ANFS 181
From the Cow to the Cone:
The Science and Business of Ice Cream.
3 Credits
Winter 2017

Instructor: Melinda Shaw
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Email: mlit@udel.edu
Office: UDairy Creamery
Office hours: Please email for appointment

Class schedule: Monday, Tuesday, Wednesday & Thursday from 12pm-2:15pm

This course explores the many facets of food science and entrepreneurship as it relates to the ice cream business. This course will cover all aspects From the Cow to Cone including dairy herd and milk production; milk composition and pasteurization; legality and types of frozen desserts; ice cream base composition and production; ice cream freezing and production; ingredients; final product and product development; business start-up and funding, ice cream sales and cost of sales, marketing ice cream.

Course Student Learning Outcomes:
1. Understand the processes behind pasteurization and milk composition
2. Understand the difference between ice cream and other frozen desserts and their composition
3. Gain knowledge on how to start and financially manage an ice cream business
4. Experience product development and testing

Books:
1. Ice Cream by Goff, H Douglas, Hartel, Richard W  7th ed. 2013
Available to read online at: http://delcat.worldcat.org/title/ice-cream/oclc/825962122?referer=di&ht=edition

Class Participation and Attendance: Students should come to class prepared for discussion on reading topics and worksheets. During the semester, class participation and group participation are expected. Regular attendance of class and field trips are extremely important. If you are unable to attend class you are expected to inform the instructor as early as possible. If you miss class, you do not get credit for participation in the activity, which may in turn affect your group assessment grade. If you are absent from class, it is your responsibility to obtain class notes from a fellow student.

Examinations: There will be two written (non-cumulative) exams and one final (cumulative) exam

Assignments: Reading assignments are listed in the syllabus to be discussed during class. It is expected that the reading will be completed prior to class. There will be worksheets handed out in class to be filled out during class or at home relating to topics discussed. There will be two written homework assignments that will be collected and graded.

Final Project: Students will form groups of 4 or 5. Students will create a product launch plan to develop, test and market a new ice cream flavor, product, or ingredient. Students will be given time in the first week of class to form groups and begin brainstorming ideas. There will be time dedicated each week to discuss issues and update the class on their progress. Time can be arranged with the UDairy Creamery and test kitchen to use the space as a working lab area need be. Participation in the group is mandatory and a final presentation of 10-15 minutes will occur the last week of class.
Grading:

Exams (55%)
Exam 1 (15%)
Exam 2 (15%)
Final Exam (25%)

Homework Assignments (10%)

Class Participation (5%)

Final Project (30%)
Group game project and presentation (25%)
Peer evaluation (5%)

Final Grade determination:

Grade > % of total possible points
A  93
A-  90
B+  88
B   83
B-  81
C+  78
C   73
C-  71
D+  68
D   63
D-  61
F  < 61

Academic Honesty: Academic dishonesty in any form will not be tolerated. Students are encouraged to become familiar with the University's Policy on Academic honesty found in the Student Guide to University Policies (http://www.udel.edu/stuguide/04-05/code.html#honesty). The content of the guide applies to this course. Responsible computing guidelines can be found at http://www.udel.edu/stuguide/04-05/code.html#respcomp.

Code of Conduct: Guidelines for appropriate conduct can be found at http://www.udel.edu/stuguide/04-05/code.html#code. Electronic devices should be turned off and not accessed during class, including cellular phones, pagers, and personal digital assistants. Students are encouraged to arrive at class on time as announcements will be given at the beginning of class.

Support Services: The instructor is willing to give help if and when needed. Questions are welcomed in and out of class or via email. Do not wait until the morning of an exam to seek help. Other support can be found at:
Academic Services Center: http://www.udel.edu/ASC/
Writing Center: http://www.english.udel.edu/wc/
Library: http://www.lib.udel.edu/
Computer Center: http://www.udel.edu/sites/
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<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>GUEST LECTURER</th>
<th>ASSIGNMENT</th>
<th>ACTIVITY</th>
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<tbody>
<tr>
<td></td>
<td>Introductions, Course Requirements</td>
<td></td>
<td>Read Chapter 1 &amp; 2</td>
<td>Making ice cream the old fashioned way</td>
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<td><strong>Chapter 1:</strong> History of ice cream; Types of Frozen desserts</td>
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<td>Dairy Production</td>
<td>Guest Lecturer: Dr. Tanya Gressley on dairy production</td>
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<td>Visit UD Dairy farm</td>
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<td><strong>Chapter 2</strong> Ice cream composition/nutrition labels</td>
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<td>Read Chapter 3</td>
<td>Read the 5 article weblinks and write an opinion article. (HW#1)</td>
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<td><em>Project Review</em></td>
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<td><strong>Chapter 3</strong> Ice cream mix ingredients: Milk composition: Fats, milk solids</td>
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<td>Read rest of Chapter 3</td>
<td>Taste the difference: Butterfat content in ice cream</td>
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<td>MLK Day- No Class</td>
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<td>Get ahead on reading!</td>
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<td><strong>Chapter 3</strong> Ice cream mix ingredients: sweeteners, stabilizers, emulsifiers</td>
<td>Guest Lecturer: Dr. Rolf Joerger on the Biotechnology of sugar, emulsifiers &amp; Stabilizers</td>
<td>Read Pages 89-96</td>
<td>Stabilizers in action: testing how stabilizers react in water</td>
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<td><strong>EXAM 1- beginning of class</strong></td>
<td>Group meeting time</td>
<td>Read Chapter 5</td>
<td>Product development exercises. Submit idea for new product</td>
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<td><strong>Chapter 4</strong> Flavoring and Coloring, inclusions, variegates</td>
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<td><strong>Chapter 5</strong> Mix processing: Pasteurization, homogenization, aging</td>
<td>Guest Lecturer: Dr. Haiqiang Chen on mix processing</td>
<td>Read pages 193-220</td>
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<td><strong>Chapter 13:</strong> Sanitation &amp; food safety</td>
<td>Guest Lecturer: Dr. Kali Kniel on food safety issues</td>
<td>Read Chapter 10</td>
<td>Foodborne Outbreak Activity</td>
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<td>Natural by Nature Tour</td>
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<td><strong>Exam 2- beginning of class</strong></td>
<td>Group work</td>
<td>Ice cream in a bag</td>
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<td>Ice Cream structure</td>
<td>Read Chapter 13</td>
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<td><strong>Chapter 8 &amp; 9:</strong> Other ice cream products HACCP</td>
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<td>HW2 HACCP plan for pasteurization</td>
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<td>Market analysis, pricing, cost analysis</td>
<td>Group Work</td>
<td>Cost analysis activities</td>
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<td>Packaging, branding</td>
<td>Group work</td>
<td>Design a new logo or slogan</td>
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<td>Sat</td>
<td>Group presentations</td>
<td>Final exam</td>
<td>Frozen dessert jeopardy</td>
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Schedule, topics, assignments and activities are subject to change.