

### **DEPARTMENT of SCIENCE**

### **COURSE OUTLINE -WINTER 2019**

MI 2950 (A3): Infection and Immunity – 3 (3-0-0) 45 Hours for 15 Weeks

**INSTRUCTOR:** Sean Irwin **PHONE:** 780-539-2860

**OFFICE:** J224 **E-MAIL:** Sirwin@gprc.ab.ca

**OFFICE HOURS:** Tuesday and Thursday 10 - 11:20 am, Friday 1 - 2:20 pm

### CALENDAR DESCRIPTION:

This course introduces the principles and mechanisms of immunity in eucaryotes. It will provide an overview of the major groups of infectious agents (virus, bacteria, parasites) and examine selected microorganisms within the context of the host response to pathogens as well as pathogen evasion strategies.

**PREREQUISITE(S)/COREQUISITE:** BC 2000 or BC 2030, and MI 2650

## **REQUIRED TEXT/RESOURCE MATERIALS:**

There is no textbook for the course. The following material will be put on reserve in the library.

- 'Basic Immunology' Abbas & Lichtman
- 'Essential Immunology' Roitt
- 'Mims' Pathogenesis of Infectious Disease Nash et al.
- 'Infection and Immunity' Playfair and Bancroft
- 'Viral Pathogenesis' Katze et al.
- 'Human Virology' Collier & Oxford

**DELIVERY MODE(S):** Lectures - Mondays and Wednesdays 1000-1120, J203

### **COURSE OBJECTIVES:**

- 1. To understand basic aspects of the immune response to pathogens.
- 2. To facilitate an in-depth understanding of the pathogenesis of infections.
- 3. To foster the development of critical thinking skills.

### **LEARNING OUTCOMES:**

Upon successful completion of this course a student will have a working knowledge of the biological basis of immunology and the pathogenesis of infectious diseases.

### TRANSFERABILITY:

A list of institutions to which this course transfers (For example: UA, UC, UL, AU, GMU, CU, CUC, KUC. Please note that this is a sample and it must be replaced by your specific course transfer)

\*Warning: Although we strive to make the transferability information in this document up-to-date and accurate, the student has the final responsibility for ensuring the transferability of this course to Alberta Colleges and Universities. Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at Alberta Transfer Guide main page http://www.transferalberta.ca or, if you do not want to navigate through few links, at http://alis.alberta.ca/ps/tsp/ta/tbi/onlinesearch.html?SearchMode=S&step=2

\*\* Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. **Students** are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability

**EVALUATIONS:** Mid-term Exam I 30%

- In order to defer an exam due to illnes

Mid-term Exam II 30%

you will require a medical note.

Final Exam 40%

Mid-term I will cover material in the Immunology section of the course. Mid-term II will cover material from the Pathogenesis section of the course. The Final Exam will be cumulative, with approximately 40% of marks assigned to material covered in the Immunology and Pathogenesis sections, and 60% to that from the Virology section.. Throughout the course an emphasis will be placed on the integration of the concepts of immunology and infection. A thorough understanding of material covered in the Immunology section will be essential on ALL exams.

# GRADING CRITERIA: (The following criteria may be changed to suite the particular course/instructor)

Please note that most universities will not accept your course for transfer credit **IF** your grade is **less** than C-.

Alpha	4-point	Percentage	Alpha	4-point	Percentage
Grade	Equivalent	Guidelines	Grade	Equivalent	Guidelines
A+	4.0	90-100	C+	2.3	67-69
A	4.0	85-89	С	2.0	63-66

A-	3.7	80-84	C-	1.7	60-62
B+	3.3	77-79	D+	1.3	55-59
В	3.0	73-76	D	1.0	50-54
B-	2.7	70-72	F	0.0	00-49

### **COURSE SCHEDULE/TENTATIVE TIMELINE:**

# MI 2950 – Topic Outline

- 1 Introduction to Immunology
- 2 Innate defenses: cells and tissues of the immune system
- 3 Innate Signaling: The Toll Pathway
- 4 Introduction to Adaptive Immunity
- 5 Antigen Capture and Presentation
- 6 Antibodies: Structure and Generation
- 7 Humoral Immunity
- 8 T cell development
- 9 Complement
- 10 Cellular Immunity
- 11 Hypersensitivities
- 12 Immune response to eukaryotic parasites

# MID-TERM EXAM I – February 6<sup>th</sup>

- 13 Bacterial Pathogenesis: Introduction and Definitions
- 14 Bacterial structure in relationship to pathogenesis
- 15 Adherence and invasion: pili, adhesins, iron uptake
- 16 Bacterial strategies of immune evasion
- 17 Bacterial secretion systems used in pathogenesis
- 18 Bacterial toxins
- 19 Examples of bacterial diseases

## MID-TERM EXAM II - March 13th

- 20 Introduction to viruses
- 21 Structure and classification of viruses
- 22 Viral replication
- 23 Patterns of infection
- 24 Immune response to viruses
- 25 Influenza viruses
- 26 Human Immunodeficiency Virus
- 27 Herpesviruses
- 28 Poliovirus

## STUDENT RESPONSIBILITIES:

Refer to the College Policy on Student Rights and Responsibilities at www.gprc.ab.ca/d/STUDENTRIGHTSRESPONSIBILITIES

## STATEMENT ON PLAGIARISM AND CHEATING:

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the College Calendar at <a href="http://www.gprc.ab.ca/programs/calendar/">http://www.gprc.ab.ca/programs/calendar/</a> or the College Policy on Student Misconduct: Plagiarism and Cheating at <a href="https://www.gprc.ab.ca/about/administration/policies">https://www.gprc.ab.ca/about/administration/policies</a>

\*\*Note: all Academic and Administrative policies are available on the same page.