

Course Syllabus
INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING
MME 2303
Spring 2020

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 Materials: (Required)

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

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

Non-Graphing Calculator. NO programmable calculators will be allowed for exams or quizzes.

Professor:

Dr. Shalayna Smith, P.E.

Office:	M-201HC
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Office Hours:

TR 9:00-10:20 or by appointment

Class Meeting Times and Places:

Tuesday and Thursday 10:30 am -11:50 am
Miners Hall 201

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 percentages are as follows:

Attendance: 5%

Journal/Notes: 5%

Assignments (out-of-class and in-class): 5%

Quizzes: 5%

Exams: 60% (15% per exam)

Final Exam: 20%

Homework is to provide you with a forum to practice problems in order to study for the exams and quizzes. Homework must be completed on Engineering Paper. All answers must be boxed. 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. There will be no make-up for homework grades.

Attendance is required and a sign-in sheet will be provided at the beginning of class. There is no makeup grade for attendance. If you have low attendance you will be dropped on drop day.

A journal or notebook grade will be given on a bi-weekly basis. It is required that you take notes.

Quizzes will be given at the beginning of class and will be based on homework problems or examples from a previous class. There will be no make-up 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 (May 8th) 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, as those will be given a zero score.
- 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.

Understanding basic concepts of failure analysis in terms of 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, 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. However do not copy work.

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.

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 and Accommodations:

If you have a disability and/or 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.

Topic	
1/21	Syllabus & Introduction
1/23	Atomic Structure and Atomic Bonding in Solids
1/28	Metallic Structures
1/30	Metallic Structures
2/4	Defects
2/6	Diffusion
2/11	Diffusion & Mechanical Tests/Behavior—Metals
2/13	Test 1
2/18	Mechanical Tests/Behavior—Metals
2/25	Dislocations
2/27	Deformation Mechanisms—Metals
3/3	Strengthening/Hardening—Metals
3/5	Strengthening/Hardening—Metals
3/10	Failure—Metals
3/12	Failure—Metals
3/24	Test 2
3/26	Phase Diagrams—Metallic Systems
3/31	Phase Diagrams—Metallic Systems
4/2	Phase Diagrams—Metallic Systems
4/7	Kinetics of Phase Transformations
4/9	Recovery, Recrystallization, Grain Growth
4/14	Test 3
4/16	Correlation of Properties with Microstructure
4/21	Metal Alloy Types/Properties/Applications
4/23	Ceramic
4/28	Polymers
4/30	Composites
5/5	Test 4
5/7	Review
5/8	Dead Day - Make up Exams
5/14	Comprehensive Final Exam (10am-12:45pm)