



UM | Faculty of Agricultural
and Food Sciences

Syllabus

FOOD 4260: Water Management for Food Processing
(Winter 2022)



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COURSE DETAILS

Course Title & Number:	FOOD 4260 Water Management in Food Processing
Number of Credit Hours:	3
Class Times & Days of Week:	Mondays, Wednesdays 10:00 AM - 11:15 AM Lab Section: Monday 2.30 pm-5.25 pm
Location for classes/labs/tutorials:	Virtual classes via WebEx Labs will be virtual and In-person (Location to be notified)
Pre-Requisites:	No prerequisite

Instructor Contact Information

Instructor(s) Name & Preferred Form of Address:	Dr. Chamila Nimalaratne Instructor will respond to any civil form of address such as first name, last name or Dr. etc
Office Location:	Room 244, Ellis Building (Email to schedule an appointment)
Office Hours or Availability:	Wednesdays 1:00 PM - 2:00 PM; Other times by appointment.
Office Phone No.	204-474-6287 780-966-1320 (mobile)
Email:	Chamila.Nimalaratne@umanitoba.ca (preferred method of communication) All emails should contain FOOD 4260 at the subject line
Contact:	Email is the preferred method of communication. All emails will be answered within 24 hours. For urgent reasons, you can contact me by phone.

Course Description

U of M Course Calendar Description

The course is devoted to the management of water and wastewater in the food process industry. The roles of water in food processing, recycle and reuse opportunities, treatment options for water and wastewater are presented. The course discusses water stewardship in relation to food processing, water and wastewater regulations and implications for HACCP and ISO. Water and wastewater management as it relates to sustainability in food processing is discussed. Laboratory sessions are designed for the student to become familiar with Standard Methods for the Examination of Water and Wastewater.

General Course Description

Importance of water management in the food industry and sustainable use of water will be discussed in this course. Major emphasis will be given to understand effective water use and re-use systems and technologies used in the food industry.

Course Goals

1. Be familiar with the acceptable standards of water quality parameters
2. Understand the principles and techniques available for quality testing of water and wastewater
3. Know methods of selecting appropriate water testing methods
4. Understand the importance of water as a scarce resource and identify the ways of sustainable use of water

Course Learning Objectives

At the end of the course, students should:

1. Learn proper water and wastewater management in food processing
2. Be aware of water and wastewater laws and regulations that govern the food industry.
3. Become familiar with the terms water stewardship and food industry sustainability.
4. Understand the roles of water in food process applications.
5. Become aware of opportunities to conserve, recycle, reuse water.
6. Learn treatment options for water and wastewater.
7. Be aware of water and wastewater implications for HACCP and ISO
8. Be familiar with analytical test procedures for the analyses of water and wastewater.
9. Understand the principles behind analytical techniques for water and wastewater.
10. Demonstrate practical proficiency and teamwork in the laboratory
11. Be able to interpret and report results in a scientific report.

Textbook, Readings, and Course Materials

No textbook is required for this course. Instructor will provide necessary reading materials during the course.

Using Copyrighted Material

Please respect copyright. Copyrighted content used in this course is appropriately acknowledged and has been used in accordance with copyright laws and University guidelines. Copyrighted works, including those created by the instructor, 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, unless 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.

Course Technology

The instructor's general policy is that students should refrain from any behaviour that may be distracting to other students. Accordingly, all technology resources are to be used in a responsible, efficient, ethical and legal manner. The course lectures will be delivered remotely through WebEx on UMLearn and the labs will be in-person and virtual as indicated in the lab schedule.

Expectations: I Expect You To

Attend the classes regularly and punctually. I will be asking questions during the class and will expect the students respond and actively participate in the class (even though you are not sure if the answer is correct).

I will treat you with respect and would appreciate the same courtesy in return. See [Respectful Work and Learning Environment Policy](#).

I expect you to follow these policies around Class Communication, Academic Integrity, and Recording Class Lectures.

Class Communication:

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:

https://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html

Academic Integrity:

Each student in this course is expected to abide by the University of Manitoba [Academic Integrity principles](#). 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](#). Visit the [Academic Calendar](#), [Student Advocacy](#), and [Academic Integrity](#) web pages for more information and support.

Specific course requirements for academic integrity for individual and group work:

- I. Group projects are subject to the rules of academic dishonesty;
- II. Group members must ensure that a group project adheres to the principles of academic integrity;
- III. Students will work on assignments with provided lab data (for each group), but need to submit a individual lab reports.
- IV. All work should be completed independently unless otherwise specified.

Recording Class Lectures:

The instructor and the University of Manitoba hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission from Dr. Chamila Nimalaratne. 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 \(SAS\)](#) 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

Expectations: You Can Expect Me To

Do in-class revisions before the exams.

Respond to your emails related to class within 24-48 hr.

Be available for questions/clarifications related to course content by appointment.

CLASS SCHEDULE AND COURSE EVALUATION

The schedule provided below is subject to change at the discretion of the instructor but such changes are subject to Section 2.8 of the – [ROASS](#)- Procedure.

Complete Mark Allocation for Course

Midterm test ^a	25%
Short quizzes ^b , 2@5%	10%
Lab Hand-Ins and Reports ^c (7@ ~ 4%)	21%
Assignment	7%
Final Examination (all lecture sections, 2 hr) ^d	35%
Class participation/ attendance	2%
Total	100%

^aMidterm test is tentatively scheduled on Mar 16th

^bQuizzes are tentatively scheduled on Mar 02nd and Apr 13th

^cLab reports are due 2 weeks after laboratory session according to schedule and instructions below.
Penalty for late submission is deduction of 10%/day of original mark. Refer to LAB SCHEDULE below for due dates.

^dFinal exam date will be set by the Registrar's Office.

Date	Class Content & Teaching Strategies*	Required Readings or any Pre-class Preparation	Evaluation		
			Type of Assessment	Due Date	Value of Final Grade
Week 1 Jan 24-28	Introduction to the course 1. Laws and regulations Drinking water standards/ Wastewater standards				
Week 2 Jan 31-Feb 04	2. Roles of water in food process applications				
Week 3 Feb 07-Feb 11	3. Food Industry Sustainability, Water Stewardship, HACCP, ISO				
Week 4 Feb 14-Feb 18	4. Analytical parameters for potable water – acidity, alkalinity, hardness, chlorine, microbiology				
Feb 21-25 Winter Term Break (No Classes)					
Week 5 Feb 28-Mar 04	5. Wastewater parameters important in surcharge - COD, BOD, TOC, SS		Quiz 1	Mar 02	5%
Week 6 Mar 07-Mar 11	6. Calculations in volumetric analysis - molarity - normality				
Week 7 Mar 14-Mar 18	Midterm revision and exam		In-class Midterm Exam	Mar 16	25%
Week 8 Mar 21-Mar 25	7. Determination of physical and chemical properties of water and wastewater - turbidity, alkalinity, acidity, hardness				
Week 9 Mar 29-Apr 01	8. Water disinfection 9. Microbiology of drinking water				
Week 10 Apr 04-Apr 08	10. Methods of wastewater treatment - Primary treatment - screening - filtration				

Week 11 Apr 11-Apr 13	- Secondary treatment - biological - Tertiary or advanced treatment - nitrogen, phosphorus removal - water disinfection - coagulation - activated carbon - membrane (MF,UF,RO)		Quiz 2	Apr 13	5%
Week 11 Apr 18-Apr 22	Revision and Final Exam Review		Assignment	Due Apr 20	7%
Exam period: Apr 26 –May 03, 2022			Final exam (scheduled by Registrar’s Office during Fall Term Exam period: Apr 26–May 03, 2022)		35%
			Class attendance/ participation		2%
			Total		100%

***Lecture topics are only a guideline; These may change slightly as the course move on.**

Important Information about Evaluation Procedures

- There will be 2% of the final marks for attendance/ active class participation.
- There are no makeup quizzes, if absent for a quiz without a proper physician note or substantiated and compelling personal matter documented in writing, the quiz mark = 0. If a valid excuse is provided within 24hrs after the quiz, the value of the quiz mark to be added to the next following term test or final exam.
- If a student is absent for the midterm test and provides a proper physician note or written explanation of a substantiated and compelling personal matter, a makeup test will be scheduled as soon as possible. Otherwise, a mark of 0 will be applied.
- If you are a student with a disability, please contact Student Accessibility Services (SAS) for 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
<http://umanitoba.ca/student/saa/accessibility/>, 520 University Centre, phone: 204-474 7423, email: Student_accessibility@umanitoba.ca

Lab Expectations

Any communication related to the lab section of the course have to be primarily directed to the lab TA. If you need further clarifications on the lab section, you can reach me using my email (preferred method of communication - Chamila.Nimalaratne@umanitoba.ca)

- Technicians and Lab TAs will treat you with respect and would appreciate the same courtesy in return. You are expected to comply with all lab rules and regulations as stipulated in the lab handout which will be given before the labs.

***NOTE: If you haven't done yet, prior to the first laboratory, you are required to complete and pass (with a mark of at least 80%) an online WHMIS quiz available through UM Learn. You may take this test as many times as is necessary to pass.**

- The overall goal is to give students a practical experience in the advanced analysis of foods, and for students to learn to effectively work in groups. The labs for this course are group projects that require students to in-person or virtually attend the labs they are registered for. **There will be a total of 21% of the final grade given for labs.** The lab handouts will be distributed prior to the labs.
- **Virtual/ in-person lab attendance is mandatory (there are no makeup labs). 100% of mark allocated to a lab will be deducted if absent without a physician note or documentation of a compelling personal matter. Students are not allowed to submit the lab reports if absent for the virtual/ in-person labs.**
- For labs, students may work in groups as assigned, but each student will submit his/her own report. Any evidence of plagiarism in lab reports (e.g. whether from another lab partner, or group, or lab report from previous courses) will result in "0" mark and matter will be subject to disciplinary action in accordance with university policy on academic misconduct.

Tentative Lab Schedule*

Date	Lab Content	Location	Lab report	
			Due Date	Value of Final Grade
Jan 31	Laboratory 1 (Microbiology)	Virtual lab	Feb 14	3%
Feb 07	Laboratory 2 (Alkalinity lab) – Group 1	Student lab	Feb 21	3%
Feb 14	Laboratory 2 (Alkalinity lab) – Group 2	Student lab	Feb 28	3%
Feb 28	Laboratory 3 (Hardness lab) Group 1 (2:30 – 4:00 pm) Group 2 (4:15 – 5:45 pm)	Student lab	Mar 14	3%
Mar 07	Laboratory 4 (COD lab) Group 1 (2:30 – 4:00 pm) Group 2 (4:15 – 5:45 pm)	Student lab	Mar 21	3%

Mar 14	Laboratory 5 (Solid's lab and COD reading) Group 1 (2:30 – 4:00 pm) Group 2 (4:15 – 5:45 pm)	Student lab	Mar 28	3%
Mar 21	Laboratory 6 (BOD lab) Group 1 (2:30 – 4:00 pm) Group 2 (4:15 – 5:45 pm)	Dairy building	Apr 11	3%
Mar 28	BOD reading lab Group 1 (2:30 – 4:00 pm) Group 2 (4:15 – 5:45 pm)	Dairy building		
Apr 04	Laboratory 7 (Chlorine lab) Group 1 (2:30 – 4:00 pm) Group 2 (4:15 – 5:45 pm)	Student lab	Apr 18	3%

* A complete lab schedule with exact times and location of in-person labs for each group will be posted on UMLearn.

Grading

Letter Grade	Percentage out of 100	Final Grade Point
A+	90-100	4.5
A	80-89.9	4.0
B+	75-79.9	3.5
B	66-74.9	3.0
C+	61-65.9	2.5
C	56-60.9	2.0
D	50-55.9	1.0
F	Less than 50	0

Voluntary Withdrawal

The last day to drop the class and receive 100% refund is 4th February 2022. And the last day to withdraw with no refund (voluntary withdrawal) is 25th April 2022. Students who did not drop the course by the VW deadline would be assigned a final grade. However, withdrawal courses will be recorded on official transcript. Please refer to the [Registrar's Office](#) web page for more information.

Referencing Style

Assignments should use the APA reference style as outlined in the text: American Psychological Association. (2009). Publication manual of the American Psychological Association (6th ed.). Washington, DC: Author.

Assignment Extension and Late Submission Policy

Lab reports/ Hand-Ins are generally due 2 weeks after laboratory session according to schedule and instructions. Penalty for late submission is deduction of 10% per day of original mark. Refer to LAB SCHEDULE for due dates. UM Learn submission of assignments is the accepted method of handing over assignment.

UNIVERSITY SUPPORT OFFICES & POLICIES

The [Schedule "A"](#) provides information on university support offices and policies available for students during the academic terms.

Schedule "A"

Section (a) 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.

Section (b) provides information regarding mental health resources that are available at University of Manitoba:

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/faculties/education/current/474.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-supports/health-wellness/university-health-service>

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 <http://umanitoba.ca/student-supports/health-wellness>

Contact Health and Wellness Educator 204-295-9032 or britt.harvey@umanitoba.ca for more information.

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): 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): 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/student-supports/academic-supports/academic-integrity>. View the **Student Academic Misconduct** procedure for 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 to 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-supports/sexual-violence-support-and-education>
- For information about rights and responsibilities regarding **Intellectual Property** view the policy
https://umanitoba.ca/admin/governance/governing_documents/community/235.html

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-supports/academic-supports/academic-advising>

520 University Centre

204 474 7423

<http://umanitoba.ca/student-supports/academic-supports/student-advocacy>

Students - UM COVID-19 - Syllabus Insert – January 19, 2022

The University of Manitoba (the “UM”) is committed to maintaining a safe learning environment for all students, faculty, and staff. Should campus operations change because of health concerns related to the COVID-19 pandemic or other campus-wide emergency, it is possible that this course will move to a fully remote delivery format. Should the instructor be required to stay at home for an extended period and an alternate instructor not be available, the course may move temporarily to a remote delivery format. In that instance, you may be provided with an asynchronous option to minimize the impact the change may have on your schedule

PPE and Mask Wearing In a face-to-face environment, our commitment to safety requires students to observe all physical distancing (2m) and personal protective equipment (PPE) guidelines set by the University (<https://umanitoba.ca/coronavirus>)

While on campus and in class, you must wear PPE (Personal Protective Equipment) as stipulated in current [University policies, procedures, and guidelines](#). Students who fail to comply are subject

to disciplinary action in accordance with the [Student Discipline Bylaw](#) and [the Non-Academic Misconduct and Concerning Behaviour Procedure](#).

Medical-grade 3-ply masks are available at many locations on campus, including specific classroom locations, designated by your unit, the Elizabeth Dafoe Library (Fort Garry Campus) and the Brodie Centre main doors (Bannatyne Campus). Additional PPE, if necessary for a specific learning environment, will be provided to you by the teaching unit.

If you do not follow masking and other requirements you will be asked to leave the learning space and may only return to the class already in progress when you have complied with these requirements. Repeated issues will result in disciplinary action as previously noted.

Students should not eat or drink during class time.

Illness

Remember: **STAY HOME IF YOU HAVE SYMPTOMS OR ARE ILL**. If you become sick or are required to self-isolate you should notify your instructor by email so you can develop a plan to complete the course learning outcomes while you are absent.

If you have symptoms, do not come to campus or any UM facilities. Complete the [self-assessment](#) on the Manitoba Public Health site and follow the guidelines, which may include booking a COVID-19 test.

What to do if you become ill while at UM:

1. Leave the classroom, lab or workspace immediately. Continue to wear your mask while leaving the premises and/or while waiting for transportation
2. Perform hand hygiene (soap and water or hand sanitizer) and avoid contact with others, and minimize contact with the physical environment.
3. Once at home, complete the [MB self-assessment](#) and follow the directions that are provided.
4. Inform your supervisor(s), instructor(s) or, if in residence, the appropriate individual.
5. You must remain off campus and all UM facilities until cleared to return in accordance with self-assessment, testing results, or MB Health requirements.

Recommended transportation options (in order):

1. Drive yourself home.
2. Pick-up by family or friend – remember to keep your mask on and to distance as much as possible, and where possible, open a window to improve ventilation.
3. Pickup by taxi/Uber:
 - Remain masked and perform hand hygiene before entering the vehicle.
 - o Avoid touching the inside of the vehicle
 - o Keep your mask on for the duration of the ride
 - o Where possible, open a window to improve ventilation.
4. Winnipeg Transit buses - Winnipeg Transit has indicated that individuals that are ill **must not use Transit**