

## **PATHOLOGY 4980E**

### **SEMINAR AND RESEARCH PROJECT**

#### **METHODOLOGY, EXPERIMENTATION AND COMMUNICATION IN PATHOLOGY**

Department of Pathology and Laboratory Medicine  
Schulich School of Medicine & Dentistry  
Western University

**2019-2020**

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**Lectures:** Wednesdays, 10:30-1:30

**Location:** MSB 193C/D

**Requisites:**

**Prerequisite(s):** Pathology 3500 with a mark of at least 70% or the former Pathology 3240A and Pathology 3245B with marks of at least 70% in each; and one of the following: (Pharmacology 3620, Physiology 3120, and registration in Year 4 of the Honors Specialization in Pathology), (Microbiology and Immunology 3610F and Microbiology and Immunology 3620G with marks of at least 70% in each and registration in Year 4 of an Honors Specialization in Microbiology and Immunology with Pathology), or (Biochemistry 3380G with a mark of at least 70% and registration in Year 4 of an Honors Specialization in Biochemistry and Pathology of Human Disease).

**Anti-requisite(s):** The former Pathology and Toxicology 4980E.

***Senate regulation regarding the student's responsibility regarding requisites:***

*Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.*

**OWL:** Students with OWL issues should see: <https://owl.uwo.ca/portal/site/owldocs>

**Coordinator:**

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**Support Staff:**

Cheryl Campbell, Undergraduate Program Administrator

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## **2019-2020 Course Outline**

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### **1. GENERAL OUTLINE**

*Pathology* overlaps the disciplines of both basic and clinical sciences. Within the Department of Pathology and Laboratory Medicine at Western University, clinical and basic scientists conduct research into diseases that affect Canadians, using both animal models and human tissues, and conduct service work within the Department of Pathology and Laboratory Medicine (London Health Sciences Centre). In addition, we enjoy collaborations with other basic and clinical scientists at Schulich School of Medicine & Dentistry, and London's research institutes to study the mechanisms and outcomes of disease.

The honors specialization modules in *Pathology*, and combined modules with Microbiology & Immunology and Biochemistry will introduce you to the basic principles within pathology and to the effects of a variety of chemicals (drugs, toxins, etc.) in living organisms. The goal of this methodology- and research-based course is to develop qualitative and quantitative skills required to pursue a career in research. Students will have the opportunity to gain familiarity with a variety of research techniques. The course will allow students to conduct an independent research project under the supervision of a faculty member.

This will involve:

- a) formulation of a research proposal and research hypothesis,
- b) collection of data to test your hypothesis,
- c) statistical analysis of the data (as appropriate),
- d) interpretation of the data, and
- e) oral and written presentation of the methodology, results and conclusions.

Independent study, self-directed experimental/research design and analysis, and effective communication skills will be emphasized in the course. In the classroom and within the laboratory, you will learn a number of techniques that are used in modern pathology research (e.g. epidemiological data, immunohisto- and immunocyto-chemistry, quantitative PCR, gene knockdown and knockout, measures of cellular activity, microscopic examination and image analysis).

*Students are required to spend at least 10-15 hours/week in their laboratory or on the research project. This is in addition to time spent in preparing for the presentation and class reports. Specific times will be worked out between the student and supervisor early in September.*

In addition, we will hold a **weekly seminar session on Wednesdays from 10:30 am to 1:30 pm.**, but there is some flexibility in order to accommodate supervisor's schedules during those sessions in which you will present your proposals or final research projects. You will be required to present your project proposal report during the Fall term (in written and oral form), and a final report (written and oral form) during the Winter term.

Students registered in Pathology 4980E may use the facilities of the Leslie S. Valberg Resource Centre (VERC, MSB M150 and satellite computer labs DSB 4006, 4007 or 4008). The VERC has a number of networked computers, and programs and image databases that pertain to pathological, pharmacological, and toxicological concepts.

## **2. COURSE OUTLINE**

### **INTRODUCTION & ORIENTATION**

During the first 2-3 weeks of September, sessions addressing laboratory safety and biosafety will be held and all Pathology 4980E students will be expected to attend before starting to work in their research laboratories. Additional sessions addressing hospital-based issues may be given to those student(s) who may be working within the hospital. These sessions will address additional concerns regarding laboratory safety and biosafety (e.g. handling of human tissues) and issues of confidentiality and privacy of patient information within a hospital setting, particularly with reference to dealing with forensic cases.

#### **i. LABORATORY & RESEARCH TECHNIQUES**

Students will pursue a research project in one of the University, hospital or research institute-based pathology research laboratories.

*Within your supervisor's research laboratory or facility, you will learn a number of techniques related to your research project (e.g. collection of epidemiological data, immunochemistry, cell staining, cell tissue culture, RNA and protein analysis). Specific techniques learned will depend upon the research project and the techniques being used within the supervisor's laboratory and research field.*

Those student(s) who pursue a more clinically-oriented research project within the LHSC-based clinical pathology laboratories (e.g. with the forensic pathologist) will also be expected to acquire the necessary technical or research skills during the Fall term and undertake a full research project (that will continue and be completed in the Winter term). The student may also have the opportunity to learn policies and procedures related to hospital and coroners' autopsies in the Autopsy Suite (Regional Forensic Pathology Unit).

#### **ii. RESEARCH PROJECT**

There are two main mechanisms for research/laboratory placement.

1) Students who were working/volunteering in a research laboratory (in Pathology or other Schulich departments) prior to starting their 4th year thesis projects may be able to continue in the same laboratory, provided that the thesis portion 'builds' on the project (i.e. students cannot use the data obtained prior to the thesis project start date of September to satisfy the requirements), and the supervisor agrees on taking the student as a 4th year thesis student.

2) A list of available research projects is provided to students. These projects cover a wide range of topics including basic laboratory science projects, Pathology education research, and clinical science projects. Students review these projects and inform the coordinator of their preference. Every effort is made to match the student and their preferred project. It is possible, however, that students may not be matched to their first choice.

Once the laboratory placements are finalized, students should report to their faculty supervisor to discuss weekly hours, research projects and the initial research proposal.

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A written research project proposal is due in December (copy to supervisor and copy to Dr. Z. Khan). The final written research project report will be due in April (copy to supervisor and to Dr. Z. Khan).

### **iii. SCIENTIFIC COMMUNICATION**

During the weekly seminar sessions, students will have an opportunity to practice their oral presentation skills and to present their initial research proposal (in Fall) and a final research project report (Winter). We will also have a *Research Day* where students will be expected to present your work-in-progress in the form of a poster and be available to answer questions from fellow students and faculty (typically scheduled during the last week of March).

You will also present a critique of one of the key journal articles in your topic area during January as you develop your project proposal and participate as a discussant in other journal critiques.

## **3. OBJECTIVES AND EVALUATION**

### **I. Laboratory & Research Techniques**

**Objectives:** To develop a familiarity with a variety of methodologies in common use in pathology laboratories.

### **II. Research Projects**

**Objectives:**

- To develop skills in the formulation of hypothesis and the design and execution of a research project.
- To develop the analytical skills required to conduct research in Pathology, perform the associated data analysis and to derive appropriate conclusions.
- To develop skills in critical evaluation of medical and scientific information.

### **III. Scientific Communication**

**Objectives:** To develop skills in oral and written communication.

## **EVALUATION:**

	% Total Mark
I. Laboratory techniques	
Based on Supervisor evaluation <sup>a</sup>	10 %
II. Research Project	
Written proposal <sup>b</sup>	10 %
Research Day poster presentation <sup>c</sup>	10 %
Final written report <sup>d</sup>	20 %
III. Communication	
Participation <sup>e</sup>	10 %
Journal critique	10 %
Proposal presentation	10 %
Final research presentation	20 %

<sup>a</sup> Supervisors will take into consideration, evidence of competency and particular excellence in laboratory investigation/research methodology, as well as motivation, and work habits.

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<sup>b</sup> Research Proposal – The proposal should be prepared in consultation with your supervisor. Detailed guidelines will be provided to all students before the submission deadline. In brief, proposal reports should include the following sections:

- *Background/Knowledge to date*  
A brief introduction and evidence that led to formulation of hypothesis
- *Hypothesis*  
A concise working hypothesis
- *Specific Aims*  
Objectives of the study
- *Methodology/Experimental Design*  
How are you going to explore/test your hypothesis, including experimental model and approaches (qualitative or quantitative including statistical analyses) to be used?
- *Significance of Research*  
What is the significance of the study? You may also include the expected results.
- *References*  
A complete list of literature cited.

<sup>c</sup> Poster presentation – Evaluation provided by invited faculty and course coordinator. General format to include: Objectives & Aims, brief outline of Methodology, Results to date, Summary and Significance of Research. Student will also be evaluated on how well they understood the research methodology, results and significance of research in answering questions.

<sup>d</sup> Final Report – The written report should be in the format of a scientific article (can use an appropriate format for submission, e.g. Toxicology and Applied Pharmacology; Archives of Pathology & Laboratory Medicine; Clinical and Experimental Pathology, Laboratory Investigation, etc.). Reports may also include:

1. a general discussion of the problems encountered and the possible solutions,
2. the direction of the research if the project were to be continued.

<sup>e</sup> Participation - Regular *attendance* and *participation* in class *discussions* is expected and will be evaluated by the course coordinator.

#### ***Policy on the Rounding and Bumping of Marks:***

*Across the Basic Medical Sciences Undergraduate Education programs and within the department of Pathology and Laboratory Medicine, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. Final grades on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark “bumping” will be denied.*

#### **4. ADDITIONAL INFORMATION & STATEMENTS**

The website for the Office of the Registrar is <http://www.registrar.uwo.ca>

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**Statement on Official Email Addresses:** In accordance with policy, <http://www.uwo.ca/its/identity/activatenonstudent.html>, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

**Statement on Use of Electronic Devices:** Tablets and computers is permitted in the lectures/learning sections.

**Statement on Academic Offences:** Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following website:  
[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf)

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com <http://www.turnitin.com>.

### **5. ABSENCE FROM COURSE COMMITMENTS**

#### **Academic Consideration for Student Absences**

If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. Approval can be granted either through a self-reporting of absence or via the Academic Counselling Office of the Faculty of Science located in NCB 280, and can be contacted at [scibmsac@uwo.ca](mailto:scibmsac@uwo.ca).

**NEW!!** For further information, please consult the university's policy on academic consideration for student absences as there are updates to the academic consideration procedures.  
[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Consideration\\_for\\_absences.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf)

The policy on Accommodation for Religious Holidays can be found here:  
[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_religious.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf)

#### **A. Absence for medical and non-medical reasons:**

Students must familiarize themselves with the Policy on Accommodation for Medical Illness for Undergraduate Students, located at:  
[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_medical.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf)

A Western Student Medical Certificate (SMC) is required when a student is seeking academic accommodation. This documentation should be obtained at the time of the initial consultation with the physician/nurse practitioner or walk-in clinic.  
[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)

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### **Medical/Compassionate Relief Program Policy**

*It is current policy that students who are unable to write a test or examination or other form of course evaluation are required to obtain a medical certificate that is taken to the Academic Counseling Office, NCB 280 (for Science and Basic Medical Science students) or to your appropriate Home Faculty Counseling Office. In the case of an unexpected absence on compassionate grounds, documentation is also requested. **Such documentation must be submitted by the student directly to the Academic Counseling office and not to the instructor.** An academic counselor in that office will review and either approve or deny the accommodation request. It will be the Academic Counseling office that will determine if accommodation is warranted. This policy applies to all forms of assessment, including evaluations that are less than 10%.*

### **Statement from the Academic Counselling Office, Faculty of Science (for Science and BMSc students)**

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 Academic Counselling Office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved by the Academic Counselling Office and the instructor has been informed.

### **Marking for missed sessions and assignments**

Without an academic accommodation, late submission of assignments/reports will receive a mark of zero. Similarly, absence from sessions and presentations will receive a mark of zero for participation. The same procedure will be followed for components worth 10% or less.

If a student has received academic accommodation, missed components will not be excused. Instead, components (participation, attendance, assignments, presentations) may be reweighted. The same procedure will be followed for components worth 10% or less.

## **6. STATEMENT ON EVALUATION OF UNDERGRADUATE ACADEMIC PERFORMANCE**

The 15% Assessment Rule applies to 1000- and 2000-level courses. Pathology 4980E course is exempt from the 15% assessment policy ([www.uwo.ca/univsec/pdf/academic\\_policies/exam/evaluation\\_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/exam/evaluation_undergrad.pdf)).

## **7. COPYRIGHT STATEMENT**

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws.

## **8. SUPPORT SERVICES**

Academic Counselling (Science and Basic Medical Sciences):  
<http://www.uwo.ca/sci/counselling>

**Accessibility:** Please contact the course coordinator if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation. The policy on Accommodation for Students with Disabilities can be found here:

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[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic%20Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf)

**Student Development Centre (SDC):** Learning-skills counsellors at SDC are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling. <http://www.sdc.uwo.ca>

**Mental Health:** Students who are in emotional/mental distress should refer to Mental Health@Western for a complete list of options about how to obtain help. [http://www.health.uwo.ca/mental\\_health](http://www.health.uwo.ca/mental_health)

**Student Health Services:** <https://www.uwo.ca/health/shs/index.html>  
Additional student-run support services are offered by the USC, <http://westernusc.ca/services>