

Department of Materials Science and Engineering
MSE 318 Materials Science & Engineering
Physical Materials Laboratory (1 credit)

Catalog Description:

Experimental work to accompany MSE 315. Microstructural development in inorganic materials (1 credit.)

Prerequisites: (by topic):

Concurrent with MSE 315, Kinetic Processes and Transformations in Materials

Textbook:

None required.

References:

Metals Handbooks, (in particular the Volume on Microstructure)

Course Objectives: The student will be able to

1. Demonstrate proper laboratory safety and preparation techniques.
2. Demonstrate hands on experience in metallographical principles and procedures
3. Demonstrate the ability to write logical laboratory reports
4. Apply methods of metallography in the lab
5. Analyze the microstructural processes and resultant changes in materials during the processes of grain growth and recrystallization and during non-equilibrium phase transitions.
6. Describe the relationship between the properties and changes in microstructure that result from different processing conditions.

Topic Covered:

Reflected light microscopy, hardness measurements, grain structure, etching, grain growth, polish section preparation, digital image recording, calculation of magnification, quantitative microscopy.

Class/Laboratory Schedule:

One, three hour laboratory section per week

Contributions of Course to Meeting the Professional Component

This course teaches basic laboratory techniques for specimen preparation and observation, needed for all materials scientists in professional careers.

Relationship of course to program Objectives

The primary contribution of this course is to the items 2, 4, 5, 6, 9 and 10 listed in our departmental objective sections.

Prepared by: Lucien N. Brush, Associate Professor, September 2000