

Rules and Regulations for Carl Zeiss Libra 120 Plus, JEOL TEM 2010, JEOL TEM 2100F

Carl Zeiss Libra 120 Plus (120 KV)

Users: PhD Students, Research Staff

Suitability for: Soft Materials such as Biological Samples, Polymers and Organic Crystal Research etc.

Not suitable for: High Resolution Imaging

Operating Hours:

Office Hour: 8am to 6pm (Monday to Friday)

After Office Hours: 6pm to 8am (Monday to Friday)

Saturday and Sunday Whole Day

Booking: Block of 2 hours per session, Maximum booking up to 4hrs per week

PhD Students and Research Staff

Criteria for PhD Students/Research Staff to use Libra 120 Plus – Normal Users (Office Hours)

- 1) Users must pass safety quiz first and attend safety training
- 2) PhD Students and Research staff without any experience must attend Prof Huang's online lecture recordings for MS7003 module before taking TEM quiz. They can only attend the training after passing the TEM quiz. Quiz is set online. The online lecture can be found here - http://webservice.mse.ntu.edu.sg/lt_recording/lt.asp?subject=348
- 3) Research staff with prior TEM experience must pass the TEM quiz before training is given.
- 4) Trainee must also show good performance during training as a criterion to gain access to the instrument.
- 5) Training will be divided into 2 parts. During the first part of the training, users will learn basic usage of the TEM plus some TEM alignment.
- 6) At the moment, Part 2 training are meant for users who need EELS characterization. However, we are still planning the training schedule for this part at the moment. The training plan will be released at a later date. Nevertheless, users must inform us to arrange for the part 2 training.
- 7) Upon accumulating 30 hrs of experience, PhD student/Research staff be able to access the tem after office hour.

Criteria for PhD Students/Research Staff to use Libra 120 Plus – Advanced Users (After Office Hours)

- 1) Must accumulate at least 30 hrs of office hour usage
- 2) Must pass a hands-on test on sample loading, TEM alignment (without manual), image focusing and in-column energy filter handling and diffraction (if necessary).
- 3) They will also be tested on basic troubleshooting when TEM is down

JEOL TEM 2010

Users: PhD Students, Research Staff

Suitability for: High Resolution Imaging

Not suitable for: Soft materials such as Biological Samples, Polymers and Organic Crystal Research

Operating Hours

Office Hour: 8am to 6pm (Monday to Friday)

After Office Hours: 6pm to 8am (Monday to Friday)

Saturday and Sunday Whole Day

Booking : Block of 2hr per session,

: Maximum booking up to 4hrs per week

PhD Students and Research Staff

Criteria for PhD Students/Research Staff to use JEOL 2010 – Normal Users (Office Hours)

- 1) Users must pass safety quiz first and attend safety training
- 2) PhD Students and Research staff without any experience must attend Prof Huang's online lecture recordings for MS7003 module before taking TEM quiz. They can only attend the training after passing the TEM quiz. Quiz is set online. The online lecture can be found here - http://webservice.mse.ntu.edu.sg/lt_recording/lt.asp?subject=348
- 3) Research staff with prior TEM experience must pass the TEM quiz before training is given.
- 4) Trainee must also show good performance during training as a criterion to gain access to the instrument.
- 5) Training will be divided into 2 parts. During the first part of the training, users will learn basic usage of the TEM plus some TEM alignment.
- 6) Users will then be given access to use the TEM for at least 8 hours (4 sessions) before eligible to go for the part 2 training which will include the rest of the alignment training, plus revision of the part 1 training. Users must inform us to arrange for the part 2 training.
- 7) Upon accumulating 30 hrs of experience (users must go through both Part 1 and 2 training to be eligible). Please note that 30 hrs includes the first 8 hrs of usages before Part 2 training and the total hours of usages after Part 2 training. PhD student/Research staff can have the following options
 - a. Apply access to TEM 2010 for after office hour access. Upon choosing this option, they will no longer have access to TEM 2010 during office hour. Other pre-requisites apply. Please refer to the "Criteria for JEOL 2010- Advanced User".
 - b. Apply access to TEM 2100F office hour for EDX analysis. Other pre-requisites apply. Please refer to the "Criteria for JEOL 2100F – Day User"
 - c. Choosing both options (a) and (b)

Criteria for PhD Students/Research Staff to use JEOL 2010 – Advanced Users (After Office Hours)

- 1) Must accumulate at least 30 hrs of office hour usage
- 2) Must pass a hands-on test on sample loading , TEM alignment (without manual), image focusing and electron diffraction
- 3) They will also be tested on basic troubleshooting when TEM is down

JEOL TEM 2100F

Users: PhD Students, Research Staff

Suitability for: High Resolution Imaging, Analytical Research

Not suitable for: Biological Samples, Polymers and Organic Crystal Research

Operating Hours

Office Hour: 8am to 6am (Monday to Friday)

After Office Hours: 6pm to 8am (Monday to Friday)

Saturday and Sunday Whole Day

Booking: Block of to 2hr per session,

: Maximum booking up to 4hrs per week

Broad hours booking of more than 4 hours will be available under Special Request for Analytical Characterization

Criteria for PhD Students/Research Staff to use JEOL 2100F – Day Time

- 1) Must submit one page proposal covering the following:
 - a. Project Objective
 - b. Introduction of your project and current result
 - c. Explain why JEOL 2010 cannot support the current course of work.
 - d. Propose exact strategy of using TEM 2100F, e.g. how it can solve the user's problem
- 2) Must accumulate at least 30 hours hands-on experience on JEOL 2010
- 3) Must be able to perform advanced TEM alignment based on misalignment scenario within 30 mins on JEOL 2010
- 4) Must have completed JEOL 2100F operation training
- 5) Successful applicants can only use JEOL 2100F during office hour
- 6) Users will be trained to use STEM mode and EDX in STEM mode

Criteria for PhD Students/Research Staff to use JEOL 2100F – Expert User

- 1) Must accumulate at least 30hrs of hands on experience on JEOL 2100F during office hour
- 2) Must pass the alignment procedure for JEOL 2100F.
- 3) Test will also require applicant to perform a proper EDX using STEM mode
- 4) Once criteria (1) to (3) are fulfilled, the user can have 24 hr access to both JEOL 2010 and JEOL 2100F 24hrs

Penalty for All TEM Users

- 1) Charges will apply if they didn't turn up for the booked session.
- 2) Users must cancel the booking at least 24 hr before their session. Charges apply if users cancel booking thereafter.
- 3) User must use at least 2 TEM session within 3 months if not their account will become inactive.
- 4) Following (2), they have to wait for at least the following month for retraining. There will be charges for retraining.
- 5) Their account will only be reactivated on the following month after we verify that they are able to manage the instrument without issues.
- 6) Users will bear the cost of any damage and will be banned from using the instrument due to misuse.
- 7) Users must bear the full responsibility of the instrument for the session they have booked. If user allow unauthorized users to operate the instrument during the session that he/she has booked, penalty will be implemented as follows:

1st time

- i. User will be banned from using all instruments in MSE
- ii. On the following month, users will be downgraded to day access to that particular instrument, reassessment will be given before upgrading again

2nd Time

- i. User will be banned on all instruments in MSE
- ii. On the following month, user must apply for retraining with full training cost before accessing to that particular instrument. Training is subjected to availability.

3rd Time

- i. User will be banned from using all instruments in MSE
- ii. On the following month, users must apply for retraining for that cluster of instruments (either SEM cluster; FESEM cluster; XRD cluster 1+2; TEM cluster), with full training costs.

- 8) In case of Sample Dropped in Chamber – User who dropped the sample will be banned for one month and have to be retrained on that particular instrument. Training is subjected to availability and will be fully chargeable.
- 9) All users must submit the incident report within 1 working day after the incident. Otherwise, user's access to the instruments will be suspended indefinitely until the incident report have been submitted and the indicated time of access removal will take effect from the time of submission.

For Users who have not booked and used TEM for a long time

1. If users have fulfilled the entire criterion stated above but are unable to use the TEM frequently after that, their access might be reverted to office hours usages until he is certified to be able to use the TEM proficiently.
2. The FOM will remove the access of the user who have not used the TEM for a year. In such event, user have to be re-trained and training cost is fully chargeable.

For Visiting Professors/Postgraduate Students

- 1) Visiting Professors or Postgraduate Students who will be staying in NTU for less than half a year will not be allowed to be trained in TEM.