EM 472/580 EM Course - Adminstration

Professor Rodney Herring

Course Text Books

1) The Transmission Electron Microscope (Second Edition, Springer) by David B. Williams and C. Barry Carter

It has 40 chapters – we will cover ~20 of them.

Each lecture will cover ~1 chapter worth of material.

My lectures cannot cover all the material in each chapter but you are expected to know it by your readings – see me if you need help.

Each chapter has a Preview, Main Body, Summary, Self-Assessment Questions, Text-Specific Questions.

2) Let's Familiarize Ourselves with the TEM - Hitachi

3) Let's Familiarize Ourselves with the SEM – Hitachi

We will first cover the SEM book by Hitachi

Other Course Materials

1) Journal Information

Nature, Science, Ultramicroscopy, J. Electron Microscopy, Microscopy, Microscopy & Microanalysis, Micron, Optik, etc.

2) Conference Proceedings

Microscopy & Microanalysis, International Congress of Microscopy, Electron Microscopy & Analysis Group (EMAG), etc

3) Personal research results

Course Website

The lectures and course requirements can be found on the internet at:

http://moodle.uvic.ca/

Marking - Undergraduates

Your grade will be determined by the following scheme:

2 assignments 40 marks

1st assignment SEM – 15 marks

2nd assignment TEM – 25 marks

2 mid-terms 60 marks

1st mid-term SEM – 20 marks

2nd mid-term TEM – 40 marks

Marking - Graduates

Your grade will be determined by the following scheme:

2 assignments 40 marks

1st assignment SEM – 15 marks

2nd assignment TEM – 25 marks

2 mid-terms 40 marks

1st mid-term SEM – 15 marks

2nd mid-term TEM – 25 marks

1 report - 10 marks

1 presentation - 10 marks

Assignments

There will be two major assignments to help you prepare for the mid-terms.

I will try to give these assignments to you early enough in the lecture series so you can answer their questions during the class when the material is being presented and discussed.

Guest Lecturers

There will possibly be two guest lecturers:

Elaine Humphrey on SEM for Life Sciences

(Lab Manager of STEHM Lab, UVic)

Various visitors will come to UVic. If appropriate, I will have them give you a guest lecture.

Missed Lectures - Students

Two lectures during the semester may be missed for personal reasons.

Students who are absent because of illness, an accident or family affliction should report to the instructor on their return to class.

Missed Lectures - Professor

I plan on being at UVic for the full semester so I shouldn't miss any lectures due to travel.

I will be finishing the implementation of UVic's Scanning Transmission Electron Holography Microscope (STEHM), which may cause me to miss a lecture.

Office Hours

The best time to come to my office is during the daytime on Tuesdays, Wednesdays and Friday afternoons.

Friday mornings I meet with my graduate students and group members so I will not be available.

Please do not come at the end of the day as I have family commitments.

Laboratories

There will be no laboratories but I'll arrange a tour and possibly a demonstration of the SEM, FIB and STEHM plus their accessories such as the Ion Miller, Plasma and UV cleaners, carbon and metal deposition devices.

Tutorials

There are no tutorials for this course although if you need help please come to see me.

TAs

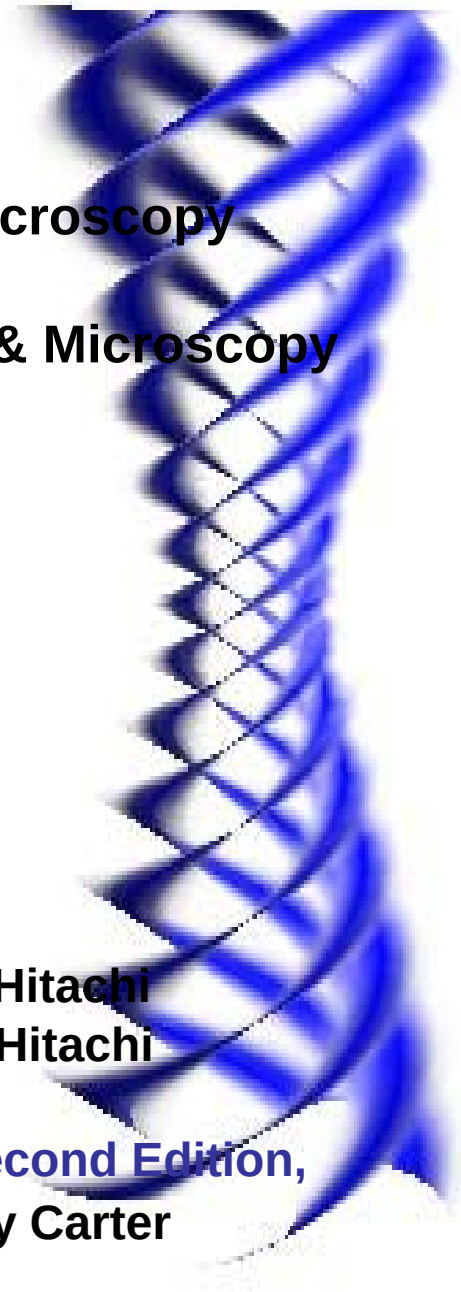
There is one TA for this course.

His name is Luis Melo. When I have his contact information I'll inform you.

Clickers

If everyone has an *i*clicker, we'll use them.

MECH 472/Mech 580



- Introduction to Scanning Electron Microscopes & Microscopy Procedures for Imaging
- Introduction to Transmission Electron Microscopes & Microscopy Procedures for Imaging
- Electron Diffraction – (thinking in reciprocal space)
- Atomic Resolution Imaging
- Electron Vortex Beams
- Electron Holography
- Etc.

Textbooks

Introductory Lectures

Let's Familiarize Ourselves with the TEM - Hitachi

Let's Familiarize Ourselves with the SEM - Hitachi

In-depth Lectures

The Transmission Electron Microscope (Second Edition, Springer) by David B. Williams and C. Barry Carter

UVic's Scanning Transmission Electron Holography Microscope (STEHM) Infrastructure

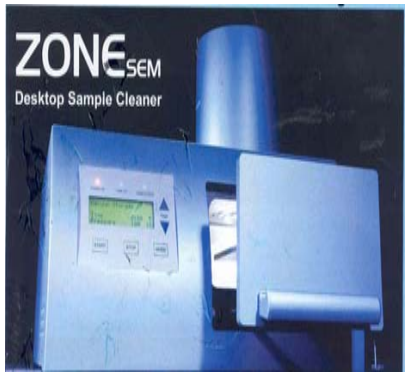
STEHM – Hitachi HF3300v

SEM – Hitachi S4800
(+ Bruker EDS)

FIB – Hitachi HB-2100

Fischione Ion Miller
(Model 1010)

Fischione Plasma Cleaner
(Model 1020)



Hitachi UV Cleaner
(ZoneSEM)

Pelco Carbon Coater
(Cressington 208C)

+ Anatech Metal Coater (Au+Pd)