EMA 3010 – Introduction to Materials Science and Engineering
Course Syllabus – Fall 2018 Section 2999

	Office	E-Mail
Prof: G. Bahar Basim	205 C Particle Sci. & Tech.	gbbasim@ufl.edu
TA: Darshan Bamney		darshan.bamney@ufl.edu

Course Description (3 credit hours)

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

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.

Class Time

Monday, Wednesday, Friday Period 2 08:30-9:20 pm LIT 0101

Prerequisites: CHM 2045

Text book: (required)

Title: Materials Science and Engineering: An Introduction, 10th Edition
Author: William D. Callister and David G. Rethwisch
ISBN: 9781119405498, 10th edition, e-book

Course Website

The course website is on the Canvas system http://elearning.ufl.edu/, where you can find the syllabus, lecture notes, homework problems, announcements, and your grades. Please check it frequently.

Lectures

Lectures are critical to success in this MSE course. Attendance is not required but highly encouraged since there will be In Class Exercises (ICE) and pop-quizzes. Students are encouraged to ask questions and participate. The fundamental concepts will be repeated as required based on the ICE discussions as well as quiz averages as needed.

Homework, due as shown in WileyPlus Assignments

Homework exercises from the end of each chapter will be assigned. These homework questions are essential to your study and some exam questions will be adapted from them. There will be 12 homework assignments throughout the semester, and the lowest 2 will be dropped from the final score. Each homework assignment is weighted equally, and the homework will account for **10%** of your grade. Homework will be multiple-choice and will be posted, sub-

mitted, and graded through the Canvas/WileyPLUS web site via e-learning. **No late homework assignments will be accepted.** You will be allowed 1 or more re-submission attempts for each homework, but this must be done before the homework due date/time, so start your homework assignments early to allow time for resubmission. Please see the TAs during office hours to discuss homework problems.

Exams

There will be 3 Midterm exams throughout the semester. 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 20% of your final grade. There will be a comprehensive Final Exam which is also 20% of your final grade. Review sessions will be given prior to each exam. The tentative exam dates are as follows;

Midterm Exam 1	: Monday, September 24, 2018
Midterm Exam 2	: Wednesday, October 24, 2018
Midterm Exam 3	: Friday, November 16, 2018
Final Exam	: Wednesday, December 12, 2018

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

Make up exams will be provided only with the ***prior approval of the instructor in accordance with university policies as per the following link.***
(https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx)
In general, acceptable reasons for excused absence from an exam include illness, serious family emergencies, special curricular requirements, military obligation, court-imposed legal obligations, and religious holidays. In all cases, you will be required to provide written documentation, and obtain prior instructor approval. You will not be excused from any exam without following the policy above, with no exceptions. Students not in attendance for the scheduled exam will receive a score of zero. **You must notify the instructor no less than 1 week of the scheduled exam of your intent and justification for missing the exam.** Make-up exams for excused absences as well as exam conflicts must occur within 1 week of the missed exam, and may occur before the missed exam.

Grading

Grades will be based on your understanding and mastery of the material as demonstrated by quantitative scores on homework (10%), quiz and In Class Exercise assignments (10%), three Midterm exams (20% each) and a comprehensive Final (20%).

Grading Scale

Percentage	≥90	≥84	≥80	≥76	≥72	≥68	≥64	≥60	≥56	≥52	≥50	<50
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

A "C-" will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: A C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Office Hours

Office hours : Tuesday 1:00 pm - 3:00 p.m. [PS&T 205C]
(you can also ask questions after the classes as necessary)

TA office hours : TBD

I will always try to respond to e-mail questions as fast as possible. Important e-mail questions (minus identifying information) and answers will be posted to the class either by e-mail or on the course website for the benefit of other students.

Contribution of course to meeting the professional component

(ABET only – undergraduate courses)
This course addresses the following MSE Program outcomes (note: Numbers refer to the list of MSE Program outcomes):
1.Ability to apply knowledge of mathematics, science, and engineering to materials systems.

- Bonus points - There may be some bonus point activities that will be assigned during the class hours.
- Quizzes- There will be pop quizzes during the classes. Quizzes are personal assignments. "Working together" is not allowed.
- In Class Exercises (ICE) - There will be multiple "in class" exercises during the class hours. Students will be allowed to work in small groups or work individually depending on the type of given assignment. ICE will either be graded or assigned as bonus points as an indicator of class participation.
- Midterm Exams –
    - All cell phones must be turned off and they cannot be used in place of a calculator.
    - 1 letter size paper can be used as a cheat sheet for the exams that only contains the formula relevant to the chapters included in the exam.
    - You are responsible to know all the functions of your calculators
    - Show all your work as needed

- Any suspicious activity during exam will result in marking of your exam paper to be evaluated accordingly.

- Behaviour in class –
    - No behavior that can distract the other students in class will be allowed.
    - Jean-Jacques Rousseau Principle "Ones freedom ends where the others freedom starts."
    - Destructive behavior will result in your dismissal from the class.

- Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.
  Note that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures.
  See https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/
- Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.
- UF Counseling Services –Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
  UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
  Career Resource Center, Reitz Union, 392-1601, career and job search services.
- 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.
- Software Use – All faculty, staff and student 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.

- Record keeping - all materials from this class that students did not pick up (graded exams, etc.) within 1 year of the end of class will be shredded on or after June 30, 2019.
- 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.***

Tentative Course and Lecture Outline

Week	Class dates	Topic	Chapter
1	August 22	Course Objectives, Syllabus, Introduction	**1**
	August 24	Atomic Structure and Interatomic Bonding	**2**
2	August 27	The Structure of Crystalline Solids	**3**
	August 29		
	August 31		
3	**September 3**	**Veteran's Day**	
	September 5	Imperfections in Solids	**4**
	September 7	Imperfections in Solids/ Diffusion	**4-5**
4	September 10	Diffusion	**5**
	September 12	Mechanical Properties of Metals	**6**
	September 14		
5	September 17	Dislocation and Strengthening mechanisms	**7**
	September 19		
	September 21	Review	**1-7**
6	September 24	In Class Midterm Exam 1	**1-7**
	September 26	Failure	**8**
	September 28		
7	October 1	Phase Diagrams	**9**
	October 3	Phase Diagrams	**9**
	October 5	Phase Diagrams	**9**
8	October 8	Phase Diagrams (Review)	**9**

Week	Class dates	Topic	Chapter
	October 10	Phase Transformations	**10**
	October 12	Phase Transformations	**10**
9	October 15	Phase Transformations (Review)	**10**
	October 17	Thermal Processing of Metal Alloys and Metal Alloys	**11**
	October 19	Thermal Processing of Metal Alloys and Metal Alloys/Review	**11**
10	October 22	Review	**7-11**
	October 24	In Class Midterm Exam 2	
	October 26	Structure and Properties of Ceramics	**12**
11	October 29	Ceramic Processing	**13**
	October 31	Polymer Structures	**14**
	November 2	**Homecoming**	
12	November 5	Polymer Processing	**15**
	November 7	Composites	**16**
	November 9	Corrosion and Degradation of Materials	**17**
14	**November 12**	**Veteran's Day**	
	November 14	Review	**12-17**
	November 16	In Class Midterm Exam 3	**12-17**
15	November 19	Electrical Properties	**18**
	November 21	Electrical Properties	**18**
	November 23	**Thanksgiving**	
16	November 26	Thermal Properties	**19**
	November 28	Magnetic Properties	**20**
	November 30	Optical Properties	**21**
17	December 3	Economics, environmental issues/Review (18-22)	**22**
	December 5	Review	**All**