

CHEM 102 The Science of Cooking Intersession 2019

University of San Diego Chemistry and Biochemistry

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Required Text: Science of Cooking. Understanding the Biology and Chemistry Behind Food and Cooking. ISBN: 978-1-118-67420-8 AND Lab Handouts

Supporting website: Class website is linked from <http://home.sandiego.edu/~josephprovost/> Go to this website for all class information, lecture handouts, important links and updates.

Course Description: This course is designed for the non-science major with a focus on food, cooking and baking while introducing chemistry and biochemistry foundational concepts. No science prerequisite is needed. Using a mix of approaches including hands-on activities, students will learn the chemical and biochemical principles of food and cooking. Students will investigate the molecular structure and changes that take place in food and drink while cooking and baking. Topics may include: making cheese and ice cream, spices and hot sauces, caramelization and food browning reactions, molecular gastronomy, taste and smell, cakes and cookies and chocolate. Students will participate in inquiry-based laboratories integrated throughout the semester where you will design and perform scientific experiments to investigate the nature of food and cooking. Students complete 2 hours of lecture per week and 4 hours of lab every other week (at least 40% of class time devoted to experimental/laboratory work).

Course objectives. The goal of this course is to improve your understanding of the scientific principles of food and cooking. Students will use methods of chemistry, biology, and physics to better understand the importance of science in food, nutrition, how foods taste different, are best prepared and the effects on the human body. To achieve these goals, students will learn the concepts and principles of macromolecular molecules and their reactions as they learn about each food topic. Students will collect data from their in class and take home laboratory problems to interpret and report their hypothesis and observations. As students do this, they will understand major scientific theories of biochemistry, chemistry and biology as they relate to food science.

Student Learning Objectives: The goal of this course is to improve your understanding of the scientific principles of food and cooking. Students will use methods of chemistry and biochemistry to better understand the importance of science in food, nutrition, how foods taste different, are best prepared, and the effects of food on the human body. To achieve these goals, students will learn the concepts and principles of macromolecular molecules and their reactions as they learn about each food topic. Students will collect data in class/laboratory to interpret and report their hypotheses and observations. As students do this, they will understand major scientific theories of chemistry and biochemistry as they relate to food science. The laboratory component this course will support student learning using guided inquiry and the scientific approach.

Upon completion of this course, students will be able to:

1. Design and conduct an investigation based on the scientific method.
2. Analyze observable facts and numerical data to arrive at an evidence-based conclusion.
3. Apply knowledge of fundamental chemistry/biochemistry principles to food and cooking examples.
4. Identify and use appropriate and sufficient scientific evidence to evaluate claims and explanations about the natural and designed world in the context of food and cooking.

Grading:

- Three exams.	3 x 200 pts = 600 pts
- Learning activities	2 x 25 pts = 50 pts
- Lab write-ups	4 x 50 pts = 100 pts
- Quizzes (5 total, drop lowest)	4 x 10 pts = 40 pts
- Extra Credit assn (TBA) 20 pts	
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	TOTAL = 790 pts

Late assignments will be deducted points (5 pts/day) until half of the possible points are deducted.

Plagiarism or cheating will result in a deduction of 25 percent from that assignment with an option to fail the course. There will be an extra credit assignment worth 20 pts TBA

The cut offs for grades are A-90%, B-80%, C-70%, D-60% and F-50%. These cut offs are tentative and depending on how the class performs, may be altered.

Attendance Policy: Attendance is required; it is critical for learning Science of Cooking. There are a number of in-class activities and quizzes that cannot and will not be made up.

Class	Date	Activity	Assignments/Notes
1	Mon Jan 6	Chapter 1: The Science of food and cooking – Macromolecules.	
	Tues Jan 7	Chapter 1: The Science of food and cooking – Macromolecules.	Quiz 1
2	Wed Jan 8	Chapter 5: Cheese, Yogurt and Sour Cream.	Pages 156 - 185
3	Thurs Jan 9	Lab Activity I – Making Cheese	Quiz 2 Lab Handout on Web Bring printed out
4	Fri Jan 10	9:00 – 10:00 Exam I 10:00-12:00 Chapter 5: Cheese, Yogurt and Sour Cream.	Exam I on Chpt 1, cheese lab and portions of Chapter 5. Bring your textbook!!!
5	Mon Jan 13	Chapter 3: Milk and Ice Cream	Pages 93 – 111 & 121 - 125
6	Tues Jan 14	Active Learning Assignment - Group Work on Proteins, and Milk.	Assignments on class web Bring printed out Bring your textbook!!!
7	Wed Jan 15	Chapter 3: Milk and Ice Cream Chapter 6: Browning	Quiz 3 Pages 93 – 111 & 121 – 125 Pages 193 – 217
8	Thurs Jan 16	Lab Activity II - Caramel	Lab Handout on Web Bring printed out
9	Fri Jan 17	9:00 – 10:00 Exam II 10:00-12:00 Lab Activity III - Ice Cream	Chpts 3, 5, Learning activity and ice cream lab Bring your textbook!!! Lab handout on web
10	Mon Jan 20	Chapter 6: Browning	Pages 193 - 217
11	Tues Jan 21	Chapter 10: Breads, Cakes and Pastries	Quiz 4 Entire Chapter
12	Wed Jan 22	Chapter 12: Beer and Wine	Pages 432 - 445
13	Thurs Jan 23	Lab Activity IV – Best Cookies or Trip to brewery TBD	Quiz 5 Lab Handout on Web Bring printed out
14	Fri Jan 24	9:00 – 10:00 Exam Review 10:00-12:00 Exam III	Chpts 6, 10 & 12