MSE 323: Materials Characterization Laboratory

Course description: Laboratory exercises on materials characterization: X-ray, TEM, SEM.

Number of credits: 2 (1-3)

Course Coordinator: Pui Ching (Amy) Wo

Prerequisites by course: MSE 321 or c//

Prerequisites by topic: Atomic structure, bonding, introduction to crystal structures, optics, interference, diffraction.

Postrequisites: MSE 425: Senior Thesis I
MSE 426: Senior Thesis II

Textbooks/other required materials: None

Course objectives:
1. To provide hands-on experience with SEM
2. To provide experience on examining the fracture surfaces of materials and identifying the fracture mechanism
3. To enable students to use EDS to determine chemical composition
4. To provide experience in using EBSD in the SEM
5. To provide hands-on experience with TEM
6. To allow students to obtain, record, and index diffraction patterns from a variety of materials
7. To allow students to obtain bright field and dark field images


Expected student outcomes:
1. To be able to operate a SEM in SEI mode and obtain images of fracture surfaces
2. To use these images to identify fracture mechanisms
3. To be able to use EDS for chemical identification and to use this information to identify the materials used in semiconductor device fabrication
4. To be able to obtain, record, and correctly index electron diffraction patterns
5. To be able to obtain a range of images and correctly interpret them

Class schedule: None

Laboratory schedule: One 3-hour laboratory session per week, for one semester.

Contribution to meeting the professional component: Engineering Topics

Relationship of course to program objectives: Meets:
1. School of MME Educational Objectives: 1, 2, 3
2. School of MME Program Outcomes: (a), (b), (k)
3. ABET EC2000, Criterion 3: (a), (b), (k)

Prepared by: D. P. Field

Date: September 18, 2014

POLICIES
A. Reasonable Accommodation (the nature of the particular course determines which one applies):
- Pullman Campus, Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center.
- WSU Online Course, Reasonable accommodations are available in online classes for students with a documented disability. All accommodations must be approved through your WSU Disability Services office. If you have a disability and need accommodations, we recommend you begin the
process as soon as possible. For more information contact a Disability Specialist on your home campus: Pullman or WSU Online (http://accesscenter.wsu.edu), Spokane (http://spokane.wsu.edu/students/current/studentaffairs/disability/), Tri-Cities (http://www.tricity.wsu.edu/disability), Vancouver (http://studentaffairs.vancouver.wsu.edu/student-resource-center/disability-services).

B. Academic Integrity
WSU expects all students to behave in a manner consistent with its high standards of scholarship and conduct. Students are expected to uphold these standards both on and off campus and acknowledge the university's authority to take disciplinary action. The Standards of Conduct for Students can be found at http://conduct.wsu.edu.

C. WSU Safety
WSU is committed to maintaining a safe environment for its faculty, staff, and students. Safety is the responsibility of every member of the campus community and individuals should know the appropriate actions to take when an emergency arises. In support of our commitment to the safety of the campus community the University has developed a Campus Safety Plan, http://safetyplan.wsu.edu. It is highly recommended that you visit this web site as well as the University emergency management web site at http://oem.wsu.edu/ to become familiar with the information provided.