

Materials

EMA 3010 Section(s) 1933, 1934, 1936, 1938, 23B4, 23B5

Class Periods: 1933, 1934, Period 4, 10:40-11:30
23B4, 23B5, Period 6, 12:50-01:40
1936, 1928, Period 7, 01:55-02:45

Location: Zoom Links (See Below)

Academic Term: Spring 2021

Instructor:

G. Bahar Basim

gbbasim@ufl.edu

352-846-3557

Office : Particle Science and Technology Building
1180 Center Drive
205 C

Live sessions M, W, F Zoom Links:

Sections 1933, 1934, Period 4, 10:40-11:30 <https://ufl.zoom.us/j/95059190752>

Sections 23B4, 23B5, Period 6, 12:50-01:40 <https://ufl.zoom.us/j/99640164183>

Sections 1936, 1928, Period 7, 01:55-02:45 <https://ufl.zoom.us/j/98198599614>

Office Hours: Wednesdays, 4:00-6:00 pm

Zoom Link: <https://ufl.zoom.us/j/96822254139>

Teaching Assistants:

Please contact through the Canvas website

- Amanda Velazquez
e-mail: velazquez.amanda@ufl.edu

Office Hours : Tue, Thus 4:00-5:30 pm

Zoom Link :

Course Description

Conceptual perspective for origin of materials behavior and the interrelationships of structure/property /performance. Materials selection and use of familiar material (metals, ceramics, polymers, electronic materials and composites) in electronics and structural and other engineering applications.

Course Pre-Requisites / Co-Requisites

CHM 2045 (or equivalent)

Course Objectives

This is an introductory course, designed to provide the fundamental concepts of Materials Science and Engineering. Students will be able to describe structure, properties, and applications of metallic, ceramic, polymeric and composite materials and the significance of the electronic, thermal, magnetic and photonic properties in applications.

Materials and Supply Fees

N/A

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 engineering problems by applying principles of engineering, science, and mathematics.	High
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	
4. An ability to communicate effectively with a range of audiences	
5. 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.	
6. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	
7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	

*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

- Title : Fundamentals of Materials Science and Engineering: An Integrated Approach
- Author : William D. Callister and David G. Rethwisch
- Publication date and edition: Wiley 5th Edition
- ISBN number : 9781119035640

PLEASE NOTE: You need to acquire the e-book version with access to both Wiley Plus and Perusall as these online tools will be used for assessment as indicated in the evaluation of grades and will provide you with additional learning tools.

The simplest and cheapest way to acquire the e-book is via UF ALL ACCESS. This includes a UF Negotiated rate for both products of \$87.50.

HOW TO: Login at the following website and Opt-In to gain access to your UF All Access course materials - <https://www.bsd.ufl.edu/AllAccess> – UF All Access will provide you with your required materials digitally at a reduced price, and the charge will be posted to your student account. This option will be available starting one week prior to the start of the semester and ends three weeks after the first day of class.

Recommended Materials

- Title : Understanding Materials Science
- Author : Rolf Hummel
- Publication date and edition : 1998, Springer 1st Edition
- ISBN number : 0387983031

- Title : Essentials of Modern Materials Science and Engineering
- Author : James Newell
- Publication date and edition : 2009, Wiley 1st Edition

Tentative Course Schedule

Week	Class dates	Topic	Chapter
1	January 11	Course Objectives, Syllabus, Wiley Introduction/ Introduction	1
	January 13	Atomic Structure and Interatomic Bonding	2
	January 15	Atomic Structure and Interatomic Bonding	2
2	January 18	Holiday	
	January 20	Structure of metals, ceramics	3
	January 22	Structure of metals, ceramics	3
3	January 25	Structure of metals, ceramics	3
	January 27	Structure of metals, ceramics	3
	January 29	Structure of Polymers	4
4	February 1	Structure of Polymers	4
	February 3	Structure of Polymers	4
	February 5	Review Midterm Exam I	1-4
5	February 8	Defects in Solids	5
	February 10	Defects in Solids	5
	February 12	Diffusion	6
6	February 15	Diffusion	6
	February 17	Diffusion	6
	February 19	Review Midterm Exam II	5-6
7	February 22	Mechanical Properties	7
	February 24	Mechanical Properties	7

Week	Class dates	Topic	Chapter
	February 26	Mechanical Properties	7
8	March 1	Deformation and strengthening mechanisms	8
	March 3	Deformation and strengthening mechanisms	8
	March 5	Deformation and strengthening mechanisms/Failure	8/9
9	March 8	Failure	9
	March 10	Failure	9
	March 12	Review Midterm Exam III	7-9
10	March 15	Phase Diagrams	10
	March 17	Phase Diagrams	10
	March 19	Phase Diagrams	10
11	March 22	Phase Diagrams	10
	March 24	Phase transformations	11
	March 26	Phase transformations	11
12	March 29	Phase transformations	11
	March 31	Phase transformations	11
	April 2	Review /Recitation Midterm Exam IV	10, 11
13	April 5	Types and applications of materials	13
	April 7	Types and applications of materials/Composites	13/15
	April 9	Composites	15
14	April 12	Composites	15
	April 14	Economic, Environmental, and Societal Issues in MSE	22
	April 16	Economic, Environmental, and Societal Issues in MSE	22
15	April 19	Review /Recitation Midterm Exam V	13, 15, 22
	April 21	Review /Recitation For Final Exam	All

Course Website

The course website is on the Canvas system <http://elearning.ufl.edu/https://ufl.instructure.com/>, where you can find the syllabus, lecture notes, homework problems, announcements, and your grades. Please check it frequently. Within CANVAS you can purchase and access the book as well as Perusall and Wiley Plus.

Lectures and Attendance Policy

Lectures are critical to success in this MSE course. You are required to watch the pre-recorded lecture presentations before the synchronous live classes. Live classes will not be recorded and focus on various In Class Active Learning Activities.

Attendance to Live Classes is not required but highly encouraged since there will be In Class Active Learning Activities through individual and group work, discussions, pop quizzes etc'. Students are encouraged to ask questions and participate. The fundamental concepts will be repeated as required based on the ICE discussions and exam results as needed. You will not be allowed to make up for any In Class Assignment unless you have a valid medical excuse.

Pre-Class Preparation Materials

- **Reading Assignments:** You will be assigned readings from your textbook to help you prepare for both the pre-recorded lectures and the in-class active learning activities including In Class Exercises (ICE), (pop) quizzes as well as In Class Homeworks (ICHW). Your completion of the reading and interaction will be worth 10% of the course grade and will be assessed using Perusall and pop-quizzes during the live sections.
- **Pre-Recorded Lectures:** Each chapter will have pre-recorded lectures posted under the related Chapter Module on Canvas. These pre-recordings will help you prepare for the active learning activities and are a critical aspect of learning the content of this course. You are required to watch them using Perusall and you will be assessed using Perusall and pop-quizzes during the live sections which will be worth 10% of the grade.

Details on WileyPlus and Perusall platform use, social learning interaction and assessment will be covered in the first class session as well as in the Related Module on Canvas.

Exams

There will be 5 Midterm exams throughout the semester. Your lowest exam grade will be dropped. The exam content may change, and the dates are tentative and will be finalized after the add/drop period.

Each exam is weighted equally, and each exam will be worth **10%** of your final grade. Review sessions will be given prior to each exam. Exams will be given as Assembly exams during the E2-E3 period (8:20-9:30 pm) on the assigned dates. Exams will be presented on CANVAS using Respondus LockDown Browser and Zoom.

There will be a comprehensive final exam that is with **15%** of the grade.

You have two weeks after the test results are posted to resolve any questions about scores and grades. No changes to your exam grade will be made after that time.

Exam Conflicts with other course exams

The official UF policy on exam conflict resolution states that when two exams conflict, the course with the higher number will take priority. There will be no exceptions to this rule.

Make-up exams

Students who do not take an exam will receive a grade of 0. There will be a make-up for a missed exam. 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.

All the Makeup exams will be scheduled by the course instructors.

Bonus points

There maybe some bonus points and assignments throughout the semester which will be announced ahead of time.

In Class Active Learning Activities (25% of grade)

There will be various In Class Active Learning Activities. Students who missed in-class activities will receive a grade of zero (0) and there will be no make-up for these unless the students have a valid excuse as defined by the UF policies.

- **In Class Exercises (ICE) (10%)**

There will be multiple “in class” exercises (ICE) introduced during the live class hours. Students will be allowed to work in small groups or work individually depending on the assignment. Everybody will be responsible to submit their own work under the ICE assignment on Canvas. There will be many ICE assigned and the lowest 2 grades will be dropped at the end of the semester.

- **Homeworks and In Class Homeworks (ICHW)**

You will be given practice Homework Problems on WileyPlus to study after each chapter. These assignments will not be graded.

In addition, there will be 5 “in class” Homework (ICHW) assignments during the live class hours. ICHWs are open book exams for students to take individually. They will be given before the Midterm Exams as a practice exam for the students and the questions will be reviewed during the live sections before the Midterm exams. The lowest ICHW grade will be dropped among the 5 ICHW assignments.

- **In Class Discussions (ICD) (5%)**

There will be In Class Discussions as concept checks to review the outcomes of the readings and the pre-recorded lectures.

Record keeping

All materials from this class that students will be saved for a year and will be shredded afterwards.

Syllabus Changes

I reserve the right to make changes in the syllabus as needed. Any changes will be clearly announced on canvas and in class.

Evaluation of Grades

Assignment	Number of Assignments	Percentage of Final Grade
In Class Active Learning Activities	TBD	25%
Prerecorded lectures	32	10%
Reading Assignments	32	10%
Midterm Exams	(5 at 10%, drop the lowest)	40%
Final Exam	1	15%
		100%

Grading Policy

The final grade of the course will be calculated based on the total points scored as follows:

Points	≥92	≥88	≥84	≥80	≥76	≥72	≥68	≥65	≥62	≥59	≥56	<56
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Grade Points	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0

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

Online Teaching

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. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

The university syllabi policy, including the information regarding COVID impacts can be found on the following website:

<http://www.syllabus.ufl.edu/syllabus-policy/>

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

Materials, EMA 3010
Dr. G. Bahar Basim, Spring 2021

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>.

UNIVERSITY OF FLORIDA
Student Honor Code (Abridged)

Preamble: In adopting this Honor Code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the University community. Students who enroll at the University commit to holding themselves and their peers to the high standard of honor required by the Honor Code. Any individual who becomes aware of a violation of the Honor Code is bound by honor to take corrective action. Student and faculty support are crucial to the success of the Honor Code. The quality of a University of Florida education is dependent upon the community acceptance and enforcement of the Honor Code.

The Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty 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."**

Violations of the Student Honor Code include (in part):

(a) **Plagiarism**, in the form of quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution; or submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

(b) **Unauthorized use of Materials or Resources ("Cheating")**. A student shall not use unauthorized materials or resources in an academic activity. Unauthorized materials or resources shall include:

1. Any paper or project authored by the student and presented by the student for the satisfaction of any academic requirement if the student previously submitted substantially the same paper or project to satisfy an academic requirement.
2. Any materials or resources prepared by another student and used without the other student's express consent or without proper attribution to the other student.
3. Any materials or resources that the faculty member has prohibited.
4. Use of a cheat sheet when not authorized to do so or use of any other resources or materials during an examination, quiz, or other academic activity without the express permission.

(c) **Prohibited Collaboration or Consultation**. A student shall not collaborate or consult with another person on any academic activity unless the student has the express authorization.

1. Prohibited collaboration or consultation shall include but is not limited to:
 - Collaborating when not authorized to do so on an examination, take-home test, writing project, assignment, or course work.
 - Collaborating or consulting in any other academic or co-curricular activity after receiving notice that such conduct is prohibited.
 - Looking at another student's examination or quiz during the time an examination or quiz is given. Communication by any means during that time, including but not limited to communication through text messaging, telephone, e-mail, other writing or verbally, is prohibited unless expressly authorized.
2. It is the responsibility of the student to seek clarification on whether or not use of materials or collaboration or consultation with another person is authorized prior to engaging in any act of such use, collaboration or consultation.