

**EMA 3010 – Introduction to Materials**  
**Fall 2003**  
**MWF, Period 5 (11:45am-12:35pm)**  
**Class room: MCCA G186**

**Instructor:**

Dr. Fereshteh Ebrahimi  
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Website:

**Office Hours:**

Mondays and Thursdays  
from 2pm to 4pm  
(or by appointment)

**Teaching Asistant:**

Ms. Nichole Whitney  
Materials Science and Engineering Department  
165 Rhines Hall  
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**Office Hours:**

Wednesdays and Fridays  
from 2pm to 4pm

**Text Book:**

Materials Science and Engineering: An Introduction, W. D. Callister, Jr., 6<sup>th</sup> Edition, John Wiley and Sons, 2003.

**Web Communication:**

The information regarding this course will be disseminated via **WebCT** ([www.webct.ufl.edu](http://www.webct.ufl.edu)). All announcements, class handouts and homework assignments will be given on **WebCT**. Also the grades will be posted on this site. There will be a demonstration of how to use the WebCT on the first day of the class. You may acquire further help from your TA.

**Conduct:**

Correct behavior in class is always important but even more so in a large class such as this. **Making noise, talking, reading the paper, leaving your cell phone on, leaving early or arriving late can be very distracting.** If your cell phone rings during class it will be confiscated for the remainder of the class period.

Attendance in class is important. Material covered in class will follow the book closely in some areas and will deviate from them in others. **Those not in class for any reason are responsible for the material covered and the homework assigned.**

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

## Academic Honesty:

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 student at the University of Florida and to be honest in all work submitted and exams taken in this class and all others.

## Assignments:

### Homework

There will be a total of six homework assignments. Each homework is due a week after it has been assigned. The homework should be handed to the TA in the beginning of the class. **No late homework will be accepted!**

The average homework grade will be based on the best five homework grades (the worst grade will be dropped).

### Group Projects

There will be a total of three group projects. On the first day of the class you will be assigned into a group. The group listing will also be announced on the WebCT. The only way to change your group assignment is to find a person in your desired group who is willing to switch place with you. Such a change should be brought to the attention of your TA.

Every member will evaluate the participation of the other members in her/his group for each project. This evaluation will be confidential. If a person receives more than three negative evaluations by her/his group members, she/he will not receive only 50% of the grade. For more than five negative evaluations, the person will receive 0% of the grade.

## Exams:

There are four examinations. The dates and the percent grade for each exam are given below. The place of examinations will be determined at a later date.

<b>Exam 1</b>	Monday, September 22 <sup>nd</sup> , 7:00pm-9:00pm	25%
<b>Exam 2</b>	Monday, October 20 <sup>th</sup> , 7:00pm-9:00pm	30%
<b>Exam 3</b>	Wednesday, Nov. 19 <sup>th</sup> , 7:00pm-9:00pm	30%
<b>Exam 4</b>	Thursday December 18, 3pm-5pm	15%
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	Total	100%

## Grades:

Homework	15%
Group Projects	10%
Exams	75%
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Total	100%

Letter grades will be assigned as follows:

≥90 = A; 85-89 = B+; 80-84 = B; 75-79 = C+; 70-74 = C; 65-69 = D+; 60-64 = D; 59 ≤ = E

There will be **no curving** of grades

## Objectives:

The objectives of this course are:

1. To learn the atomic, molecular, crystal, nano-, micro- and macro-structure of various materials.
2. To become familiar with the mechanical and physical properties of materials and their relationship with the structure of materials.
3. To gain knowledge of the fabrication techniques and applications of materials.

## Outcomes:

1. The students will be able to distinguish different types of materials such as metals, ceramics and polymers.
2. The students will know the basic fabrication and processing methods for each type of materials.
3. The students will be able to select materials for general applications.
4. The students will be able to function effectively in a group.

## Schedule:

The following is a tentative schedule for this course.

Subject	Reading Assignment	# Sessions	Homework Assignments
<b>1. Introduction</b>	Chapter 1	1	-
<b>2. Structure of Materials</b>			
2.1. Atomic Structure and Bonding	Chapter 2	1	Project 1
2.2. Structure of Metals and Ceramics <b>Dr. Susan Sinnott will teach this section.</b>	Chapter 3, 12-1 through 12-4	3	HW #1
2.3. Imperfections	Chapter 4 12-5	2	Project 1 is due!
			HW #1 is due!
2.4. Diffusion	Chapter 5, 12-6	2	HW #2
2.5. Structure of Polymers	Chapter 14	2	HW #2 is due!
<b>Exam 1</b>			

<b>3. Mechanical Properties</b>			
3.1. Tensile and Creep Testing	6-1 thru 6-8, 15-1 thru 15-8, 8-14, 8-15	4	HW #3
			Project 2
3.2. Hardness and Flexural Testing	6-10, 12-9	1	HW #3 is due!
3.3. Fracture and Fatigue	8-1 thru 8-13, 12-8, 15-5	3	HW #4
			Project 2 is due!
3.4. Deformation Mechanisms	7-1 thru 7-10, 15-7 thru 15-9, 12-10, 12-11	4	HW#4 is due!
<b>Exam 2</b>			
<b>4. Processing and Application</b>			
4.1. Fabrication of Metals	11-4 thru 11-6, 7-11 thru 7-13	2	
4.2. Phase Diagrams	9-1 thru 9-15	2	HW #5
4.3. Kinetics of Phase Transformation	Chapter 10	3	
			HW #5 is due!
4.4. Fabrication and Processing Ceramics	Chapter 13	2	Project 3
4.5. Fabrication and Processing of Polymers	15-10 thru 15-24	3	Project 3 is due!
<b>Exam3</b>			
<b>5. Physical Properties</b>			
5.1. Corrosion	17-1, 17-2, 17-7, 17-9	2	HW #6
5.2. Electrical Properties	18-1 thru 18-12	3	HW #6 is due!
5.3. magnetic Properties	20-1 thru 20-7	2	
<b>Exam 4</b>			