



DEPARTMENT OF SCIENCE
COURSE OUTLINE – WINTER 2018
MI 2950 – INFECTION & IMMUNITY
3 Credits (3-0-0) 45 hours 15 weeks

INSTRUCTOR: Philip Johnson **PHONE:** 780-539-2863
OFFICE: J224 **E-MAIL:** PJohnson@gprc.ab.ca

OFFICE HOURS: Mondays 1130-1300; Tuesdays & Thursdays 1000-1120.

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

REQUIRED TEXT/RESOURCE MATERIALS:

The following texts will be placed on Reserve in the GPRC library:

- 'Basic Immunology' – Abbas & Lichtman
- 'Fundamentals of Immunology' - Bier *et al*
- 'Immunobiology' - Janeway *et al*
- 'Essential Immunology' - Roitt
- 'Mechanisms of Bacterial Pathogenesis' - Groisman (editor)
- 'Mechanisms of Microbial Disease' - Engleberg *et al*
- 'Bacterial Pathogenesis: A Molecular Approach' - Salyers & Whitt
- 'Viral Pathogenesis and Immunity' - Nathanson
- 'Human Virology' - Collier & Oxford
- 'Principles of Virology' - Flint *et al*

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.

CREDIT/CONTACT HOURS: 3 credits (3-0-0)

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

OBJECTIVES:

1. To understand basic aspects of the immune response to pathogens and to be able to read with confidence newspaper and popular magazine reports dealing with immunity and infectious diseases.
2. To enroll in more advanced undergraduate courses in the areas of immunology and infections.
3. To write concise answers to questions relating to complex biological phenomena.

LEARNING OUTCOMES:

1. Knowledge of the components and mechanisms of innate immunity
2. Knowledge of the components and mechanisms of acquired immunity.
3. Knowledge of the factors influencing bacterial pathogenicity and virulence.
4. Knowledge of viral replication strategies and their effect on the host.
5. Knowledge of the host immune response to viral infections.

TRANSFERABILITY: University of Alberta - IMIN 200 (Immunology and Infection)

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%
	Mid-term Exam II	30%
	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:

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A⁺	4.0	90 – 100	
A	4.0	85 – 89	
A⁻	3.7	80 – 84	
B⁺	3.3	77 – 79	
B	3.0	73 – 76	
B⁻	2.7	70 – 72	
C⁺	2.3	67 – 69	
C	2.0	63 – 66	
C⁻	1.7	60 – 62	
D⁺	1.3	55 – 59	
D	1.0	50 – 54	
F	0.0	0 – 49	FAIL
WF	0.0	0	FAIL, withdrawal after the deadline

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STUDENT RESPONSIBILITIES:

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

If you are absent from an exam, you **MUST** notify the instructor of your absence (by email or voice message) on the day of the missed exam, or as soon as possible after. Also you may be asked to provide a doctor's certificate or a verification that explains your absence for that particular time. Only then will an alternate time be scheduled for you to write a different exam.

Attendance:

Students are expected to attend all classes and complete all assignments and tests.

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 <http://www.gprc.ab.ca/programs/calendar/> or the College Policy on Student Misconduct: Plagiarism and Cheating at <https://www.gprc.ab.ca/about/administration/policies>

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

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

- 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

- 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