

Chem 494 Biochemistry of Food and Cooking Spring 2021

Dr. Joseph J. Provost

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Office - SCST 375 Lab 425



Lecture M&W@ 12:20 – 1:15 pm SCST 230

Lab F@ 12:20-3:00 pm Lobby of SCST

Office Hours:

Monday	10:10	Tuesday	2:30 & 7:00	Wednesday	10:10
Thursday	Arraigned	Friday	10:10		

Zoom link for office hours: <https://sandiego.zoom.us/j/8137064371>

Zoom link for classes – in Bb.

Course Description: Simple – you will apply your understanding of biochemistry and chemistry to food and cooking. AND have fun. That is it, nothing more, nothing less.

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

Supporting website: Class website is linked from http://home.sandiego.edu/~josephprovost/BIOCHEM_of_FOOD.html
Go to this website for all class information, lecture handouts, important links and updates. Bb will only have grades and class zoom links/recordings

Grades: The grade cut offs are A-90%, B-80%, C-70%, D-60% and F-50%. These are tentative, may be decreased but will not be increased. Learning objectives and chapter questions will be provided but not graded.

GRADE BREAKDOWN – See web for due dates and assignment information.

- Science Chef Group Work Participation Points 6 @ 10 pts	60 points
- Lecture Quizzes 8 @ 20 points each – drop lowwest	140 points
- Deep Dive Paper Reviews 5 @ 50 points each	250 points
- Lab “Reports” 4@ 50 points each	200 points
- Final –Science Café Menu	50 points
- Final – Torero Chopped Grill	50 points
	<u>750 possible points</u>

Mondays will be traditional, formal lecture by the instructor (Head Chef (Dr. Provost)). There will be seven topics as indicated on the schedule.

Wednesdays will be a “Science Chef-Group Work”. The class will be divided into 5 kitchen restaurant of 5 cooks. One student will be assigned Sous Chef for the day. The remaining 4 students will be Line Cooks.

- The Head Chef will assign different scientific publication related to the topic of the week to each kitchen.
- The Sous Chef of the day is responsible for leading the Line Cooks in their kitchen to discuss the paper.
- One of the Line Cooks (NOT the Sous Chef) will be assigned by the Head Chef to present the publication. No slides, just a simple oral presentation. 3-5 min max. The presentation will be the hypothesis of the publication, a very simple background and the key finding and result of the paper.
- Each member of the kitchen will anonymously award all kitchen members (except themselves) up to 10 participation points. The average of the points will be awarded and posted on Bb.

Head Chef -a highly skilled professional cook who oversees the operations of a restaurant or dining facility. They are responsible for the food that comes out of a kitchen, from conception to execution. While many of these professionals gain the necessary skills through work experience as line cooks, college programs in the culinary arts are widely available. Some cooks learn through apprenticeships

Sous Chef - the top assistant in a professional kitchen The typical restaurant kitchen is set up so the absence of the head chef is not felt in the dining room. It is the assistant, the sous-chef, who is usually in charge of production, with the head chef the administrator and creative force

Line Cooks are employed by many restaurants and prepare much of the food that comes out of the kitchen. They work under a head chef or sous chef, and each line cook is typically assigned a particular place on the line, such as the grill, stove or vegetable prep area. Formal education is not required for this position, but prospective line cooks may wish to enter a culinary program for formal training and to improve their advancement opportunities.

Lecture Quizzes – Bb based, asynchronous quizzes due by 11:50 pm each Sunday. The quizzes will be simple 2-ten point questions based on Monday’s Lecture. The questions will be posted on the class website and blackboard. You can prepare 2 of your choice and paste into the quiz. These will be done outside of class.

Deep Dive Paper Reviews - There will not be any exams in the class. Instead you will expand on 5 of the 7 topics, find 2-3 papers on related science of cooking on the topic and write a 2 page paper discussing the purpose of the publication, background summary, description of key (not all) experimental methods and the results and describe the conclusion of the papers. The key is to use your existing understanding of biochemistry and chemistry to dig deeper into the science of what is happening to food and drink during cooking. No more than ONE of these reviews can be nutritional/biomedical. The rest have to be on the chemical and biochemical processes of cooking or preparing food. i.e. the role starch gelification plays in making a French-fry crispy. Two will be due by April 19. The remaining by Thursday May 21 by Midnight. This is giving you flexibility to adjust to other issues in your semester – do NOT wait until the end. I will NOT be flexible.

Lab Reports - This is another opportunity to show how you can apply the science you've gained at USD. There are 6 laboratory experiments. You are responsible to “report” on 4 of the 6. The report will be a rif/extension of the experience of the lab. The “report” will be some way to communicate an extension of the experience using language accessible to the lay audience. The report is to be a recipe (extending beyond what we did in class) and will incorporate science of the recipe and food describing what is happening. This can take the form of a podcast, a blog, food network like website, an infographic, or even your own Alton Brown web-show. Your choice each time. Each is due the 9 days (Sunday) following the experiment.

Science Café Menu – Your Kitchen of Five (all line cooks now) will create a three course menu for a Science Café. It is up to your team what each course will be. Anything is fair game – be creative and have fun. Each menu item is NOT a recipe but instead a description of the food/cooking process using scientific terms and MUST have at least three “fun facts” about the chemistry, biology or biochemistry behind each menu item. Look throughout the book for inspiration and information. Due at your final presentation.

Chopped Torero Grill – On May 3rd you and your kitchen team will be presented with a list of ingredients to be used to make a science-driven food. Like the TV series “Chopped” (google it if you haven’t seen it). You will have two hours to create a single dish to present to the judges (all the line cooks and the Head Chef). You will present why you made what you did, the science used in making the dish and behind the food/dish. This will be graded based on creativity (simply googling for an answer will not earn many points) and your presentation based on science. The Head Chef and possible guest Chefs will participate in the “grilling” part of the Torero Gill.

Date	Topic
Mon March 15	Browning and Flavor Enhancement: Lecture
Wed March 17	Browning and Flavor Enhancement: Science Chef -Group Work
Fri March 19	FOOD LAB – Caramel and Ice Cream
Mon March 22	Milk and Cheese: Lecture
Wed March 24	Milk and Cheese: Science Chef -Group Work
Fri March 26	FOOD LAB – Cheese Making and Flavor Profiles
March 29-April 5	SPRING/EASTER BREAK
Wed April 7	Remote Breads, Cakes and Pasta: Lecture
Fri April 9	Remote Breads Cakes and Pasta: Science Chef -Group Work
Mon April 12	Beer, Wine and Liquor: Lecture
Wed April 14	Beer, Wine and Liquor: Science Chef -Group Work
Fri April 16	FOOD LAB – Making Beer & Wine / Sommelier Intro
Mon April 19	Sauces and Gravy – Emulsions: Lecture
Wed April 21	Sauces and Gravy – Emulsions: Science Chef -Group Work
Fri April 23	FOOD LAB – Pasta & Roux and Two of the Five Mother Sauces
Mon April 26	Molecular Gastronomy: Lecture
Wed April 28	Molecular Gastronomy: Science Chef -Group Work
Fri April 30	FOOD LAB – Spherification
Mon May 3	Meats, Fish, Poultry and Synthetic Meat: Lecture
Wed May 5	Meats, Fish, Poultry and Synthetic Meat: Science Chef -Group Work
Fri May 7	FOOD LAB – Making the “Best” Cookie
Mon May 10	Seasonings, Hot Peppers, Herbs, and Spices: Lecture
Wed May 19	Final Exam 2:00 – 4:00 Torero Science Café and Chopped