FOOD 3160  Frozen Dairy Products

Credits:  (3-L:0-0)3

Instructor: John Thoroski, Dept. of Food Science (Available during normal working hours)
Room 006A – Dairy Science Building
Room 203 – Ellis Building
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Description: Technology of frozen dairy products, including selection and processing of materials and handling of products. Standards and quality control programs for major frozen dairy products will be covered.

Learning Objectives: Upon completion of this course students should be able to:

1. Understand the principles of Frozen Dairy Products technology
2. Describe the unit operations involved in Frozen Dairy Products technology
3. Demonstrate knowledge in ingredient technology
4. Understand and explain practical techniques in product manufacture, and analytical techniques including chemical, microbiological and sensory.
5. Have knowledge of current research and development in the field
6. Demonstrate knowledge with respect to government regulations required for the manufacture and sale of dairy products.

Texts/References:

http://www.foodsci.uoguelph.ca/dairyedu/home.html

Trade and Journal Publications:
Dairy Foods
Journal of Dairy Science

Subject Outline
Industry facts and statistics
Milk composition and microbiology
Chemical and microbiological analysis of frozen dairy products
Development and growth of the industry
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.

The physical-chemical properties of an ice cream mix

Calculation of simple and complex mixes

Mix processing unit operations: Separation, mixing, homogenization, pasteurization, 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

 Marks Awarded

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<th>Percentage</th>
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<tr>
<td>Laboratory reports</td>
<td>20%</td>
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<tr>
<td>Project / Assignment</td>
<td>10%</td>
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<td>Mid term test</td>
<td>20%</td>
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<td>Final examination</td>
<td>40%</td>
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<td>Attendance</td>
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 Grades:  
 A+ 90-100  
 A 80-89.9  
 B+ 75-79.9  
 B 70-74.9  
 C+ 65-69.9  
 C 60-64.9  
 D 50-59.9  
 F under 50
Course Outline 2017

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

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.

Schedule for Tests and Laboratories:
- March 10th – Mid Term Exam
- March 24th – Assignment of Project
- Lab Dates – Fridays beginning February 3rd
- 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

<table>
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<tr>
<th>Topic</th>
<th>Date</th>
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<tr>
<td>Microbiological analysis of frozen dairy products.</td>
<td>Friday Feb 3rd</td>
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<td>Chemical analysis of frozen dairy products (solids, fat, acidity)</td>
<td>Friday Feb 17th</td>
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<td>The processing of other frozen dairy products i.e., frozen yogurt</td>
<td>Friday Mar 3rd</td>
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<td>Calculation of ice cream mixes, mixing, and batch freezing method.</td>
<td>Friday Mar 17th</td>
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<td>The processing of ice cream mixes by the H.T.S.T. method (Demonstration)</td>
<td>Friday Mar 24th</td>
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<td>The freezing of ice cream mixes by the continuous process</td>
<td>Friday Mar 31st</td>
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<td>Sensory analysis and judging of various types of ice cream, frozen yogurt and sherbets for colour, packaging, melting quality, body, texture and flavour attributes.</td>
<td>Friday Apr 7th</td>
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Electronic Equipment: 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.

Students With Disabilities: Students with disabilities are encouraged to contact Student Disability Services in order to facilitate the implementation of accommodations. The Instructor will be available to meet with Students to discuss the accommodations recommended by Student Disability Services.

Policy on Plagiarism and Cheating (from University Calendar)

“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.”