

**BISC 115Lxg The Biology of Food
Spring Semester 2023
(Section 13115)**

Lecture Syllabus

Lecture: Tuesday and Thursday 2:00 – 3:20pm

- Lecture Location: THH 301
- Lab Location: ZHS 469

Instructor: Grayson Jagers, PhD

Office: ZHS 256

Office Hours: Tuesdays 1-1:50 PM, or by appointment

Email: jagers@usc.edu

Teaching Assistants

TBD

Course Description and Learning Objectives

Food is something we all have some sort of a connection with. Whether you see it as a tool for artistic expression, or simply as fuel for your body, food is derived from the living world around us. BISC 115Lxg will relate concepts from the biological sciences in an applicable context by using the food we eat to provide students with an understanding of molecular biology, biochemistry, microbiology, and nutrition.

Along with lectures, students will be provided weekly lab presentations and assignments in place of the usual lab. The goal of these presentations and assignments is to further illustrate concepts learned in lecture. Students will also be provided with procedures (recipes) for their own at-home experimentation, which will be encouraged but is not mandatory.

Students from a variety of majors will leave this course having learned how the food they eat demonstrates various aspects of biology, and how it is connected to the environment that produces it. This course seeks to promote further interest in the biological sciences, as well as foster an appetite for cooking, and exploring the culinary world.

Optional Reading

McGee, Harold. *On Food and Cooking: The Science and Lore of the Kitchen*. Revised Edition: First Scribner, 2004.

Description and Assessment of Assignments

Exams will be provided during the lecture section on the dates listed below. Exams are a mixture of multiple-choice and true/false questions, and scantrons will be provided. For students who receive testing accommodations, please provide Dr. Jagers with the appropriate documentation as soon as possible.

There is participation credit associated with each lab. To receive full-participation, students must arrive on time, contribute to the in-class work, and behave appropriately. Additionally, there are ten homework assignments. Each homework assignment must be turned in at the beginning of the lab period for the week that they are due.

Grading Breakdown

Three exams, and your six lab meetings will determine your course grade. Each exam will be worth 100 points. The laboratory sections will make up the remaining 100 points. The laboratory score will be determined by eleven labs and their related homework assignments.

Midterm 1: 100 points

Midterm 2: 100 points

Final Exam: 100 points

Lab Homework (10x 4pts) : 40

Lab Participation (12x 5 pts): 60

Class Total: 400 points

A range: 90% and Up

B range: 80-89%

C range: 70-79%

D range: 55-69%

F: 54% and Below

Tentative Lecture and Lab Schedules

Scheduled lecture topics are subject to change. Exam dates, however, will not be moved unless circumstances absolutely require it.

Week of -	Lecture Topic
Jan 10	Course Introduction Four Basic Food Molecules
Jan 17	Four Basic Food Molecules
Jan 24	Micronutrients, Oxidation and Antioxidants
Jan 31	Microbiology and Food
Feb 7	Alcohol, Midterm 1 Exam
Feb 14	Taste, Flavor and Aroma
Feb 21	Biology of Plants
Feb 28	Fiber & Phytochemicals, Coffee & Caffeine
Mar 7	Biology of Land Animals, Fish, and Shellfish
Mar 21	Meat Alternatives, Midterm 2 Exam
Mar 28	Reactions in Cooking, Chocolate
Apr 4	Food Production and Agricultural Pollution, Fundamentals of Genes & Inheritance
Apr 11	Genes & Inheritance, Domestication of Wheat and Corn
Apr 18	History of GMOs
Apr 25	GMOs, The Relationship between Diet and Disease

Exam Dates

Midterm 1: Thursday, February 10

Midterm 2: Thursday, March 24

Final Exam: Thursday, May 4. 2:00-4:00PM

Week Of -	Lab Topic	Homework Due
Jan 17	Laboratory Introduction	
Jan 24	Cheese and Tofu	
Jan 31	Cooking and Vitamin C Content	HW 1
Feb 7	Lacto-fermentation	HW 2
Feb 14	Miso Fermentation	HW 3
Feb 21	Taste Receptors	
Feb 28	Flavor Chemistry	HW 4
Mar 7	No Lab	HW 5
Mar 14	Spring Break	
Mar 21	Ice Cream Experiment	

Mar 28	Chemical Leavening	HW 6
Apr 4	GMO Detection Part 1: DNA Extraction	HW 7
Apr 11	GMO Detection Part 2: PCR	HW 8
Apr 18	GMO Detection Part 3: Gel Electrophoresis	HW 9
Apr 25	No Lab	HW 10

Lecture and Laboratory Meetings

Lectures will be conducted in-person, as well as live on Zoom. Lecture recordings will be posted on Blackboard. When attending lecture via zoom, **please log in through Blackboard**. Otherwise, I have to manually admit participants, which I won't do.

*Attendance: **Laboratory and exam attendance is mandatory.*** Students are required to attend the laboratory section that they are registered for, and no remote options are provided. If a student misses a lab, the lab must be made up within the same week to receive credit. To make up a lab, please email Dr. Jagers, and provide days and times that fit into your schedule. If you are required to quarantine, and cannot make up the lab in the same week, alternative assignments may be provided. Make-up exams are not offered.

If you are a member of a university club or athletic team, and you know in advance that you cannot attend a specific meeting, please let me know as soon as possible.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* (<http://dornsife.usc.edu/ali>), which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* (http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html) provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* (<http://emergency.usc.edu/>) will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* (<https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>). Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, (<http://policy.usc.edu/scientific-misconduct/>).

Academic Integrity Violations

Students who violate University standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the University. Since dishonesty in any form harms the individual, other students and the University, academic integrity policies will be strictly enforced.

Disruptive and Threatening Behavior

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* (<http://equity.usc.edu/>) or to the *Department of Public Safety* (<http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>). This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* (<http://www.usc.edu/student-affairs/cwm/>) provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.

End-of-Semester Evaluations

I value your thoughts on the course, and myself, as your instructor. At the end of the semester, please take time to complete the course and instructor evaluations. I am always trying to improve the course, and this is a great way for me to utilize your insight.