

MAE 3324-002
Structure and Mechanical Behavior of Materials
Fall 2009
Tu-Th 9:30 – 10:50 am
311 Woolf Hall

Instructor: Roger D. Goolsby

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Course Prerequisites: CHEM 1465 or CHEM 1441; PHYS 1444, MAE 2312 (or concurrent enrollment).

Required Textbook: *Fundamentals of Materials Science & Engineering, An Integrated Approach, 2nd Edition*, William D. Callister, Jr.

Course Description: This course is concerned with the interrelationships between processing, structure and properties of engineering materials, with emphasis on the mechanical behavior of metals, polymers, and composite materials.

Course Learning Goals/Objectives: Students should develop a thorough understanding of the factors affecting the mechanical behavior of materials.

Attendance Policy: Students are expected to attend each class. Each student will be required to sign a daily attendance record. It is the responsibility of students missing classes that their assignments are turned in on time. Make-up policies are detailed under the sections: Major Exams and Homework and Mini-exams.

Classroom Etiquette: In the classroom, all electronic devices must be silenced. Laptops are not to be open during class. Please: no earphones or texting during class.

Course Content: The textbook chapters listed below will be covered during this course. Supplemental information may also be provided via the web site.

<u>Chapter Sections</u>	<u>Page #</u>	<u>Description</u>
1.1-.7	1-8	Introduction
2.1-.8	10-29	Atomic Structure and Atomic Bonding *PARTIAL REVIEW*
3.1-.6	32-46	Structure of Metals and Ceramics
.10-.19	54-61	
	63-75	
	82-83	
4.1-.12	93-118	Polymer Structures
5.1-.13	123-149	Imperfections in Solids
6.1-.7	154-171	Diffusion
10.1-20	357-409	Phase Diagrams
11.1-.2	418-420	Phase Transformations
.5	432-443	
.7-.17	447-467	
7.1-.17	177-219	Mechanical Properties
	223-225	
8.1-.19	236-275	Deformation and Strengthening Mechanisms
9.1-.15	282-331	Failure (Fracture, Impact, & Fatigue)
	345-347	
15.1-.10	626-654	Composites
.14-.15	659-662	
12.1-.13	475-500	Electrical Properties
.15	502-509	
	522-523	
16.1-.3	668-678	Corrosion and Degradation of Materials
.5-.9	686-699	
	706-708	

Course Grading Policy: The final course grade will be based on homework, mini-exams and major exams as detailed below.

First Exam	20 %
Second Exam	35 %
Comprehensive Final Exam	35 %
Homework, Mini-exams	<u>10 %</u>
	100 %

- Major Exams:**
- (a) Three major exams will be given (which includes a comprehensive final exam). Tentative dates for the first two exams are: Thursday October 1 (Exam #1); Thursday November 12 (Exam #2). The Final Exam is scheduled for Thursday December 10, 8:00 – 10:30 a.m.
 - (b) Make-up policy - there will be a comprehensive make-up exam scheduled for the last week of the semester for students missing one of the two mid-term exams during the semester.
 - (c) No electronic devices of any kind are allowed during exams.

Homework and Mini-exams (missing assignments and late policy):

A portion of the final grade will be determined from homework and mini-exam scores. No late homework will be accepted for credit. Students missing mini-exams will not have opportunity for make-up.

American with Disabilities Act

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112 - The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide “*reasonable accommodation*” to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels. Information regarding specific diagnostic criteria and policies for obtaining academic accommodations can be found at www.uta.edu/disability. Also, you may visit the Office for Students with Disabilities in room 102 of University Hall or call them at (817) 272-3364. If you require an accommodation based on disability, I would like to meet with you in the privacy of my office during the first week of the semester to make sure that you are properly accommodated.

Academic Dishonesty

It is the philosophy of the University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

“Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.” (Regents’ Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22)

You may not copy any portion of another student’s homework or the homework solutions from previous years, including sharing spreadsheet formulas and output. You may discuss homework and solution techniques with a fellow classmate only after you have attempted to solve the problem. After the discussion you must work the problem by yourself. You are not to use solutions manuals for the text used in this course for homework problems.

It is your responsibility to know University policies on these matters.

Student Support Services Available:

The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally or socially should contact the Office of Student Success Programs at (817) 272-6107 for more information and appropriate referrals.

E-Culture Policy

The University of Texas at Arlington has adopted the University e-mail address as an official means of communication with students. Through the use of e-mail, UT Arlington is able to provide students with relevant and timely information, designed to facilitate student success. In particular, important information concerning registration, financial aid, payment of bills, and graduation may be sent to students through e-mail.

All students are assigned an e-mail account and information about activating and using it is available at www.uta.edu/email. New students (first semester at UT Arlington) are able to activate their e-mail account 24 hours after registering for courses. There is no additional charge to students for using this account, and it remains active as long as a student is enrolled at UT Arlington. Students are responsible for checking their e-mail regularly.

Drop Policy & Grade Grievance Policy

Please refer to the university drop and grade grievance policies.