Course Description:
The Electron Microscope is utilized by many Biologists to image ultrastructural features of cells, tissues, biopolymers and nanoparticles (for example: Chemists, Physicists and Engineers). The preparation of Biological samples is dependent on the type of sample and the information that the researcher is looking to obtain. The aim of this course is to instruct students in protocol design, specimen processing procedures, and operation of the microscope. At the conclusion of the course students should be able to choose the appropriate specimen preparation procedure for a given biological sample, devise a working protocol and be comfortable with using the equipment. Students should also leave with an advanced understanding of the Philips CM 10 Transmission Electron Microscope which will allow them to use other TEMs that they might encounter in the future.

Course Objectives:
1. A basic understanding of biological specimen preparation
2. A basic understanding of electron optics
3. A basic understanding of image formation
4. The ability to section and collect material from the ultramicrotome
5. The ability to operate the CM10 TEM in its various modes

Course Information:
Instructor: Dr. Richard Gardiner
Office: Biotron Room 105E
Office Hours: By appointment
Phone: Ext 82241
Email: rgardine@uwo.ca

Lecture Hours: Approx. 2 hours per week to be set by participants.
    Day and Room TBA.

Laboratory Hours: Approx. 2 – 3 hours per week
    Day TBA Location Room 105 Biotron

During lab, I will use a combination of lecture and demonstration to show you a technique. Once I am finished with the demo, we will then devote the
remainder of the lab time to practicing the technique(s), with myself present to guide you along. Students are encouraged to have some of their own material that they can look at in the labs. If you have some samples to try speak to me prior to the start of the course.

**Laboratory Safety:**

All Participants must have taken and completed Western’s safety courses and be aware of general laboratory procedures. Students must wear proper clothing, have a lab coat and safety glasses. Gloves and other safety related materials will be provided.

**Evaluation:**

- Test One 15 %
- Test Two 20 %
- Essay / Presentation 15 % (10% essay + 5 % Talk)
- Written Assignments 10 % (2 x 5 % each)
- Lab Participation 40 %

Essay: A different topic will be assigned to each student on an aspect of electron microscopy and students will make a short presentation to the class on their topic in one of the lecture periods. (800 - 1000 words)

Written assignments: Consist of research into the fixation and preservation of a particular biological material. Students will be asked to briefly describe why each step in the protocol is used and to elucidate the steps not described in the paper (1 – 2 pages).

**Textual Resources:**

1. TBA
2. Lab Manual
   R. B. Gardiner
   2013
   This manual is required for the course.

**OWL:**

Course notes, grades, lecture and lab schedules, and ancillary information will be available on the course web site.
Topics Covered:

This is a general overview of the major areas that will be discussed and demonstrated. Other procedures will be described and Guest speakers will come and speak to the course on various topics.

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<td>Preparing Grids / Handling specimens</td>
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<td>Biological Specimen Preparation Techniques</td>
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<td>Fixation and Embedding</td>
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Policy Regarding Illness

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Graduate Chair of your program as soon as possible and contact the Instructor immediately. It is the student’s responsibility to make alternate arrangements with their Instructor once the accommodation has been approved and the Instructor has been informed.

Notes on Plagiarism

Students must write their essay and assignments in their own words. Plagiarism is a major academic offence – see Scholastic Offence Policy in the Western Academic Calendar.

Scholastic offenses are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:
http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_grad.pdf