

ChE 105 Materials Engineering
11:00 am - 12:15 p.m. TTh
Fall 1996

Instructor: Edwin L. Kugler

Office Hours: 10:00 - 11:00 am TTh, 2:00 - 3:00 pm MW, and by appointment
431 Engineering Sciences Building
293-2111 ext. 414

Required Textbook Materials Science and Engineering, An Introduction, William D. Callister, Jr., John Wiley, 3rd edition, 1994

Course Outline:

- A. Basic Concepts
 - 1. Atomic Structure and Interatomic Bonding
 - 2. Structure of Crystalline Solids
 - 3. Imperfections in Solids
 - 4. Diffusion
- B. Properties of Metals
 - 1. Mechanical Properties of Metals
 - 2. Dislocations and Strengthening Mechanisms
 - 3. Failure
 - 4. Phase Diagrams
 - 5. Phase Transformations
 - 6. Thermal Processing
 - 7. Metal Alloys
- C. Properties of Ceramics
 - 1. Structures and Properties of Ceramics
 - 2. Processing of Ceramics
- D. Polymers
 - 1. Polymer Structures
 - 2. Characteristics, Applications and Processing of Polymers
- E. Composite Materials
- F. Corrosion and Degradation of Materials

Grading: The grade will be determined by homework and three in-class exams. Class average after three exams will separate B's and C's. One standard deviation up and down will define cut-off for A's and D's. The final exam is optional and may be used to replace either the homework or the lowest exam grade. There will be no make-up exams.

Homework	(25%)	weekly assignments
Exam 1	(25%)	Thursday, September 19
Exam 2	(25%)	Tuesday, October 22
Exam 3	(25%)	Thursday, November 21
Final	(optional)	3:00 - 5:00 pm, Thursday, December 12