Engineering Materials

Catalog Description

Pre-requisites
- CHEM 111 or CHEM 114, or CHEM 115; MATH 190.

Reference books
- Material Science and Engineering: An Introduction (9th Edition), W. D. Callister and Rethwisch

Note: i>clicker2 (students may also use Reef Polling App) is required.

Course Objectives
- Students will analyze relationships between the elastic, plastic, and fracture properties of materials and their bonding and microstructure.
- Students will analyze fatigue, creep and fracture mechanics for material selection and component design.
- Students will predict the composition of phases in alloys from phase diagram.
- Students will discuss the basic elements of corrosion in metals.
- Student will understand the fundamentals of materials and their physical and mechanical properties.

Topics Covered
- Bonding between atoms, packing of atoms in solids.
- Imperfection, defects and dislocation in solids.
- Diffusion and Fick’s laws.
- Elasticity, the physical basis of Young’s modulus.
- Plasticity, yielding, ductility, dislocations, strengthening.
- Failure, fatigue and creep.
- Phase diagram.
- Basic knowledge on metals, ceramics, polymers and composites.
- Corrosion and degradation.*
- Brief introduction to electrical, magnetic and optical materials.*

*Note: If time allows.

Instructor
- Dr. Reza Foudazi
  Assistant Professor
  Email: rfoudazi@nmsu.edu
  Office: Regents Row, room A106
Office hours: MW 11:30 am – 1:00 pm

Teaching Assistant
- Bo Yang
  Email: phoiyang@nmsu.edu
  Office: Regents Row, room A101
  Office hours: Thursdays 3:00 pm – 4:00 pm
  Recitation: Wednesdays 5:30 pm – 7:00 pm

Class/Laboratory Schedule
- Location: Thomas & Brown Hall 104
- Time: MWF 10:30 am - 11:20 am

Grading
- Quizzes from assigned homework (multidisciplinary group) 20
- Clicker questions 20
- Two mid-term exams 20
- Project report (multidisciplinary group) 15
- Project presentation (multidisciplinary group) 5
- Final exam 20

Total points 100

Grading Scale: A+ ≥ 95%; A ≥ 90%; A− ≥ 85%;
               B+ ≥ 80%; B ≥ 75%; B− ≥ 70%;
               C+ ≥ 65%; C ≥ 60%; C− ≥ 55%; D ≥ 45%;

Syllabus Last Update
- 8/25/15

The NMSU Department of Chemical & Materials Engineering maintains a syllabus addendum containing course requirements common to all courses with the CHME prefix online. This document is accessible from the URL:
http://chme.nmsu.edu/academics/syllabi/chme-common-syllabus-addendum/