

**MICR 303: IMMUNOLOGY**  
**COURSE OUTLINE FALL 2017**

**INSTRUCTORS**

**Catherine Bachewich**

Affiliate Associate Professor  
Dept. Biology, Concordia University  
Affiliate Associate Professor  
Dept. Biochemistry and Microbiology  
University of Victoria

Email: [cbachewich@uvic.ca](mailto:cbachewich@uvic.ca)  
Office: Petch 183  
Phone: 250-853-3669

**Brad Nelson**

Director and Distinguished Scientist  
Deeley Research Center, BCCA  
Professor, Dept. Biochemistry and Microbiology  
Adjunct Professor, Dept. Biology, University of Victoria  
Professor, Medical Genetics, University of British Columbia

Email: [bnelson@bccrc.ca](mailto:bnelson@bccrc.ca)

**LOCATION**

Mon, Thurs, 11:30-12:50  
David Strong Building C103

**TEXT**

Janeway's Immunobiology, 9<sup>th</sup> Ed

**OFFICE HOURS**

TBA in class

---

**COURSE CONTENT**

This course provides an overview of components of the immune system and how they function to generate diversity in immune responses, antibody-mediated and cell-mediated immune responses and antigen recognition, and the immune system and its functional role in health and disease. Experimental details on how the information has been obtained will be included throughout, where possible. Students will learn common techniques used by immunologists to probe the function of the immune system, including: flow cytometry, ELISA, use of transgenic mice, transfer of immune cell types, and pharmacological blocking or depletion of cell types/receptors/cytokines

**Part I: Introduction to the Immune System**

1. Overview of the immune system (Chapter 1):
  - key immune cell types, origin, principles of innate vs adaptive immunity
2. Innate immunity: first lines of defence (Chapter 2+3).
  - anatomical barriers, antimicrobial peptides, complement, pattern recognition
3. Innate immunity: key cells and effector mechanisms (Chapter 2+3)
  - effector mechanisms of neutrophils, eosinophils, macrophages, mast cells, basophils, innate lymphoid cells

4. Adaptive immunity: antigen recognition by B cells and antibody effector mechanisms (Chapter 4+10)
  - antigen, structure of antibody molecule, antigen binding, types of immunoglobulin
5. Adaptive immunity: antigens and antigen presentation to T cells (Chapter 6)
  - antigen processing and presentation via MHCI or MHCII to T cells, co-stimulation
6. Adaptive immunity: T cell activation, subsets and effector mechanisms (Chapter 7+9)
  - T cell activation, subsets of CD4 T cells, unconventional T cell subsets
7. Adaptive immunity: generation of lymphocyte antigen receptors, interactions between immune players (Chapter 5+10)
  - rearrangement of immunoglobulin gene, T cell receptor gene, T and B cell interactions and antibody production

## **Part 2: The Immune System in health and Disease**

8. Immunological memory (Chapter 11+16)
  - memory B and T cells, vaccination
9. Immunity to infectious pathogens
  - immune responses to bacteria, viruses, fungi, parasites
10. Mucosal immunity (Chapter 12)
  - challenges faced by mucosal surfaces, host defence, role of microbiome
11. Pathogen evasion of immune responses (Chapter 13)
12. Generation of tolerance and regulatory mechanisms (Chapter 8)
  - development of B and T cells, mechanisms preventing auto-reactivity, thymic and peripheral generation of regulatory T cells
13. Immune-mediated disease: Autoimmunity and transplants (Chapter 15)
  - mechanisms leading to autoimmunity and transplant rejection
14. Immune-mediated disease: Immunodeficiency, hypersensitivity and allergy (Chapter 13 + 14)
  - immunodeficiency disorders, mechanisms leading to allergy, hypersensitivity.
15. Tumor immunology (Chapter 16)
  - tumor immune environment, immunotherapy

## **ASSESSMENT OF STUDENT PERFORMANCE**

### **(1) Techniques to be used:**

- Grading of short answer and longer answer exam questions on material presented in the course and assignment of a numerical mark to each question.
- Exams are based on material covered in lectures and in provided course materials (lecture slides). Textbook reading will be recommended to reinforce what is taught in class, and provide extra details for those that are interested. Students won't be examined on extra information found in the textbook.

### **(2) Evaluation and weighting:**

- Midterm 1\* (**Oct. 2**)           15%\*\*
- Midterm 2\* (**Nov. 2**)       35%\*\*
- Final exam                       50%

\*\*Of the 2 midterms, the poorest grade will contribute 15 marks, while the highest grade will contribute 35 marks.

### **(3) UVIC Grading Scheme:**

<b>A+</b>	90 -100	<b>B+</b>	77 - 79	<b>C+</b>	65 - 69	<b>F</b>	< 50
<b>A</b>	85 - 89	<b>B</b>	73 - 76	<b>C</b>	60 - 64	<b>N **</b>	< 50
<b>A-</b>	80 - 84	<b>B-</b>	70 - 72	<b>D</b>	50 - 59		

#### **\*\* N grades**

Students who have completed the following elements will be considered to have completed the course and will be assigned a final grade:

- Midterm 1, Midterm 2, Final Exam

Failure to complete one or more of these elements will result in a grade of "N" regardless of the cumulative percentage on other elements of the course. An N is a failing grade, and it factors into a student's GPA as 0. The maximum percentage that can accompany an N on a student's transcript is 49.

### **COURSE EXPERIENCE SURVEY (CES)**

We value your feedback on this course. Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete a confidential survey regarding your learning experience (CES). The survey is vital to providing feedback to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. When it is time for you to complete the survey you will receive an email inviting you to do so. Please ensure that your current email address is listed in MyPage (<http://uvic.ca/mypage>). If you do not receive an email invitation, you can go directly to <http://ces.uvic.ca>. You will need to use your UVic netlink ID to access the survey, which can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more detailed information nearer the time but please be thinking about this important activity during the course.

### **RESOURCE CENTER FOR STUDENTS WITH DISABILITY**

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, approach the Resource Centre for Students with a Disability (RCSD) as soon as possible (<http://rcsd.uvic.ca/>.) in order to assess your specific needs.

### **DEPARTMENT INFORMATION AND POLICIES**

1. The Department of Biochemistry and Microbiology upholds and enforces the University's policies on academic integrity. These policies are described in the current University Calendar. All students are advised to read this section.
2. Cell phones, computers, and other electronic devices must be turned off at all times unless being used for a purpose relevant to the class. Students having a cell phone, tablet, or computer on their person during an exam will be assumed to have it for the purpose of cheating.
3. Any recordings of lectures may only be performed with written permission of the instructor, and are for personal use only. The instructor retains copyright to such recordings and all lecture materials provided for the class (electronic and otherwise); these materials must not be shared or reposted on the Internet.
4. Course materials, such as notes, problem sheets, quizzes, examinations, example sheets, or review sheets, may not be redistributed without the explicit written permission of the instructor.
5. Students are expected to be present for the midterm and final exams. Instructors may grant deferrals for midterm examinations for illness, accident, or family affliction, and students must provide appropriate documentation 48 hours after the midterm exam. The Department of Biochemistry and Microbiology considers it a breach of academic integrity for a student taking a deferred examination to discuss the exam with classmates. Similarly, students who reveal the contents of an examination to students taking a deferred examination are considered to be in violation of the University of Victoria policy on academic integrity (see current University Calendar). Deferral of a final exam must be requested with an Academic Concession form and submitted directly to Undergraduate Records. Deferred final exams for fall term courses will be arranged by the instructor. Deferred final exams for spring term courses will be arranged through Undergraduate Records and must be written before the end of the summer term as stipulated in the University Calendar.
6. Multiple choice scan sheets for machine scoring (bubble sheets) are considered the authentic exam answer paper and will be retained by the department for 1 year.
7. Professors may refuse to review/remark exams not written in indelible ink. In addition, requests for review/remark of a midterm exam must be made within one week of the exam being returned. Students are expected to promptly pick up midterm exams after marking has been completed, either in class or from the instructor.
8. Examination papers that have pages removed, or are mutilated will not be marked.
9. The instructor reserves the right to use plagiarism detection software or other platforms to assess the integrity of student work.

***\*\*\*\*In the event of extraordinary circumstances beyond the University's control, or at the discretion of the instructor, the content and/or evaluation scheme in this course is subject to change***