

VEGA 3 XMU SEM Training Policy

For users with little or no SEM experience in actual independent control of the SEM:

1. Because the basic theory of SEM operation is required, extra time is allotted for training to increase understanding of how the controls change the scanning beam characteristics. The first session(s) will be the log in, the location of the mouse operated controls and the console controls, venting, the sample installation on the stage and pumping down the sample in the chamber. Turning on the beam, focusing, and control of charging will be discussed for the example sample provided by the potential user along with any special advice on sample preparation. Suggested reading materials to become more familiar with the generation of the image in a SEM are listed below.
2. Because all samples, user image (and analysis) requirements, and user cognitive and manipulative proficiencies are different, the next 2 or 3 sessions are devoted to the individual problems related to the samples to be observed with the SEM and the operation of the individual detectors (secondary, low vacuum secondary, backscatter, and energy dispersive spectrometer) as well as the operation of the heating and cooling stage. Aperture adjustments and exchanges required for certain detectors and take-off angles of detectors will only be changed by staff. For difficult samples, there may be additional training required.

For users with SEM experience in actual independent control of the SEM:

1. Experienced users will not need a review of the basic SEM theory, but will need to learn how to operate the SEM with the unfamiliar control system of the VEGA SEM. In some cases, this will require a new set of learned cognitive prompting so that the users will be able to "find the new controls" to activate the SEM in the manner they are familiar with.
2. Because all samples, user image (and analysis) requirements, and user cognitive and manipulative proficiencies are different, the next 2 or 3 sessions are devoted to the individual problems related to the samples to be observed with the SEM and the operation of the individual detectors (secondary, low vacuum secondary, backscatter, and energy dispersive spectrometer) as well as the heating and cooling stage. For difficult samples requiring the use of several detectors with the heating or cooling stage, there may be additional training required.

Training Costs for the operation of the VEGA 3 XMU SEM:

In most cases, both experienced and inexperienced operators can learn to acquire secondary images in 3 sessions of 2 hours each with additional sessions for additional detectors or temperature controlled stages. Costs for training are listed on the website. Technician charges are added to microscope charges to calculate the total charge if the technician is present during the SEM operation.

Recommended reading material:

1. Reference Book: Joseph I. Goldstein et al. "Scanning Electron Microscopy and X-ray Microanalysis" (available in Evans Library at Texas A&M University).
2. Some websites with good summarized information:
 - (i) http://www.charfac.umn.edu/sem_primer.pdf
 - (ii) http://serc.carleton.edu/research_education/geochemsheets/techniques/SEM.html
 - (iii) <http://www.uiowa.edu/~cemrf/methodology/sem/index.htm>