FE - SEM (JSM-7500F) TRAINING POLICY

The training for SEM will be divided into two categories – basic and advanced training. The basic training will allow users to operate the SEM to generate images which will require 2 or 3 sessions depending on prior SEM experience of users. If users wish to use the Energy-dispersive x-ray spectroscopy (EDS), they will be required to take the advanced training once they have shown proficiency in the basic usage of the SEM. **Users should always discuss their samples with staff before they begin training so that they can prepare their samples appropriately.**

I. Basic training

I.1 First-time users

- First-time users are strongly encouraged to read some of the recommended materials* before the 1st session of the hands-on training so as to understand the basics of how an SEM works and how its operating parameters affect the final image captured. This will eventually help you achieve the best images for your research.
- the training will consist of 3 sessions (1½ - 2hr each)

1st session:
- Orientation of the instrument: signal and image generation, instrument operation, operating variables, image interpretation and applications of SEM will be discussed
- step-by-step hand-on training will be conducted for generating images of a standard sample
- up to 3 users from the same research group can attend this session

Training fee

2nd session:
- Users will practice, under supervision, using the standard sample

Training fee

3rd session:
- Depending on the proficiency of the users, users will practice with supervision as needed. Users can perform measurements of their own samples in this session *if they have been discussed with and approved by the MCF staff.*

Training fee

Remarks:

(a) Upon completion of the 3rd training sessions users will be allowed to sign up for measuring time during MCF business hours while the staff is present. This will facilitate the user becoming independent but will also enable the staff to assist the user should any problems arise.

(b) Users will have to log *6 hrs (3-4 times)* of such measuring time in a ninety day period before they can be checked out – users should pass the "driving-test" (check out) on the microscope to demonstrate competence with sample loading, alignment, obtaining well focused and astigmatism corrected images, etc.

Instrument fee

I.2 Users with prior SEM experience

Users with previous SEM experience, either at the MIC or other labs, will be requested to go through 2 sessions of hands-on training (1 - 1½hr each) in order to understand the specifics of the JSM-7500F. Users can bring their own sample for the hands-on training.

1st session:

- brief orientation of the instrument
- step-by-step instruction for generating images

Training fee

2nd session:

User will practice under supervision just to make sure they remember the steps especially at the beginning of the session

Instrument fee

Remarks:

Users will have to log *4 hrs (2-3times*) of such measuring time in a ninety day period before one can be/request to be checked out – users should pass the "driving-test" on the microscope to demonstrate competence with sample loading, alignment, obtaining well focused and astigmatism corrected images, etc

I.3 Assisted use for TAMU users

For those who do not wish to do the training and are infrequent users, MCF staff will assist you in getting images of your sample.

Staff time + instrument fee

II. Advanced SEM training - EDS

Advanced training will be available to users who have shown proficiency in performing the basic operation of the SEM and would like to perform compositional analysis using the EDS. This will require a 1 session training (1- 1½hr).

Training fee

III. Supplies for SEM use

The MCF will provide you with specimen holder stubs, carbon and copper tape. There is also a sputter coater exclusively dedicated for SEM use only.

IV. Refresher training

If users find themselves not using the SEM for more than **6months** at a time after being checked out, they will be required to take a refresher training.

* *Recommended reading material*

1. Reference Book: Joseph I. Goldstein et.al. “Scanning Electron Microscopy and X-ray Microanalysis”

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

   (iv) http://www.ammrf.org.au/myscope/ (Very good interactive website for SEM and many other analytical techniques)