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Syllabus

FOOD 4150 Food Microbiology

(Fall 2023)

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# COURSE DETAILS

|  |  |
| --- | --- |
| **Course Title & Number:** | Food Microbiology 4150 |
| **Number of Credit Hours:** | 3 |
| **Class Times & Days of Week:** | MWF 9:30 am – 10:20 am |
| **Location for classes/labs/tutorials:** | Frank Kennedy Centre 136: Lectures  Ellis Building – Room 241 Laboratory  Lab sessions;  B01: Monday 2:30 - 3:55 pm  B02: Monday 4:00 - 5:25 pm  B03: Tuesday 2:30 - 3:55 pm  B04: Tuesday 4:00 – 5:25 pm  B05: Tuesday: 10- 11:25 am |
| **Pre-Requisites:** | No course pre-requisite is necessary. However, an introductory course in microbiology is strongly recommended since several topics to be covered will assume prior knowledge of specific microbiological terms and concepts. Some independent reviews of microbiology may be needed by some students to bring them to the average initial awareness level of students in the class |

# Instructor Contact Information

|  |  |
| --- | --- |
| **Instructor(s) Name & Preferred Form of Address:** | Claudia Narvaez-Bravo, please address me by Dr. Narvaez or Professor Narvaez |
| **Office Location** | 238 Ellis building |
| **Office Hours or Availability:** | By appointment. I am generally in my office, 238 Ellis Building, from 8:30 a.m. - 4:30 p.m. daily, and I’m readily available with a prior arrangement. To make an appointment, please use the UML email system. |
| **Office Phone No.** | 204-474-6658 |
| **Email:** | Claudia.narvaezbravo@umanitoba.ca  Note: All email communication must conform to the Communicating with Students university policy. |
| **Teaching Assistant (TA) and Markers** | **Email** |
| Daniel Mayboca (TA & Marker) | maybocad@myumanitoba.ca |
| Office: Ellis building room # 262 |  |
| Kavitha Koti (TA)  Office Ellis building room 260 | kotik@myumanitoba.ca |
| Haque, Md Mahamudul (Marker) | [haquemm@myumanitoba.ca](mailto:haquemm@myumanitoba.ca) |
| **Contact** | By email, previous appointment |

# Course Description

**U of M Course Calendar Description**

Relationships of microorganisms to processing and spoilage of food.

**General Course Description**

FOOD4150 focuses on the significance of the presence and/or growth of microorganisms in foods and their importance in the production and safety of foods. Contents include the microbial ecology of food, beneficial microorganisms in food systems, pathogenic and spoilage microorganisms, toxins, characteristics of foodborne infection, food intoxication and the influence within the food system of the growth and survival of microorganisms and contaminants that may occur in a food-processing environment. Food preservation and food processing related to food microbiology are also discussed.

This course has a laboratory section that deals with conventional and rapid methods for testing food products, including microbial indicators and foodborne pathogens. Good manufacture practices (GMP), Standard Operating Procedures (SOP), and HACCP basics will be introduced. Food microbiology addresses the safety and quality of foods. Food microbiology is an essential discipline that connects with fields related to food production and processing (pre and post-harvest level). Microbes play a crucial role in food preservation, food safety, human health, and food biotechnology, and all of them are essential aspects of food production. You will have the opportunity to learn and have hands-on experience in different techniques (conventional and rapid) to enumerate and identify bacteria related to food in the laboratory.

To support experiential learning FOOD4150 is also working with Riipen. Riipen helps to bring real industry and real-world industry projects into the classroom.

# Course Goals

Food microbiology is an exciting field, technologically dynamic and fundamental for food development, food production, and public health; it assists us in answering questions arising from food production and food technology disciplines supporting a multibillion-dollar food industry. Food Microbiology not only assures the quality and shelf life of different food products but also ensures that food products are safe for the consumer. The production of food under food safety parameters and regulations is beyond the simple memorization of knowledge. It requires critical thinking, integration of knowledge, and innovative approaches to problem-solving. It will help students to foster these skills throughout, using a variety of teaching methods, including lecturing, group discussion, and other activities in the classroom. This course will combine classroom lectures with a laboratory environment on the fundamentals of food microbiology and food safety. Additionally, the student's written skills will be improved through multiple writing assignments, including laboratory reports..

# Course Learning Objectives

* Define microbial food spoilage, food quality, food safety and the factors affecting the

growth and control of microorganisms in food.

* Identify relevant beneficial, pathogenic and spoilage microorganisms in foods and the conditions under which they grow.
* Articulate the use of hurdle technology and food preservation in the control of foodborne pathogens in food systems.
* Describe the conditions under which relevant pathogens are commonly destroyed or controlled in foods.
* Discuss the principles of food preservations and to describe the different food preservation methods.
* Describe the role of beneficial microorganisms in food processing, preservation and safety, and their potential health benefits.
* Explain the causes of foodborne microbial diseases and predict the pathogens that can grow in any given food during different stages of the food production system
* Explain the different factors that take place during food processing and how food can be contaminated in the food continuum (pre and post-harvest level)
* Identify potential hazards and food safety issues in specific foods
* Describe routes of physical, chemical, and biological contamination of foods
* Recognize and articulate the importance of SSOP, GMP and HACCP in the food industry
* Discuss methods for controlling physical, chemical, and biological hazards
* Apply laboratory techniques to identify microorganism in foods
* Apply rapid microbiology techniques to assess food safety and quality
* Demonstrate the use of appropriate lab techniques commonly used in the food microbiology laboratory
* Work effectively as a team in designing and using food microbiology laboratories and in-class activities

**Note: specific learning outcomes will be delivered in each lecture**

# Foundational Knowledge Content Areas for Dietetic Education

This dietetic education program is an accredited program by the Partnership for Dietetic Education and Practice (PDEP) and prepares students for eligibility for registration with a provincial dietetics regulatory body.

*Highest level achieved: 1= demonstrate broad knowledge; 2= demonstrate comprehensions; 3= analyze, interpret and apply knowledge.*

|  |  |  |
| --- | --- | --- |
| **Content Area** | **Foundational Knowledge** | **Cognitive Complexity Level** |
| **Communication** | Strategies for effective written communication  Strategies for effective interpersonal communication | 3 |
| 3 |
| **Food** | Physical properties and chemical composition of food  Food preservation, storage, and packaging  Foodborne illness | 2 |
| 1 |
| 2 |
| **Food Service Systems** | Quantity food production and distribution  Hazard Analysis and Critical Control Points (HACCP) | 2 |
| 2 |
| **Interprofessional Collaboration** | Interprofessional communication  Team functioning  Collaborative leadership | 2 1  1 |
| **Management** | Organizational behaviour and development | 1 |
| **Microbiology** | Classification of microbes  Microbes in food safety  Host-vector spread of infection and risk management  Microbes in food production including prebiotic and probiotics | 1  2  2  1 |
| **Profesional Practice in Dietetics** | Ethical conduct  Reflective practice  Professional development  Decision making | 3  2  1  2 |

# Textbook, Readings, and Course Materials

**Recommended textbook:** Food Microbiology. An Introduction. Edited by Thomas J. Montville and Karl R. Mathews (2017). 2nd Ed. ASM Press.

*Note:* the textbook is available online, You can also use older editions that can be found at the university library. You can also revise the material in other microbiology books:

* Modern Food Microbiology, edited by Jay J.M., Loessner, M.J. and Golden, D.A. (2005), 7th ed. Springer, New York, NY.
* Food Microbiology: Fundamentals and Frontiers, edited by Doyle, M. P., and Beuchat,

R. L. (2007) 3rd ed. ASM Press, Washington, DC

[University of Manitoba Libraries](http://umanitoba.ca/libraries/)

**FOOD4150 Laboratory Manual**: Available at UML under the content tab.

**Supplementary readings**

* A Guide to Writing in the Sciences. Gilpin, A.A., Patchet-Golubev, P. University of Toronto Press 2000.
* Lab Math: A Handbook of Measurements, Calculations, and Other Quantitative Skills for Use at the Bench By Dany Spencer Adams[. http://www.amazon.ca/Lab-Math-](http://www.amazon.ca/Lab-Math-) Measurements-Calculations Quantitative/dp/0879696346
* Compendium of Methods for the Microbial Examination of Foods. Edited by Downes,

F.P. and Ito, K. (2001) 4th ed. American Public Health Assoc.

**Recommended or required materials (e.g. lab equipment, art supplies, computers, etc.)** – why they are needed, cost and where they can be purchased.

You will need a laptop and I strongly recommend to use a citation manager to handle references for your written assignments. Suggested softwares: Mendeley cite or Endnote.

# Using Copyrighted Material

Please respect copyright. We will use copyrighted content in this course. I have ensured that the content I use is appropriately acknowledged and is copied in accordance with copyright laws and university guidelines. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, uncles an exception to the *Copyright Act* applies or written permission has been confirmed. For more information, see the University’s Copyright Office website at <http://umanitoba.ca/copyright/> or contact [um\_copyright@umanitoba.ca](mailto:um_copyright@umanitoba.ca).

# Course Technology

I will be using the iclicker student response system in class this Fall 2020 term. Please make sure you install iclicker reff in your smart/iphone phone/laptop/ipad. iClicker helps me to understand what you know and gives everyone a chance to participate in class. I will check for attendance using iclicker. You will also get bonus marks for your class participation using iClicker.

For the course management, I will be using UM Learn.

In addition, the use of other technology (i.e., tablets, cellphones, laptops, etc.) is allowed 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.

# Expectations: I Expect You To

Expectations for Active Engagement and Success in the Course

Your active involvement in this course is essential to your academic growth. Active participation encompasses various aspects, including attentive listening and participation during class discussions – perfection is not the aim here! Additionally, it entails staying up-to-date with lecture materials and assignments, and proactively seeking assistance for any concepts that remain unclear.

While PowerPoint presentations offer a condensed view of the content, they only cover a fraction of the knowledge to be imparted. Thus, it is imperative that you delve into the recommended textbook to grasp the complete spectrum of course material.

For the lab component, instructional videos will be made available. I encourage you to review your lab manual before accessing these videos and before going to the laboratory to enhance your learning experience.

While attendance is not mandatory, it significantly contributes to your success. Note that if you are absent on the day of an in-class assignment, credit will not be granted. Promptness and readiness are expected when connecting to class activities.

Our classroom thrives on diversity, and I anticipate that each member will respect the rights of their peers. A considerate and inclusive environment is paramount to our collective growth.

To foster effective communication, I will be available for questions or discussions 10 minutes before the lecture starts. Respect is the cornerstone of our interactions, and mutual courtesy will be greatly appreciated.

Please acquaint yourself with the Respectful Work and Learning Environment Policy, as it outlines the expectations for behavior and conduct within the course.

Kindly adhere to the policies governing Class Communication, Academic Integrity, and Recording Class Lectures, ensuring an equitable and conducive learning environment for all. Your commitment to these principles will undoubtedly enrich your learning journey.

**Class Communication:**

*Example:* You are required to obtain and use your University of Manitoba email account for all communication between yourself and the university. All communication must comply with the Electronic Communication with Student Policy: <http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html>.

**Academic Integrity:**

*Example:* Each student in this course is expected to abide by the University of Manitoba [Academic Integrity principles](http://crscalprod1.cc.umanitoba.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=300&chapterid=3762&topicgroupid=20190&loaduseredits=False). Always remember to reference the work of others that you have used. Also be advised that you are required to complete your assignments independently unless otherwise specified. If you are encouraged to work in a team, ensure that your project complies with the academic integrity regulations. You must do your own work during exams. Inappropriate collaborative behavior and violation of other Academic Integrity principles, will lead to the serious [disciplinary action](https://umanitoba.ca/sites/default/files/2020-02/um-ai-minimum-penalties-definitions.pdf). Visit the [Academic Calendar](http://crscalprod1.cc.umanitoba.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=300&chapterid=3755&topicgroupid=20145&loaduseredits=False), [Student Advocacy](http://umanitoba.ca/student/resource/student_advocacy/cheating_plagiarism_fraud.html), and [Academic Integrity](http://umanitoba.ca/academicintegrity/) web pages for more information and support.

Refer to specific course requirements for academic integrity for individual and group work such as:

1. Group projects are subject to the rules of academic dishonesty;
2. Group members must ensure that a group project adheres to the principles of academic integrity;
3. Students should also be made aware of any specific instructions concerning study groups and individual assignments;
4. The limits of collaboration on assignments should be defined as explicitly as possible; and
5. All work should be completed independently unless otherwise specified.

**Recording Class Lectures:**

No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission Claudia Narvaez.  Course materials (both paper and digital) are for the participant’s private study and research.

Videos covering the laboratory sessions will be provided by the instructor. Course materials (both paper and digital) are for the participant’s private study and research only.

**Student Accessibility Services:**

The University of Manitoba is committed to providing an accessible academic community. [Students Accessibility Services (SAS)](https://umanitoba.ca/student-supports/accessibility) offers academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations.  Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services

520 University Centre

Phone: (204) 474-7423

Email: [Student\_accessibility@umanitoba.ca](mailto:Student_accessibility@umanitoba.ca)

# Expectations: You Can Expect Me To

Punctuality and Preparedness: I am committed to being punctual and prepared for each class, ensuring a conducive learning environment.

Consultation Availability: Regular consultation sessions will be part of my routine, ensuring that I am accessible to address your questions and concerns.

Preferred Communication Method: Email is my preferred mode of communication. You can anticipate a response within 24 hours on weekdays.

Urgent Queries: If you encounter pressing questions, do not hesitate to send an email. I am here to assist. However, kindly ensure that your query is relevant and pertains to material that remains unclear even after reviewing class notes, videos, or the textbook.

Guidance and Advice: I am more than willing to offer concise advice on course content or assignments. Your progress is important to me.

Assignment Grading Timeline: Assignments submitted on time will be assessed and returned within a span of two weeks from the due date. In cases of late submissions, grading will be conducted as my or graders schedule permits.

Respectful Interaction: Your questions and comments will be treated with the utmost respect, and any concerns you raise will be taken seriously.

Open Discussion: Should you encounter any challenges, please feel free to discuss them with me. Do not postpone seeking assistance until the last moment, especially if you require additional marks to pass the course. At that point, my ability to offer meaningful help may be limited.

# My commitment is to your academic growth and success, and I am here to support you every step of the way. Your proactive engagement and timely communication are key to a productive learning experience

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# CLASS SCHEDULE AND COURSE EVALUATION

This schedule is subject to change at the discretion of the instructor and/or based on the learning needs of the students but such changes are subject to [Section 2.8 of ROASS](http://umanitoba.ca/admin/governance/governing_documents/students/278.html).

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| --- | --- |
| **Date** | **Topics, Readings, Assignments** |
| Sept 6 | Introduction |
| Sept 8 | Microbiology: basic review.  Mandatory reading: Montville, Section 2. Pages 15, 18, 19, 20, 21, 22, 23 |
| Sept 11 | Microbiology: Sample Reception and preparation for microbiological analysis, enumeration.  Mandatory reading: Montville, Chapter 4: Detection and enumeration of microbes in food. |
| Sept 13 | Indicator microorganism. Standards, guideline and specifications |
| Sept 15 | Methods to Detect Coliforms, faecal coliforms and *E. coli*. Mandatory reading: Compendium of Methods for  Microbial examination of foods. 4th Ed. 6.4. Most Probable Number Techniques |
| Sept 18 | Continuation ….Methods to Detect Coliforms, faecal coliforms and *E. coli*. Mandatory reading: Compendium of Methods for  Microbial examination of foods. 4th Ed. 6.4. Most Probable Number Techniques |
| Sept 20 | Yeast and molds |
| Sept 22 | Hurdle Technology |
| Sept 25 | **Group activity 1**: Hurdle Technology. Introduction/teamwork and critical thinking.  Mandatory reading: Montville, Chapter 2. Microbial Growth, survival and death in foods. |
| Sept 27 | Spoilage introduction, Meat, poultry and seafood.  Book reading Montville: Chapter 21Chapter 21. Page 299-306. |
| Sep 29 | Meat, poultry and seafood/ Cross contamination demo |
| **Oct 2** | **National Truth and Reconciliation Day** |
| Oct 4 | Milk and Dairy Products/fruits and vegetables  Book reading Montville: Chapter 21. Pages 309-322. |
| Oct 6 | Control of microorganisms in foods: Chemical preservation/ Modified Atmosphere Package.  Book reading Montville: Chapter 25. Pages 403-418 |
| **Oct 9** | **Thanksgiving** |
| Oct 11 | Control of microorganisms in foods: Food Preservation: High-temperature processing, Low-temperature preservation.  Book reading Montville: Chapter 27. Pages 432-445 |
| Oct 13 | Bio-preservation  Book reading Montville: Chapter 26. Pages 419-431. |
| Oct 16 | Midterm 1 – Online exam |
| Oct 18 | Foodborne Intoxications and Toxico-Infections: *S. aureus* and *B. cereus* |
| Oct 20 | Foodborne Intoxications and Toxico-Infections: *C. botulinum* and *C. perfringens* |
| Oct 23 | Foodborne infections  - *Salmonella*  *- Listeria* |
| Oct 25 | *- Campylobacter* |
| Oct 27 | Foodborne infections: *E. coli* |
| Oct 30 | Foodborne infections:  -*Shigella, Yersinia*  -*Vibrio paraheamolyticus*  - Norovirus, Hepatitis A |
| Nov 1 | Molecular methods for foodborne pathogens detection: Introduction to PCR |
| Nov 3 | Biofilms in the Food Industry |
| Nov 6 | Cleaning and sanitation.  Book reading Montville. Chapter 9. Page 471 |
| Nov 8 | Sanitation and Standard Operating Procedures (SSOP). Book reading. Chapter 29. Page 474 |
| Nov 10 | Sanitation and Standard Operating Procedures (SSOP). Book reading. Chapter 29. Page 474. Continues…. |
| Nov 13- 17 | Fall Term Break |
| Nov 20 | Good Manufacture Practices.  Book reading. Chapter 29. Page 466  Mandatory reading: Chapter 1 Prerequisites to HACCP (Posted UML) |
| Nov 22 | Good Manufacture Practices.  Book reading. Chapter 29. Page 466  Mandatory reading: Chapter 1 Prerequisites to HACCP (Posted UML)…continues |
| Nov 24 | Lecture: Food hygiene Monitoring |
| Nov 27 | HACCP: Introduction, Hazard analysis and critical control points Book reading. Chapter 29. Page 474  Mandatory reading: Chapter 2. Hazard Analysis and Critical Control Points Principles and Application Guidelines (Posted UML) |
| Nov 29 | HACCP: Biological, chemical and physical hazards, Critical limits, Monitoring procedures, corrective actions |
| Dec 1 | HACCP: Verification, record keeping and documentation procedures |
| Dec 4 | HACCP Presentations |
| Dec 6 | HACCP Presentations |
| Dec 8 | **Invited lecturer: "Foodborne Disease Surveillance and Outbreak Response in Canada"**  Celine Nadon, PhD. Chief, Enteric Diseases National Microbiology Laboratory  Public Health Agency of Canada  Note: Waiting for confirmation |
| Dec 11 | **Remaining material or review** |
| Final Exam | Time will be determine - Online exam |
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**Laboratory Expectations**

Lab Manual and Asynchronous Learning: Ahead of your lab session, it's crucial to familiarize yourself with the 4150 lab manual. Accompanying this, lab videos will be available for asynchronous learning, enabling you to engage with the material at your own pace. This flexibility allows you to fulfill requirements within a timeframe that suits you best.

Responsibility for Lab Video Review: As part of your responsibilities, you are expected to independently access and review the lab videos. These videos contribute significantly to the course requirements and should be a key component of your lab preparation.

Safety and Aseptic Techniques: Once you're present in the lab, adherence to safety protocols and the observance of aseptic techniques are paramount. These practices ensure a secure and controlled lab environment conducive to productive learning.

Attire Requirements: All lab participants must wear lab coats or smocks, along with closed-toed shoes. If you have long hair, it should be securely tied up. These attire guidelines are mandatory at all times during your work in the micro food lab.

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| --- | --- | --- |
| **Food Microbiology in-person Lab Schedule** | | |
| **Laboratory** | **Date** | **Lab Report Due Date** |
| Lab# 1 Serial dilution | Monday Sept. 11  Tuesday Sept. 12 | No report |
| Lab #2Petrifilm   * Standard Plate Count Method * Yeast and Mold * Coliform *& E.coli* | Monday Sept. 18  Tuesday Sept. 19 | Oct. 3 |
| Lab #4 Enterococci & Staph aureus | Monday Sept. 25  Tuesday Sept. 26 | Oct. 10 |
| **No Labs (National Day for Truth and Reconciliation)** | Monday Oct.2  Tuesday Oct.3 |  |
| **No Labs (Thanksgiving )** | Monday Oct. 9  Tuesday Oct. 10 |  |
| Lab #3Most Probable Method (MPN) | Monday Oct. 16  Tuesday Oct. 17 |  |
| Lab #3Most Probable Method (MPN) continued | Monday Oct. 23  Tuesday Oct. 24 | Nov. 7 |
| Lab #5 Bacillus cereus | Monday Oct. 30  Tuesday Oct. 31 | Nov. 14 |
| Lab #6 *Salmonella* | Monday Nov. 6  Tuesday Nov. 7 | Nov. 21 |
| **No Labs (Fall break)** | Monday Nov. 13  Tuesday Nov. 14 |  |
| Lab #7 Molecular Rapid Detection Methods | Monday Nov. 20  Tuesday Nov. 21 | Dec. 5 |
| Lab #8 ATP | Monday Nov. 27  Tuesday Nov. 28 | Dec. 12 |
| Practicum lab exam | Dec Monday 4 &  Tuesday 5 |  |

|  |  |  |
| --- | --- | --- |
| Evaluation | | |
| Type of Assessment | **Due Date** | **Value of Final Grade** |
| Mid-Term 1 | 9:30-10:20 am, Monday Oct 16, 2022. In-person. | 30% |
| Lab Reports | For due dates, please check the Food Microbiology lab schedule (page 13) | 20% |
| Group Assignments | |  |
| Assignment 1 | Hurdle Technology (Group) | 5% |
| Assignment 2 | HACCP (Group) | 20% |
| Assignment 3 | An ethical dilemma | 10% |
| Practicum lab exam | Dec 4 & 5 (regular lab session hours) | 15% |
| Final examination | No final examination | - |
| Total marks |  | **100%** |
|  | | |

# Grading

Indicate your grading scale. A sample is given below that you can adjust to your course expectations.

|  |  |  |  |
| --- | --- | --- | --- |
| Letter Grade | Percentage out of 100 | Grade Point Range | Final Grade Point |
| A+ | 95-100 | 4.25-4.5 | 4.5 |
| A | 86-94 | 3.75-4.24 | 4.0 |
| B+ | 80-85 | 3.25-3.74 | 3.5 |
| B | 72-29 | 2.75-3.24 | 3.0 |
| C+ | 65-71 | 2.25-2.74 | 2.5 |
| C | 60-64 | 2.0-2.24 | 2.0 |
| D | 50-59 | Less than 2.0 | 1.0 |
| F | Less than 50 |  | 0 |
|  |  |  |  |

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Kindly take note that the grading system employed in this course will not involve curving of grades. To ensure transparency and fairness, the following guidelines will be adhered to when assigning letter grades:

* Rounding for Letter Grades: Percentage grades that have a decimal point of 0.5 or above will be rounded up to the nearest whole number. Conversely, percentage grades with a decimal point below 0.5 will be rounded down to the nearest whole number.

**Illustrative Examples**: For instance, if your final percentage grade falls between 89.5 and 89.9, it will be rounded to 90, which corresponds to an A grade. On the other hand, if your final percentage grade is 70.4, it will be rounded down to 70, and your letter grade will be C+.

* Universal Application: This rounding rule is applicable to all students in the course, without any exception.

# Voluntary Withdrawal

Last Date to Drop without Penalty Last date to drop and have course excluded from transcripts; VWs will be recorded on transcripts for courses dropped after this date. There will be no refunds for courses dropped after this date. Additional or differing dates exist for Agriculture Diploma; students in this program should also see their respective section of the Academic Schedule.

Fall Term.........................................................................................Sept 19, 2023

Last date to withdraw and not receive a final grade; students cannot withdraw from courses after this date.

Fall Term classes.............................................................................Nov 21, 2023

Please refer to Ask the Registrar’s Office web page for more information [Registrar’s Office](http://umanitoba.ca/student/records/leave_return/695.html)

# Generatve Artificial Intelligence (genAI)

GenAI technology can be used to:

* Students are encouraged to make use of technology, including genAI tools to contribute to their understanding of course materials.
* Students may choose to use genAI tools as they work through the assignments in this course carefully. The final submitted assignment must be original work produced by the individual student alone. The documentation should include what tool(s) was/were used, how the tool(s) was/were used, and how the result(s) from the genAI was/were incorporated into the submitted work.
* Students may not use artificial intelligence tools for taking tests in this course

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# ASSIGNMENT DESCRIPTIONS

**Laboratory Reports:**

You will have a total of eight lab periods, in which you must hand in a total of seven laboratory reports. Lab reports 2-8 are mandatory, and must be handed in by ALL students:

- Lab.2. Petrifilm for indicator microorganisms (standard plate count, yeast and moulds and coliforms and *E. coli*)

- Lab.3 Most Probable Number (MPN)

- Lab 4 Enterococci & *Staphylococcus aureus*

- Lab 5 *Bacillus cereus*

- Lab.6 *Salmonella*

- Lab 7. Molecular rapid detection methods

- Lab 8. Hygiene monitoring: ATP testing system

• A portion of the laboratory will be evaluated in the midterm exams and a final examination. A practicum exam (15%) will take place at the end of the laboratory sessions.

• Each student will write their report (not a group activity).

• Each student must hand in their report using UML. Reports send by email will not be graded.You are responsible to upload your report in the right folder.

• Only typed reports will be accepted.

Note: A detailed rubric for laboratory reports assessment is available at UML.

**Groups Activities**

**Group Activity 1: Exploring Hurdle Technology - Intrinsic-Extrinsic Factors**

Assessment: Group activities, instructor evaluation, and peer evaluation sheets.

Main Topic: Understanding Intrinsic-Extrinsic Factors Affecting Microbial Growth and Hurdle Technology.

Content: Exploring the impact of intrinsic and extrinsic factors on microbial growth. Delving into the concept of hurdle technology.

Purpose: This activity aims to enhance comprehension of hurdle technology and its significance in ensuring food preservation and safety. The activity employs active learning strategies such as:

Applying hurdle technology principles to diverse food products.

Sharing knowledge among group members and peers regarding hurdle technology.

Cultivating teamwork and critical thinking skills.

Procedure:

a. This activity will take place during the scheduled lecture time (refer to the class schedule).

b. Students will be grouped randomly via UM Learn. Group assignments will be accessible through UM Learn under the "Communications" section, then "Groups." Each group will be assigned a specific food product, with relevant information uploaded to the UM Learn group files. These assignments will be provided after the third week of classes.

c. The instructor will provide a concise introduction, outlining the activity's purpose and expectations.

d. Within lecture time, students will revisit intrinsic and extrinsic factor definitions, outline their components, review the definition and significance of hurdle technology, and read the assigned textbook material. Students will describe their assigned food product's characteristics, ingredients, processing technology, packaging, storage, and the types of microorganisms that might be present.

e. To gather information, students can use electronic devices, peer-reviewed papers, textbooks, and class notes.

f. Sharing Information: Students will explain whether a hurdle approach was applied to their food product, detail the intrinsic/extrinsic factors targeted, and provide reasons. Selected groups will present their findings to the class (5-8 minutes per presentation). The instructor will offer feedback for potential revisions.

g. Conclusion: The instructor will briefly recap the lecture's key points and its connection to the group activity using PowerPoint.

h. Assessment: Each group must prepare a written summary (approximately 1 ½ pages or 5,000 characters with 1.0 line spacing) for the activity. Activity 1 summaries are to be submitted via UM Learn's assignments feature within seven days after the in-class activity. Submissions are due five days after the activity, and only one student from each group needs to submit.

i. All students must complete the peer evaluation sheets**.**

**Group Activity 2: Developing a HACCP Program**

Assessment: Group activity instructor evaluation and peer evaluation sheets.

a. This activity will be initiated during student-arranged time.

b. The groups formed for the previous hurdle technology activity will be used for this task. The same food product assigned earlier will be used to create a Hazard Analysis and Critical Control Point (HACCP) program.

c. The instructor will provide an introduction, explaining the activity and its expectations, along with an assessment rubric.

d. Groups will present their developed HACCP plans within a 7-minute presentation time (refer to the class schedule).

e. If questions arise during the development of this activity, students can arrange appointments with the course instructor, either remotely or in-person.

f. Activity Assessment: Students must draft a written HACCP plan, up to 15 pages with 1.0-line spacing. Only one team member should submit the assignment. Tables and flow diagrams can be included as needed.

g. All students must complete the peer evaluation sheets.

**Group Activity 3: Enhancing Ethical Decision-Making: Group Case Study Activity**

Objective: To engage students in critical ethical thinking through a collaborative case study analysis and evaluation.

Activity:

1. Groups: The class will be divided into groups at ramdom (UML) each tasked with assessing into an ethical dilemma presented in a case study.
2. Introduction and Expectations: The instructor will initiate the session by providing a concise overview of the activity's purpose and anticipated outcomes, setting clear expectations for participation and engagement.
3. Case Discussion and Question Response: Students within each group will actively discuss the case, analyze its intricacies, and collaboratively respond to pertinent questions posed by the instructor.
4. Information Presentation: Equipped with laptops (PP slides), students will creatively list their group's findings and insights. Each group will then have a brief 5-minute window to present their key takeaways to the class.
5. Activity Assessment: Students must draft a written HACCP plan, up to 4 pages with 1.0-line spacing. Only one team member should submit the assignment.
6. Peer Evaluation: Crucially, each student will be tasked with completing peer evaluation sheets, providing valuable input on their group members' contributions and collaborative efforts.

**Useful Resources**

**STOP FOODBORNE ILLNESS**

[Foodborne Illness - Causes, Symptoms and Prevention | STOP (stopfoodborneillness.org)](https://stopfoodborneillness.org/)

[Public Health Notices - Canada.ca](https://www.canada.ca/en/public-health/services/public-health-notices.html)

[Outbreaks | Food Safety and Inspection Service (usda.gov)](https://www.fsis.usda.gov/food-safety/foodborne-illness-and-disease/outbreaks)

Bacteriological Analytical Manual FDA.

<https://www.fda.gov/food/laboratory-methods-food/bacteriological-analytical-manual-bam>

HACCP guidelines:

<https://inspection.canada.ca/preventive-controls/preventive-control-plans/the-food-safety-enhancement-program/eng/1525869691902/1525869759693#a65>

<https://inspection.canada.ca/food-safety-for-industry/archived-food-guidance/safe-food-production-systems/haccp-generic-models-and-guidance-documents/generic-model-fresh-cut-vegetables/eng/1371034721098/1371034722410>

Models: [Model HACCP Plans | Center for Meat Process Validation (wisc.edu)](https://meathaccp.wisc.edu/Model_Haccp_Plans/index.html)

Cleaning and Sanitation

<https://inspection.canada.ca/preventive-controls/cleaning-and-sanitation-program/eng/1511374381399/1528206247934>

<https://www.fsis.usda.gov/guidelines/2020-0009>

<https://extension.psu.edu/best-practices-for-fresh-produce-food-safety>

Current Good Manufacturing Practice (CGMP) Regulations

<https://inspection.canada.ca/food-safety-for-industry/archived-food-guidance/non-federally-registered/safe-food-production/guide/eng/1352824546303/1352824822033>

<https://www.fda.gov/food/guidance-regulation-food-and-dietary-supplements/current-good-manufacturing-practices-cgmps-food-and-dietary-supplements>

Code of Federal Regulations Title 21 (CFR 21) (US Department of Health and Human Services: <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/cfrsearch.cfm>

***Note: The rubrics for assessments are available at UML.***

# Referencing Style

All written assignments (group activities summary) and lab reports in this course shall include an in-text citation. Reference Style: International Journal Food Microbiology:

<https://www.elsevier.com/journals/international-journal-of-food-microbiology/0168-1605/guide-for-authors>

All publications cited in the text should be presented in a list of references following the text of the manuscript.

All citations in the text should refer to:

1.Single author: the author's name (without initials, unless there is ambiguity) and the year of publication;

2.Two authors: both authors' names and the year of publication;

3.Three or more authors: first author's name followed by 'et al.' and the year of publication.

Citations may be made directly (or parenthetically). Groups of references should be listed first alphabetically, then chronologically.

Examples: "as demonstrated (Allan, 1996a, 1996b, 1999; Allan and Jones, 1995). Kramer et al. (2000) have recently shown "

List: References should be arranged alphabetically by authors' names and should be as full as possible, listing all authors, the full title of articles and journals, publisher and year. Note that journal names are to be abbreviated. The manuscript should be carefully checked to ensure that the spelling of authors' names and dates are the same in the text as in the reference list.

Examples:

Reference to a journal publication:

Oguro, M., Imahiro, S., Saito, S., Nakashizuka, T., 2015. Mortality data for Japanese oak wilt disease and surrounding forest compositions. Mendeley Data, v1. http://dx.doi.org/10.17632/xwj98nb39r.1

Ono, K., Yamamoto, K., 1999. Contamination of meat with *Campylobacter jejuni* in Saitama, Japan. Int. J. Food Microbiol. 47, 211-219.

Reference to a book:

Strunk Jr, W., White, E. B., 1979. The Elements of Style, third ed. Macmillan, New York. Reference to a chapter in an edited book:

Kramer, J.M., Gilbert, R.J., 1989. Bacillus cereus. In: Doyle, M.P. (Ed.), Foodborne Bacterial Pathogens. Marcel Dekker, New York, pp. 22-70.

Caddick, M.X., 1994. Nitrogen metabolite repression. In: Martinelli, S.D., Kinghorn, J.R. (Eds.), *Aspergillus*: 50 Years on, Progress in Industrial Microbiology, vol. 29. Elsevier Science, Amsterdam, pp. 323-353.

# Assignment Feedback

# We are committed to offering constructive feedback on your performance in two distinct forms: formative feedback in the form of comments, and summative feedback represented by grades. Both types of feedback will be conveniently delivered through the UML platform electronically.

# Please take note that our assessment process involves two dedicated graders who will primarily evaluate lab reports. Should you have any inquiries regarding their evaluation methods, we encourage you to directly connect with the assigned graders. In the event that your concerns persist, and you require further assistance, feel free to reach out to me, Dr. Narvaez. I will be more than willing to review the matter and provide the necessary guidance.

# Our ultimate aim is to ensure that you receive comprehensive and fair feedback that aligns with your academic progress, promoting your continual growth and success.

# Assignment Extension and Late Submission Policy

* 1. *Late Assignments:*

Assignments are classified as late if they are not submitted by their designated due date. For each day following the due date (excluding weekends), a deduction of 10% from the grade will be implemented.

* 1. *Makeup exams or absence:*

Regular attendance is a critical factor contributing to students' success in this course. Each class and lab session will feature an attendance check to maintain a record of participation. If any student anticipates missing lectures for a valid reason, it is their responsibility to communicate with fellow classmates to obtain notes and stay informed about the material covered during those sessions.

Concerning lab sessions, attending lab sessions is mandatory, it is allowable to miss a single session with proper justification. However, exceeding this limit can lead to complications. It's important to note that lab sessions cannot be repeated for students who miss them. While we are open to considering exceptions in unique situations, such decisions will be made on a case-by-case basis.

Makeup exams, assignments, or absence on required days will be given only with the instructor’s permission or TA’s if they are authorized by the instructor.

**Group Work Policies:**

You are expected to execute group work with a high level of professionalism. Following each activity, you will have the opportunity to assess your peers' contributions through a peer evaluation process. The assessment received from your classmates might lead to adjustments in your marks. When completing the peer evaluation, we emphasize the importance of maintaining a tone that is respectful, impartial, and reasonable.

It's important to acknowledge that not all group members may receive a perfect peer rating. While it's uncommon for all members to receive top marks, scenarios might arise where multiple group members assess one member poorly (for example, in a group of 4 members, 3 members assign a failing grade to a single member). In such cases, appropriate adjustments will be applied to that member's final grade (e.g., a deduction of marks from 50% to 0%).

**Important Note on submissions:** Please ensure that you are mindful of the designated folders assigned for each UML assignment. In the event that you accidentally use a different folder, it will be your responsibility to rectify the situation by submitting the assignment in the correct folder. Please note that using the wrong folder could result in the assignment being considered late.

***I want to emphasize that I will not be able to accept assignments submitted via email. Your cooperation in adhering to the designated submission method is greatly appreciated***.

**In the case of final exams, be advised that only the Dean’s Office, not individual instructors or Departments, are in a position to grant deferred examinations.**

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# UNIVERSITY SUPPORT OFFICES & POLICIES

**Schedule “A”**

**Section (a) sample** re: A list of academic supports available to Students, such as the Academic Learning Centre, Libraries, and other supports as may be appropriate:

**Writing and Learning Support**

The Academic Learning Centre (ALC) offers services that may be helpful to you throughout your academic program. Through the ALC, you can meet with a learning specialist to discuss concerns such as time management, learning strategies, and test-taking strategies. The ALC also offers peer supported study groups called Supplemental Instruction (SI) for certain courses that students have typically found difficult. In these study groups, students have opportunities to ask questions, compare notes, discuss content, solve practice problems, and develop new study strategies in a group-learning format.

You can also meet one-to-one with a writing tutor who can give you feedback at any stage of the writing process, whether you are just beginning to work on a written assignment or already have a draft. If you are interested in meeting with a writing tutor, reserve your appointment two to three days in advance of the time you would like to meet. Also, plan to meet with a writing tutor a few days before your paper is due so that you have time to work with the tutor’s feedback.

These Academic Learning Centre services are free for U of M students. For more information, please visit the Academic Learning Centre website at: <http://umanitoba.ca/student/academiclearning/>

You can also contact the Academic Learning Centre by calling 204-480-1481 or by visiting 205 Tier Building.

**University of Manitoba Libraries (UML)**

As the primary contact for all research needs, your liaison librarian can play a vital role when completing academic papers and assignments.  Liaisons can answer questions about managing citations, or locating appropriate resources, and will address any other concerns you may have, regarding the research process.  Liaisons can be contacted by email or phone, and are also available to meet with you in-person.  A complete list of liaison librarians can be found by subject: <http://bit.ly/WcEbA1> or name: <http://bit.ly/1tJ0bB4>.  In addition, general library assistance is provided in person at 19 University Libraries, located on both the Fort Garry and Bannatyne campuses, as well as in many Winnipeg hospitals. For a listing of all libraries, please consult the following: <http://bit.ly/1sXe6RA>. When working remotely, students can also receive help online, via the Ask-a-Librarian chat found on the Libraries’ homepage:[www.umanitoba.ca/libraries](http://www.umanitoba.ca/libraries).

**Section (b) sample:** re: A statement regarding mental health that includes referral information:

**For 24/7 mental health support, contact the Mobile Crisis Service at 204-940-1781.**

**Student Counselling Centre**

Contact SCC if you are concerned about any aspect of your mental health, including anxiety, stress, or depression, or for help with relationships or other life concerns. SCC offers crisis services as well as individual, couple, and group counselling. *Student Counselling Centre:* <http://umanitoba.ca/student/counselling/index.html>

474 University Centre or S207 Medical Services

(204) 474-8592

**Student Support Case Management**

Contact the Student Support Case Management team if you are concerned about yourself or another student and don’t know where to turn. SSCM helps connect students with on and off campus resources, provides safety planning, and offers other supports, including consultation, educational workshops, and referral to the STATIS threat assessment team.

*Student Support Intake Assistant* <http://umanitoba.ca/student/case-manager/index.html>

520 University Centre

(204) 474-7423

**University Health Service**

Contact UHS for any medical concerns, including mental health problems. UHS offers a full range of medical services to students, including psychiatric consultation.

*University Health Service* <http://umanitoba.ca/student/health/>

104 University Centre, Fort Garry Campus

(204) 474-8411 (Business hours or after hours/urgent calls)

**Health and Wellness**

Contact our Health and Wellness Educator if you are interested in peer support from *Healthy U* or information on a broad range of health topics, including physical and mental health concerns, alcohol and substance use harms, and sexual assault.  
*Health and Wellness Educator* <https://umanitoba.ca/student/health-wellness/welcome-about.html>[britt.harvey@umanitoba.ca](mailto:britt.harvey@umanitoba.ca)

**Live Well @ UofM**

For comprehensive information about the full range of health and wellness resources available on campus, visit the Live Well @ UofM site:

<http://umanitoba.ca/student/livewell/index.html>

**Section (c) sample:** re: A notice with respect to copyright:

All students are required to respect copyright as per Canada’s *Copyright Act*. Staff and students play a key role in the University’s copyright compliance as we balance user rights for educational purposes with the rights of content creators from around the world. The Copyright Office provides copyright resources and support for all members of the University of Manitoba community. Visit <http://umanitoba.ca/copyright> for more information.

**Section (d) sample:** re: A statement directing the student to University and Unit policies, procedures, and supplemental information available on-line:

**Your rights and responsibilities**

As a student of the University of Manitoba you have rights and responsibilities. It is important for you to know what you can expect from the University as a student and to understand what the University expects from you. Become familiar with the policies and procedures of the University and the regulations that are specific to your faculty, college or school.

The [Academic Calendar](http://umanitoba.ca/student/records/academiccalendar.html) <http://umanitoba.ca/student/records/academiccalendar.html> is one important source of information. View the sections *University Policies and Procedures* and *General Academic Regulations*.

While all of the information contained in these two sections is important, the following information is highlighted.

* If you have questions about your grades, talk to your instructor. There is a process for term work and final **grade appeals**. Note that you have the right to access your final examination scripts. See the Registrar’s Office website for more information including appeal deadline dates and the appeal form <http://umanitoba.ca/registrar/>
* You are expected to view the General Academic Regulation section within the Academic Calendar and specifically read the **Academic Integrity** regulation. Consult the course syllabus or ask your instructor for additional information about demonstrating academic integrity in your academic work. Visit the Academic Integrity Site for tools and support <http://umanitoba.ca/academicintegrity/> View the **Student Academic Misconduct** procedurefor more information.
* The University is committed to a respectful work and learning environment. You have the right to be treated with respect and you are expected conduct yourself in an appropriate respectful manner. Policies governing behavior include the:

**Respectful Work and Learning Environment**

<http://umanitoba.ca/admin/governance/governing_documents/community/230.html>

**Student Discipline** <http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html>and,

**Violent or Threatening Behaviour** <http://umanitoba.ca/admin/governance/governing_documents/community/669.html>

* If you experience **Sexual Assault** or know a member of the University community who has, it is important to know there is a policy that provides information about the supports available to those who disclose and outlines a process for reporting. The **Sexual Assault** policy may be found at: <http://umanitoba.ca/admin/governance/governing_documents/community/230.html> More information and resources can be found by reviewing the Sexual Assault site <http://umanitoba.ca/student/sexual-assault/>
* For information about rights and responsibilities regarding **Intellectual Property** view the policy [https://umanitoba.ca/governance/sites/governance/files/2021-06/Intellectual Property Policy - 2013\_10\_01 RF.pdf](https://umanitoba.ca/governance/sites/governance/files/2021-06/Intellectual%20Property%20Policy%20-%202013_10_01%20RF.pdf)

For information on regulations that are specific to your academic program, read the section in the Academic Calendar and on the respective faculty/college/school web site <http://umanitoba.ca/faculties/>

Contact an **Academic Advisor** within our faculty/college or school for questions about your academic program and regulations <http://umanitoba.ca/academic-advisors/>

**Student Advocacy**

Contact Student Advocacy if you want to know more about your rights and responsibilities as a student, have questions about policies and procedures, and/or want support in dealing with academic or discipline concerns.

<http://umanitoba.ca/student/advocacy/>

520 University Centre

204 474 7423

[student\_advocacy@umanitoba.ca](mailto:student_advocacy@umanitoba.ca)