

**FS 429/529 DAIRY PRODUCTS (3 credits)**

Fall 2016

**Instructor:** Dr. Denise Smith  
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**Office Hours:** Wednesday noon – 1:00 p.m. and by appointment

**Prerequisites:** CHEM 345; MBIOS 303; FS303

**Lecture:** Monday, Wednesday and Friday 11:10 a.m. – noon in 103/155 FSHN (Foods Lab)

**Required Resource Materials:**

*Tetra Pak Dairy Processing Handbook.* Available online: [www.dairyprocessinghandbook.com](http://www.dairyprocessinghandbook.com)

*The Dairy Science and Technology eBook.* HD Goff, Dairy Science and Technology Education Series, University of Guelph, Canada. Available online: [www.uoguelph.ca/foodscience/book-page/dairy-science-and-technology-ebook](http://www.uoguelph.ca/foodscience/book-page/dairy-science-and-technology-ebook)

*Cheese Making Technology eBook.* AR Hill. Dairy Science and Technology Education Series, University of Guelph, Canada. Available online: [www.uoguelph.ca/foodscience/book-page/cheese-making-technology-ebook](http://www.uoguelph.ca/foodscience/book-page/cheese-making-technology-ebook)

*The Ice Cream eBook.* HD Goff. Dairy Science and Technology Education Series, University of Guelph, Canada. Available online: [www.uoguelph.ca/foodscience/book-page/ice-cream-ebook](http://www.uoguelph.ca/foodscience/book-page/ice-cream-ebook)

Additional materials will be distributed in class or by e-mail.

**Attendance:**

Attendance is essential to your success in this class. Attending all lectures, studying your notes, reading the assigned chapters, completing all assignments on time and asking questions, will help you succeed. Announcements regarding assignments, exams and other important changes/events will be made in class. Excused absences include university-sanctioned events, illness and family emergencies as per WSU policy. Please provide a signed Class Absence Request form if you will miss a class due to an off-campus activity. It is the student's responsibility to acquire lecture notes, assignments and handouts from missed classes.

**Academic Etiquette:**

To get the most out of this class, students should become engaged in the interactive learning processes, participate in classroom discussions, and ask questions when a particular topic or point is unclear. Appropriate professional behavior demonstrating respect for fellow students and the instructors is expected. Please turn off or mute cell phones during class.

**Course Grading:**

Detailed instructions for each assignment will be given in class. Grades for late assignments will be reduced by 10% per day.

Several worksheets will be turned in for a grade throughout the course. The lowest worksheet grade will be dropped when calculating the final worksheet score.

A university approved absence must be presented to the instructor prior to missing an exam. Failure to take an exam without previous permission will result in an automatic zero for the exam. Arrangements to take a make-up exam must be made prior to the scheduled exam.

Exams are closed book and will include material from lectures, handouts, worksheets and assigned reading. You may prepare and bring to each exam one 3" x 5" index card with hand-written notes. Dictionaries, notes, textbooks, cell phones, and electronic equipment cannot be used, played, or consulted during examinations unless authorized by the instructor in advance.

**FS 429**

ACTIVITY	POINTS
Exam I	100
Exam II	100
Worksheets	50
Dairy company profile	50
Hot topic report, presentation and critiques	120
<b>TOTAL POINTS</b>	<b>420</b>

**FS 529**

ACTIVITY	POINTS
Exam I	100
Exam II	100
Dairy company profile	50
Hot topic report, presentation and critiques	120
Processing presentation & supporting materials	220
<b>TOTAL POINTS</b>	<b>590</b>

**Grading Scale:**

Grade	Total Points (%)
A	>92
A-	89-92
B+	86-88.9
B	82-85.9
B-	79-81.9
C+	76-78.9
C	72-75.9
C-	69-71.9
D+	66-68.9
D	60-65.9
F	<60

**FS 429/529 Course Outline – Fall Semester 2016**

	<b>Date</b>	<b>Topic</b>	<b>Speaker</b>	<b>Assignment</b>
1	M Aug 22	Introduction and Course Policies		
2	W Aug 24	Course Assignments		Companies assigned
3	F Aug 26	Graduate Student Specific Assignment	Undergraduate student attendance is not required	Topics assigned
4	M Aug 29	Milk Composition and Consumption Trends		
5	W Aug 31	WSU Creamery: History, Products and Operations	John Haugen, Manager, WSU Creamery	
6	F Sept 2	Milk Marketing	John Swain, WSU Animal Sciences	
	M Sept 5	<b>HOLIDAY</b>		
7	W Sept 7	On Farm Milk Handling: Factors Affecting Milk Quality	Dr. Amin Ahmadzadeh, Faculty, UI Animal Science	
8	F Sept 9	WSU Dairy Farm Tour or Standards of Identity		Graded worksheet
9	M Sept 12	Trends in Dairy Foods I	Mike Schmitt, Technical Services Manager for Consumer Products Darigold, Seattle	
10	W Sept 14	Trends in Dairy Foods II	Mike Schmitt	
11	F Sept 16	Pasteurization I	Russ Salvadalena, Creamery Manager Emeritus	
12	M Sept 19	Pasteurization II	Russ Salvadalena	
13	W Sept 21	Fluid milk processing; raw milk handling, pasteurization, homogenization	Pasteurization Models and Creamery Tour, Nial Yager	Graded worksheet
14	F Sept 23	Pasteurized Milk Ordinance	Les Boian, Consumer Safety Officer, FDA, Spokane	
15	M Sept 26	Dairy Company Profiles	Student presentations	
16	W Sept 28	Dairy Company Profiles	Student presentations	
17	F Sept 30	Dairy Company Profiles/Hot Topic Team Meeting	Student presentations	Hot Topics Title Due
18	M Oct 3	Quality Control of Fluid Milk	Nial Yager, Certified Cheese Professional, WSU Creamery	
19	W Oct 5	Cleaning and Sanitizing	Dave Soler, Assistant Manager, WSU Creamery	
20	F Oct 7	CIP/COP Systems	Creamery Tour; Nial Yager, Dave Soler	Graded worksheet
21	M Oct 10	Microbiology of Milk – Lactic Acid	Dr. Gulhan Unlu, Faculty,	

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		Bacteria	SFS	
22	W Oct 12	Microbiology of Milk – Pathogens and Spoilage Organisms		
23	F Oct 14	<b>Review</b>		
24	M Oct 17	<b>EXAM I</b>		
25	W Oct 19	Milk Components I		
26	F Oct 21	Milk Components II		
27	M Oct 24	Sensory Evaluation of Dairy Products	Dr. Helen Joyner, Faculty, SFS	
28	W Oct 26	Evaporation and Concentration Processes: Concentrated Milks	Graduate Student	Graded worksheet
29	F Oct 28	Drying: Milk and Whey Powders	Dr. Girish Ganjyal, Faculty, SFS	
30	M Oct 31 (354 FSHN)	Homogenization, Separation and Blending; Cream Products Production, Standardization and Quality	Graduate Student	Graded worksheet
31	W Nov 2 (354 FSHN)	Butter, Dairy Spreads and AMF: Manufacturing and Quality	Graduate Student	Graded worksheet
32	F Nov 4 (354 FSHN)	Extended Life Milk Products; UHT/aseptic processing and packaging	Graduate Student	Graded worksheet
33	M Nov 7	Ice Cream Manufacturing	Graduate Student	Graded worksheet
	W Nov 9	Cultured Dairy Products: Yogurt	Graduate Student	Graded worksheet
34	F Nov 11	<b>HOLIDAY</b>		
35	M Nov 14	Cheese Manufacturing	Graduate Student	Graded worksheet
36	W Nov 16	Membrane Processing: Milk and Whey Powders, Specialty Proteins	Graduate Student	Graded worksheet
37	F Nov 18	Hot Topic Team Meeting		
	Nov 21-25	<b>HOLIDAY</b>		
38	M Nov 28	<b>Review</b>		
39	W Nov 30	<b>EXAM 2</b>		
40	F Dec 2	Probiotics and Health	Film: <i>Microwarriors. The Power of Probiotics</i>	
41	M Dec 5	Hot Topics in Dairy	Team presentations	Critiques
42	W Dec 7	Hot Topics in Dairy	Team presentations	Critiques
43	F Dec 9	Wrap up, Course evaluation		

The course outline may change at the discretion of the instructor due to availability of guest lecturers or other unforeseen issues. Modifications will be communicated as far in advance as possible.

**STUDENT LEARNING OUTCOMES:**

<b>At the end of this course, the student should be able to:</b>	<b>The following topics will address this outcome:</b>	<b>This outcome will be evaluated primarily by:</b>
Describe and discuss the size and scope of the dairy processing industry	Weeks 2, 4, 6. Production and consumption trends; Dairy Company Profile assignment; Guest lectures	Class discussion; Exams; Presentations and written assignment
Explain the scope and purpose of the Pasteurized Milk Ordinance	Weeks 4, 5. PMO and pasteurization	Class discussion; Exams
Explain how the chemical and physical properties of milk components impact the characteristics and quality of dairy products	Weeks 8, 9. Composition and chemistry of milk components; Dairy ingredients in food product development	Class discussion; Exams
Describe the important pathogens and spoilage microorganisms in dairy products and the conditions under which they grow	Weeks 7, 8. Microbiology of milk, cleaning and sanitizing	Exams; Presentations and written assignments; Class discussion
Describe the principal quality attributes, shelf life stability issues and defects that occur in dairy products	Weeks 8, 10-14. Quality, microbiology, sensory and unit operations	Exams; Presentations and written assignments; Class discussion
Explain the unit operations applied in the manufacture of fluid milk and dairy products	Weeks 4, 5, 10-14. Fluid milk and dairy products processing lectures	Exams; Presentations and written assignments; Class discussion
Explain and discuss relevant concepts in dairy foods in a succinct and technically sound manner	Individual and team assignments; classroom discussion; small group discussion	Exams; Presentations and written assignments; Class discussion
Utilize credible scientific information and critical thinking skills to prepare a written and oral presentation on a controversial topic affecting the dairy foods industry	Week 15. Hot topic team assignment	Team report and presentation
<b>FS 529 only:</b> Prepare a lesson plan and teach a unit on dairy processing suitable for junior/senior level students	Weeks 10-13. Processing presentations	Class presentation and supporting materials

**WSU Reasonable Accommodation Statement:** Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information contact a Disability Specialist in Pullman: 509-335- 3417. <http://accesscenter.wsu.edu>, [Access.Center@wsu.edu](mailto:Access.Center@wsu.edu)

**WSU Academic Integrity Statement (Updated August 2016):** “Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU’s Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) will receive [insert academic sanction (e.g., fail the course, fail the assignment, etc.)], will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student Conduct.

Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of the definitions of cheating: <http://app.leg.wa.gov/WAC/default.aspx?cite=504-26-010>. If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding.

If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at [conduct.wsu.edu](http://conduct.wsu.edu).”

**WSU Plagiarism Statement:** Plagiarism is defined by Webster’s Dictionary as, “*to steal and pass off the ideas or words of another as one’s own.*” There are two general forms of plagiarism:

- (a) Unintentional: the use of other writers’ words, phrases, sentences, paragraphs as though they were your own *without understanding* the need to cite the original source. Unintentional plagiarism normally occurs when the individual does not understand the conventions of scientific writing and the need to cite sources of information.
- (b) Intentional: the use of another writers’ work and claiming it as your own. Intentional plagiarism includes *knowingly copying* or incorporating sections of books, articles, or other sources into your work without citation.

To avoid plagiarism, you must acknowledge the source of information. In scientific writing, this can be performed in the text of your work through the use of surnames of authors and the year of publication (e.g., Smith et al., 2003) or by using numbers enclosed by parentheses which correspond to specific citations in the reference section. In addition to employing citations in the text, plagiarism can be avoided by applying special techniques when writing about information obtained from a source:

- (a) Paraphrase: rewording information in which you accurately present the main ideas from the source but do so using your own organization, words, and sentence structures.
- (b) Summary: a concise statement of the main idea from a section within a source.

(c) Direct quotation: use of quotes surrounding the passage written by another author.

Plagiarism is dishonest and is **not** tolerated. If caught using a purchased paper, all or portions of a current or former classmate's writing/notes or other sources of information without proper attribution will result in a grade of "zero" for the assignment. Additional penalties for plagiarism are possible as outlined by WSU policies.

**WSU Safety and Emergency Notification (Updated August 2016):** "Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the "Alert, Assess, Act," protocol for all types of emergencies and the "Run, Hide, Fight" response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able).

Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI's Run, Hide, Fight video and visit the WSU safety portal."