

Sophomore Materials Lab

EMA3000L Sections

Class Periods: EMA3013C-M 1:55-4:55 (13721)

EMA3013C-F 1:55-4:55 (13747)

EMA3013C-T 1:55-4:55 (13748)

EMA3013C- W 11:45-1:40 (13749)

Lecture M 12:50-1:30 PM NEB 202

Location: Rhines B06

Academic Term: Spring 2020

Instructor:

Nancy Ruzycki

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352 846 2991

Office Hours:

Teaching Assistants:

Please contact through the Canvas website

- JT Keane
- Bryan Miller
- TBA

Course Description

Conceptual perspective of the origin of materials behavior and the interrelationships of the materials tetrahedron: structure/property/performance/processing. Conduct experiments on the materials tetrahedron.

1 Credits

Course Pre-Requisites / Co-Requisites

Corequisite: EMA 3010.

Course Objectives

The Table below has the Module and Objectives for each of the Modules

Module/Weeks	Objectives	Main Activities/Labs	Professional Products
Safety Personal Profile Team Development (week 1)	Learn basic lab safety practices Learn to read and understand an MSDS Learn to read and use a Standard Operating Procedure Learn your personality type Learn about effective teamwork Learn about your personality type	1. Actions and Reactions Lab Safety Training 2. MSDS reading and research 3. SOP FTIR of polymers 4. 16 Personalities 5. Teamwork activity 6. Teamwork type assessment	Safety Certificate Professional Journal
Entrepreneurial Mindset (Week2)	Learn about attributes that exist in entrepreneurs. Learn about myths on entrepreneurs which exist and can be debunked. Learn about engineers as entrepreneurial leaders.	1. Activity on Entrepreneurship 2. Activity on personal attributes. 3. Interview with entrepreneur	Professional Journal Biosketch

	Learn about the life of an entrepreneur.		
Engineering Design (Week 3)	Learn about parts and processes within engineering design. Learn about sustainable engineering. Learn about ways of thinking which support design (Design Thinking)	1. Engineering Design on-line activity. 2. Sustainable design Activities 3. In class design activity 4. Design Activity	Professional Journal
Tools for Design and Sustainability (Week 4)	Learn about whole system mapping Learn about measuring sustainability Learn about greener materials, energy effectiveness and lightweighting. Learn how to involve stakeholders as positive forces in design work.	1. Whole system mapping activity 2. Measuring Sustainability 3. Using Granta software to identify green materials. 4. Using Granta software to conduct sustainable design and lightweighting. 5. Interviews and Surveys with Stakeholders. .	Professional Journal
Project Tools/Entrepreneurship Practices (week 5)	Learn about the Inventing Green Toolkit and the business canvas Learn about scrum boards and Gantt charts for process mapping. Learn how to communicate through the design process using project management websites.	1. Design Activity with Business Canvas. 2. Design Activity with Scrum Boards. 3. Activities on ways of professional communication.	1. Business Canvas 2. Scrum Board design 3. Gantt Chart design 4. Plecticia Mapping for design process Professional Journal
Introduction to Bioprinting and Bioprinters (Week 6)	Learn the basics of a bioprinter. Learn the basics of materials used in bioprinting. Learn about stakeholder needs for bioprinting.	1. Activity of bioprinting gel into gel 2. Activity on bioprinting fluorescent material 3. Activity on bioprinting using silica beads. 4. Activity on FDM printing of biomaterials. 5. Grant design activity on biomaterials. 6. Collecting background information on stakeholder needs activity.	Professional Journal Key Learnings document. STAR report.
Engineering Design Project in Biomaterials (Weeks 7-15)	Identify areas for innovation and entrepreneurship within the bioprinting process. Work as a team to conduct research to improve the bioprinting process. Learn to use stakeholders to keep design process focused. Communicate progress for design work.	Develop a team for one aspect of bioprinting (materials, hardware, optimization) and select a bioprinting printer. Conduct a design process to improve an aspect of bioprinting. Consult with experts to refine and improve the design process. Communicate the findings of the design project at every stage.	Creation of project management website Weekly key Learning meetings Weekly team reports Scrum Boards Professional Journal Business Canvas Design Process map Interim Pitch Final Pitch

		Identify areas for innovation and entrepreneurship within the design process.	
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Materials and Supply Fees

See Course Catalogue for Materials and Supplies Fees

Professional Component (ABET):

State the contribution of the course to meeting the professional components of the ABET-accredited degree.

Relation to Program Outcomes (ABET):

The table below is an example. Please consult with your department’s ABET coordinator when filling this out.

Outcome	Coverage*
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	Medium
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	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	
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

None

Recommended Materials

- Fundamentals of Materials Science and Engineering, an Integrated Approach.
- Callister

- 2015, 5E
- ISBN:9780471395515

Course Schedule/(see objectives Matrix for outcomes and weeks)

Attendance Policy, Class Expectations, and Make-Up Policy

Laboratory Attendance is Required and there are no make ups for a missed lab. : Excused absences are allowed with prior notification and lab make-up conducted in advance. These policies are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation. Medical Absences requires a doctors note.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Professional Journal	100 each	15%
In Class Activities	25 each	10%
Project Deliverables	Varies	60%
Project presentations		10%
Team work check-ins	25 each	5%
		100%

Grading Policy

The following is given as an example only.

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>

Writing Requirement.

None

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/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://www.dso.ufl.edu/sccr/process/student-conduct-honor-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 support, 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://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

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