

FDSCTE/ASM 3400 Food Supply-Chain Equipment Operations

Autumn 2020

Credit Hours: 2

Meeting Dates and Location:

Lectures: Tuesday/Thursday; 910-1005 am 114 Parker Food Science and Technology Building

Recitation: Wednesday; 1130 am -1225 pm 311 Parker Food Science and Technology Building

Course Format: P

Instructors:

Course Coordinator:

Dennis R. Heldman

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Office hours; 229 Parker; 10 am-12 noon; Fridays

Valente Alvarez

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Office hours: by Zoom; 1-3 pm; Wednesdays

<https://osu.zoom.us/j/99922743283?pwd=OTJ5RERHaXliQVZkRjBLRE02dEwzdz09>

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Office hours: by zoom; 10 am to 2 pm; Tuesdays

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Office hours: by zoom; 10 am to 3 pm; Tuesdays

Jeff Caminiti, TA

Office hours:

Prerequisites: None

Mode of delivery: This course is hybrid. The class will take sections in person and sections on-line. Students must be logged in to Carmen at a scheduled time.

Pace of activities: Hybrid portions of the course will be released during the appropriate weeks (as identified in schedule of courses). Students are expected to keep pace with weekly deadlines, as identified within the course schedule.

Credit hours and work expectations: This is a **2-credit-hour course**. According to Ohio State policy (go.osu.edu/credithours), students should expect around 2 hours per week of time spent on direct instruction (instructor content and Carmen activities) in addition to 4 hours of homework (reading and assignment preparation) to receive a grade of (C) average.

Attendance and participation requirements: Portions of this course are presented in hybrid mode and student involvement is based on online activity and participation. The following is a summary of students' expected participation:

- **Participating in online activities for attendance:**
Students are expected to log in to the Carmen site every week. If students are unable to log in each week, all four Instructors should be notified.

Course Description:

The focus of this course is on the description of equipment used throughout the food supply chain from the point of harvest or assembly through preparation for consumption. Students will gain an understanding of how equipment and components function during handling, storage, transport, processing and packaging in an efficient manner while ensuring safe and high-quality food products. On completion of the course, students will recognize how equipment systems are assembled within a facility and understand the role of sensing and control systems in operation of facilities for handling, manufacturing, storage, distribution and preparation of foods.

Goals:

1. Gain recognition of major equipment systems required for safe and sanitary handling, preservation, storage and transport of foods between harvest or assembly and final preparation for consumption.
2. Understand the operating mechanisms of primary equipment systems used in the transformation of raw food materials into safe and high-quality food products.
3. Develop an understanding of the equipment systems needed and the configuration of equipment components needed to manufacture consumer food products.
4. Appreciate the importance of sensors, instrumentation and control systems required for efficient operation of facilities for transport, storage, manufacture and distribution of high-quality and safe food products.

5. Understand the importance of sanitary design of all food contact surfaces in equipment used throughout the food supply chain.

Course Materials and Technology

Textbooks/Readings: None

Optional Readings:

Additional Required Materials:

Other Fees or Requirements: None

Course technology

For help with your password, university e-mail, [Carmen](#), or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at [OCIO Help Hours](#), and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** (<http://ocio.osu.edu/selfservice>)
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Technology skills necessary for this specific course

- Zoom text, audio, and video chat

Required equipment

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone

Required software

- **Microsoft Office 365:** All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through [Microsoft's Student Advantage program](#). Full instructions for downloading and installation is found <https://ocio.osu.edu/kb04733>.
- **Approved browsers:**

Carmen Access

You will need to use [BuckeyePass](#) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](#) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click “Enter a Passcode” and then click the “Text me new codes” button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the [Duo Mobile application](#) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

Grading and Faculty Response

ASSIGNMENT CATEGORY	POINTS
Quizzes: 15-min tests	35
Midterm: Mid-semester examination	30
Final Exam (comprehensive)	35
Total	100

Description of major course assignments

Quizzes: 15-min tests will be given on Wednesdays of alternate weeks to ensure that students are gaining an understanding of important concepts.

Midterm: A comprehensive examination will be given at mid-semester

Final examination: Comprehensive examination for entire course

Late assignments

Late submission of assignments will be accepted but will receive a maximum of 50%.

Academic integrity policy

Ohio State's academic integrity policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's *Code of Student Conduct* (studentconduct.osu.edu), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If a student is suspected of committing academic misconduct, university rules require the Instructors to report suspicions to the Committee on Academic Misconduct. If COAM determines that the student has violated the university's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university. If there are questions about the above policy or the definition of academic misconduct in this course, please contact one of the Instructors.

Other sources of information on academic misconduct (integrity) include:

- Committee on Academic Misconduct web page (go.osu.edu/coam)
- Ten Suggestions for Preserving Academic Integrity (go.osu.edu/ten-suggestions)
- Eight Cardinal Rules of Academic Integrity (go.osu.edu/cardinal-rules)

Copyright for instructional materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the

educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on Title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at titleix.osu.edu or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit equity.osu.edu or email equity@osu.edu.

Commitment to a Diverse and Inclusive Learning Environment

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Mental health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, on-demand resources are available at go.osu.edu/ccsondemand. You can reach an on-call counselor when CCS is closed at 614- 292-5766, and 24-hour emergency help is also available through the 24/7 National Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org. The Ohio State Wellness app is also a great resource available at go.osu.edu/wellnessapp.

Requesting accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; 098 Baker Hall, 113 W. 12th Avenue.

Accessibility of course technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- [Canvas accessibility \(go.osu.edu/canvas-accessibility\)](https://go.osu.edu/canvas-accessibility)
- Streaming audio and video
- CarmenZoom accessibility (go.osu.edu/zoom-accessibility)
- Collaborative course tools

Course schedule

Week Number	Date of Week	Topics
1	08/25-08/27	Introduction to the food supply chain; understanding the scope of the supply chain and the important role of equipment in meeting the demands of converting raw food materials into safe, high quality consumer products in an effective and efficient manner (DRH).
2	09/01-09/03	Basic principles of equipment design to ensure that food contact surfaces meet industry standard; both voluntary (3A, etc.) and from regulatory agencies. Understanding that sanitary design applies to facilities as well as equipment (VA). Lecture Outline https://osu.zoom.us/j/99922743283?pwd=OTJ5RERHaXliQVZkRjBLRE02dEwzdz09
3	09/08-09/10	Materials handling equipment for raw food materials; washing fruits and vegetables in the field, bulk transportation of liquids (including pumps for liquid transport), slaughter house equipment for meat products, drying, storage and handling of grain (VA). Lecture Outline: https://osu.zoom.us/j/99922743283?pwd=OTJ5RERHaXliQVZkRjB

Week Number	Date of Week	Topics
		LRE02dEwzdz09 Quiz #1
	09/15-09/17	Separation and mixing systems; a description of various types of equipment used to separate liquid foods into components, from milk separators to membrane systems for separation; equipment for mixing, blending and agitation of liquids (RJF)
5	09/22-09/24	Heat exchanges; a descriptive review of heat exchangers used throughout the food supply chain; from refrigeration condensers to plate heat exchangers for liquids to heating/cooling of solid foods (convection, microwave, infrared) to cooking in oil bathes (BB) Quiz #2
6	09/29-10/01	Equipment for food preservation and preparation, including blanching of solid materials, pasteurization of liquid foods, UHT for aseptic products and retorts for canned foods; including an introduction to equipment for non-thermal preservation methods (BB)
7	10/06-10/08	Refrigeration; an introduction to the primary components of refrigeration systems, with emphasis on recognizing system components in large scale systems, as well as small-scale appliances. Food freezing and frozen food storage; food freezing equipment, materials handling in frozen food storage. (DRH) Quiz #3
8	10/13-10/15	Extrusion equipment; description of various types of extrusion equipment, from single-screw to double-screw; and with an emphasis on understanding the role of the equipment on characteristics of products produced (BB) Mid-Semester Examination
9	10/20-10/22	Concentration of liquid foods; a description of thermal evaporation systems, from single- effect evaporators to multiple-effect systems for efficient removal of water and concentration of product solids; an introduction to non-thermal concentration methods (RJF) Quiz #4
10	10/27-10/29	Food dehydration; a review of the range of drying systems used for food products, from basic cabinet dryers to spray dryers for liquid

Week Number	Date of Week	Topics
		foods. Equipment used for manufacturing of bakery products will be presented and described (RJF)
11	11/03-11/05	Extraction equipment; an array of different types of equipment used for extraction of components from food materials will be described; including grinding steps for flour products and extraction of oil from oil seeds (RJF) Quiz #5
12	11/10-11/12	Packaging equipment; a review of the range of filling equipment used for liquid foods and for placement of solid food in containers; specific attention to the unique requirements for aseptic filling and similar systems (VA) Lecture Online: https://osu.zoom.us/j/99922743283?pwd=OTJ5RERHaXliQVZkRjBLRE02dEwzdz09
13	11/17-11/19	Storage and distribution; a review of materials handling equipment for shelf-stable foods during transportation and distribution, including unique types of transportation vehicles and materials handling in warehouses (DRH) Quiz #6
14	11/24-11/25	Cleaning and sanitation equipment; presentation of key components of cleaning systems for food contact surfaces; introduction to control systems for ensuring that in-place cleaning is accomplished in an efficient and effective manner (DRH)
Final Exam Week:	12/07-12/11	Final Examination – Monday, December 8; 10 to 1145 am