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Department of Mechanical Engineering
***Mechanical Behavior of Engineering Materials* (ME108)**
Spring 2015

Course Content

Introduction (Ch. 1)
Microstructure and Deformation of Materials (Ch. 2)
Alloying and Hardening (Ch. 3)
Heat Treatment (class notes)
Slip Planes, Dislocations, Twinning (class notes)
Introduction to Mechanical Testing (Ch. 4)
Stress and Strain (Ch. 5)
Complex Stress/Strain States (Ch. 6)
Special topics on complex stress states (class notes)
Yielding and Fracture Criteria (Ch. 7)
Plastic Deformation (Ch. 12)
Ductile and Brittle Fracture (Ch. 8)
Fracture Mechanics (Ch. 8, class notes)
Fatigue, Stress-based Approach (Ch. 9)
Fatigue, Strain-based Approach (Ch. 14, class notes)
Cumulative Fatigue Damage (notes)
Notch Effects in Fatigue (Ch. 10)
Crack Growth (Ch. 11)
Time-dependent Deformation, Creep (Ch. 15)
Friction and Wear of Materials (class notes)
Micromechanics (class notes)

Labs
Lab 1: Heat Treatment, Phase Diagrams, and Indentation Hardness
Lab 2: Deformation due to Monotonic Loading & Fracture Toughness
Lab 3: Time- and Rate-Dependent Deformation
Lab 4: Deformation due to Cyclic Loading
Lab 5: Fatigue
Lab 6: Wear