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Syllabus

FOOD 4010: Food Processing 2

(Fall 2021)



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Course Details

Course Title & Number:	FOOD 4010: Food Processing 2
Number of Credit Hours:	3
Class Times & Days of Week:	Classes: Tuesdays and Thursdays 1:00 – 2:15 pm Labs and Tours: Wednesdays at 2:30 – 5:25 pm
Location for classes/labs:	Virtual classes (UM Learn – Cisco Webex) All classes will be recorded and be available to students for review Virtual labs (UM Learn – Cisco Webex)
Pre-Requisites:	FOOD 3010: Food Processing 1 or Equivalent

Instructor Contact Information

Instructor Name & Preferred Form of Address:	Dr. Filiz Koksel I will respond to any civil form of address such as Filiz, Dr. Filiz, Dr. Koksel, etc.
Office Location:	Virtual via UM Learn Cisco Webex
Office Hours & Availability:	Arrangement of mutually convenient time. To book an appointment, please send an email to: Filiz.Koksel@umanitoba.ca
Office Phone No:	(204) 474-6486
Email:	Filiz.Koksel@umanitoba.ca (preferred method of communication) All emails should contain FOOD 4010 at the subject line. All email communication must conform to the Communicating with Students university policy.
Contact:	Email is the preferred method of communication.

Course Description

U of M Course Calendar Description

The processing of specific food groups is covered. The functions and changes in the primary chemical components of the commodities receive special consideration. New technologies including thermal/non-thermal and radiative processing, extrusion, minimal processing and other advanced processing methods are studied.

General Course Description

This course is a foundational course for the Food Science discipline. However, it fits into the broader program of studies such as Nutritional Sciences, Biosystems Engineering, Agriculture Engineering, Animal Science, Plant Science, Agronomy and most of agricultural disciplines, in particular agro-food programs.

ATTENTION: STUDENTS RESIDING OUTSIDE WINNIPEG:

As this is a remote learning course, all instructional activities and deadlines will be Winnipeg time (Central Time). Please make sure your calendars are adjusted to reflect any time changes. Please inform Dr. Koxsel as soon as possible if you are taking the course while residing outside of Winnipeg, specifically:

- If you are in a rural Canadian area affected by poor internet connections that may impact completing assessments and exams on time.
- If you are in another time zone within or outside Canada, specify where you are, and if you foresee any challenges with attending classes and completing assessments and exams on time.

NOTE: It is your responsibility to communicate with Dr. Koxsel well in advance of tests/exams/assignment due dates, of any ongoing issues, OR immediately once an issue arises that may impact your ability to complete course work.

Class Topics

1. Introduction and history of food processing

Basic principles

2. Ambient-temperature processing

Size reduction of solid foods

Milling

Mixing and Forming

Separation and concentration of food components

Fermentation technology

High pressure processing

Minimal processing methods under development

3. Water sustainability and waste water management**4. Processing by application of heat**

Extrusion

Dehydration

Baking

Blanching, pasteurization, heat sterilization

Evaporation, distillation

5. Processing by direct and radiated energy

Infrared, dielectric, ohmic heating

6. Processing by removal of heat

Chilling, freezing

Freeze concentration

Course Learning Objectives

Objectives: By the end of the course, the student should:

1. Understand food chemistry principles in order to assess how the properties of various food components limit the shelf life of foods.

- Describe the role that components within food have on shelf life, and assess how processing tools can be employed to limit the dynamics of deterioration.

- Summarize the effect of various physical processes employed in food processing on the chemistry of various food components, particularly high molecular weight components such as starch and proteins.

2. Identify the extent to which specific processing methods preserve foods by inactivation or destruction of microorganisms.

- State the principles of food preservation by fermentation processes. Quantify the extent to which certain physical processes, e.g., electrical or thermal energy, affect the survival of pathogenic and spoilage organisms. Define the extent to which microorganism type and numbers affect processing strategies in specific agricultural commodities.

3. Analyze the mechanisms by which a range of physical processes are employed in various advanced food processing operations to optimize food quality and extend shelf life of foods.

- Distinguish the source and variability of raw food material and how it affects various food processing operations.
- Point out the principles that permit various advanced food technologies to make a food product safe for consumption.
- Compare the role of transport processes and unit operations in food processing. Show how various unit operations are linked to produce a given food product.
- Construct process flow diagrams from visits to food processing facilities, and critique the flow for critical control points related to product safety and quality.
- Differentiate the principles and practices in advanced processing techniques and distinguish the effects of processing parameters on product quality.
- Understand why specific practices of cleaning and sanitation are followed in food processing operations.

4. Apply basic physical and chemical principles to food science issues.

- Solve real processing and food quality problems by applying food chemistry principles. Use statistical principles to solve food processing applications.
- Apply food processing principles to control and assure the quality of food products.
- Be aware of current topics of importance to the food industry and how consumer pressure and government regulations affect processing strategies.

5. Synthesize specific success skills to prepare for a career in the food industry.

- Demonstrate effective written communication skills. Organize critical thinking skills to solve issues arising from new situations, especially new processes.
- Explain why skills established on scientific principles will permit one to continually educate oneself.
- Improve upon information acquisition skills and organizational skills.

Textbook, Readings, and Course Materials

Required textbook: None

Selected References:

1. Food Processing Technology – Principles and Practice (2016). P. J. Fellows. Third edition. CRC Press, Woodhead Publishing Limited. (Full text available through UM libraries)
2. Unit operations in food processing (1966). R. L. Earle. Pergamon Press: Oxford.
3. Physical Properties of Foods and Food Processing Systems. (1990). M. J. Lewis. Ellis-Horwood: New York.

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, 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

All course materials will be available to registered students through UM Learn.

The general University of Manitoba policy is that all technology resources are to be used in a responsible, efficient, ethical, and legal manner.

Expectations: I Expect You To

- Attend the classes, lab and tour sessions regularly and punctually.
- Attend the discussions actively and answer questions I may ask (to the best of your ability). Active class participation is worth 10% of your overall grade.
- Use your laptop/phone/tablet in the class for course-related purposes only, and not interrupt the others.
- Not leave the class before it ends.
- Follow the 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:

http://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.

Recording Class Lectures:

Dr. Filiz Koxsel 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 the permission of Dr. Filiz Koksel.

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

- Treat you with respect. Please see [Respectful Work and Learning Environment Policy](#). I would appreciate the same courtesy in return.
- Respond to your emails within 48 hours (except holidays and weekends).
- Be available for regular consultation regarding course materials. I will be available 5 minutes prior to and after each virtual class time, to discuss any immediate questions or comments you may have. For individual student consultation, please email me for setting up a mutually agreeable time.

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](#).
- The midterm and final exams include all materials covered in class, lab (and tour) sessions. The final exam will not be comprehensive, and will only cover the materials, lab (and tour) sessions after the midterm exam.
- No makeups will be offered for missed quizzes. If absent for a quiz without a doctor's note or substantiated and compelling personal matter documented in writing, the quiz mark = 0. If a valid excuse is provided within 24 h after the quiz, the value of the quiz mark will be added to the final exam.
- If absent for the midterm without a doctor's note or substantiated and compelling personal matter documented in writing, the midterm mark = 0. If a valid excuse is provided, a makeup test will be scheduled as soon as possible.
- Class participation will be recorded via iClicker through UM Learn. Students are required to install iClicker Student - formerly known as iClicker Reef - on their phone.

Complete Mark Allocation for the Course:

Class participation	10%	Throughout the semester
Midterm	25%	21 Oct, Thursday
Lab and tour reports (5% x 5)	25%	See schedule under "Lab Schedule"
Quizzes (5% x 2)	10%	5 Oct, Tuesday & 23 Nov, Tuesday
Final exam	30%	TBA
TOTAL:		100%

Date	Class Content	Required Readings or Pre-class Preparation
9 Sep, Thu	Introduction & History of food processing	Course outline & iClicker Reef
14 Sep, Tue	Size reduction of solid foods, Milling	Lecture notes on UM Learn
16 Sep, Thu	Milling, Mixing and Forming	Lecture notes on UM Learn
21 Sep, Tue	Separation and concentration of food components	Lecture notes on UM Learn
23 Sep, Thu	Separation and concentration of food components	Lecture notes on UM Learn
28 Sep, Tue	Fermentation technology	Lecture notes on UM Learn
30 Sep, Thu	No class – The national day for truth and reconciliation	
5 Oct, Tue	High pressure processing	Lecture notes on UM Learn
7 Oct, Thu	Minimal processing methods under development	Lecture notes on UM Learn
12 Oct, Tue	Minimal processing methods under development	Lecture notes on UM Learn
14 Oct, Thu	Water sustainability and waste water management	Lecture notes on UM Learn
19 Oct, Tue	Water sustainability and waste water management	Lecture notes on UM Learn
21 Oct, Thu	No class – Midterm	
26 Oct, Tue	Extrusion	Lecture notes on UM Learn
28 Oct, Thu	Extrusion	Lecture notes on UM Learn
2 Nov, Tue	Dehydration	Lecture notes on UM Learn
4 Nov, Thu	Baking	Lecture notes on UM Learn
8-12 Nov	No class – Fall term break	
16 Nov, Tue	Blanching, pasteurization, heat sterilization	Lecture notes on UM Learn
18 Nov, Thu	Blanching, pasteurization, heat sterilization	Lecture notes on UM Learn
23 Nov, Tue	Evaporation, distillation	Lecture notes on UM Learn
25 Nov, Thu	Evaporation, distillation	Lecture notes on UM Learn
30 Nov, Tue	Infrared, dielectric, ohmic heating	Lecture notes on UM Learn
2 Dec, Thu	Infrared, dielectric, ohmic heating	Lecture notes on UM Learn
7 Dec, Tue	Chilling, freezing	Lecture notes on UM Learn
9 Dec, Thu	Freezing, Freeze concentration	Lecture notes on UM Learn

Lab Schedule

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](#).

Date	Lab (or Tour) Content	Required Readings or Pre-lab (or tour) Preparation	Report Due Date
22 Sep, Wed	Canadian International Grains Institute (CIGI) milling tour	Tour videos and rubric	6 Oct, Wed
6 Oct, Wed	Brewery fermentation tour	Tour videos and rubric	20 Oct, Wed
27 Oct, Wed	Yellow pea flour puffs extrusion lab	Lab manual, videos and rubric	10 Nov, Wed
3 Nov, Wed	Farm & Food Discovery Centre (FFDC) signature bread at home lab	Lab manual, videos and rubric	17 Nov, Wed
1 Dec, Wed	Soybean infrared micronization lab	Lab manual, videos and rubric	15 Dec, Wed

Lab Expectations

- Any communication related to the lab (or tour) sections of the course should be directed to your teaching assistant (TA) and grader/marker (GM). If you need further clarifications on the labs (or tours) or your reports, you can reach Dr. Koxsel via email.
 - *Information about your TA and GM:*
 Name: [Neeraj Ghanghas](#)
 Email: Neeraj.Ghanghas@umanitoba.ca
- Virtual lab (and tour) attendance is mandatory (there are no makeups). Your group will be assigned and announced on UM Learn by September 22, 2021. The lab (and tour) handouts and videos will be available prior to the lab (or tour) session date.
- 100% of the mark allocated to a lab (or tour) will be deducted if absent without a doctor's note or documentation of a substantiated and compelling personal matter in writing. For virtual lab (and tour) sessions, UM Learn automatically records the login information. Students are not allowed to handover lab reports without attending the virtual lab (and tour) sessions.
- Students will work in groups as assigned for labs, and each group will be provided different data sets for their reports. **Each student will submit their own report.** Any evidence of plagiarism in lab reports (e.g., whether from another lab partner, or group, or lab report from previous courses or years) will result in "0" mark, and the matter will be subject to disciplinary action in accordance with university policy on academic misconduct.
- Lab and tour reports are due 2 weeks after a lab. Late write-ups will lose 10% of credit for submission after the due date, and 10% for each additional day late. If you miss a lab/tour without doctor's note, you get an automatic 0 (so no need to write the lab/tour report). Please see the lab and tour report rubrics on UM Learn.
- For the baking lab, lab coats, safety glasses or goggles and oven mitts must be worn, and all safety instructions must be followed carefully while baking at home.

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	72-79	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

Voluntary Withdrawal

The voluntary withdrawal date is **November 23, 2021**. Refer to the [Registrar's Office](#) web page for more information.

Assignment Descriptions

Please see UM Learn for detailed information on lab (and tour) report rubrics.

Lab (and tour) reports are due 2 weeks after a lab (or tour) session, not later than 5 pm of the day 14.

Assignment Feedback

- Marks of the midterm and one of the tours will be available prior to the voluntary withdrawal date.
- Assignment feedback will be provided through UM Learn by your TA/GM. Please book an appointment directly with your TA/GM for questions or concerns about your labs (and tours) and your reports. If you need further clarifications on the labs (or tours) or your reports, you can reach Dr. Koksel via email.

Assignment Extension and Late Submission Policy

- Lab (and tour) reports are due 2 weeks after a lab (or tour) session, not later than 5 pm of the day 14.
- Late write-ups will lose 10% of marks for submission after the due date, and 10% for each additional day late. If you miss a lab/tour without doctor's note, you get an automatic 0 (so no need to write the lab/tour report). Lab (and tour) reports must be submitted through UM Learn.
- If there are compelling reasons why you will have a late submission, an alternate due date must be arranged with Dr. Koksel **prior** to the scheduled due date.

Referencing Style

Assignments should use the APA reference style by providing the author, year, title and source of the cited work in an alphabetical list of references. Details are outlined in: American Psychological

Association. (2009). Publication manual of the American Psychological Association (6th ed.). Washington, DC.

University Support Offices & Policies

Instructors shall provide to every student the information on university support offices and policies in [Schedule "A"](#) within the first week of classes, either through a paper copy and/or via the university's student information system (i.e., Aurora, UM Learn, or such other university information system as may be approved by the university from time to time).

Schedule "A"

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.

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 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/health-wellness/welcome.html>

Katie.Kutryk@umanitoba.ca

469 University Centre
(204) 295-9032

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>

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.

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** 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 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

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 http://umanitoba.ca/admin/governance/media/Intellectual_Property_Policy_-_2013_10_01.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