

MSE 323: Materials Characterization Laboratory

<i>Course description:</i>	Laboratory exercises on materials characterization: X-ray, TEM, SEM.
<i>Number of credits:</i>	2 (1-3)
<i>Course Coordinator:</i>	David Field and Collin Merriman
<i>Prerequisites by course:</i>	MSE 321 or c//
<i>Prerequisites by topic:</i>	Atomic structure, bonding, introduction to crystal structures, optics, interference, diffraction.
<i>Postrequisites:</i>	MSE 425: <i>Senior Thesis I</i> MSE 426: <i>Senior Thesis II</i>
<i>Textbooks/other required materials:</i>	None
<i>Course objectives:</i>	<ol style="list-style-type: none">1. To provide hands-on experience with SEM2. To provide experience on examining the fracture surfaces of materials and identifying the fracture mechanism3. To enable students to use EDS to determine chemical composition4. To provide experience in using EBSD in the SEM5. To provide hands-on experience with TEM6. To allow students to obtain, record, and index diffraction patterns from a variety of materials7. To allow students to obtain bright field and dark field images
<i>Topics covered:</i>	Materials characterization using scanning electron microscopy and transmission electron microscopy.
<i>Expected student outcomes:</i>	<ol style="list-style-type: none">1. To be able to operate a SEM in SEI mode and obtain images of fracture surfaces2. To use these images to identify fracture mechanisms3. To be able to use EDS for chemical identification and to use this information to identify the materials used in semiconductor device fabrication4. To be able to obtain, record, and correctly index electron diffraction patterns5. To be able to obtain a range of images and correctly interpret them
<i>Class schedule:</i>	None
<i>Laboratory schedule:</i>	One 3-hour laboratory session per week, for one semester.
<i>Contribution to meeting the professional component:</i>	Engineering Topics
<i>Relationship of course to program objectives:</i>	Meets: <ol style="list-style-type: none">1. School of MME Educational Objectives: 1, 2, 32. ABET, Criterion 3 Program Outcomes: 2, 3, 4, 5, 63. School of MME MSE Program Outcomes: 2, 3, 4, 5, 6, 11
<i>Prepared by:</i>	Andrea Butcherite and Dr. David Field
<i>Date:</i>	May 30, 2018

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.