

**UM**Faculty of Science
Department of Microbiology

MBIO 1220 A04 – Essentials of Microbiology

Fall 2025, 3 Credit Hours

1 Course Details

Course Description

An introduction to the essential principles of microbiology including immunity, with emphasis on microbial disease.

Prerequisites and Restrictions

Prerequisites: None

Restrictions: Not available to students who have previously obtained credit in or are currently enrolled in MBIO 1010 or MBIO 1011 (or the former MBIO 2100 or MBIO 2101).

Note: MBIO 1220 is intended for students planning to enter the College of Nursing or other health care or related programs. Students that have completed MBIO 1010 but wish to take MBIO 1220 to satisfy Faculty of Nursing entrance requirements must obtain departmental permission prior to registering for MBIO 1220. MBIO 1220 cannot be used to satisfy the requirements of the Microbiology Honours or Major degree programs. MBIO 1220 can be used as an elective course in any Science program.

2 Instructor Information

Instructor: Dr. Madison Egan (she/her)

Email: Madison.Egan@umanitoba.ca

3 Course Content

3.1 Course Learning Outcomes:

This course serves as an introduction to the essential principles of microbiology and immunity, with an emphasis on human microbial diseases.

By the end of this course, you should be able to:

- Explain fundamental concepts in microbiology, such as the molecules of life, microscopy, cell structure, microbial growth and metabolism, and bacterial genetics
- Identify the main differences between prokaryotic and eukaryotic cells and the characteristics of each
- Describe the immune responses that are triggered by microbes and how they unfold
- Recall clinically important bacteria, fungi, and viruses and their effects on the various organ systems

3.2 Course Schedule

This course schedule is subject to change to accommodate some topics taking longer than others. Reading the textbook chapters before class is recommended so that you are already familiar with the topic and can focus on gaining a deeper understanding and clarifying any topics that were not clear from your readings.

Course Topic	Nester 10 th ed. Textbook Chapter(s)	Tortora 13 th ed. Textbook Chapter(s)
Part 1 – Introduction, course outline, and Humans and the microbial world	1	1
Part 1 – The molecules of life	2	2
Part 1 – Microscopy and cell structure	3	3, 4
Part 1 – Dynamics of microbial growth	4	6
Part 1 – Control of microbial growth	5	7
Part 1 – Microbial metabolism: fueling cell growth	6	5
Orange Shirt Day – No Class		
Part 1 – The blueprint of life and bacterial genetics	7, 8	8
Part 2 – Viruses, viroids, and prions	13	13
CATCH UP / REVIEW	All of Part 1	All of Part 1
Midterm #1 (in class)		
Part 2 – The innate immune response	14	16
Part 2 – The adaptive immune response	15	17
Part 2 – Host-microbe interactions	16	15
Part 2 – Immunologic disorders	18	19
Part 2 – Applications of immune responses	17	18
Part 2 – Epidemiology	19	14
Part 2 – Antimicrobial medications	20	20
Midterm #2 (in class)		
Part 3 – Respiratory system infections	21	24
Part 3 – Skin infections & Part 3 – Blood and lymphatic infections	22 & 25	21 & 23
Part 3 – Digestive system infections	24	25
Part 3 – Nervous system infections	26	22
Part 3 – Genitourinary tract infections	27	26
Final Exam Cumulative (Parts 1, 2, and 3)		

Note: The above table is available in alternate accessible formats upon request

4 Assessments

Assessment	Contribution to Final Mark (%)	Content Assessed
Midterm #1	25%	Part 1
Midterm #2	25%	Part 2
Final Exam	50%	Cumulative (Parts 1, 2 and 3)

Midterm #1 (25%): This midterm will cover everything included in Part 1 of the course. This will be a multiple-choice midterm completed using bubble sheets during our regular class time. Please bring a pencil to the midterm to fill out the bubble sheet.

Midterm #2 (25%): This midterm will cover everything included in Part 2 of the course. This will be a multiple-choice midterm completed using bubble sheets during our regular class time. Please bring a pencil to the midterm to fill out the bubble sheet.

Final Exam (50%): This final exam will cover everything taught in the course. More weight will be placed on materials learned in Part 3, but content from Part 1, 2, and 3 will be tested. This will be a multiple-choice final completed using bubble sheets. Please bring a pencil to the final exam to fill out the bubble sheet. This is a 2-hour exam, and the date and location will be scheduled by the registrar's office during the final exam period.

Note: all lecture slides will be posted on UM Learn. It is your responsibility to access the lectures and bring them to class. You will be responsible for learning what is written in the prepared notes as well as what transpires during class.

Missed Assessments:

If you are unable to attend a midterm due to an acceptable reason defined by the self-declaration form (<https://umanitoba.ca/student-supports/academic-supports/student-advocacy/self-declaration-policy-students>), the weight of the missed midterm will be transferred to the weight of the final exam if you submit a self-declaration form within 48 hours of the missed midterm. For example, if a student missed midterm 1 (worth 25%) that weight will be transferred to the final exam so it will be worth 25% more (i.e., worth 75% instead of 50%). There will be no deferred midterms.

If you are unable to attend the final exam, you **MUST** contact your home faculty to request a deferred exam. It is up to their discretion whether or not to grant a deferred final exam. Missed final exams will be subject to the University's regulations and deferral process (<https://umanitoba.ca/registrar/final-exams/conflicts-deferral>).

Determination of Final Course Letter Grade:

The following cutoffs are typically used when assigning letter grades:

Letter Grade	Percentage
A+	90.0 – 100%
A	80.0 – 89.99%
B+	75.0 – 79.99%
B	70.0 – 74.99%
C+	65.0 – 69.99%
C	55.0 – 64.99%
D	50.0 – 54.99%
F	49.99% or lower

Letter grades are assigned taking into consideration the grade distribution in the class and the University of Manitoba's descriptors: A+ (Exceptional), A (Excellent), B+ (Very Good), B (Good), C+ (Satisfactory), C (Adequate), D (Marginal), and F (Failure). See <https://umanitoba.ca/registrar/grades> for more information.

This grading scheme corresponds approximately to the percentages above. Amendments to this scheme may be made depending on the final class average. Final grades will not be rounded up under any circumstances.

5 Course Resources

5.1 UM Learn

There is a course website at <https://universityofmanitoba.desire2learn.com>. All components of this course will be housed on the UM Learn site, including this course outline, lecture slides, and links to further resources. Grades for both midterms will also be released on the site. Please post all class-related questions to the discussion board on UM Learn labeled "Class-Related Questions" so that all students can benefit from the answers. For personal questions, please email Dr. Egan (Madison.Egan@umanitoba.ca). Please familiarize yourself with this website as soon as possible and visit it regularly throughout the semester.

5.2 Textbooks

The primary textbook that we will be using for this course is Nester's Microbiology: A Human Perspective (2024 Edition; Evergreen Release) by Anderson, Salm, Beins, and Nester. McGraw Hill.

- The 8th, 9th, and 10th editions are also acceptable

An alternative textbook for this course is Microbiology: An Introduction (11th Edition) by Tortora, Funke, and Case. Pearson Education.

Please purchase the textbook that is most accessible to you, but you only need one of the above textbooks. There is no need to purchase both of them. You may purchase a textbook for this course through the bookstore (<http://bookstore.umanitoba.ca/SelectTermDept>). Alternatively, Nester's Microbiology 8th edition and 9th edition textbooks are available at the Science and Technology Library on Course Reserve. This option allows you to check out the textbook for 2 hours at a time for free.

6 Course Statements/Policies

6.1 Land Acknowledgement

The University of Manitoba campuses are located on original lands of Anishinaabeg, Ininiwak, Anisninewuk, Dakota Oyate, Dene and Inuit, and on the homeland of the Red River Métis. We respect the Treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to move forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration.

6.2 Emails

The University requires all students to activate an official University of Manitoba email account, which should be used for all communications between yourself and the university, including all your instructors. Emails sent to instructors from an email account other than the University of Manitoba account will automatically be deleted. All email communications should comply with the University's policy on electronic communication with students, which can be found at:

<https://umanitoba.ca/governance/governing-documents/governing-documents-university-community#electronic-communication-with-students>

6.3 Photo Policy

Image captures of slides/document camera material and recordings posted by the instructor are strictly for personal use only (copyright). Please do not include the instructor and/or classmates in the image. Posting of images that include lecture material and/or the instructor/classmates and recordings of the lecture on the internet is strictly prohibited.

6.4 Audio / Video Recording Policy

Prior consent must be obtained from the instructor to record the lecture. Students requiring accommodations are directed to Student Accessibility Services to facilitate the implementation of accommodations. Course instructors are willing to meet with students to discuss the accommodations recommended by Student Accessibility Services. Dr. Egan will be recording lectures to assist students who miss a class due to illness or for those that use it to support their learning after class. However, technology can break down, so these recordings are not guaranteed for each class. Students should make every opportunity to attend class. These recordings also don't capture anything other than the slides and voices, so anything done as a demonstration or through the document camera won't be captured. These are to act as a back-up when attendance isn't possible not a replacement for in-person learning. Please be mindful that if you ask questions in class or contribute answers, your voice may be captured on the recording if you are sitting close to the front. Dr. Egan will repeat the question before answering so the room can hear it, and your name may be captured in the recording if Dr. Egan is responding to you directly.

6.5 Copyrighted Materials

We will use copyrighted content in this course. The content used is appropriately acknowledged and is copied in accordance with copyright laws and University guidelines. Copyrighted works, including those created by instructors, are made available for private study and research and must not be distributed in any format without permission.

More details are available online at <http://umanitoba.ca/copyright/>.

6.6 Technology in the Classroom

It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical, and legal manner. Students should restrict their use of technology to those approved by the instructor and/or University of Manitoba Accessibility Services for educational purposes only. Electronic messaging, email, social networking, gaming, etc. should be avoided during class time. Cell phones should be on silent. If a student is on call for emergencies, their cell phone should be on vibrate mode and the student should leave the classroom before using it.

6.7 Academic Integrity

Guidelines are stated in your calendar regarding University policy with respect to academic dishonesty and behaviour (particularly cheating).

<https://umanitoba.ca/science/student-experience/academic-integrity>

<https://umanitoba.ca/student-supports/academic-supports/academic-integrity>

6.8 Equity Action Statement

In professional spaces, we often fall into the trap of defining ourselves solely by our CV. This statement is my recognition that I am more than my professional identity, credentials, and accomplishments. My life experiences and values shape how I engage with others at work. I don't shut off parts of myself when I walk into a classroom, and I don't expect you to either. I aim to bring my authentic self to my work, and I hope you feel comfortable doing the same. That said, I also recognize that it's not always safe to share every part of ourselves, so I respect your choice to engage in a way that feels safe for you.

We all carry different dimensions of diversity—both visible and invisible—along with life experiences that have shaped how we move through the world. We also hold different degrees of power and privilege, much of it unearned. It's impossible to fully understand each other's identities and experiences, so I make it a goal not to judge others because I will never know their full story. Life is not fair, and our experiences are not equal, so our responses to situations can't be either. I invite you to keep this in mind as you engage with me and others in this class. Please give yourself and others grace and kindness—we never know what someone else is going through.

Years ago, I watched an interview with Lynn Gehl, who explained the meaning of *Debwewin* from the Anishinaabe language. It refers to heart knowledge—understanding gained from lived experience—distinct from mind knowledge, which comes from learning and reading. I can define terms like diversity, inclusion, equity, intersectionality, and accessibility, but that's mind knowledge. Some of these I have heart knowledge of, but others I will never fully understand because they aren't part of my lived experience. I know what it feels like to attend a conference and not see a single female presenter on a keynote panel. I know what it feels like to be talked over, to temporarily lose the use of my right hand, to struggle with mental health, and to worry about paying for my education. I know what it feels like to feel unsafe sharing my experiences and identities. But I will never know what it feels like to be you. I can offer empathy and support, but I will trust that you are the expert of your own life. Thank you for trusting me with whatever part of yourself you choose to share. Your perspectives and experiences are valuable, and I hope you'll bring your expertise into our learning spaces.

I intend to learn as much from all of you as you learn from me in this course. One area that I am focused on learning and improving is incorporating Indigenous knowledge into my teaching. As a white settler, I recognize that non-Indigenous people in Canada benefit from systems of oppression that removed rights and resources from Indigenous peoples. This is unfortunately absolutely true, and I want to do my part to work towards reconciliation. I'm taking workshops, completing courses, and reading to educate myself on Indigenous cultures, ways of knowing, and Indigenous pedagogies so I can incorporate it into my teaching. I may not always get it right, but please let me know so I can continue to learn and grow in this space to make education more equitable and inclusive of an experience.

I want to see everyone in this class succeed, and I see us as a team in the learning journey. So, please engage with the resources provided on campus, ask questions in class, drop into my office hours, or feel free to catch me after class if you want to chat. I am here to support you and cheer you on!

7 Schedule A

Schedule A of the Responsibilities of Academic Staff with regards to Students (ROASS) policies of the University of Manitoba lists resources and policies for students. It is important that you familiarize yourself with these resources and policies. This document is available on UM Learn in the "Course Information & Resources" folder (in the Content tab)