

## **TEM Users Guide**

The TEM users guide that follows provides information concerning the following:

- 1- Knowledge and skills required of the TEM self user.**
- 2- Policy for scheduling TEM use time.**
- 3- Training policy for becoming a TEM user.**
- 4- Costs associated with TEM use.**

### **1- SKILLS REQUIRED OF A LEVEL-1 TEM USER**

A TEM CM 20 self-user has sufficient skills to independently operate the microscope during typical business hours when help is available if needed. A user can load/unload specimens; control a majority of basic instrument operational parameters; and record and manipulate digital images. A user must demonstrate that he/she understands the following general issues associated with the microscope:

1. Basic Sample Preparation
2. Specimen Exchange
3. Vacuum system, computer menu structure, control of the tip, aperture mechanisms
4. Acquisition of a selected area electron diffraction pattern
5. Bright field imaging of test specimens
6. Session Documentation
7. Proper computer use and downloading of collected data.

### **2-POLICY FOR SCHEDULING MICROSCOPE (TEM) USE TIME**

- \* An instrument reservation calendar is accessible in the TEM Room, (B-003).
- \* Users may reserve up to two sessions per week. Additional sessions may be reserved subject to instrument availability. Additional sessions beyond the first two can only be

reserved less than one day in advance of the desired session.

- \* Users who need operator assistance must make arrangements for this themselves. Contact Dr. Berton Greenberg at X5258 [bgreenbe@stevens.edu](mailto:bgreenbe@stevens.edu) to make such arrangements.
- \* Use priority must be given to occasional undergraduate and graduate teaching laboratories and to Corporate Affiliates.

### 3- TRAINING POLICY FOR BECOMING A TEM USER

Every effort will be made to encourage individual researchers and students to achieve self-user status and to train them how to operate the CM 20 TEM. This training demands a substantial commitment of time and effort. Prospective self users will be required to complete a **TEM Trainee Information Form** outlining their anticipated needs in order to justify self-user training. Training will required attendance at 4 “class/demonstration” meetings that will each last about two hours followed by 2 assisted practice sessions. Finally a self user exam will be given.

Class 1) Introduction to the theory of how the microscope works and how images are formed. Sample preparation, mounting, insertion and removal from the TEM.

Class 2) Review. Finding the beam, basic column alignment I (condenser lens, eucentric adjustment and focus).

Class 3) Review. Obtaining a diffraction pattern, a bright field image and a dark field image. Recording images.

Class 4) Review of previous techniques

Assisted Practice1\*   Assisted Practice2\*   Self Users Exam

\* The assisted practices and exam **MUST** use test specimens provided by the Microscopy Facility and must be completed within 4 weeks of completing the training.

Having successfully passed the exam, the user will be authorized to independently sign up for and use the CM 20 TEM during normal business hours when other experienced users are around in the event of a technical problem. Other less traditional hours (e.g. evening and limited weekend use) may be possible by special arrangement and by authorization of the Facility Director.

**There is a \$400 charge for training (\$200 of which will be reimbursed if 4 hours of TEM use occur during the first month after completing the self user test. The training charge may be waived by consent of the Dean of Engineering.**

## **4-COSTS ASSOCIATED WITH TEM USE**

### **Stevens Academic Users**

- \* \$50.00 per hour (funds used for instrument maintenance). There is a \$50.00 minimum charge.
- \* \$45.00 per hour charge for operator cost when instrument is operated by a staff member for an academic user. Benefits and overhead charges are added by the sponsored project office as appropriate. There will be a minimum 1 hour charge.
- \* Users are expected to bear the costs of any consumables used.
- \* Charges for non-Stevens academic users will follow a similar cost structure but will be considered on a case-by-case basis by the Facility Director (M. Libera).

### **Non-Academic Users**

- \* non-academic users must pay rates comparable to those of commercial analytical service companies.
- \* If needed, consumables will be provided at cost.
- \* Non-academic users with substantial need for characterization may elect to become a Facility Corporate Affiliate where alternate cost and use structures are available.