



**DEPARTMENT OF SCIENCE
COURSE OUTLINE – FALL 2020**

**MI2650: GENERAL MICROBIOLOGY
3 (3-0-4) 105 Hours for 15 Weeks**

INSTRUCTOR: Beatrice Amar Ph.D. **PHONE:** (780)5392031 (O), (780)9782845 (C)

OFFICE: J208/Remote **E-MAIL:** BAmar@gprc.ab.ca

OFFICE HOURS: Wednesday, Thursday and Friday 2.30 – 4.30 p.m.

FALL 2020 DELIVERY: Mixed Delivery. This course is delivered remotely with some face-to-face/onsite components at the GPRC [*Grande Prairie/Fairview*] campus.

- For the remote delivery components: students must have a computer with a webcam and reliable internet connection. Technological support is available through helpdesk@gprc.ab.ca.
- For the onsite components: students must supply their own mask and follow GPRC Campus Access Guidelines and Expectations (<https://www.gprc.ab.ca/doc.php?d=ACCESSGUIDE>). The dates and locations of the onsite components can be found on the Course Calendar.

CALENDAR DESCRIPTION:

This course will focus on the structure and physiology of free-living and pathogenic bacteria. The diversity of their metabolic activities, the interaction of microbes with their environment, symbiotic relationships and cell-to-cell communication are major topics. Lectures and laboratory exercises are coordinated to explore topics in basic microbiology, environmental microbiology, molecular microbiology, and the production of economically or medically important products through microbial biotechnology.

PREREQUISITE(S)/COREQUISITE: BI1070 and CH1610 or CH2610

REQUIRED TEXT/RESOURCE MATERIALS:

1. “Brock – Biology of Microorganisms” (15th Edition, 2017) Madigan, Martinko, Dunlap & Clark. Pearson / Benjamin Cummings Publishers.

The 14th edition may be used as the text. However, some sections of the course have changed considerably so the pages referred to on the Topic Outline may not be accurate for the 14th edition.

2. MI 2650 Lab Manual, Grande Prairie Regional College (Available on D2L course page – you can print it)

DELIVERY MODE(S): Classes	Wednesday	1.00 p.m. – 2.20 p.m. (Remote)
	Friday	1.00 p.m. – 2.20 p.m. (Remote)
Labs	Monday	2.30 p.m. – 5.20 p.m. (J130)
	Thursday	10.00 a.m. – 10.50 a.m. (J130)

COURSE OBJECTIVES:

1. To gain an understanding of microbe structure and function.
2. To understand the metabolic mechanisms that support microbial survival.
3. To gain a knowledge of the associations between microbes and other organisms.
4. To develop critical thinking skills with respect to microbiology

LEARNING OUTCOMES:

Students will be able to:

1. State the major milestones in microbiology and name the pioneers of this field and explain their contributions to microbiology.
2. Outline different types of microscopy and discuss their specific applications.
3. Explain the structure and metabolism of prokaryotic microorganisms.
4. Explain the applications of microorganisms in various industries such as agriculture, mining and bioremediation.
5. Compare and contrast classic and modern methods in studying complex microbial communities.
6. Explain the importance of microbes to the environment.
7. Apply aseptic techniques to isolate micro-organisms from environmental samples.
8. Collect scientific data and present them in the form of a scientific paper.
9. Apply learned principles to other areas of biology.

TRANSFERABILITY: UA, UC, UL, AU, CUC, GMU, KUC

***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.transferralberta.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:

Lab Reports	14%
Lab Quizzes	6%
Final Lab Exam	15%
Assignments	15%
Mid-term Exam	20%
Final Exam	30%
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Total	100%

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:**MI2650 - TOPIC OUTLINE**

To improve understanding of the material covered during classes and to ensure successful completion of MI2650, it is strongly suggested that students read the relevant text pages in advance of the classes.

	<u>TEXT READINGS</u>	
	14 th Edition	15 th Edition
1. Introduction to Microbiology	1-25; 355-359	1-33
2. Prokaryotic structure and function	32-64; 159; 111-113	34-64; 75-77; 104-105; 320-324
3. Nutrition & Metabolic Diversity of Prokaryotes	79-80; 82-84; 95-96; 379-432; 650-657	74-75; 77-78; 81-83; 94-95; 392-450; 673-678
4. Genetic Regulation & Signal Transduction	120-127; 216-230; 232-233	115-119; 173-188; 212-213
5. Microbial Growth	144-171; 305-308	137-144; 152-164; 207-209; 210-212; 552-553
6. Control of Microbial Growth	158-182; 811-826	164-170; 217-220; 852-858
7. Microbial Associations:	598-600	696-699
Nitrogen Fixation	336-339; 678-679	407-409; 700-705
<i>Agrobacterium</i>	100-102; 673-678	708-709
Ruminant digestion	683-687	721-726
Microbes and man	687-691; 714-725	730-736; 745-750; 752-754

STUDENT RESPONSIBILITIES:

Since participation in lectures, and completion of assignments are important components of this course, regular attendance in class is strongly advised. Students who chose not to attend or complete assignments must assume the risks involved.

Students in MI2650 **MUST** read the relevant pages of the textbook in order to supplement the information provided in classes. In order to successfully complete MI2650, students **MUST** attend all scheduled laboratory sessions and achieve a mean score of 50% on the laboratory assignments, including the Lab Exam. All laboratory assignments **MUST** be completed and handed in at the time specified. **Late reports will not be marked.**

Due to the complexity of the laboratory exercises in MI2650, they can be completed only during the scheduled times.

Since material covered in BI1070 is relevant to MI2650, it is assumed that students have retained that information and will be able to answer exam questions that refer to it.

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.