MTSE-3020: Microstructure and Characterization of Materials  
Fall 2011 Syllabus

INSTRUCTOR
Professor El Bouanani
Office hrs: Tuesday (10:30-11:30 am); DP E111, Other times available on request via e-mail.
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CLASS TIME & LOCATION
Mondays & Wednesdays 10:30-11:50 AM. Room: D 207A, Discovery Park
Attendance is mandatory

Suggested text books:

Microstructural Characterization of Materials, David Brandon and Wayne Kaplan, Wiley

PLAN OF STUDY

Syllabus overview/General Introduction to Characterization
S/N, error analysis
Design of Experiments
Density, particle size
Gas adsorption, Archimedes Principle

Atomic Force Microscopy

Probe: Photons
X-Ray Fluorescence
TR-XRF
X-Ray Diffraction
X-ray Photoelectron Spectroscopy/UV Photoelectron Spectroscopy
Solid State Nuclear Magnetic Resonance
Fourier Transform Infra-Red
Photoluminescence
Raman
Probe: Electrons
Scanning Electron Microscopy
Transmission Electron Microscopy
Electron Energy Loss Spectroscopy
Auger Electron Spectroscopy
Energy Dispersive X-rays
Electron Diffraction (LEED, RHEED)

Scanning Tunneling Microscopy

Probe: Particles
Rutherford Backscattering Spectrometry
Nuclear Reaction Analysis
Nuclear Activation Analysis
Particle Induced X-ray Emission
Secondary Ion Mass Spectrometry

Exam’s schedule:
Exam-1: October 5th
Exam-2: November 9th
Final (Comprehensive Exam): December 12th

GRADING:
A = 100-90, B = 89-80, C = 79-70, D = 69-60, F = <60
Homework ...............15%
Student Project ..........15%
Exams .....................40%
Final .....................30%

This is a preliminary course outline. The instructor may change material, course content, and course pace or item sequence at any time.