

MSE 3300-001 / MSE 5300-001
Introduction to Materials Science and Engineering
Fall 2015

Instructor: Kyungsuk Yum
Fine Arts Building (FA) 309
Tuesday and Thursday 5:00pm–6:20pm

Instructor

Kyungsuk Yum, Materials Science and Engineering
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Office hours: By appointment and as announced in class

Time and Place of Class Meetings: Tuesday and Thursday 5:00pm–6:20pm, FA 309

Description of Course Content: Physical, mechanical, electrical, optical, magnetic, thermal and chemical properties of metals, semiconductors, ceramics, polymers, composites, and aggregates and the relationships between these properties and the electronic, crystal, micro and macro-structures of the materials. Prerequisites: CHEM 1442 or CHEM 1465; PHYS 1444.

Required Textbooks and Other Course Materials: *Materials Science and Engineering: An Introduction* by William D. Callister, Jr and David G. Rethwisch, 9th Edition

Descriptions of Major Assignments and Examinations: Weekly (or biweekly) homework assignments, two 80 minute in-class exams, and final exam. No late homework will be accepted unless prior arrangements are made with the instructor for valid excuses. There will be no makeup exams: If you have a valid reason for missing an exam, I will work with you to reach an acceptable time to take the exam. Cases will be dealt with on a case-by-case process.

Attendance: At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I will factor attendance into the grade (15%) as follows: A (full credit) 0-1, B 2-3, C 4-5, D 6-7, F (no credit) > 7 unexcused absences. If you have a real excuse, you must notify me via email (preferably in advance).

Grading: Homework 15%, Exam 1 20%, Exam 2 20%, Final (Comprehensive) 30%, Attendance 15%

Make-up Exams: Make-up exams will not be provided unless special circumstances warrant.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with*

Disabilities Act (ADA). All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Title IX: The University of Texas at Arlington is committed to upholding U.S. Federal Law "Title IX" such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit www.uta.edu/titleIX.

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During

this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

<p>Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911.</p>

Course Schedule
(MSE 3300 / MSE 5300, Fall 2015)

Class Date		Lecture Title	Assignments
Thurs	Aug 27	Chap. 1: Introduction	
Tues	Sep 1	Chap. 2: Atomic Structure and Interatomic Bonding	
Thurs	Sep 3		HW #1
Tues	Sep 8	Chap. 3: The Structure of Crystalline Solids	
Thurs	Sep 10		
Tues	Sep 15	Chap. 4: Imperfections in Solids	
Thurs	Sep 17		HW #2
Tues	Sep 22	Chapter 5: Diffusion	
Thurs	Sep 24		HW #3
Tues	Sep 30	Chap. 6: Mechanical Properties of Metals	
Thurs	Oct 1		HW #4
Tues	Oct 6	Chap. 7: Dislocations and Strengthening Mechanisms	
Thurs	Oct 8		
Tues	Oct 13	Chap. 8: Failure	
Thurs	Oct 15	Exam 1 (Chap. 1–5)	
Tues	Oct 20		HW #5
Thurs	Oct 22	Chap. 9: Phase Diagrams	
Tues	Oct 27		
Thurs	Oct 29	Chap. 10: Phase Transformations	
Tues	Nov 3		HW #6
Thurs	Nov 5	Chap. 14: Polymer Structures	
Tues	Nov 10		
Thurs	Nov 12	Chap. 15: Characteristics, Applications, & Processing of Polymers	
Tues	Nov 17		HW #7
Thurs	Nov 19	Exam 2 (Chap. 6–10)	
Tues	Nov 24	Chap. 16: Composites	
Thurs	Nov 26	No Class - Thanksgiving Holidays	
Tues	Dec 1	Chap. 18: Electrical Properties	
Thurs	Dec 3		HW #8
Tues	Dec 8	Review	

* Final Exams: Dec 15, 2015

* Guest lecturers may be invited.

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. – Kyungsuk Yum