

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

**INSTRUCTORS**

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**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

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**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 MHC I or MHC II 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

### **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/.](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