NORTHWESTERN POLYTECHNIC

DEPARTMENT OF SCIENCE

COURSE OUTLINE – Winter 2025

MI2950 (A3): Infection and Immunity – 3 (3-0-0) 45 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR: Beatrice Amar, Ph.D. **PHONE:** 780-539-2031
OFFICE: J208 **E-MAIL:** Bamar@NWPolytech.ca

OFFICE HOURS: Mon to Thursday: 11.30 a.m. -12.30 p.m. (J208/HEC) or by appointment.

CALENDAR DESCRIPTION:

Introduces the principles and mechanisms of immunity in eukaryotes. Provides an overview of the major groups of infectious agents (virus, bacteria, parasites) and examines selected microorganisms within the context of the host response to pathogens and pathogen evasion strategies.

PREREQUISITE(S)/COREQUISITE: BC2000 and MI2650

REQUIRED TEXT/RESOURCE MATERIALS:

There is no prescribed textbook for this course. Online resources for this course including reading material, videos and internet links will be provided on the D2L course link.

DELIVERY MODE(S): Monday and Wednesday Lecture: 10.00 – 11.20 a.m. (A308)

COURSE OBJECTIVES:

1. To understand basic aspects of the immune response to pathogens.
2. To facilitate an in-depth understanding of the pathogenesis of bacterial and viral 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:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page http://www.transferalberta.ca.

** 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:

Student assessments will be conducted as given below:

Mid-term Exam I	-	25%	- In order to defer an exam due to illness
Mid-term Exam II	-	25%	you will require a medical note.
Presentation	-	12%	
Assignments	-	8%	
Final Exam	-	30%	

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:

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

Alpha Grade	4-point Equivalent	Percentage Guidelines		Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	90-100		C+	2.3	67-69
A	4.0	85-89		C	2.0	63-66
A-	3.7	80-84		C-	1.7	60-62
B+	3.3	77-79		D+	1.3	55-59
B	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

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

STUDENT RESPONSIBILITIES:

Students should attend all lecture classes and complete all assignments to get good grades in this course.

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 Northwestern Polytechnic Calendar at https://www.nwpolytech.ca/programs/calendar/ or the Student Rights and Responsibilities policy which can be found at https://www.nwpolytech.ca/about/administration/policies/index.html.

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