Windward Community College
Outline of Course Objectives
BIOL 106 ‘Ono Cooking and Food Science, S-focused
Fall 2021
Sec 60385

INSTRUCTOR: Martine Bissonnette
EMAIL: martineb@hawaii.edu
OFFICE: online for Fall 2021
OFFICE HOURS: Schedule weekly and by appointment

INSTRUCTOR: Michelle Smith
EMAIL: miliefsk@hawaii.edu
OFFICE: online for Fall 2021
OFFICE HOURS: Schedule weekly and by appointment
GOOGLE MEET: https://meet.google.com/efn-pvsy-exj

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
- Laulima class website

Recommended Reading:
  - ISBN-10: 0393081087
  - ISBN-10: 9781118674208
- Brenner et al. (2020). Science and Cooking: Physics Meets Food, From Homemade to Haute Cuisine
  - ISBN-10 : 0393634922

**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.

**Tools 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.
- Research proposal. Students are required to write a research proposal for the independent research project they conduct during the final 4 weeks of the semester.
- Final presentation on the research project. In lieu of a final exam, students make oral presentations on their independent research project via video-conference.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
</table>
| **1** Aug 23 | **Introduction**: In-person and by video conference  
Food Safety  
Unit Conversion  
Basic Cooking Tools  
**Quiz 1**: 8/23 12 am - 8/28 11:55 pm |
| **2** Aug 30 | **Basic chemistry**: organic vs inorganic  
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**: 8/29 12 am - 9/4 11:55 pm |
| **3** Sep 6 | **Molecules in biological systems**: carbs, fats, proteins (incl. enzymes), & nucleic acids  
Use of molecules by the body  
Enzymes and transformation  
GMOs - are they all evil?  
(Visit papaya farm? - enzymes and GMOs)  
**Quiz 3**: 9/5 12 am - 9/11 11:55 pm  
**Forum 1**: GMOs in Food |
| **4** Sep 13 | **Nutrition**: chemicals needed - fuel, water, minerals  
(04a & 04b)  
Reading nutrition labels  
Calories (value per type of molecule, calculate food)  
**Quiz 4**: 9/12 12 am - 9/18 11:55 pm  
**Forum 2**: Plastics, Purpose in the food industry, Plastic Ban & alternatives |
| **5** Sep 20 | **Exploring Meat**  
Concepts: What is meat?  
Composition of muscle tissue fibers.  
Processed meat  
Cooking meat  
**Quiz 5**: 9/19 12 am - 9/25 11:55 pm |
| **6** Sep 27 | **Exploring Eggs**:  
Concepts: What is an egg (biology and chemistry)?  
Types of eggs (composition)  
Egg properties allow to emulsify, bind, and thicken  
Uses in cooking: Creme brulee, angel cakes, curds, meringue, macaron, ice cream;  
**Quiz 6**: 9/26 12 am - 10/2 11:55 pm |
<p>| <strong>7</strong> | <strong>Exploring Dairy</strong> |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 4</td>
<td>Biology of milk</td>
<td>What about those other “milks”? Video ASAP science on environment impact of making milks (soy, almond, oat, other nut milks) Visit Goat Milk Farm- get cheese for Floyd (Sweet Land Farm in Waialua, <a href="https://www.sweetlandfarmhawaii.com/">https://www.sweetlandfarmhawaii.com/</a>) Quiz 7: 10/3 12 am – 10/9 11:55 pm</td>
</tr>
<tr>
<td>8 Oct 11</td>
<td>Exploring sugar:</td>
<td>Sugar sources (beet, cane, honey, maple) - (local sources: honey, sugar cane, and history) Roen’s honey? Chemical structure (-OH) Alternative sweeteners (aspartame, stevia, etc…) Cooking: syrup, lollipop, caramel, &amp; tempering of chocolate (make mac nut pralines (maillard reaction) or mac nut chocolate) Dipping chocolate (see Dan Swift) (Visit cacao farm or tour Manoa chocolate); Quiz 8: 10/10 12 am – 10/16 11:55 pm</td>
</tr>
<tr>
<td>9 Oct 18</td>
<td>Exploring flours:</td>
<td>Biology of wheat, coconut, rice, almond, etc... What the heck is gluten? Study of leavening agents What can you use to replace gluten? Cooking: pizza with and without gluten; cake Quiz 9: 10/17 12 am – 10/23 11:55 pm Forum 3: diet and health</td>
</tr>
<tr>
<td>10 Oct 25</td>
<td>Beasties:</td>
<td>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 Quiz 10: 10/24 12 am – 10/30 11:55 pm Forum 4: the food, the bad, and the ugly (effects of microbes on crops and cooking) Select Proposal Topic Select topic (1 per person; no duplicates) Topic List: place your name beside your topic (max 3 per topic), you can propose other topics which must be approved by instructor Gluten</td>
</tr>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Details</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11 Nov 1</td>
<td>Alcohol</td>
<td>Sources of alcohol (fermentation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Distillation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cooking with wine, beer, spirits? (flambe, vodka pie crust, sauces, baking, tenderizing, risotto)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tour microbrewery or whisky distillery</td>
</tr>
<tr>
<td></td>
<td><strong>Proposal Due</strong></td>
<td>Quiz 11: 10/31 12 am – 11/6 11:55 pm</td>
</tr>
<tr>
<td>12 Nov 8</td>
<td>Food in Hawai‘i: cooking and food security</td>
<td>Native, invasive, and toxic plants: taro, guava, kiawe bean pods, gorilla ogo, Kalihi ginger, tea;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uses and benefits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Food security</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Virtual Tour of medicinal garden and discuss agripharmatech class (Teena, Inga);</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fishpond (Waikalua Loko with Roz Dias)</td>
</tr>
<tr>
<td></td>
<td><strong>Quiz 12</strong>: 11/7 12 am – 11/13 11:55 pm</td>
<td><strong>Forum 5: Toxins in the food chain (microplastics, mercury, ciguatera)</strong></td>
</tr>
<tr>
<td>13 Nov 15</td>
<td>Food preservation</td>
<td>Ancient and modern methods of food preservation</td>
</tr>
<tr>
<td></td>
<td><strong>Quiz 13</strong>: 11/14 12 am – 11/20 11:55 pm</td>
<td><strong>Food Flavors: Taste &amp; Smell, and Chemistry</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Science of taste and smell</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemistry of flavor</td>
</tr>
<tr>
<td></td>
<td><strong>Quiz 14</strong>: 11/14 12 am – 11/20 11:55 pm</td>
<td></td>
</tr>
<tr>
<td>14 Nov 22</td>
<td>Molecular gastronomy</td>
<td>Diffusion and spherification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Experiments with limu [algae], and calcium lactates, alginates)</td>
</tr>
</tbody>
</table>
Density and acidity
Quiz 15: 11/21 12 am – 11/27 11:55 pm

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Nov 29</td>
<td>Final Project Presentation (1st set of students)</td>
</tr>
<tr>
<td>16 Dec 6</td>
<td>Final Project Presentation (2nd set of students)</td>
</tr>
</tbody>
</table>

Materials required for class (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...

ASSESSMENT TASKS AND GRADING

Grading:
Quizzes (12): 30%
Project: 40%
Participation in online forums (5) 30%
Final Grade: 100%

Grading Scale:

<table>
<thead>
<tr>
<th>Total Points</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-90%</td>
<td>A</td>
</tr>
<tr>
<td>89-80%</td>
<td>B</td>
</tr>
<tr>
<td>79-70%</td>
<td>C</td>
</tr>
<tr>
<td>69-60%</td>
<td>D</td>
</tr>
<tr>
<td>59- 0%</td>
<td>F</td>
</tr>
</tbody>
</table>

QUIZZES on Laulima (30)

Twelve quizzes will be administered weekly on laulima. They are open for 1 week during 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, 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.
**PARTICIPATION IN ONLINE FORUMS (30%)**

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 in the food industry
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)

**Project (40%)**

Select one of the topics provided by your instructor from the topic list. Only one student per topic; no duplicates. Research the topic and determine the concepts you want to demonstrate (physical, chemical, or biological properties). For example, maybe you want to demonstrate the Maillard reaction in frying potstickers (dumplings). The next step is to write a full proposal for your project.

Please adhere to the following guidelines when writing your proposal.

A. Project Title
Choose a title that gives a clear indication of the nature of your project.

B. Literature Review
1. The purpose of the literature review is to find out what has already been done on the topic. This will involve reviewing an article on your topic
2. Write a summary of the article you reviewed. This should be at least 1 double-spaced Page with a link to the article. You should describe the overall chemical, physical, or biological process tested with your recipe.

C. Specific Objective(s).
This should be a concise statement of the objectives of your project.
D. Experimental Protocol
1. Write a detailed, step-by-step protocol for the experiment/recipe you will conduct. Include a list of all ingredients and tools that you will need to conduct the experiment.
2. Carefully explain the principles underlying the experimental methods and techniques you plan to use.

E. References
 Please follow the format used by the APA to citing references

F. Provide a PPT or video introducing your topic and completion of your project.

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, royinouy@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:

Kaahu Alo, Student Life Counselor & Designated Confidential* Advocate for Students

Phone: (808) 235-7354
Email: kaahualo@hawaii.edu
Office: Hale ʻĀkoakoa 232
*confidentiality is limited

Desrae Kahale, Mental Health Counselor & Confidential Resource

Phone: (808) 235-7393
Email: dkahale3@hawaii.edu
Office: Hale Kākoʻo 101

Karla K. Silva-Park, Title IX Coordinator

Phone: (808) 235-7468
Email: karlas@hawaii.edu
Office: Hale ʻĀkoakoa 220

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
TWO-WAY COMMUNICATION DEVICES

These devices are not allowed in the classroom. Please see to it that these devices are turned off while in class.

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.