

Instrument-Specific Policies

Scanning Electron Microscopes

JEOL JSM-7200 FE-SEM and Tescan Vega 3 SEM

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Safety Trainings

SciTech requires individuals who will be using the SEMs independently to complete safety training for the SEM lab(s) in which they will be working. Safety training for SEM spaces will be delivered in person. (Online safety training for SEM spaces will be available in the future.)

Training and Certification for Independent Use

Standard training for independent SEM use requires multiple sessions. A user will be approved for independent use when the user feels comfortable operating the SEM on their own AND SciTech staff have determined the individual has sufficiently shown the ability to operate the instrument safely and effectively. A user must have explicit permission from SciTech staff to use the SEMs on their own.

Standard training includes:

- General lab space and safety introduction
- Logging into FOM and starting the instrument software
- Specimen loading and unloading
- General SEM software introduction
- Working distance (WD) and stage height (z-height) and how to safely move to a chosen WD
- General controls for SEM: magnification, scan speed, probe current/beam intensity
- How and why to change accelerating voltage (as needed)
- Acquiring images
- File transfer

Users must be explicitly trained to use any specialized modes of operation or special attachments before they can operate them independently. Please email the SciTech staff instrument lead to request additional training.

Specialized modes of operation that require additional training from the SciTech staff include, but are not limited to:

- Tilt imaging
- Back-scattered electron (BSE) imaging
- Energy-dispersive X-ray spectroscopy (EDS) for elemental analysis and elemental mapping
- Transmission in SEM (tSEM, aka STEM) - JEOL only
- Cathodoluminescence (CL) - Tescan only

- Variable pressure (aka low-vacuum) - TESCAN only
- Through-the-lens and Gentle beam (beam deceleration) - JEOL only
- Automated image mapping and EDS mapping – JEOL only
- Specimen preparation, Carbon coating, Au or Pt sputter coating

Scheduling Instrument Time

Requests for training must be made two days in advance of the desired session time by emailing the instrument staff lead.

Individuals approved to use the SEM should work within these restrictions:

- Reservations can be made no more than 30 days and no less than 24 hours in advance.
- Limit of **two** sessions per week (unless permission is given by SciTech)
- A maximum of **four** reservations can be active at any one time.
- Reservations may not exceed **four** hours (unless appropriate arrangements have been made with SciTech)
- Overnight reservations on the JEOL for automated imaging can be scheduled only with the permission of SciTech staff
- SEM time scheduled on FOM is for SEM use only. Specimen preparation or coating should be completed before the session starts

Note: Scheduling restrictions are meant to promote equal access to SEMs by all users and ensure that SciTech can best support SEM users.

Consumables and other lab equipment

SciTech provides appropriate holders for loading specimens into the SEM. Specimens often require mounting on SEM stubs with an adhesive. Users will be supplied with a limited number of stubs and mounting media by SciTech. Users should either reuse the stubs or purchase their own stubs for ongoing SEM analysis.

Specimen Preparation

Simple specimen preparation can be done at the SEM lab. However, more complicated specimen preparation should be handled in other lab facilities. Please discuss specimen preparation requirements with SciTech staff ahead of time.

Specimen Disposal

Users are responsible for handling all of their own specimen disposal. See instrument-specific policies for guidance on available waste streams within SciTech lab spaces. Please reach out to the SciTech staff to determine safe protocols if unsure of availability of proper waste streams within lab spaces. With staff approval, samples may be left in the laboratory for short periods of time. Each specimen should be well labeled with the User full name, research group name, date, and a brief description of what the specimen is.

Key codes and room access

Allocation of key codes and room access for users is determined at the discretion of SciTech staff. Key codes should never be shared between users.

Keys must be returned to the hallway key box immediately after opening the door.

Data transfer and storage

SciTech is presently working on establishing methods for centralized data sharing and long-term data storage. Individuals are expected to save their data to an external source such as a flash drive, SharePoint, or Google Drive. Data can be temporarily stored on the local E:drive of the FCM's workstation computer; however, due to limited space, any files older than a year may be deleted.