

SYLLABUS

METALLURGICAL AND MATERIALS ENGINEERING (MME) 1301 AND 1101 INTRODUCTION to MME DESIGN FALL 2016

Course Description: This course is designed to introduce you to the metallurgical and materials engineering profession, including the role and responsibilities of the metallurgical/materials engineer in today's society. This course will introduce you to some of the methods that we use in picking the right material for a particular application, testing material properties, manufacturing metals and other materials, investigating why products or materials sometimes fail, and developing new and improved materials. Along the way, you will gain experience in analyzing data and writing professional reports. We will explore effective procedures for solving simple metallurgical and materials engineering and design problems, using mathematics, common software applications, basic measuring systems and devices, microscopes and laboratory instruments, computational tools, and statistical concepts. The laboratory portion (MME 1101) will provide hands-on, practice-oriented experiences in metallurgy laboratories, both on campus and in nearby industries. The lab experiences will also introduce you to some of the advanced equipment that you will be learning during future course work, including the x-ray diffractometer, the scanning electron microscope, etc. Safe practices and ethical behavior in lab work will be emphasized.

Instructor: Dr. Christopher Bradley
Email: cbradley2@utep.edu (*preferred method of communication*)
Office: Metallurgy Suite, Room M201-H

Office Hours: MW 10:30 am – 12:00 pm

If you need to meet with me and are unable to attend normal office hours, please email me so that we can make other arrangements as needed.

Required Textbook: No textbook is required for this course. However, there will be weekly assignments from books available in the library, online references and other materials that I will make available to you on Blackboard.

All class materials and student assignments will be submitted digitally via Blackboard folder established for this specific class. Assignments submitted on paper will not be accepted without prior approval from me.

Your Output and Grading: MME 1101 Lab Work, Reports, Presentations 100%

MME 1301 Class Participation	10%
Homework	20%
Mid-Term Exam 1	20%
Mid-Term Exam 2	20%
Final Exam	30%

Honesty and Professionalism: Any instance of cheating or plagiarism will be reported to the Dean of Students for appropriate action (which includes possible failure of this course and/or dismissal from the University).

Classroom Etiquette: Part of being a professional is arriving on time and being prepared to participate. Another part is respecting the other people in the class, including the speaker. If you come late to class or have to leave early, please do so quietly. Please use professional discretion with your cell phone, and turn off the ringer during class. If you must answer the phone, please leave the class discreetly. You may return to the class once your call is finished.

GENERAL COURSE TOPICS

- Understanding a foundational principle of MME:
Structure ↔ Processing ↔ Properties ↔ Performance
- An Introduction to Materials Selection
- Engineering ethics, including honesty and “data ethics”
- Enforcing laboratory/workplace/chemical safety principles
- Developing the problem-solving and design skills of engineering
- Analyzing facts and data to provide defensible conclusions
- An Introduction of Design of Experiments
- Using spreadsheet software to analyze data and create professional graphics
- Statistical analysis of data and drawing conclusions from experiments
- Writing concise and professional scientific and engineering reports
- Developing and delivering a powerful presentation
- Planning your career path in metallurgy and materials engineering
- Case studies in failure investigations
- Non-destructive evaluation (NDE)

As part of this classroom experience, students should expect to actively participate in discussions, give presentations on a variety of topics and do what every good engineer does instinctively – **Ask Many Questions!**