.

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