1. Course Information

Course Description:
This course will familiarize students with several common immunology techniques that are widely used to assess the overall immunocompetence of humans/animals in clinical/veterinary settings (e.g. diagnostic labs), research labs and biopharma. Students will also gain advanced scientific writing skills. Overall, this course will prepare students to competently perform immunological methodologies relevant to 4th-year/graduate research projects in microbiology & immunology, plus write a 4th-year/graduate thesis and scientific paper.

Learning Outcomes:
1. Gain an understanding and proficiency performing common methodologies in immunology.
2. Understand the structure of primary scientific articles.
3. Develop advanced scientific writing skills.
4. Appreciate and comply with the ethical responsibilities of a scientist.

Course Objectives: To provide students with an advanced understanding of:

1. Immune responses occurring in vivo following vaccination and infection. Specifically:
   1) Development of antibody responses to a vaccine antigen
   2) T cell proliferation
   3) Generation of macrophages from bone marrow cells
   4) Activation of macrophages following microbial infections (cytokine production and cell signaling)

2. Common immunology methodologies.
   Techniques learned include vaccine production, immunoelectrophoresis, chromatography, ELISA, MTT assay, TNF bioassay, Western Blot and RT-PCR. Students will also learn basic mouse handling, blood collection, intraperitoneal injections, spleen and bone marrow cell isolation. A student can decline from handling mice without penalty, however it is imperative that you make Dr. Summers aware of this prior to/during the first week of class.

3. Scientific writing skills.
   This course will prepare students to competently write a lab report, 4th-year or graduate thesis, and scientific paper. A “Guide to Writing Hypothesis-Testing Papers” document created for this course, plus online scientific writing modules will help you gain advanced scientific writing skills. Former 4th-year students felt “well-prepared to undertake research and write their honors thesis after taking this course.”

Lectures: Tuesdays @ 1:30 – 2:20 pm, DSB-2016. Lecture on Jan 17th is mandatory.
- Attendance will be taken at each lecture as they constitute the pre-lab talk.
- Read, sign and hand in the “Code of Conduct” form at the first lecture.

Labs: Tuesday or Wednesday @ 2:30 – 5:20 pm. Lab 1 on Jan 17/18 is mandatory.
- Some follow-up labs occur 24 or 48 hours later to harvest plates and obtain results (see the Schedule).
- Lab 1 is a mouse training lab located in the ACVS Workshop Lab.
- All remaining labs are in the student labs in MSB-120.
- Provide your own lab coat and lock. No Lab Coat = No Lab!
- Lockers are located outside the lab for your belongings. Locks must be removed after the lab.
- Only stationary is allowed in the lab (no phones, tablets, laptops, etc.).
Requirements to be permitted to work with mice in this course: In accordance with federal, provincial and university laws, all individuals at Western using animals must obtain the proper information and training. Therefore, it is mandatory that all students in Microimm 3620G complete each of the following:

1. Attend the Animal Care and Veterinary Services (ACVS) lecture on January 17th. A student absent from this lecture must obtain Dean’s approval, in which case they can instead complete and pass the online ACVS Animal Ethics Course and Quiz.

2. Pass a quiz on the above ACVS lecture material with a minimum 70% mark (quiz is in Lab 2).

3. Attend the ACVS Workshop Lab on January 17th (Tues lab group) or 18th (Wed lab group). There is no makeup lab so students who miss this lab will not be allowed to handle mice in this course.

Directions to the ACVS Workshop Lab: Follow the “ACVS Workshop” signs posted outside the elevators on the lower ground floor of the Dental Sciences Building. Call ACVS Security using the keypad for access into the facility. Tell them you are in the microbiology course. Bring your own lab coat and notebook.

Course Requisites:

Antirequisite(s): the former Microbiology and Immunology 3600G
Prerequisite(s): Biochemistry 2280A with a mark of at least 65%; Biology 2581B; Chemistry 2213A/B and 2223B with marks of at least 65% in both courses; Microbiology and Immunology 2500A/B.
Pre-or Corequisite(s): Microbiology and Immunology 3300B

Senate regulation regarding the student’s responsibility for 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.

Please contact the course instructor if you require material in an alternate format or if any other arrangements can 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 questions regarding an accommodation.

2. Instructor Information: available by appointment

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Email</th>
<th>Office</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Dr. Kelly Summers</td>
<td><a href="mailto:Kelly.Summers@schulich.uwo.ca">Kelly.Summers@schulich.uwo.ca</a></td>
<td>DSB-3024</td>
<td>519-661-3432</td>
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<tr>
<td>Course Coordinator</td>
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<tr>
<td>Dr. Sung Kim</td>
<td><a href="mailto:Sung.Kim@schulich.uwo.ca">Sung.Kim@schulich.uwo.ca</a></td>
<td>SDRI-119</td>
<td>519-850-2961</td>
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<td>Instructor</td>
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3. Course Materials

Textbook: There is no textbook requirement. However, the following textbooks may be useful for supplementing lecture material, methodologies or general interest.
- Kuby Immunology by Owen, Punt and Stratford
- Immunobiology by CA Janeway, P Travers, M Walport and MJ Shlomchik.

WebCT: Students are responsible for checking OWL at regular intervals. OWL will be used to communicate information about the course, access lecture notes and online modules, submit lab reports to Turnitin, and post questions. Students with OWL problems should contact the ITS Helpdesk by phone (519-661-3800), web form (itshelp.uwo.ca) or in person (Support Services Building, main floor).
4. Course Policies

**Mandatory:**
“Code of Conduct” Document. Please read, sign, and hand in this form at the first lecture.

**Laboratory Health and Safety.** You are expected to follow standard lab health and safety procedures. Western has a “Laboratory Health and Safety Manual for General Laboratory Practices” document available [here](#). Sections relevant to this course are essential for you to know and have been incorporated into a course-adapted version called “Lab Health & Safety in Microimm 3620G” (posted on OWL). Please [read this version](#), then complete the mandatory online Lab Health & Safety quiz, due January 17th.

**Ethical Responsibility.** You are expected to conform to the ethical responsibilities of an author. Scholastic offenses of relevance to paper/lab report submissions include Plagiarism, Data Falsification and Data Fabrication. Please complete the mandatory online Ethical Responsibilities module, due January 24th.

**Missed Labs:** There is no make-up lab for any reason. Absence without penalty will be given to students with reasons approved by the Dean’s Office. Penalty for an unexcused absence is 5% deducted from the final grade for each lab missed.

**Emergency Procedures:** For FIRST AID, students are to go to Student Health for non-emergency accidents/situations. Otherwise call 911 where Campus Police will connect the caller to the appropriate emergency service immediately. This may be SERT (Student Emergency Response Team). **NOTE:** Phones are located on the east wall of the lab doors that lead to the hallway.

5. Evaluations

<table>
<thead>
<tr>
<th>Component</th>
<th>% Value</th>
<th>Due Date</th>
</tr>
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<tbody>
<tr>
<td>Online Lab Health &amp; Safety Quiz</td>
<td>3</td>
<td>Jan 17 - mandatory</td>
</tr>
<tr>
<td>Online Ethical Responsibilities Quiz</td>
<td>3</td>
<td>Jan 24 - mandatory</td>
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<tr>
<td>Online Scientific Writing Modules:</td>
<td></td>
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<tr>
<td>Abstract (online quiz only)</td>
<td>3</td>
<td>Jan 31</td>
</tr>
<tr>
<td>Figures</td>
<td>3</td>
<td>Jan 31</td>
</tr>
<tr>
<td>Title</td>
<td>3</td>
<td>Feb 7</td>
</tr>
<tr>
<td>Introduction</td>
<td>3</td>
<td>Feb 7</td>
</tr>
<tr>
<td>Lab Report 1: written Abstract &amp; Results for Labs 2&amp;3</td>
<td>5</td>
<td>Feb 7/8 @ 2:30pm in the lab &amp; Turnitin</td>
</tr>
<tr>
<td>Lab Report 2: B cell Immunity</td>
<td>10</td>
<td>Feb 17 by noon in M&amp;I office dropbox &amp; Turnitin</td>
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<tr>
<td>Methodology Quiz 1</td>
<td>7</td>
<td>March 7 (in-class)</td>
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<tr>
<td>Lab Report 3: T cell Immunity</td>
<td>10</td>
<td>March 7/8 @ 2:30pm in the lab &amp; Turnitin</td>
</tr>
<tr>
<td>Methodology Quiz 2</td>
<td>7</td>
<td>March 28 (in-class)</td>
</tr>
<tr>
<td>Lab Report 3: Myeloid Development and Signaling</td>
<td>25</td>
<td>April 7 by noon in M&amp;I office dropbox &amp; Turnitin</td>
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<td>Lab Preparation Reports</td>
<td>10</td>
<td>due at the start of each lab</td>
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<tr>
<td>Participation Marks</td>
<td>8</td>
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Across the Basic Medical Sciences Undergraduate Education programs and within the Department of Microbiology& Immunology 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 will be rounded up to the next whole integer, e.g. a 73.5 becomes a 74 and marks will not be bumped to the next grade or GPA, e.g. a 79 will not be rounded up to an 80, an 84 will not be rounded up to an 85, etc. The mark attained is the mark you achieved and the mark assigned; requests for mark “bumping” will be denied.

6. Course Expectations

1) Online Scientific Writing Modules:
The goal of each module is to improve your understanding of specific aspects of scientific writing. There are 4 scientific writing modules: Abstract, Figures, Title, Introduction. Each module comprises 1-2 graded assignments/quiz. Read the relevant section in the “Guide to Writing Hypothesis-Testing Papers” document prior to completing each module, as it contains more comprehensive information and examples. Your feedback is requested and appreciated to improve each module (this is anonymous and not graded). Late modules will not be accepted for any reason.

2) Participation:
You will be working in pairs within a small group supervised by a TA. The TA will assign each student a “Lab Participation” mark for each lab. You are expected to attend all lectures and labs, participate in group discussions, converse freely with your colleagues and TA to share ideas, help each other, ask/answer knowledge-based (not just clarification) questions, discuss science, courses/modules, graduate studies, etc. In addition, you are expected to follow lab rules and safety, perform lab techniques with proficiency, and share the experimental work equally with your lab partner (one partner should not do all the work).

3) Lab Notebook:
The goal is to help you develop record-keeping habits expected of all lab personnel. Your TA will check and mark your lab notebook at each lab. Use any bound notebook of your preference. Your notebook entries should be an up-to-date, accurate account of the following items:

- Title as stated in the lab manual, e.g. Lab 5: Lymphocyte Proliferation
- Lab Objectives.
  Record any changes to the protocol, errors made during the procedure, etc.
- Results. Document raw data, calculations, drawings, graphs, answers to questions posted in the lab manual, OD readings, etc.
- Conclusion. State what your results mean (your findings) in 1-2 sentences.

4) Lab Preparation Report:
For best performance and understanding of the lab objectives and methods, it is important to prepare for each lab in advance. This includes reading the lab manual and preparing a “Lab Preparation Report” before you enter the lab. This report gives an account of what you are going to do during the lab. Your TA will check your report at the start of each lab as evidence of your advanced preparation. Failure to do so will result in a Lab Preparation mark of zero. Include:

1. Lab Objective(s): 1-2 handwritten sentences, and
2. Flowchart Diagram: that outlines the general methodical steps (what procedures you will be doing and when). It can either be handwritten or prepared on a computer and pasted into your notebook. Page 5 of the Lab Manual has more information on the flowchart.
5) Lab Reports:
The goal of the lab reports is for you to gain advanced scientific writing skills to prepare you to write a 4th-year thesis, graduate thesis and scientific paper. You will be given “Guidelines” for each lab report. Discussions of data and interpretations are encouraged with your lab mates, TA and instructor prior to writing your report but each student must write her/his lab report independently (i.e. in your own words). Material cited must be referenced. Academic dishonesty will not be tolerated.

Lab Report Submission: Submit BOTH a hard copy to your TA or M&I office dropbox (DSB-3016), as requested, and an electronic copy to Turnitin on OWL by the due date/time. A late penalty of 25% per day will apply if both are not submitted on time. No reports will be accepted after 2 days without a valid medical or compassionate reason approved by the Dean’s Office.

6) Methodology Quizzes:
The goal of these two in-class quizzes is to test your understanding of the immunology methodologies that you performed in the labs. They may comprise short answer and/or multiple choice questions.

6. Additional Information/Statements

Statement on Intellectual Property:
All course material produced by faculty is copyright protected and to reproduce this material for any purpose other than the student's own educational use contravenes Canadian Copyright law. This includes posting any course material (e.g. lecture notes, lab manual) on public domains.

Statement on Academic Offences
Academic dishonesty is defined as cheating, plagiarism and any form of copying. The university requires all members of the University Community to familiarize themselves and to follow copyright and fair use requirements. Scholastic offences are taken seriously and will not be tolerated. Violations will subject you to disciplinary action under university policies. You are responsible for reading and respecting the university’s policy, specifically the definition of what constitutes a Scholastic Offence, at the following website: http://www.uwo.ca/univsec/appeals_discipline/index.html

All lab reports will 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 reports 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 UWO and Turnitin.com (http://www.turnitin.com).

Absences from lectures, labs, tests, etc. or late lab reports, assignments, etc. due to:
A. Medical Illness:
   Students must familiarize themselves with the Policy on Accommodation for Medical Illness.

B. Non-Medical Reasons:
   • Religious Holiday. Students must familiarize themselves with the Policy on Accommodation for Religious Holidays.
   • Bereavement or Compassionate Reasons. Documentation must be submitted by the student directly to the Dean’s Office and not to the instructor. It will subsequently be the Dean’s Office that will determine if accommodation is warranted.
Statement from the Dean’s Office, Faculty of Science:
If you are unable to meet a course requirement due to illness or other serious circumstances (e.g. bereavement), you must provide valid medical or other supporting documentation to the Dean's 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 and the instructor has been informed. A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services.

Support Services:

Registrarial Services:  http://www.registrar.uwo.ca

Academic Counselling (Science and Basic Medical Sciences):
http://www.uwo.ca/sci/undergrad/academic_counselling/index.html

Student Support Services:  http://westernusc.ca/service/

Student Development Services:  http://www.sdc.uwo.ca

Student Health Services:  http://www.shs.uwo.ca

Students who are in emotional/mental distress should refer to Health and Wellness website for a complete list of options about how to obtain help: http://www.health.uwo.ca/mental_health