

THE UNIVERSITY OF TEXAS AT EL PASO – COLLEGE OF ENGINEERING
DEPARTMENT OF BIOMEDICAL, METALLURGICAL AND MATERIALS ENGINEERING

MME 2303 Materials And Manufacturing Processes

1. **Course number and name:** MME 2303 Introduction to Materials Science & Engineering
2. **Credits and contact hours:** 3 SCH – 3 hours of lecture
3. **Instructor’s or course coordinator’s name:** Dr. Stephen W. Stafford
4. **Text book title, author, and year:** The Science & Engineering of Materials, 6th edition by Donald R. Askeland, Pradeep P. Fulay & Wendelin J. Wright (2011)
 - a. **other supplemental materials:**
 - reference books:**
none
 - web resources:**
 1. Granta CES EduPack Software
5. **Specific course information**
 - a. **brief description of the content of the course (catalog 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.
 - b. **prerequisites or co-requisites:** CHEM 1305 with a grade of “C” or better
 - c. **indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program:** Required course. Contributes 3 SCH for the engineering area.
6. **Specific goals for the course**
 - a. **specific outcomes of instruction:**

The student should:

 - Understand & apply the concept of Structure-Processing-Properties-Performance relationship.
 - Understand the behavior of materials under an applied load & changing temperature.
 - Understand the following types of material processes & how corresponding material structure & properties are affected- work hardening, alloying, solidification, heat treatment specific to designated alloy systems.
 - Name four different types of structural steel & cite compositional differences, distinctive properties & typical applications.
 - Name seven different types of non-ferrous alloys & for each cite distinctive physical & mechanical characteristics, & list at least three applications for each.
 - Cite the differences in behavior and structure for thermoplastics, thermosets & ceramics.
 - Diagram the total materials cycle & briefly discuss relevant issues that pertain to each stage.
 - Be able to read & interpret a mill test report.
 - Understand & recognize the six forms of material degradation to include wear, corrosion, fatigue, excessive deformation, fracture and creep

- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course:

Student Outcomes						
1	2	3	4	5	6	7
X						

7. Brief list of topics to be covered

- Introduction
- Material Structures
- Mechanical Properties of Engineering Materials
- Processing of Engineering Materials
- Material Performance
- Material Systems
- Case Studies in Materials Selection and Design