

Course Syllabus
INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING
MME 2303
Fall 2018

Course Description:

An introduction to the properties of engineering materials and their relationships to structure, behavior, and processing; materials testing and measurement of properties. Selection of materials for engineering applications considering the interrelationships between structure, properties, processing and performance. Prerequisite: CHEM 1305 with a grade of "C" or better.

Course Text:

Materials Science & Engineering: An Introduction, 10th Edition, Callister

The 9th edition can also be used (either ebooks or hardcover)

Professor:

Dr. Shalayna Smith, P.E.

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Office Hours:

TR 10:30-12:00 or by appointment

Class Meeting Times and Places:

Tuesday and Thursday 9:00 am -10:20 am
Liberal Arts 122

Deliverables and Grading:

The purpose of grading is not to rank you, but to uphold a standard of quality and to give you feedback. The final letter grade will be based on a combination of quizzes and exams. The percentages are as follows:

Homework: 0%
Quizzes/Mini-Projects: 20%
Exams: 60% (15% per exam)
Final Exam: 20%

Homework will be assigned but not graded or turned in for credit. Homework is to provide you with a forum to practice problems in order to study for the exams and quizzes.

Quizzes will be given at the beginning of class and will be based on homework problems or example from a previous class. There will be no make-up quizzes.

Please Note: NO programmable calculators will be allowed for exams or quizzes.

Make-up Exam Policy - If you miss a regularly scheduled exam, you may take a make-up exam in accordance with the following:

- All make-up exams will be given on Dead Day (December 7th) at a time that will be announced. There will be no exceptions.
- You can only take one make-up exam. So, do not miss more than one exam during the semester.
- Every effort will be made to construct make-up exams to cover the appropriate material that was designated for the regularly scheduled exams. The length and difficulty should be comparable.

Measurable Student Learning Outcomes:

How atomic bonding affects the properties of materials?

What common crystalline structures are found in materials and how these structures affect their properties?

What are the common crystalline imperfections and how do they affect the properties exhibited by materials?

The relationships between crystal structure, defects, and material properties.

What are the fundamental mechanical tests and how is the data obtained from these tests used in engineering design?

How to predict and control the properties in materials through processing to include solidification, deformation and heat-treating?

The general mechanical and physical properties of industrially utilized materials.

Materials selection in engineering design.

Understanding the essence of material performance in terms of service conditions that induce creep, excessive deformation, fatigue, fracture, wear or corrosion.

What do I need to do to learn these things?

This course has a lot to do with concepts. To learn the concepts you have to read the book ahead of class time, attend class regularly and take notes, review the PowerPoint slides presented on Blackboard, do the homework and study for all of the exams.

Can I work in a group?

I encourage you to work together in groups to solve homework problems. Discussing problems in groups is a very effective way to learn difficult concepts.

You must work alone when completing quizzes and exams.

Your work must be professional. If you would be embarrassed to hand your homework/quiz/test to your supervisor, please do not hand it to me. Work that is deemed unprofessional will be returned ungraded.

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Cheating/Plagiarism:

Cheating is unethical and not acceptable. Plagiarism is using information or original wording in a paper or reference without giving credit to the source of that information or wording: it is also not acceptable. You may not submit work for this class that you did for another class. If you are found to be cheating or plagiarizing, you will be subject to disciplinary action, per UTEP catalog policy. Refer to <http://www.utep.edu/dos/acadintg.htm> for further information.

Disabilities:

If you have a disability and need accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.

MME 2303 – Proposed course schedule and important dates.

Date	Topic
8/28	Syllabus & Introduction
8/30	Atomic Structure and Atomic Bonding in Solids
9/4	Metallic Structures
9/6	Metallic Structures
9/11	Defects
9/13	Test 1
9/18	Diffusion
9/20	Diffusion & Mechanical Tests/Behavior—Metals
9/25	Mechanical Tests/Behavior—Metals
9/27	Dislocations
10/2	Test 2
10/4	Deformation Mechanisms—Metals
10/5	Drop Deadline
10/9	Strengthening/Hardening—Metals
10/11	Strengthening/Hardening—Metals
10/16	Failure—Metals
10/18	Failure—Metals
10/23	Test 3
10/25	Phase Diagrams—Metallic Systems
10/30	Phase Diagrams—Metallic Systems
11/1	Phase Diagrams—Metallic Systems
11/6	Kinetics of Phase Transformations
11/8	Recovery, Recrystallization, Grain Growth
11/13	Test 4
11/15	Correlation of Properties with Microstructure
11/20	No Class
11/22	No Class
11/27	Metal Alloy Types/Properties/Applications
11/29	Ceramic
12/4	Polymers
12/6	Composites & Review
12/7	Dead Day - Make up Exams
12/11	Comprehensive Final Exam (10am-12:15pm)