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BIOL 106 Syllabus



UNIVERSITY of HAWAII*
WINDWARD
COMMUNITY COLLEGE

Outline of Course Objectives

BIOL 106 'Ono Cooking and Food Science, S-focused

INSTRUCTORS: Martine Bissonnette & Michelle Smith

OFFICE HOURS: Scheduled weekly and by appointment

EMAIL: To email your instructors, select the email icon on the left task bar, select Roles, and select Instructor. This will provide your questions to both instructor's.

ZOOM Meetings: link provided weekly

CREDITS: 3

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

'O keia ka wā kūpono e ho'onui ai ka 'ike me ka ho'omaopopo i kō Hawai'i mau ho'oilina waiwai. Aia nō ho'i ma ke Kulanui Kaiāulu o ke Ko'olau nā papahana hou o nā 'ike 'akeakamai a me nā hana no'eau. Me ke kuleana ko'iko'i e ho'ohiki ke Kulanui e kāko'o a e ho'okumu i ala e hiki kē kōkua i ka ho'onui 'ike a nā kānaka maoli. Na mākou nō e ho'olako, kāko'o a paipai i nā Ko'olau a kō O'ahu a'e me nā hana no'eau ākea, ka ho'ona'auao 'oihana a me ka ho'onui 'ike ma ke kaiāulu — hō'a'ano a e ho'oulu i nā haumāna i ka po'okela.

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai'i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide O'ahu's Ko'olau region and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

Catalog Description

BIOL 106 'Ono Cooking and Food Science is an online course designed to integrate the science of food with the chemical, physical, and biological nature of food. It will incorporate Hawaiian resources and sustainability. The overall goal of this course is to enhance students' understanding of the science of food using the home kitchen to demonstrate the principles of chemistry, biology, and physics of food through videos, online meetings, inquiry-based activities, and a student-designed research project.

Prerequisite(s): Credit for high school chemistry and algebra, or instructor's consent.

LEARNING RESOURCES

Required Instructional Materials:

- Instructor-provided resources

- Lulima class website

Recommended Reading:

- J. Kenji López-Alt (2015). The Food Lab: Better Home Cooking Through Science. W. W. Norton & Company; 1st edition. ISBN-10: 0393081087; ISBN-13: 978-0393081084

Available at WCC Library [The Food Lab; The Science of Cooking \(ebook\); Science and Cooking.](#)

- Provost, et al. (2016). The Science of Cooking: Understanding the Biology and Chemistry Behind Food and Cooking 1st Edition. Wiley Pub. ISBN-13: 978-1118674208; ISBN-10: 9781118674208

Available at WCC Library [Science and cooking : physics meets food, from homemade to haute cuisine](#)

- Brenner et al. (2020). Science
- Brenner et al. (2020). Science and Cooking: Physics Meets Food, From Homemade to Haute Cuisine

ISBN-10 : 0393634922

ISBN-13 : 978-0393634921

STUDENT LEARNING OUTCOMES

The student will be able to:

1. Describe the fundamental molecules that provide the structure, function, and chemical/physical properties of foods.
2. Describe the microbiology and biotechnology in food systems.
3. Apply food science principles.
4. Describe the local resources that can be used in preparing or preserving food.

TOOL USED FOR ASSESSMENT OF LEARNING OUTCOMES

- Weekly quizzes (these are designed to test students' understanding of and preparation for the week's activity).
- Online forums.
- **Food Journals**
- Final exam that is cumulative on course content.

OPTIONAL MATERIAL FOR CLASS RECIPES (PURCHASE):

- Must have access to home kitchen
- pH meter
- Food thermometer
- Basic cooking supplies: bowls, measuring cups and spoons, pots & pans, spoons and spatulas, cookie sheet, oven, microwave, etc...

STUDENTS RESPONSIBILITIES

If the student has an allergy to a food or any special dietary considerations please inform your instructor prior to the activity. They will do their best to find an alternative.

ASSESSMENT TASKS AND GRADING

Grading:

Quizzes (12): 30%

Food Journal 15%

Final Exam: 30%

Participation in online forums (5) 25%

Final Grade: 100%

Grading Scale:

Total Points	Grade
100-90%	A
89-80%	B
79-70%	C
69-60%	D
59- 0%	F

QUIZZES ON LAULIMA (30%)

Fifteen quizzes will be administered on Lulima. They are open for the specified time period listed on your class schedule. These quizzes will address the detailed content and major concepts presented in the lectures, readings, and activities. A **study guide** is available in Lulima, in Syllabus, in Tests and Quizzes. Click on the Study Guide link. Since these quizzes may be taken using home computers connected to the Internet, students may refer to instructional resources (lecture notes, etc.) while taking the quizzes. However, each quiz will be timed, the student having only 30 minutes to complete it. No make-up quizzes for missed quizzes.

FOOD JOURNAL ON LAULIMA (15%)

At the end of each module you will need to complete the food journal assignment. Journal your thoughts on this weeks lecture, video or article links.

PARTICIPATION IN ONLINE FORUMS (25%)

The student will actively engage in **five online forums** during the semester. These forums, which are meant to entice interest in food science, will involve posting your research or reaction about the specific topic (with a link to any reference). Science Daily is a good place to start looking for an article.

This is posted on the **FORUMS** page on the class Laulima site. Each forum topic will be open for limited periods of time (typically 1 week) and students will only be able to comment/respond during these open periods.

It should be a few paragraphs in length. For full credit you will also need to comment on another student's post in a respectful manner. A sentence consisting of 'I really like your post' doesn't count as a valid response.

Forum Topics

1. GMOs in food
2. Plastics: discussion on plastics, purpose in food industry, plastic ban, alternatives.
3. Diet and health
4. The food, the bad, and the ugly (effects of microbes on crops and cooking)
5. Toxins in the food chain (mercury in fish, microplastic, ciguatera)

Final Exam (30%)

FINAL EXAM: The final exam will be posted on Laulima at the end of the semester. There will be 50 multiple choice questions. You will have 1 hour 50 minutes to complete it. You are allowed a 2-sided hand-written note sheet. Please look over the quiz study guides, it covers the same material.

Common sense cooking safety

- Do not cross contaminate veggies by chopping them on a cutting board previously used for meat
- Do not rinse poultry
- Take extra care when preparing foods that contain raw egg, such as homemade mayonnaise, tiramisu and eggnog. Bacteria present on eggshells and inside the egg can contaminate these types of food and cause food poisoning.
- Clean surfaces by washing with warm soapy water; spray tables with standard cleaner with bleach.
- Replace dish sponge often

NATURAL SCIENCES DEPARTMENT POLICY ON WITHDRAWALS AND INCOMPLETE

1. WITHDRAWALS (W GRADES) –

It is the student's responsibility to know the last day of withdrawal, found on academic calendar list:

<https://windward.hawaii.edu/Academics/Calendar/>

Students who no longer attend class and who DO NOT OFFICIALLY WITHDRAW from the course will receive "F" grades.

2. **INCOMPLETE (I GRADE)** – Students must present the "Request for Incomplete" form prior to the last day of instruction. "I" grades will be given only to students who are achieving passing grades and are very close to completing the course. In addition, the student must have a very good reason for not being able to complete all the work on time.

Examples of extreme or unusual circumstances are:

1. a certified medical reason
2. a death in the immediate family

WINDWARD COMMUNITY COLLEGE POLICY

1. Windward Community College is an Equal Opportunity/ Affirmative Action Institution.
2. Extended time in a distraction-free environment is an appropriate accommodation based on a student's disability. If you do have a disability and have not voluntarily disclosed the nature of your disability and the support you need, you are invited to contact Ann Lemke at 235-7448, lemke@hawaii.edu, or you may stop by Hale 'Akoakoa 213 for more information.
3. Students are expected to attend all classes for which they are registered. If a student is unable to attend class, he or she should contact the instructor in advance to give notification of the absence and make necessary arrangements.

For those students who receive financial aid and fail to attend the first week of classes without making arrangements with the instructor, the instructor will submit the student's name to the Financial Aid Office. The student will be denied financial aid for the class he/she is not attending. In addition, it is solely the student's responsibility to withdraw from the class or attend the class and pay the tuition.

DISABILITIES ACCOMMODATIONS

If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Accessibility Counselor to discuss reasonable accommodations that will help you succeed in this class. Roy Inouye can be reached at (808) 235-7448, royinouye@hawaii.edu, or you may stop by Hale Kāko'o 106 for more information.

SEX DISCRIMINATION AND GENDER-BASED VIOLENCE RESOURCES (TITLE IX)

Windward Community College is committed to providing a learning, working, and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking.

If you or someone you know is experiencing any of these, WCC has staff and resources to support and assist you. To report an incident of sex discrimination or gender-based violence, as well as receive information and support, please contact one of the following:

UH CONFIDENTIAL ADVOCATE**UH Confidential Advocate****Phone: (808) 348-0663****Email: advocate@hawaii.edu****TITLE IX COORDINATOR****Karen Cho, Title IX Coordinator****Email: kcho@hawaii.edu****Phone: 808-235-7404****<https://windward.hawaii.edu/about-wcc/title-ix/>****Office: Hale Kāko'o 120B**

As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and I cannot guarantee confidentiality, you will still have options about how your case will be handled. My goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need.

For more information regarding sex discrimination and gender-based violence, the University's Title IX resources and the University's Policy, Interim EP 1.204, go to manoa.hawaii.edu/titleix/

ACADEMIC INTEGRITY

Work submitted by a student must be the student's own work. The work of others should be explicitly marked, such as through use of quotes or summarizing with reference to the original author.

In this class, students who commit academic dishonesty, cheating or plagiarism will have the following consequence(s):

Students will receive a failing grade for plagiarized assignments.

All cases of academic dishonesty are referred to the Vice Chancellor for Student Affairs.

ALTERNATE CONTACT INFORMATION

If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office:

- Location: Alaka'i 121
- Phone: (808) 235-7422

UH POLICY ON EMAIL COMMUNICATION

The electronic communications policy adopted in December 2005 establishes the University of Hawai'i Internet service as an official medium for communication among students, faculty, and staff. Every member of the system has a hawaii.edu address, and the associated username and password provide access to essential Web announcements and email. You are hereby informed of the need to regularly log in to UH email and Web services for announcements and personal mail. Failing to do so will mean missing critical information from academic and program advisors, instructors, registration and business office staff, classmates, student organizations, and others.

Class Schedule

BIOL 106 Weekly Topics Fall 2023

Week	Topic	PPT
1 Aug 21	Introduction: In-person and by video conference (watch for email announcement on date and time) <ul style="list-style-type: none"> Food Safety Unit Conversion Basic Cooking Tools Quiz 1: 8/21 12 am- 8/27 11:55 pm	01
2 Aug 28	Basic chemistry (organic vs inorganic) <ul style="list-style-type: none"> States of matter and transformation pH, acid-base reactions Amounts used in recipes Solubility, pressure, temperature and amount impact on cooking (video on effect of elevation on boiling) Quiz 2: 8/21 12 am- 9/3 11:55 pm	02
3 Sep 4	Molecules in biological systems (carbs, fats, proteins (incl. enzymes), & nucleic acids) <ul style="list-style-type: none"> Use of molecules by the body Enzymes and transformation GMOs - are they all evil? Quiz 3: 8/21 12 am- 9/10 11:55 pm Forum 1: GMOs in Food	03a 03b 03c
4 Sep 11	Nutrition (chemicals needed - fuel, water, minerals) (04a & 04b) <ul style="list-style-type: none"> Reading nutrition labels 	04a 04b

	<ul style="list-style-type: none"> Calories (value per type of molecule, calculate food) <p>Quiz 4: 8/21 12 am- 9/17 11:55 pm</p>	
5 Sep 18	Exploring Meat <ul style="list-style-type: none"> Concepts: What is meat? Composition of muscle tissue fibers. Processed meat Cooking meat <p>Quiz 5: 8/21 12 am- 9/24 11:55 pm</p>	05
6 Sep 25	Exploring Eggs: <ul style="list-style-type: none"> Concepts: What is an egg (biology and chemistry)? Types of eggs (composition) Egg properties allow to emulsify, bind, and thicken Uses in cooking: Creme brûlée, angel cakes, curds, meringue, macaron, ice cream <p>Quiz 6: 8/21 12 am- 10/1 11:55 pm</p>	06
7 Oct 2	Exploring Dairy <ul style="list-style-type: none"> Biology of milk What about those other “milks”? ASAP science video on environment impact of making milks (soy, almond, oat, other nut milks) Visit Goat Milk Farm-Sweet Land Farm in Waialua (video) https://www.sweetlandfarmhawaii.com/ <p>Quiz 7: 8/21 12 am- 10/8 11:55 pm</p>	07
8 Oct 9	Exploring sugar: <ul style="list-style-type: none"> Sugar sources (beet, cane, honey, maple) - (local sources: honey, sugar cane, and history) Chemical structure (-OH) Alternative sweeteners (aspartame, stevia, etc...) Cooking: syrup, lollipop, caramel, & tempering of chocolate <p>Forum 2: Plastics, Purpose in the food industry, Plastic Ban & alternatives</p> <p>Quiz 8: 8/21 12 am- 10/15 11:55 pm</p>	08
9	Exploring flours:	09

Oct 16	<ul style="list-style-type: none"> • Biology of wheat • Study of leavening agents • What the heck is gluten? • What can you use to replace gluten? <p>Quiz 9: 8/21 12 am- 10/22 11:55 pm</p>	
10 Oct 23	<p>Beasties:</p> <ul style="list-style-type: none"> • Organisms that aid in cooking: yeast, bacteria • Fermentation process • Cheese making (Noella Marcellino Video) • live cultures, discuss food saver, longevity of uncooked food in fridge (chicken, meat, fish) • Cooking: kimchi, yogurt, cheese, sourdough bread <p>Forum 3: diet and health</p> <p>Quiz 10: 8/21 12 am- 10/29 11:55 pm</p>	10
11 Oct 30	<p>Alcohol</p> <ul style="list-style-type: none"> • Sources of alcohol (fermentation) • Distillation • Effects on the body • Cooking with wine, beer, spirits: Chef Dan's pineapple flambé video, vodka pie crust, sauces, baking, tenderizing, risotto) • Tour microbrewery (video) <p>Quiz 11: 8/21 12 am- 11/5 11:55 pm</p>	11
12 Nov 6	<p>Food in Hawai'i: cooking and food security</p> <ul style="list-style-type: none"> • Native, invasive, and toxic plants • Uses and benefits • Food security • Virtual Tour of medicinal garden and discuss agripharmatech (video) • Hawaii: Strangers in paradise video and handout <p>Topic 4: The food, the bad, and the ugly (effects of microbes on crops and cooking)</p> <p>Quiz 12: 8/21 12 am- 11/12 11:55 pm</p>	12a 12b
13 Nov 13	<p>Food preservation</p> <ul style="list-style-type: none"> • Ancient and modern methods of food preservation 	13

	Quiz 13: 8/21 12 am- 11/19 11:55 pm	
14 Nov 20	Food Flavors: Taste & Smell, and Chemistry <ul style="list-style-type: none"> • Science of taste and smell • Chemistry of flavor Forum 5: Toxins in the food chain (microplastics, mercury, ciguatera) Quiz 14: 8/21 12 am- 11/26 11:55 pm	14a 14b
15 Nov 27	Molecular gastronomy <ul style="list-style-type: none"> • Techniques in cooking • Spherification video Quiz 15: 8/21 12 am- 12/3 11:55 pm	15
16 Dec 4	Final Exam 8am to 10 pm	

Student Requirements

It is your responsibility to be prepared for this online investigative science cooking class:

1. Submit activities on time

- Quizzes
- Food Journal
- Forums
- Final Exam

2. Follow the USDA guidelines for food safety: <https://www.foodsafety.gov/keep-food-safe/4-steps-to-food-safety>. wash, separate, cook and chill.

3. If you are not sure, **ask your instructor**

Waiver

Please fill out the [waiver](#) to participate in this class. If you are under 18 at the start of this class you will need your parents signature (online).

Forums

Forums (25% of grade)

Students will actively engage in **five online forums** during the semester. These forums, which are meant to entice interest in food science, will involve posting your research or reaction about the specific topic (with a link to any reference). Science Daily is a good place to start looking for an article.

This is posted on the **Forums** page in relevant modules. Each forum topic will be open for limited periods of time (typically 1 week) and students will only be able to comment/respond during these open periods.

It should be a few paragraphs in length. For full credit you will also need to comment on another student's post in a respectful manner. A sentence consisting of 'I really like your post' doesn't count as a valid response.

Forum Topics & Due Dates

- **Forum 1: GMOs in Food** 9/4 12 am – 9/10 11:55 pm
- **Forum 2: Plastics, Purpose in the food industry, Plastic Ban & alternatives** 10/9 12 am – 10/15 11:55 pm
- **Forum 3: diet and health** 10/23 12 am – 10/29 11:55 pm
- **Forum 4: The food, the bad, and the ugly** 11/6 12 am – 11/12 11:55 pm
- **Forum 5: Toxins in the food chain (microplastics, mercury, ciguatera)** 11/20 12 am – 11/26 11:55 pm

Food Journal

Food Journal (15% of grade)

We will be using Padlet to journal about a topic for each Module. Please create a free Padlet account to be allowed to post. When clicking on the Padlet link below, you will land on the correct journal page for each module. Use the large pink plus sign on the lower right corner of your screen to contribute. Don't hesitate to comment or "like" other classmates' posts.

Quiz Information

Quizzes in Laulima (30% of grade)

Fifteen quizzes will be administered weekly on Laulima. They are open for the specified time period listed on your class schedule. These quizzes will address the detailed content and major concepts presented in the lectures, readings, and activities. Since these quizzes may be taken using home computers connected to the Internet, students may refer to instructional resources (lecture notes, books, Google search, etc.) while taking the quizzes. However, each quiz will be timed, the student having only 30 minutes to complete it. No make-up quizzes for missed quizzes. Be sure to review the Quiz Study Guide ([click the link](#)) before taking the quiz.

Quiz 1: 8/21 12 am- 8/27 11:55 pm

Quiz 2: 8/21 12 am – 9/3 11:55 pm

Quiz 3: 8/21 12 am – 9/10 11:55 pm

Quiz 4: 8/21 12 am – 9/17 11:55 pm

Quiz 5: 8/21 12 am – 9/24 11:55 pm

Quiz 6: 8/21 12 am – 10/1 11:55 pm

Quiz 7: 8/21 12 am – 10/8 11:55 pm

Quiz 8: 8/21 12 am – 10/15 11:55 pm

Quiz 9: 8/21 12 am – 10/22 11:55 pm

Quiz 10: 8/21 12 am – 10/29 11:55 pm

Quiz 11: 8/21 12 am – 11/5 11:55 pm

Quiz 12: 8/21 12 am – 11/12 11:55 pm

Quiz 13: 8/21 12 am – 11/19 11:55 pm

Quiz 14: 8/21 12 am – 11/26 11:55 pm

Quiz 15: 8/21 12 am – 12/3 11:55 pm

[+Add attachments](#)

Final Exam Information

Final Exam (30%)

FINAL EXAM: The final exam will be posted on Lualima at the end of the semester. There will be 50 multiple choice questions. You will have 1 hour 50 minutes to complete it. You are allowed a 2-sided hand-written note sheet (8.5x11 inches). Please look over the quiz study guides, it covers the same material.

Grade Information

ASSESSMENT TASKS AND GRADING

Grading:

Quizzes (12): 30%

Food Journal: 15%

Final Exam: 30%

Participation in online forums (5) 25%

Final Grade: 100%

Grading Scale:

Total Points	Grade
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100-90%	A
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89-80%	B
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79-70%	C
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69-60%	D
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59- 0%	F
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Textbook Information

The following are recommended readings. They are not required, but are useful to this class.

Recommended Reading:

- J. Kenji López-Alt (2015). The Food Lab: Better Home Cooking Through Science. W. W. Norton & Company; 1st edition.

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- Brenner et al. (2020). Science and Cooking: Physics Meets Food, From Homemade to Haute Cuisine

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Sustainability Focused Course & Academic Subject Certificate

BIOL 106 Is an S-focused course.

Sustainability (S) focused courses are designed to teach students about sustainability across a variety of academic disciplines. This certificate is a campus-wide effort that connects social sciences, natural sciences, and Hawaiian indigenous knowledge systems to understand our current ecological crises.

Requirements include the following:

- One 3-credit S-focused course in Natural Sciences (you are taking this now)
- One 3-credit course in Humanities, Social Sciences, Math & Business or Language Arts
- One 3-credit course in Hawaiian Studies
- One 3-credit Independent Study. This can be a research project or service learning project, with a final presentation, that has been approved by the Sustainability Curriculum Committee.

*The issuance of the Academic Subject Certificate requires that the student must earn a grade of "C" or higher for all courses required in the certificate.

S-focused courses can be found at our website:

https://windward.hawaii.edu/Committees/Sustainability_Curriculum/s-designated_courses.php