Metallurgy Lab

EMA 4020L Section 4021

Class Periods

Wednesday: Periods 10 & 11 (5:10-7:05 pm)

Location

MAEB 0234, B06

Academic Term

Spring 2023

Please wear closed-toe shoes and pants during the lab sessions

Instructor:
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352-294-1789
Office Hours: TBD

Teaching Assistant:
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Office Hours: TBD

Course Description
Laboratory aspects of metals processing. Science and Technology of metal and manufacturing processing.

Course Co-requisite:
EMA 4120 (Phys. Met I) and EMA 4623 (Process Metallurgy)

Course Objectives
To introduce the student to microstructure-properties-processing inter-relationships in structural materials.

Approach: Demonstrate connections between processing, microstructures, and properties in metals. Use laboratory experiments to illustrate the effect of processing on microstructures and properties.

Materials and Supply Fees
$80

Contribution of Course to Meeting the Professional Component: This is a 1 credit course which counts for engineering sciences.

Relation to Program Outcomes (ABET):
This course addresses the following MSE Program outcomes (Note: Numbers refer to the list of MSE Program Outcomes)

1. Apply knowledge of mathematics, science and engineering principles to materials science and engineering.
2. Design and conduct materials science and engineering experiments and analyze and interpret the data.
3. Design a materials science and engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability constraints.
4. Communicate technical data and design information effectively in speech and in writing to other materials engineers.

ABET
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to function on multidisciplinary teams
(g) an ability to communicate effectively

Required Textbooks and Software
None required

Recommended Materials
Title: Physical Metallurgy Principles,4th Edition
Authors: Reza Abbaschian, Lara Abbaschian, Robert E. Reed-Hill,
Publisher: Cengage Learning
Publication date and edition: 2010/1994, Fourth Edition
ISBN number: 13: 978-0-495-43851-9; 10:0-495-43851-0

Course presentations and reference material to be provided to the students

Course Schedule:
Below is the intended/tentative schedule of classes.

Week	Date	Topic
1	Jan 11	Introduction, Course background/overview
2	Jan 18	Metals Polishing, hardness testing, and SEM
3	Jan 25	Tensile testing
4	Feb 1	Reports and presentations on microstructural analysis and mechanical properties
5	Feb 8	Background on types and heat treatments of steel, steel microstructures
6	Feb 15	Austenitizing, quenching, and tempering experiments
7	Feb 22	Metallography of heat-treated steels
8	Mar 1	Reports and presentations on steel heat treating
9	Mar 8	Background on precipitation hardening
10	Mar 15	Precipitation hardening of Aluminum alloys and hardness testing
11	Mar 22	**Spring Break!**
12	Mar 29	Reports and presentations on precipitation hardening
13	Apr 5	Background on heat treatment of cold rolled metal alloys
14	Apr 12	Recovery, Recrystallization, and grain growth
15	Apr 19	Recovery, Recrystallization, and grain growth
16	Apr 26	Reports and presentations on recovery, recrystallization and grain growth

Attendance Policy
Attendance is required in this course.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies:
https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Evaluation of Grades

Assignment	**Percentage of Final Grade**
Reports	60%
Presentations	40%
Total	100%

Grading Policy

Percent	**Grade**	**Grade Points**
92.0 - 100	A	4.00
88.0 - 91.9	A-	3.67
84.0 – 87.9	B+	3.33
80.0 – 83.9	B	3.00
76.0 - 79.9	B-	2.67
72.0 – 75.9	C+	2.33
68.0 – 71.9	C	2.00
65.0 – 67.9	C-	1.67
62.0 – 64.9	D+	1.33
59.0 – 61.9	D	1.00
56.0 – 58.9	D-	0.67
0.00 – 55.9	E	0.00

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

1) No exams will be given during the course.
2) The reports must be original work and will be evaluated for any evidence of plagiarism (All work will be run through TurnItIn.com). If there is any evidence of plagiarism, the paper will be given an "F" and zero-points.

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, assignment changes, etc. in a timely manner.

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 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

- 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.