

Materials of Chemical Engineering

ECH 4824 Section: NS01

Class Periods: Tue, Period 2-3 (8:30 am – 10:25 am)

Location: Zoom meeting (will be post on Canvas)

Academic Term: Fall 2020

Instructor:

Name: Fan Ren

Email Address : fren@che.ufl.edu

Office Phone Number: 352-392-4727

Office Hours: Zoom meeting (will be post on Canvas) Thurs (8:30 am – 10:25 am)

Tutor:

Boruk, Reena rboruk00@ufl.edu

Tuesday: 10:30 – 12 and Thursday 9:30 to 11:00 or 3:00 to 4:30 PM

Grader:

Boruk, Reena rboruk00@ufl.edu Please prepare the answers of your homework in **Word file** and email it to Boruk Renna.

Course Description

Relations between microscopic structure and macroscopic mechanical, thermal and electrical properties of organic and inorganic solid materials. Engineering applications, including corrosion. (Credit: 2)

Course Pre-Requisites / Co-Requisites

ECH 3023 (Materials and Energy Balances) and ECH 4123 (Phase and Chemical Equilibria)

Course Objectives

Upon completion of this course, a student should be able to:

- Have a broad technical understanding of material properties, behavior, and processing
- Define the mathematical expression to explain material behavior
- Qualitatively describe how material performance can be enhanced by controlling the atomic and molecular structure and composition of the material
- Apply chemical engineering science (e.g., thermodynamics, transport, and kinetics) to the understanding of material processing, properties, and failure (corrosion)
- Estimate how much force can be applied before a specific material fails
- Identify modes of failure and conditions that trigger material failure
- Describe methods for characterizing the structure and properties of materials
- Give examples of the importance of material properties as they benefit humanity
- Give examples of the material failure that has played in technological disasters

Materials and Supply Fees

Course materials, homework assignments, and important announcements and grading policies will be posted on Canvas. Check it regularly

Required Textbooks and Software

No textbook required

Recommended Materials

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Course Schedule

Wk	Date	Topic	HW
1	9/1	Crystal and Amorphous Structure in Materials	

Course Title, Prefix, and Number

Course Instructor and Academic Term

Page 1

2	9/8	Crystal and Amorphous Structure in Materials/Oxidation	HW Crystal
3	9/15	Oxidation	
4	9/22	Diffusion in Solid/Oxidation	HW Oxidation
5	9/29	Exam 1 (Crystal/Oxidation)	
6	10/6	Diffusion in Solid	HW Diffusion
7	10/13	Polymer	
8	10/20	Exam 2 (Diffusion in Solid/Polymer)	HW Polymer
9	10/27	Mechanical Property	
10	11/3	Mechanical Property /Surface Analysis	HW Mech Prop
11	11/10	Surface Analysis	HW Surface Analysis
12	11/17	Exam 3 (Mechanical Properties/Surface Analysis)	
13	11/24	Corrosion	HW corrosion
14	12/1	Semiconductors & Bioinspired Materials	HW Semiconductor
15	12/8	Exam 4 (Corrosion/Ceramic and Semiconductor)	

Attendance Policy, Class Expectations, and Make-Up Policy

State whether attendance is required and if so, how will it be monitored? What are the penalties for absence, tardiness, cell phone policy, laptop policy, etc. What are the arrangements for missed homework, missed quizzes, and missed exams? This statement is required: Excused absences must be consistent with university policies in the [Graduate Catalog](#) and require appropriate documentation. Additional information can be found in [Attendance Policies](#).

Evaluation of Grades

Assignment	Percentage of Final Grade
Homework Sets	40%
Exam (4)	60%
Total	100%

Grading Policy

The following is given as an example only.

Percent	Grade	Grade Points
90.0 - 100.0	A	4.00
87.0 - 89.9	A-	3.67
84.0 - 86.9	B+	3.33
81.0 - 83.9	B	3.00
78.0 - 80.9	B-	2.67
75.0 - 79.9	C+	2.33
72.0 - 74.9	C	2.00
69.0 - 71.9	C-	1.67
66.0 - 68.9	D+	1.33
63.0 - 65.9	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:

[UF Graduate Catalog](#)
[Grades and Grading Policies](#)

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the [Disability Resource Center](#). 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 feedback on the quality of instruction in this course by completing [online evaluations](#). 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 on the [Gator Evals page](#).

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](#) 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.

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 the [Notification to Students of FERPA Rights](#).

Campus Resources:

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

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

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or 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, Various ways to receive assistance with respect to using the libraries or finding resources.
<http://cms.uflib.ufl.edu/ask>.

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>.