ENGR45: Introduction to Materials Science and Engineering
Spring 2017

Class times
Lecture:
T, R 10:30 am - 11:45 am; CLSSRM 105. Lectures start promptly; you are expected to arrive on time to hear important announcements that include the learning objectives for each lecture.

Discussion Section: T 1:00 pm
Lab Sections: Please sign up for each lab section.

Course goals:
You will apply a basic knowledge of physics, chemistry, mathematics and biology to develop an understanding of how structure and processing affect the properties and performance of materials. You will learn the basic principles of materials selection.

Learning outcomes
You will be able to
- Identify which material properties mush be optimized for particular applications,
- Identify candidate materials that, because of their composition and structure, exhibit those properties, and
- Design viable processing strategies that achieve the necessary chemical and physical micro-structures in the chosen material.

You will practice these skills – and hone the appropriate information-gathering, computational and data-handling proficiencies – in homework, laboratory, and discussion exercises. You will demonstrate these skills and proficiencies formally in the midterm and final examinations.

Lead instructor

Vincent Tung
Office hours: T 1:00 pm – 2:00 pm; SE2-292

Teaching assistants (TAs)

Anley "T" Tefera	**Vipawee "Yen" Limsakoune**	**Vishal Zade**
Office hours:	Office hours:	Office hours:

Text (required):

Materials Science and Engineering: An Introduction, 9th Edition, 2014, by William D. Callister, Jr. and David G. Rethwisch. This edition incorporates some significant updates and improvements relative to previous editions.

Laboratory/Discussion Sections

Learning a subject is enhanced by ***doing*** the subject – working in the laboratory, discussing concepts, and solving (many) practice problems. Your Laboratory/Discussion sections (L/Ds) are designed to support your efforts to learn the course material by working with it in as many ways as possible.

You will experience a variety of practical, computational and analytical exercises in the L/Ds. None of these will be graded, and attendance is not mandatory, ***but*** material covered in the L/Ds can and will be included on homework, midterms and the final, and attendance will be recorded.

Homework

Homework is a critical component of this course and is designed to help you learn, understand and practice the material. Homework will be *due each week at the beginning of the Thursday lecture*, unless otherwise stated. **Late homework will not be accepted.** To account for illness and other emergencies, the lowest homework score will be dropped. You are encouraged to work with your peers when doing homework. However, each student must turn in his/her own homework assignment and it must reflect his/her own work. You must explicitly identify all peers with whom you worked.

If you have access to solutions from a previous semester, you might feel tempted to use these as a substitute for doing your own work. While this might boost your homework score, it will be of little help in preparing you for the midterms, the final, and a successful professional career.

Exams

There will be two in-class midterm exams as indicated on the accompanying schedule. There will also be a comprehensive final exam. There will be no make-up exams. If you are sick during a regularly scheduled exam, please bring a note from the university clinic or your own doctor verifying your illness. Your course grade will then be determined by the rest of your work.

Crib sheets will not be allowed during any of the exams. However, calculators will be allowed when necessary, provided that they are not used to store data or formulae pertaining to the course.

Past midterm and final exams are available on the class UCMCROPS site.

Grade Determination

Your final grade will be based on the following components:

- homework (10%).
- first midterm (20%)
- second midterm (20%)
- materials essay (10%)
- final exam (40%) Note that grades will not be assigned on a curve, but will be based on an absolute measure of your work. **Dropping the Course** Please see the UC Merced General Catalog and the Registrar's / Student First website for details. **UCMCROPS** The UCMCROPS site "S17-ENGR 045 01" will be used for periodic course announcements, and for the distribution of class notes, L/D exercises, homework sets, and solutions. You can also check the scores that you have received on your homework assignments and exams. **Warning: pay no attention to any letter grade that is reported on UCMCROPS,** *except* **for the midterm and final grades.**

Handouts for a given week will normally be posted during the preceding weekend, and can be annotated electronically or printed. Full copies of lecture slides will normally be posted during the weekend following the lecture. To encourage you to take effective notes, and to think about the material, the lecture slides are "read only".
UCMCROPS may also be used to distribute audio podcasts (.mp3 files) of some lectures. These can be used best in conjunction with the corresponding slides.

Special Accommodations

If you qualify for accommodations because of a disability, please submit a letter from Disability Services to the instructor in a timely manner so that your needs may be addressed. Student Affairs determines accommodations based on documented disabilities.
The instructors will make every effort to accommodate all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please speak with the lead instructor during the first week of class regarding any potential academic adjustments or accommodations that may arise due to religious beliefs.

Academic Honesty and Conduct

Students are expected to complete their own work and to abide by the UC Merced academic honesty policy, which can be found on the Student Life website http://studentlife.ucmerced.edu/ under the "Student Judicial Affairs" link.
Note that most of the handouts provided in this course are protected by copyright, and are flagged accordingly on UCMCROPS. They are for your *personal* use only. Re-posting the files or their contents on sites such as (for examp le) "Course Hero" is an explicit violation of this copyright.
Students and instructors are expected to honor UC Merced's Principles of Community: http://www.ucmerced.edu/about-uc-merced/principles-community.

Final Thoughts

If you are in trouble (behind in homework, doing worse in the course than you would like, etc.) for whatever reason, please let us know. We'll try to help!

As is always the case at university, there is quite a lot of material in this course, and not a lot of time in which to learn it. There are many resources available to help you. We strongly encourage you to take advantage of them.

Because this is a 4-unit course, you should plan to do *at least* 12 hours of work on it, per week. Here is one suggestion for how to spend this time effectively:
- reading the textbook ahead of the lectures: 2.5 hours/week
- attending the lectures: 2.5 hours/week
- attending and participating in lab/discussion: homework: 2 hours/week
- review, and preparation of review notes: 2 hours/week

It is a good idea to explicitly block out time for all these activities in your schedule. The same is true for your other courses too!