

# “You Are What You Eat: A Course in Food Chemistry”

First Year Seminar Syllabus –Fall 2014

Rooms: There are several! Note each week where you need to be.

**JBC** Joy Burns Center – Student Kitchen (in the basement, room 119, enter through 117)

**STURM** Sturm Hall 410

**AAC** Anderson Academic Commons

**SGM** Seeley G Mudd 101 (my office)

Time: Friday 12-3:50 pm

Final Paper due November 19<sup>th</sup> at 3:50 pm (during our final exam time)

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*Office Hours:* Th 3-4 pm, F 10am-11pm. Email for other times.

## **Introduction and Learning Outcomes:**

During this course we will be part of an intellectual community and learn through critical thought and scientific reasoning. The main goal of this course is to *learn how to approach complex problems* – ones you do not know the answers to, where the answers may not be clear, and ones you will need to research. We will use writing to communicate our point of view and back up our conclusions with scientific evidence and experimentation. In the process, you will also learn about the chemistry and molecules in our food.

**Online Materials:** You are responsible for materials posted on Canvas.

## **Reading Materials:**

- ✓ The Science of Good Cooking by The Editors of America's Test Kitchen and Guy Crosby Ph.D (\$22-\$24 at Amazon), *needed immediately*
- ✓ New York Times – Science Times on Tuesdays, Dining on Wednesdays. Available free at DU. This is great for finding topics for your research paper.
- ✓ Additional online materials and journal articles will be provided for many topics and posted on Blackboard.

## **Grade Evaluation is based on:**

### **A. Papers:** We will focus on writing two styles of papers:

- 1) Experimental Papers – 6 group papers to be written about the kitchen experiments. This will be in the form of a scientific journal article. I will post example papers from science literature on Canvas as well as my assessment regarding organization of the papers. Science writing is highly structured. You must explain the experiment with “chemical detail”. Chemistry is the study of atoms and molecules and the changes they undergo. You will need to use the on-line lectures, videos and research to gain chemical understanding then apply that knowledge to your observations in the kitchen labs.

*Group work is an essential skill. In science and most other fields, nothing is done alone! Not experiments and not writing. In writing these papers, all members of the group must: 1) contribute to the writing of the paper and 2) have read and approved the final version. If you were not present in lab, you cannot contribute to the paper unless you have a valid excuse for your absence.*

- 2) Research paper – Due 11/19 Choose a controversial topic of your interest on food/nutrition/farming that can be addressed from researching the science. 10 pages double spaced, Times New Roman, size 12 font, 1” margins. References **do not** count as part of the 10 pages. You need at least 5 scientific references. **A 5 page draft with 3 scientific references is due on 11/7. This will be graded!**

*Your honesty and integrity matter. Plagiarism will not be tolerated in any form. If you plagiarize you will receive a 0 and will not be able to make up the assignment. See me if you do not know what counts as plagiarism.*

### **B. Kitchen Experiments:** All will be done in groups of 3-4 and groups will often have different tasks or slightly different variables. At the end of each lab session, we will gather and each group will discuss what they did. Observations will be made about final products and, hopefully, most will be edible.

- Lab #1: Ice Cream and Colligative Properties
- Lab #2: Cheese making and Protein Denaturation
- Lab #3: Flour, gluten and protein structure
- Lab #4: Leavening with soda: Acid Base Chemistry
- Lab #5: Yeast leavening and the role of water
- Lab #6: Caramelizing Reactions: Organic Chemistry makes for good candy!

I will assign the teams so that people interested in science or experienced with cooking are grouped with those that are less inclined. In the kitchen lab setting, each team has four roles and these will be assigned and rotate weekly:

1. Leader/delegator: assign tasks then do odd jobs you missed, be observant of others in your group. They may work more meticulously, carefully, slowly than you do. No need to rush people. There's plenty of time.
2. Clean up captain: You don't have to do all cleaning, just make sure it is clean when people leave.
3. Safety inspector: Gloves as needed, cutting techniques, don't walk away from a hot plate/stove that is on. Combine with 2 if your group only has 3 people.
4. Timer/recorder: Written reports require documented observations. Photos, written work, movies, etc. Your phone is your method for recording and timing – no lab books required.

**C. Worksheets (4):** 10 point each and they are all posted on Canvas. See the schedule below for due dates.

**D. Presentation (1):** 50 points. This is a 10 minute presentation with 2-3 minutes for questions and will take place on November 14<sup>th</sup>. The topic is the same as your research topic. More information and guidance will be given in class, but practice is essential for any good talk.

**Lectures:** Lectures will be varied from in class to short online video lectures available on Canvas or Course Reserves. This includes video episodes of Alton Brown, Food Detectives and America's Test Kitchen on the topics of: Proteins, Starch and Sugar, Salt, Acids/pH, Fat, leavening agents, flour, and specific recipes.

**Late Policy:** Contact me if you will miss class for any reason. Unexcused absences will result in zero points for that experiment and the subsequent write-up. There are no make-up experiments.

### Evaluation and Grades:

<i>Assignment</i>	<i>points</i>
Experimental Papers (6)	240 (group grade)
Term Paper Draft (1)	50
Term Paper (1)	100
Presentation	50
Safety, cleanliness, and participation	20 (group grade)
Worksheets (4)	40
<i>Total</i>	<i>500</i>

<i>Letter</i>	<i>Percent</i>
A	93-100
A-	90-93
B+	88-90
B	82-88
B-	80-82
C+	77-80
C	70-77
C-	65-70
D-F	Below 65

**Academic Integrity:** In this course and all other courses at DU, you are expected to abide by the Honor Code. Any form of dishonesty will be taken seriously and there will be no tolerance for plagiarism.

**Library Resources:** The University Libraries Research Center answers research questions seven days a week by phone, email, in-person, chat/IM or text. One-on-one research consultations in the Anderson Academic Commons are also available on a drop-in basis or by appointment. Consultations help students at any stage of the research process, from refining a topic, to finding books and articles, to creating a bibliography with RefWorks. Ask a question or make an appointment at 303-871-2905 or [research-help@du.edu](mailto:research-help@du.edu).

The Writing Center supports and promotes effective student writing across the University of Denver campus. In a non-evaluative collaborative setting, they help DU students with all kinds of writing projects. The Writing Center is located in Anderson Academic Commons. Please schedule an appointment. <http://www.du.edu/writing/writingcenter/index.html>

**Disability Services:** Any student who feels s/he may need an accommodation based on the impact of a disability or medical condition should contact the Disability Services Program to coordinate reasonable accommodations. They are located on the 4th floor of Ruffatto Hall; Information is also on line at <http://www.du.edu/disability/dsp>

**Course Outline:** *Tentative Schedule of Activities and Topics*

<i>Date</i>	<i>Topics/Experiments</i>	<i>BEFORE class</i>	<i>Due at the beginning of class</i>
9/12 JBC	<ul style="list-style-type: none"><li>• Safety in the Kitchen</li><li>• Example of the Scientific Process (Turkey Test) - Hypotheses and Controls (salt variable)</li><li>• Assign groups and jobs</li><li>• Ice Cream Making</li></ul>	<ul style="list-style-type: none"><li>• Read procedure for Lab #1 (on Canvas)</li><li>• Watch Food Detective Turkey Test (online)</li><li>• Watch Alton Brown (v1, disk2) “Churn Baby Churn” (on reserve)</li><li>• Read Concept 19</li></ul>	<ul style="list-style-type: none"><li>• Worksheet #1 “The Scientific Method”</li></ul>
9/19 JBC	<ul style="list-style-type: none"><li>• Lab #2: Cheese Making: Ricotta and Mozzarella</li></ul>	<ul style="list-style-type: none"><li>• Read procedure for Lab #2 – watch links (on Canvas)</li><li>• Lecture #1: Atoms, Molecules, and Bonds(on Canvas)</li><li>• Alton Brown (v16 disk 2) “Milk Made” (on reserve)</li><li>• Alton Brown (v13, disk 3) “Say Cheese” (on reserve)</li><li>• Review lab report writing guidelines (on Canvas)</li></ul>	<ul style="list-style-type: none"><li>• Lab #1 Report</li></ul>

9/26 JBC	<ul style="list-style-type: none"> <li>Lab #3: Cake: The role of Flour and Protein</li> </ul>	<ul style="list-style-type: none"> <li>Research ideas for a final paper</li> <li>Read procedure for Lab #3</li> <li>Read Concept 45</li> <li>Watch America's Test Kitchen, Season 1, Disk 2 "The Perfect All-Purpose Cake"</li> </ul>	<ul style="list-style-type: none"> <li>Present two topics for a term paper to the class</li> <li>Lab #2 Report</li> </ul>
10/3 AAC	<ul style="list-style-type: none"> <li>Researching YOUR topic Anderson Academic Commons with the Science Librarian</li> <li>Career Center</li> <li>Writing Center</li> </ul>	<ul style="list-style-type: none"> <li>Write a thesis statement for your term paper. If you are trying to narrow down topics, write a statement for both topics, research both and then decide. <i>This is mandatory!</i></li> </ul>	<ul style="list-style-type: none"> <li>Lab #3 Report</li> </ul>
10/10 JBC	<ul style="list-style-type: none"> <li>Lab #4: Sugar cookies – The role of leaveners, fat/butter, and temperature</li> </ul>	<ul style="list-style-type: none"> <li>Read procedure for Lab #4 (concept 42)</li> <li>Watch America's Test Kitchen Season 1, Disk 2, "Cookie Jar Favorites"</li> <li>Watch Alton Brown v1, disk 2, "Three Chips for Sister Marsha"</li> </ul>	<ul style="list-style-type: none"> <li>Worksheet #2: References</li> </ul>
10/17 SGM	<ul style="list-style-type: none"> <li>Writing help: Researching your topic and deciphering fact from fiction</li> <li>Advising Appointments</li> </ul>		<ul style="list-style-type: none"> <li>2-3 plans of classes, attend major advising</li> <li>Lab #4 Report</li> </ul>
10/24 JBC	<ul style="list-style-type: none"> <li>Lab #5: Pizza Bianca – Water, Gluten, and kneading</li> <li>Caramelized onions</li> </ul>	<ul style="list-style-type: none"> <li>Read procedure for Lab #5 or watch America's Test Kitchen Season 9, Disk 3 "Pizza Bianca"</li> <li>Concept 38-41 (in text)</li> <li>Watch America's Test Kitchen Season 9, disk 4, "Bread Making Simplified" (on reserve)</li> <li>Watch America's Test Kitchen Season 8 "Flour" – not a full episode, just the science.</li> <li>Read p284-287 on caramelized onions</li> </ul>	<ul style="list-style-type: none"> <li>Lab #5 Report</li> </ul>
10/31 JBC	<ul style="list-style-type: none"> <li>Lab #6: Candy Making – Caramelization and Crystallization</li> </ul>	<ul style="list-style-type: none"> <li>Read procedure for Lab #6</li> <li>Read p248-249 text (caramelizing vs. browning)</li> <li>Watch Alton Brown, Candy Making Episode (TBD)</li> <li>Read Journal Article on Caramelization</li> <li>Watch About.com – Rock Candy</li> </ul>	<ul style="list-style-type: none"> <li>Lab #5 Report</li> </ul>

11/7 STURM	<ul style="list-style-type: none"> <li>• Writing activities</li> <li>• How to give (or not give) a good presentation</li> <li>• <b>We will end early!</b></li> </ul>		<ul style="list-style-type: none"> <li>• Lab #6 Report</li> <li>• Graded Draft of your paper</li> <li>• Worksheet #3: Peer Review (we will do IN CLASS)</li> </ul>
11/14 STURM	<ul style="list-style-type: none"> <li>• Presentations</li> <li>• <b>We will go 30m over!</b></li> </ul>		<ul style="list-style-type: none"> <li>• Worksheet #4: Peer Review</li> </ul>
11/19 SGM	<ul style="list-style-type: none"> <li>• No classes – Finals week</li> </ul>		Research Paper due by 3:50 pm