



## FOOD 3160 - Frozen Dairy Products

### Course Outline: Winter 2023

**Credits:** (3-L: 0-0)3 Winter Term 2023 (Classes Begin Monday January 9<sup>th</sup>, 2023)

**Class Times:** Monday, Wednesday, Friday – 11:30 AM to 12:20 PM

**Location for Classes:** Dairy Science Building Room 206.

**Location for Labs:** Dairy Science Building Room 101 and Pilot Plant Areas.

**Prerequisite:** No prerequisite

**Voluntary Withdrawal Date:** March 22, 2023

**Last date to drop a course with refund:** January 20, 2023

**Instructor:** John Thoroski, Dept. of Food and Human Nutritional Sciences  
(Available during normal working hours)  
Room 006A – Dairy Science Building  
Phone # 204 474 9332  
E Mail – [John.Thoroski@umanitoba.ca](mailto:John.Thoroski@umanitoba.ca)

**Course Description:** *Technology of frozen dairy products, including selection and processing of materials and handling of products. Standards and quality control programs for major dairy products will be covered. Offered in 2006-07 and alternate years thereafter.* The purpose of the course is to impart the basic knowledge required for the production of a variety of frozen dairy products. Selection and evaluation of raw materials are covered. Processing, packaging and distribution of ice cream, frozen yogurt, and other frozen dairy products are studied. Regulatory and industrial standards and quality assurance tests for major frozen dairy products will be covered. Offered in alternate years.

**Learning Objectives and Course Goals:** Upon completion of this course, students should be able to:

- Explain the importance of milk composition and microbiology to Frozen Dairy Products
- Summarize industry statistics, trends, and the milk supply system
- Explain the principles of Frozen Dairy Products technology
- Identify and explain the unit operations involved in Frozen Dairy Products technology

- Demonstrate knowledge in ingredient technology
- Select and explain practical techniques in product manufacture, and analytical techniques including chemical, microbiological and sensory
- Summarize current research and development in the field
- Give advice with respect to government regulations and industrial specifications required for the manufacture and sale of Frozen Dairy Products

**Texts/References:**

Ice Cream, 2003, 6<sup>th</sup> ed. Robert T. Marshall, H. Douglas Goff and Richard W. Hartel. Kluwer Academic/Plenum Publishers, New York, Boston, Dordrecht, London, Moscow

[Http://www.foodsci.uoguelph.ca/dairyedu/home.html](http://www.foodsci.uoguelph.ca/dairyedu/home.html)

**Trade Journals and Publications:**

Dairy Foods  
Journal of Dairy Science

**Subject Outline:**

- Milk composition and microbiology
- Chemical and microbiological analysis of frozen dairy products
- Classification of frozen dairy products
- Composition of various frozen dairy products
- Ingredients used in the manufacturing process
  - The role of fat, milk solids non-fat, sweeteners, egg yolks, stabilizers and emulsifiers, total solids, air and water in frozen dairy products.
  - The sources of ingredients for frozen dairy products. The advantages and limitations of each type of ingredients.
- Industry facts and statistics
- Development and growth of the industry
- The physical-chemical properties of an ice cream mix
- Calculation of simple and complex mixes
- Mix processing with unit operations: Separation, mixing, homogenization, pasteurization, and aging.
  - The freezing process: batch and continuous freezing, the addition of colouring, flavouring and fruits to frozen dairy products. Overrun and methods to achieve overrun.
- Packaging, hardening and shipping
- Frozen dairy products including sherbets, gelato, ices, frozen yogurt and low fat products
- Defects, scoring and grading ice cream and sherbets
- Nutritional properties of frozen dairy products
- Functional foods and nutraceutical aspects
- Sanitation and quality control - government regulations (HACCP)
- New technologies

**Schedule for Tests and Laboratories:**

March 3<sup>rd</sup> – Mid Term Exam  
 March 15<sup>th</sup> - Assignment of Term Project  
 Lab Dates – Fridays beginning January 20<sup>th</sup>  
 Lab Reports – Due two weeks after lab date  
 Final Exam Date - To Be Determined

- Late assignments will be downgraded. Missed tests must be completed and may be rescheduled with the consent of the Instructor.

**Laboratory Information:**

<b>Topic</b>	<b>Date</b>
Microbiological Analysis of Frozen Dairy Products.	Friday Jan 20 <sup>th</sup>
Chemical analysis of frozen dairy products.	Friday Jan 27 <sup>th</sup>
Open	Friday Feb 3 <sup>rd</sup>
The processing of other frozen dairy products i.e., frozen yogurt	Friday Feb 10 <sup>th</sup>
Sanitation Lab	Friday Feb 17 <sup>th</sup>
No Lab – Spring Break / Reading Week	Friday Feb 24 <sup>th</sup>
No Lab – Mid-term Exam	Friday Mar 3 <sup>rd</sup>
The calculation and freezing of ice cream mixes by the batch process	Friday Mar 10 <sup>th</sup>
Freezing of ice cream by the continuous freezer	Friday Mar 17 <sup>th</sup>
Pasteurization Demonstration	Friday Mar 24 <sup>th</sup>
Sensory analysis and judging of various types of ice cream products for colour, packaging, melting quality, body, texture and flavour attributes.	Friday Mar 31 <sup>st</sup>
No Lab – Good Friday Holiday	Friday Apr 7 <sup>th</sup>

**Lab Sessions are held on Fridays**

Session 1      9:30-11:30 am  
 Session 2      12:30-2:30 pm  
 Session 3      2:30 -4:30 pm

# Students Registered = 22 (Maximum 36)

**8 Student limit per lab sessions**

**Marks Awarded**

Laboratory reports      20%  
 Project                      10%  
 Mid-term test              20%  
 Final examination        40%  
 Attendance                10%

**Grades:**

A+	90-100	C+	65-69.9
A	80-89.9	C	60-64.9
B+	75-79.9	D	50-59.9
B	70-74.9	F	under 50

**Class Attendance:** Attendance **will be monitored** and graded proportionally as listed above.

**Assignment Descriptions:** Formats, referencing style, and grading rules for the lab reports and term project for FOOD 3160 will be posted on UM Learn.

**Evaluative Feedback:** This will be both formative and summative. Each test will be reviewed and discussed during class. Laboratory report feedback and suggestions will be ongoing during the time required for completion. The evaluation of lab reports will be completed within 7 working days after submission. Feedback and evaluation detail will be available upon request.

**Electronic Equipment (course technology):** Electronic equipment (iPhone, laptop, notebook, etc.) is permitted during regular class time providing it does not disrupt other students. This equipment is not permitted during quizzes, tests, or exams.

**Class Communication:** Course material will be presented thoroughly during class time and all of the digital materials presented in class will be posted on UM Learn. Discussion and questions during class time are encouraged.

The University requires all students to activate an official University email account. Please note that all communication between me and you as a student must comply with the electronic communication within the student policy. You are required to obtain and use your U of M email account for all communication between yourself and the university.

**Recording Class Lectures:** The instructor and the University of Manitoba hold copyright over the course materials, presentations and lectures that form part of this course. No audio or video recording of lectures or presentations is allowed in any format, in whole or in part without permission of the instructor. Course materials (both paper and digital) are for the participant's private study and research.

**Using Copyrighted Material:** Please respect copyright. We will use copyrighted content in this course. The content should be appropriately acknowledged and is copied 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. 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).

**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](mailto:Student_accessibility@umanitoba.ca)

**Students Services:** A list of student services provided by the University of Manitoba will be posted in UM Learn for this course.

**Expectations:** The instructor will review expectations in the first week of classes.

**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.

### **Policy on Plagiarism and Cheating**

*“Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university). Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room (e.g., crib notes, pagers or cell phones). Exam cheating can also include exam impersonation. (Please see Section 4.2.8 on Exam Personation). A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty.*

*To plagiarize is to take ideas or words of another person and pass them off as one’s own. In short, it is stealing something intangible rather than an object. Plagiarism applies to any written work, in traditional or electronic format, as well as orally or verbally presented work. Obviously it is not necessary to state the source of well known or easily verifiable facts, but students are expected to appropriately acknowledge the sources of ideas and expressions they use in their written work, whether quoted directly or paraphrased. This applies to diagrams, statistical tables and the like, as well as to written material, and materials or information from Internet sources.*

*To provide adequate and correct documentation is not only an indication of academic honesty but is also a courtesy which enables the reader to consult these sources with ease. Failure to provide appropriate citations constitutes plagiarism. It will also be considered plagiarism and/or cheating if a student submits a term paper written in whole or in part by someone other than him/herself, or copies the answer or answers of another student in any test, examination, or take-home assignment.*

*Working with other students on assignments, laboratory work, take-home tests, or on-line tests, when this is not permitted by the instructor, can constitute Inappropriate Collaboration and may be subject to penalty under the [Student Discipline By-Law](#).*

*An assignment which is prepared and submitted for one course should not be used for a different course. This is called “duplicate submission” and represents a form of cheating because course requirements are expected to be fulfilled through original work for each course.*

*When in doubt about any practice, ask your professor or instructor.”*

Plagiarized material will receive a grade of ZERO (0) in this course.

**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)