Manufacturing Engineering
EML 4321 Sections 2G60 Class #: 12810
Class Periods: MWF, Period 6, 12:50-1:40 pm
Location: Weil 270
Academic Term: Spring 2023

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.

Instructor:
Name: Yong Huang
Email Address: yongh@ufl.edu
Office Phone Number: 352-392-5520
Office Hours: MW 1:40 -2:30 pm, Zoom meeting (https://ufl.zoom.us/j/94016069792) and by appointment

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
Please contact through the Canvas website
- Yunxia Chen, via Canvas
- Zoom (hxxps://ufl.zoom.us/j/3705765515), 9:30-10:30 am, Tuesdays and Thursdays and by appointment

Course Description
Traditional and nontraditional manufacturing processes and equipment. Application of engineering analysis tools to manufacturing.

Course Pre-Requisites / Co-Requisites
Pre-req: EMA 3010 (Materials), EML 2322L (Design & Manufacturing Lab), and EML 3005 (Mechanical Engineering Design)

Course Outline
- Mechanical Behavior of Materials, Structure of Materials, Surface and Tribology
- Casting
- Conventional and non-Traditional Machining
- Bulk Deformation Processes
- Sheet Metal Forming Processes
- Polymer Processing/Additive Manufacturing
- Electronic Fabrication/Packaging
- Topics in Advanced Manufacturing

Course Objectives
Upon completion of this course, students should be able to demonstrate
a) A descriptive and qualitative understanding of traditional and non-traditional manufacturing processes;
b) The ability to use engineering science tools such as advanced mathematics, stress analysis, vibrations, control theory, and heat transfer to analyze manufacturing processes and machines;
c) The ability to rapidly and accurately perform manufacturing engineering evaluations and analyses; and
d) The ability to create computational simulations of manufacturing processes and machines.

Materials and Supply Fees
N/A
Relation to Program Outcomes (ABET):

Outcome	**Coverage***
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of	High

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	Low
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	Low
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	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	High

*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

- Manufacturing Processes for Engineering Materials
- S. Kalpakjian and S.R. Schmid
- 2017, 6th Ed., Pearson Education
- ISBN-10: 0134290550 / ISBN-13: 978-0134290553

Websites

- Required: E-Learning (http://elearning.ufl.edu/)
- Supplementary: http://plaza.ufl.edu/yongh/EML4321.htm
- Other: Society of Manufacturing Engineers (http://www.sme.org/)

Recommended Materials

- Fundamentals of Modern manufacturing: Materials, Processes, and Systems
- Mikell P. Groover
- 2016, 6th Ed., Wiley
- ISBN-10: 1119128692 / ISBN-13: 978-1119128694

- Manufacturing Processes and Equipment
- George Tlusty
- 1999, 1st Ed., Prentice Hall
- ISBN-10: 0201498650 / ISBN-13: 978-0201498653

- Handbook of Manufacturing
- Yong Huang, Lihui Wang, and Steven Y. Liang
- 2019, World Scientific Publishing

- ISBN-10: 9813271019 / ISBN-13: 978-9813271012

Course Schedule
Tentative teaching schedule is on the last two pages.

Attendance Policy, Class Expectations, and Make-Up Policy
Class policies

- Attendance in class is expected. If one has a conflict with the scheduled office hours, he/she should make an appointment with the instructor/TA(s) as needed. If one has a documented and excusable absence for a sustained period (> 1 week), please contact the professor to make any special arrangements.
- Students are responsible for all announcements, assignments, etc., made during lectures, including changes in the scheduling of lecture topics, homework assignments, and exams. Class absence is not a valid excuse for being unprepared.
- Homework assignments, homework solutions, class handouts, sample exams and other course-related postings will be available on Canvas. Any changes in the schedule or assignments will also be announced on Canvas. Check for updates on the website before every class and monitor your Canvas-related mailbox regularly. Solutions to homework will be posted on the website.

Homework policies

- Homework must be on any type of 8.5'' × 11'' paper, and all work must be shown. Multiple sheets must be stapled in a proper order. Homework must have the homework assignment number, your name, your assigned sorting number (to be given on Canvas) and the date of submission in the upper right corner of the first page.
- Homework must have the page number in the bottom right corner of every page.
- Homework is due in class exactly a week from the assignment date (unless announced otherwise). **Homework should be submitted via Canvas before the start of class on the due date.**
- Working in groups is permitted and encouraged. However, copying homework is NOT permitted. *Use of solution manuals to complete homework is considered cheating and a violation of the honor policy, and it will be fully enforced.*
- *Only one or two problems* from each homework assignment may be graded, and each homework assignment will be given a score of 0 to 10: 5 points for completeness and 5 points for correctness of and effort for the graded problems. No homework assignment drop policy is honored.

Exam policies

- All exams will be held in the regular classroom (unless announced otherwise). The first two midterm exams will be held during the regular class periods. The final exam will be held at the time assigned by the Registrar, which is provided at the end of the class schedule (Page 8).
- A scientific calculator is required for exams. Calculators with communications capabilities will not be allowed.
- **All exams will be closed book and notes. Use of 8.5″ × 11″ formula sheet(s) (one-sided, one for each midterm and three for the final exam) is permitted.** Note: You are not allowed to have verbose descriptions/explanations and figures on the formula sheet(s). Only equations and definitions of variables appearing in the equations and **velocity/force diagrams** are allowed. Formula sheet(s) should be turned in with your test.
- It is the students' responsibility to demonstrate their knowledge on exams with all work shown. *Partial credit* may be given for work that can be followed and where the nature and magnitude of the mistake can be identified. *No credit* will be given for correct answers with insufficient indication of how they were obtained.
- Absence from a scheduled exam without prior consent of the instructor will result in zero credit for that exam. In the event of a last minute emergency, you need submit appropriate official documentation of the emergency (e.g., illness, accident, etc.) as soon as possible.

Re-grading Policy

Any re-grade requests must be communicated with the instructor within one week after return of the graded paper. If needed, a written request may be provided to explain in detail what you want the grader to do and where

you believe he/she has made a mistake in grading. The request must have a date on the top of the first page, your name, sorting number, and e-mail address.

Make-up Exam Policy

The dates and times for the exams are announced in advance. Except for valid medical reasons, no make-up exams will be given. Please schedule your other activities accordingly.

Miscellaneous Policies

Students will be held responsible for knowledge of all scheduling and policy announcements made in class. *Modifications to this syllabus may be required during the semester. Any changes to the syllabus will be posted on the course web site and announced in class.*

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets (11)	10 each	10%
Midterm Exam (2)	50 each	50%
Final Exam	100	40%
		100%

Grading Policy

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

The instructor may adjust individual grades according to a holistic evaluation of the student's performance, improvement, and effort. 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 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 Honor 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. 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
- 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/.

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 Connections 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*:* https://distance.ufl.edu/state-authorization-status/#student-complaint.

EML 4321 Tentative Class Schedule (Spring)

Index	Date		Topic
1	Jan 9	Mon	Introduction to Manufacturing Processes
2	11	Wed	Mechanical Behavior of Materials (Review)
3	13	Fri	Mechanical Behavior of Materials (Review)
	16	Mon	**M.L.K Holiday**
4	18	Wed	Lab Tour / Career Showcase
5	20	Fri	Mechanical Behavior of Materials (Review)
6	23	Mon	Structure of Materials (Review)
7	25	Wed	Structure of Materials (Review)
8	27	Fri	Surfaces & Tribology
9	30	Mon	Surfaces & Tribology
10	Feb 1	Wed	Casting
11	3	Fri	Casting
12	6	Mon	Casting
13	8	Wed	Casting
14	10	Fri	Casting
15	13	Mon	Casting
16	15	Wed	Conventional Machining
17	17	Fri	Conventional Machining
18	20	Mon	Conventional Machining
19	22	Wed	**Exam 1 (covers all materials through Casting)**
20	24	Fri	Conventional Machining
21	27	Mon	Conventional Machining
22	Mar 1	Wed	Conventional Machining
23	3	Fri	Conventional Machining
24	6	Mon	Conventional Machining
25	8	Wed	Non-Traditional Machining
26	10	Fri	Bulk Deformation Processes
	13	Mon	**Spring break**
	15	Wed	**Spring break**
	17	Fri	**Spring break**
27	20	Mon	Bulk Deformation Processes
28	22	Wed	Bulk Deformation Processes
29	24	Fri	Bulk Deformation Processes
30	27	Mon	Bulk Deformation Processes
31	29	Wed	Bulk Deformation Processes
32	31	Fri	Bulk Deformation Processes
33	Apr 3	Mon	**Exam 2 (covers all materials since Exam 1)**
34	5	Wed	Sheet Metal Forming
35	7	Fri	Sheet Metal Forming

36	10	Mon	Sheet Metal Forming
37	12	Wed	Sheet Metal Forming
38	14	Fri	Polymer Processing
39	17	Mon	Polymer Processing
40	19	Wed	Additive Manufacturing/3D printing
41	21	Fri	Electronic Fabrication/Packaging
42	24	Mon	Other Topics in Advanced Manufacturing
43	26	Wed	**Teaching Evaluation and Review**

IMPORTANT DATE:

Final exam: May 4 (Thursday) 7:30 am - 9:30 am, Weil 270