Prerequisites: Basic Physics


J. Goldstein, Scanning Electron Microscopy and X-Ray Microanalysis

Other References:
P. J. Goodhew, and F.J Humphreys, Electron Microscopy and Analysis, 1988

Course Overview:

This course will cover the theory and application of Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM) including electron optics, interference phenomena, interpretation of SEM and TEM image and TEM diffraction pattern, TEM high resolution image, electron energy spectroscopy analysis, and sample preparation. The objective of this course is to understand the principles of SEM and TEM, to know how to prepare SEM and TEM sample, to obtain the SEM and TEM image, and to be able to interpret the SEM and TEM image and electron spectroscopy. Students are encouraged to use their own samples from their undergoing projects to do the term project.

Tentative Course Schedule:

a. TEM section including (>80% hour) :
   1. Electron Optics.
   2. TEM Principal and Application
   3. TEM image mode
   4. TEM Spectroscopy
   5. TEM hand-on lab and lab report

b. SEM Section including :
   1. Electron Optics.
   2. SEM Principal and Application
   3. SEM Image Mode
   4. SEM hand-on lab and lab report

Grading: A+: 95-100%; A: 90-94%; A¯: 85-89%;
         B+: 80-84%; B: 75-79%; B¯: 70-74%
         C: 65-70%;
         D: 60-64%;
         E: 0-50%

1st exam.................. 20%
2nd exam.................. 20%
Final exam..............20%
Lab reports ..............30%

Homework is not graded, but it helps you to understand the course and prepare examination.