

## 3010

**Core Status:** new users must complete 2 trouble-free training sessions and pass a sample exchange exam to work independently during Core sessions.

**Flex Status:** core users must complete 4 "trouble-free" sessions and pass a driving test to work independently during Flex sessions

**To reserve** a 3010 session, go to [www/ncem.lbl.gov](http://www/ncem.lbl.gov), click on "Microscope Scheduling", use proposal number and password to log in. You may only sign up for 2 Core sessions and 1 Flex session at a time. **To cancel** a session, email your request to the technical staff in charge of the microscope.

### CORE LICENSE

#### **Safety**

- Understand emergency shut down procedure
- Know emergency contact numbers
- Know where LN protective equipment is

#### **Instrument Preparation**

- Set from "DP" to "Normal" mode.
- Check gun and column IGP readings ( $< 2 \times 10^{-5}$  mPa).

#### **Start HT with normal HT conditioning process.**

- Set HT to 200kV and turn on HT
- Slow condition to 300kV: 20 minutes and 0.1 kV steps required from 200kV to 300kV

#### **Fill up LN in ACD.**

- Make sure screen is covered.
- Wear protective gear (goggles, mask, gloves), refill after 6 hrs.

#### **Load specimen in holder.**

- Each in-situ holder (heating, cooling, indentation, tensile, e-bias) requires separate training and qualification.
- Place double-tilt holder properly on provided stand.
- Load sample and gently tighten retaining screw.
- Check sample snugness by gently tapping the big end of the holder.

#### **Insert holder.**

- Insert sample to pump down position
- Switch to pump, pump for 10 minutes
- Check green light and P4 reading.
- Insert holder into column, pausing at first step.
- Check column IGP reading after insertion

#### **Start filament.**

- Check "filament ready" light.
- Follow filament warm-up procedure (slow to set position ~5 minutes)

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**CORE LICENSE TEST (CONTINUED)**

**Carry out alignments**

- Find beam
- Eucentric height
- Gun alignment
- C2 aperture, C2 stigmatism
- Pivot points
- Current center, voltage center
- Objective stigmatism

**Shut down**

- Turn off filament slowly
- Center holder positions and tilts (neutralize)
- Remove holder properly, unload sample, and store the holder in desiccator
- HT shut off (set to 200kV first)
- ACD heater inserted and turned on
- Vent camera chamber and unload film/reload new film cassette
- Switch on DP mode after film chamber has returned to vacuum and opened to column

**Record session in log-book**

- Record number of images taken and any problems

**Name** \_\_\_\_\_  
**Date** \_\_\_\_\_ **Proposal #** \_\_\_\_\_  
**Pass** \_\_\_\_ **Fail** \_\_\_\_

**3010**

**FLEX LICENSE**

**Basic TEM operations**

- Bright field imaging
- Dark field imaging
- SA diffraction

**Using CCD camera**

- Check "peltier cooler" on
- Check camera setup on computer
- Block central diffraction spot if in diffraction mode
- Record image

**Using film plates**

- Check CCD camera set to "Out"
- Warm up "peltier cooler" before venting camera
- Set exposure time and record picture
- Demonstrate darkroom skills and proper reloading of plates and cassettes

**Name** \_\_\_\_\_  
**Date** \_\_\_\_\_ **Proposal #** \_\_\_\_\_  
**Pass** \_\_\_\_\_ **Fail** \_\_\_\_\_