Application Form for the
Honors Eccles Fellow Program

Return the completed form to Erik Stern, MC 2904

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Department: Psychology
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Date: Feb. 11, 2014

Co-Faculty's Name: Dr. Barb Trask
Co-Faculty’s Extension: x6169
Co-Faculty’s Department: Zoology
Co-Fac. E-mail: btrask@weber.edu
Date: Feb. 11, 2014

Please use a separate sheet of paper to answer these questions:

1. Describe the class you'd like to teach. Attach a course syllabus; the more detailed the better.

American students and the broader citizenry have shown increasingly poor performance in STEM (Science, Technology, Engineering, and Mathematics) competence and literacy at the very same time that government projections show high employment growth in STEM fields. One of the most successful methods to generate STEM enthusiasm and understanding has been to take a 'hands-on,' application-oriented approach. Many universities (e.g. Harvard, MIT, Washington and Lee, American University, Minnesota State, etc.) have found that a rigorous Science of Cooking course is an extremely successful method for engaging students in a diverse set of scientific disciplines. This proposal is designed to create a challenging, interdisciplinary, experiment-centered Science of Cooking course to be offered for the first time through the Honors Program Eccles Fellowship Program. This course has been designed to utilize the 'everyday' activity of cooking as a conduit through which to convey seminal scientific principles such as physical phase changes, the molecular composition of biological organisms, chemical bond formation and destruction, and the physiological and psychological basis for food selection, preparation, perception, and satisfaction. To master these and other scientific concepts, students will participate in laboratory-style cooking 'experiments,' and discussion sessions centered around the experiments (see attached syllabus for details).

The proposed course is a vehicle for us and our students to approach one of the most important facets of every day human existence from an interdisciplinary scientific perspective. That is, there is a very close association between food, neuroscience, and psychology (e.g. satiation, hunger, the appeal of food to the senses, motivation, learning, dietary constraints, etc.) and a direct linkage with other core scientific disciplines and concepts (e.g. organic chemistry, basic physics, genetics). Two major goals of the course are that students will 1) come to appreciate the relationship between science and their everyday lives and 2) become more comfortable with the scientific method and, thereby, become more capable of approaching many other activities scientifically as well.

To best accomplish these two goals, Science of Cooking courses at other institutions have incorporated hands-on laboratory-style exercises and experiments in which students engage. This makes sense, as hands-on laboratory exercises are core constituents of many middle- and upper-level science courses in all natural science disciplines. The many laboratory exercises proposed
(see attached syllabus) offer both controlled pre-planned experiments and student-generated experiments wherein the subtle chemical and physical changes that occur during the cooking process can be emphasized. Furthermore, by having multiple small student groups in the class concurrently completing the same exercise, it is possible to consider the effect of a single variable on a food product within a class period (e.g., each group uses a different type of flour to observe the effects on baked bread, uses different bacterial cultures to observe the effect when making yogurt, or uses different flavoring ingredients to observe the effect on gelation and freezing when making ice cream).

**Feasibility of the Course:**

- **Faculty expertise:** Drs. Schmolesky and Trask have a wealth of experience in molecular biology, chemistry, neuroscience, and psychology, as well as many different laboratory courses (e.g. our team taught NEUR 2810 Neuroscience laboratory course). We have both also had a passion for cooking for many years and have made strong efforts over the last year to read extensively on the science of cooking (see the syllabus reading list) and conduct science of cooking experiments to develop our skills and prepare for this course. We are confident that we could offer a compelling course in Science and Cooking and are actually working on a first draft manuscript of a Science of Cooking textbook that we believe will have broad appeal. While we are confident in our abilities, we are equally aware that having three or four professional chefs and one or two other professors (e.g. from the department of physics) offer guest lectures/demonstrations would add a great deal to the course. In that regard, we are pleased to say that the response from potential guest lecturers has been enthusiastic. If the current proposal is approved we have commitments from several chefs and professors (Chef Craig Bonham of Harley and Bucks; Chef Rand Groves of WSU Sodexho Dining Services; Dr. Dan Schroeder, Physics Dept.) and are in contact with other chefs (e.g. from Jaso, Vivace, Forage, etc.).

- **Student interest:** We have discussed this course with a wide variety of students over the last six months and received overwhelmingly positive feedback and interest in taking the course. Thus, we are confident that the course will fill.

- **Location:** Two suitable locations (Student Union Wildcat Room/Kitchen; Wildcat Village Student Kitchen) have been secured (see Addendum 1), having received support from those responsible for maintaining them (Keith Murray, Angie Betancourt; see Addendum 2). Both of these locations are suitable for cooking and eating, being equipped with sinks, counters with outlets, a single microwave oven and a refrigerator (or ready access to one). These locations are already used in conjunction with food preparation and consumption and, based on manager commitments, we may be able to use/observe some individual items of interest (e.g. baking ovens; blast chiller).

- **Ingredient acquisition/funding:** All ingredients (e.g. meats, vegetable, spices, etc.) for this first offering of the course will be funded through the departmental/program contributions to a Hemingway Collaborative Grant that was submitted to the RS & PG Committee ($200 each from HTHS, PSY, ZOOL, and NEUR). We anticipate making the course a semi-regular course offering and, when the course has a set prefix in the future we will build in a course-fee to cover ingredient costs.

- **Equipment acquisition/funding:** We have submitted a Hemingway Collaborative Grant proposal to acquire all culinary equipment necessary for five student work stations (three students per station) and corollary equipment (e.g. lockable storage bins for each
workstation). Thus, if the Hemingway Proposal is funded, all equipment and ingredient costs are accounted for. However, if the Hemingway Collaborative grant is not funded we have two options to ensure that the Science of Cooking course can be offered in Spring 2014: (a) we would submit a Hemingway Instructional Grant proposal in Fall 2013 for the five workstations (preferred) OR (b) use the departmental funds already allocated and our personal faculty discretionary funds to purchase one single complete workstation. It is worth noting that we did consult with the RSPG committee chair, Dr. Azenett Garza, about our Hemingway proposal; she agreed that it was suitable for either a Collaborative or Instructional submission. We also wish to highlight that option (b) is not our preference as it only allows one student group to actively experiment at a time, with the others observing; however, it is a valid approach taken by other universities.

- **Equipment/ingredient storage:** We will store all purchased food unless refrigeration is required; in that case, Mr. Keith Murray of Sodexho has agreed to allow for food storage in the Shepard Union Sodexho kitchen area refrigerators. All purchased equipment will be stored in five lockable storage bins that will be kept in the Sodexho kitchen area for the semester during which the course is taught. When the course is not in session, the equipment will be stored in the Zoology department.

- **Food allergies/hazards:** We will have students sign a standard disclosure and waiver form regarding the preparation and consumption of food items.

2. How does the class relate to your research? If you have publications in this area, please give us copies or references.

Both of us are involved in the interdepartmental Neuroscience Program and we spend a good deal of time collaborating in our teaching and research. This course links to some of our ongoing research (e.g., the impact of dietary changes on neurotrophin levels; cellular/molecular regulation of glycoproteins) and other courses (e.g., Neuroscience Laboratory; Neuroscience Topics: Environmental Neurotoxins). In addition, we are drawing expertise from our past research to address topics such as: a) synaptic plasticity underlying memory formation which is required for food preference establishment (see plasticity publications by Schmolesky), b) the neural pathways underlying sensory systems used in food selection, preparation, and perception (see visual neuroscience publications by Schmolesky), and c) food requirements and preferences related to the maintenance and construction of macromolecules necessary for cell survival (see fibrillin/glycoprotein publications by Trask). Finally, in terms of scholarly research outside the laboratory, if this proposal is supported we will finish drafting a Science of Cooking lab manual, ‘field test’ it in the course, and revise the manual to submit for publication as a Science of Cooking textbook.

**Selected Relevant publications**


3. Describe how your course contributes to the Honors Program and the Weber State community.

The Science of Cooking course includes activities designed to have an impact on members of the Honors Program, the Weber State community, and the broader local community. First, the final student project (constituting 35% of the overall course grade) includes participation in a 'Science of Cooking Showcase' to be held during the last week of class, open to the community and WSU student body. Second, the student groups will prepare Final Project Brochures to hand out to community members and WSU students and faculty, describing the science behind their recipes and cooking lessons. Third, we will design, widely distribute, and analyze data from a Science of Cooking survey to members of the Honors Program, WSU community, and the broader public. The results of this survey will be discussed with the course students, Honors Program participants, the WSU student body and members of the public in the Science of Cooking Showcase and other venues (e.g. via the textbook we are drafting for eventual publication). Fourth, we will give a university-wide lecture on the Science of Cooking course
via the Honors Program Eccles Fellowship planning.

Expected Outcomes of the Eccles Fellowship Science of Cooking Course/Project

A) That Dr. Matthew Schmolesky and Dr. Barbara Trask will participate in the Honors Program activities throughout the fellowship year, teach the Science of Cooking course, and give a university-wide lecture on the course/fellowship.

B) That a rigorous hands-on Science of Cooking course will be fully developed and offered for the first time through the Honors Program via an HNRS 3900 Honors Colloquium listing.

C) That the course will involve collaborative team teaching by Dr. Schmolesky (Psychology) and Dr. Trask (Zoology) as well as guest lectures/demonstrations by other faculty (e.g. from Physics) and professional chefs (e.g. Chef Craig Bonham of Harley and Bucks, etc.).

D) That the Science of Cooking Showcase and the Final Project Brochures will provide a forum for WSU student and local community public engagement.

E) That a survey tool will be drafted and widely distributed (e.g. to WSU students and the broader community) to assess the general state of knowledge regarding the basis of common foods (e.g. yogurt, cheese, jello, etc.) and the scientific principles underlying common cooking practices (e.g. why does cooling or salting food preserve it? Why does oil or butter reduce burning when frying? When are bacteria useful or harmful in food preparation/storage?) The results from this survey will be used for classroom discussion, public engagement, and the Science of Cooking textbook we are beginning work on.

F) That the equipment purchased for the five workstations will be used in additional course offerings in the future, either through the Honors Program and/or Continuing Education.

G) That the Science of Cooking textbook/laboratory manual being drafted by Schmolesky and Trask will be submitted for publication.

H) That a final report will be drafted and submitted to all funding sources to include quantitative and qualitative results regarding the outcomes listed above.

4. Apart from teaching the class, how will you contribute to the Honors Program during your fellowship?

As recommended, we will engage with the Honors Program by attending activities such as “Food for Thought” and “Honors Issues Forum”, winter and spring graduation banquets, as well as social and cultural events. In addition, as described above, we will be engaging with Honors Program participants through the Science of Cooking surveys, Final Project Showcase, and Final Project Brochure. Finally, we will make an Eccles Fellowship sponsored presentation about Science of Cooking Course/Project experience and outcomes to the Weber State community.

5. If you are submitting an online course proposal, briefly describe you
Honors Eccles Fellows

The Honors Program invites all tenure-track and tenured faculty to apply for an Honors Eccles Fellowship for FALL SEMESTER 2013 or possibly SPRING SEMESTER 2014.

What is it?
The goal of the Honors Eccles Fellows Program is to encourage faculty to develop their teaching and scholarly interests through involvement with the Honors Program.

How does it work?
An Eccles Fellow develops and teaches a new class in the Honors Program on a topic related to the Fellow's scholarly interests. The Fellow receives release time to pursue this research.

To apply for an Eccles Fellowship:

- Submit a proposal to teach a 3000 level Honors seminar class, either on your own or with a colleague. Preference will be given to proposals for team teaching across disciplines.
  - For a single teacher class, Honors will buy out 3 hours of teaching from the department as well as paying for 3 hours of release time, for a total of six hours.
  - For a co-taught class, each faculty will receive 3 hours of teaching from the department as well as 3 hours of release time, for a total of 12 hours for the class.
  - Either hard copies or e-mailed forms are accepted.

- Your department chair must agree to release you.

- Because the goal is to provide you with time for scholarship, you may not teach overload the semester you teach and/or take the release time.

- Preference will be given to faculty who pair across departmental lines.

- If you are co-teaching, submit a single proposal for your class.

What else do I need to know?
- The class should be a new preparation for you (and your colleague).
- We encourage you to propose a class related to your area of scholarship that you can then use for presentations and publications.
• We urge you to participate fully in Honors activities by attending activities such as "Food for Thought," winter or spring banquets, as well as social and cultural events.

• Weight will be given to applications that make a contribution to the Honors Program and to the larger Weber community.

Special Call for this year: Online Course Proposals
This year the Honors Program is also considering proposals for online courses. The course can be new or an adaptation of an existing course (as opposed to conventional proposals that must be a new preparation). The course does not necessarily have to be a 3000 level. The Honors Program is particularly interested in online courses that focus on one or more of the following:

1. Fully integrating oral, written and other forms of communication as ways for students to learn and explore course material;
2. "Signature Assignments" that ask students to synthesize course material through a summative end-of-semester project;
3. Using online course technology to allow students to engage in substantive peer feedback;
4. Using online course technology to allow students to create projects in a variety media.

If interested, fill out the Honors Eccles Fellow Program application, and include a short description of your experience in teaching online courses.

How do I apply?
Answer the questions on the next page and e-mail to Erik Stern, MC 2904, with required signatures.

How will the applicants be selected?
A committee of former Eccles Fellows, the Honors Steering Committee, and the Honors Director will read the applications and award fellowship(s) for Fall 2013.

When is the application deadline?
Friday March 1, 2013. The successful applicant(s) will teach the class in Fall 2013 or possibly Spring 2014.

Questions?
Call Erik Stern, the Honors Director, at 626-6186, or e-mail to estern@weber.edu
experience teaching online courses.

Not applicable.

6. I, Dr. Eric Amsel (Department of Psychology Chair), and I, Dr. Christopher Hoagstrom (Department of Zoology Chair), support this application for an Honors Eccles Fellowship. I agree to reimbursement from the Honors Program for the Fellowship, and will not assign overload classes to this faculty member for the duration of the Eccles Fellowship.

Dr. Amsel signature/date: [Signature] 3/1/13

Dr. Hoagstrom signature/date: [Signature] see attached

7. Applicant signature/date: [Signature] 3/1/13

Applicant signature/date: [Signature] 3/2/13

References

1 Casey, B. U.S. Senator (2012). STEM Education: Preparing for the jobs of the future. A report by the Joint Economic Committee Chairman’s Staff.

2 http://www.seas.harvard.edu/images/SPU27-SYLLABUS.pdf;


4 http://web.mnstate.edu/provost/BCBT100/index.html

5 http://www.wlu.edu/x32432.xml
experience teaching online courses.

Not applicable.

6. Dr. Eric Amsel (Department of Psychology Chair), and I, Dr. Christopher Hoagstrom (Department of Zoology Chair), support this application for an Honors Eccles Fellowship. I agree to reimbursement from the Honors Program for the Fellowship, and will not assign overload classes to this faculty member for the duration of the Eccles Fellowship.

Dr. Amsel signature/date: 

Dr. Hoagstrom signature/date:  

7. Applicant signature/date: 

Applicant signature/date: 

References


4. [http://web.mnstate.edu/provost/BCBT100/index.html](http://web.mnstate.edu/provost/BCBT100/index.html)

5. [http://www.wlu.edu/x32432.xml](http://www.wlu.edu/x32432.xml)
Addendum 2

Science and Cooking, Spring 2014

HNRS 3900 (3 credits)
Science and Cooking: From molecules to mouth
Spring 2014
TR 2:30pm-3:45pm
Location Wildcat Room, Shepard Union Building

Professors: Dr. Matthew Schmolesky and Dr. Barbara Trask
Professor’s e-mail: mschmolesky@weber.edu and btrask@weber.edu
**(This is BY FAR the best way to contact us)

Office Phones: Schmolesky: 801-626-8745  Trask: 801-626-6169
Office Hours: Schmolesky: 12:00 – 1:00 PM TR; also by appointment; Trask: 12:00 – 2:00 PM TR; also by appointment

Prerequisite: High school physics and chemistry will be useful. A special review of basic concepts (pH, logarithms, etc.) will be carried out the first week. Additional concepts will be addressed in the context of specific discussion sections.

Important Note: The course involves the preparation and (optional) consumption of food. If you have specific food allergies or needs, be in touch with the instructor to discuss arrangements that might be appropriate.

I. Course sessions and labs: Required lectures, discussions, and lab sessions are combined into the TR two hour blocks. Ordinarily, the first session of a given week will involve lecture, discussion, and mini-experiments to prepare for the second session of the week. In the second session, an hour and a half will consist of a cooking laboratory, which will illustrate the main scientific concepts of the week and culminate in a weekly recipe, which you will both make and eat! Recipes will range from grava lox, to homemade bread and pizza crust, homemade cheese and yogurt, frozen custard. and more (see detailed course schedule). The last half hour of session will be devoted to addressing questions related to homework problems and the scientific concepts of the week. Note: Attendance and preparation is mandatory. A heavy emphasis is placed on reading and thinking about the material prior to each class session.

More specific texts covering the scientific aspects of cooking, and the basic science, are listed below. They will be available in the classroom for student use and/or on reserve in the Stewart Library. Each week there will be assigned readings from *The Science of Cooking* as well as supplementary readings to cover the scientific aspects of the topic of the week.

**Other books on science and cooking that will be available for student use:**
1. *Cookwise*, Shirley Corriher
3. *Kitchen Mysteries: Revealing the Science of Food*, Herve This
4. *The Science of the Oven*, Herve This
7. *Ratio: The simple codes behind the craft of everyday cooking*, Michael Ruhlman
8. *On Food and Cooking*, Harold McGee
9. *Cooking for Geeks*, Jeff Potter
10. *Neurogastronomy: How the Brain Creates Flavor and Why it Matters*, Gordon Shepherd,

**Cookbooks written by chefs:**
1. *Alinea*, Grant Achatz
2. *The Fat Duck Cookbook*, Heston Blumenthal
3. *A Day at El Bulli*, Ferran Adria
4. *Made in Spain*, Jose Andres
5. *A Perfect Finish*, Bill Yosses

**Scientific Books:**
2. *Structured Fluids*, T.A. Witten
3. *Polymer Physics*, M. Rubenstei

**III. Course Objectives**
A. Students will learn about the scientific principles underlying food composition, preparation, and consumption by drawing on many different disciplines (i.e. chemistry, physics, molecular biology, neuroscience, and psychology)

B. Students will gain a deeper appreciation for how the “simple” process of cooking is in fact one of the most complex daily
rituals that humans engage in, and have experimented with for thousands of years.

C. Students will learn about the extraordinary variability in the human population with regards to food appreciation, and will explore how this links to genetic, psychological, and cultural differences.

D. Students will integrate theories of cooking and hands-on experiments with real-life applications so as to make the study of the science of cooking both interesting and meaningful to the students.

E. Students will be encouraged to explore the real-life application of the course materials in their own daily lives and/or in a career related to the subject matter

F. Students will engage with community leaders in the food sciences through the guest chef and guest lecturer sessions.

G. Students will engage with the WSU community and members of the public to discuss the science of cooking through the final project Showcase and Brochure

IV. Canvas – the Course Website
You are required to become familiar with and use the course website via Canvas: www.canvas.weber.edu We will post documents on this site (e.g. copy of syllabus, Powerpoint files, grades, etc.) and will occasionally email students with announcements. For technical issues (e.g. having difficulties accessing Canvas or downloading a document) contact computer support by: a) calling 626-7777, or b) emailing csupport@weber.edu, or (if possible and you prefer it), c) go to Lampros Hall and ask for assistance. Computer support is open 24 hours a day, 7 days a week.

IV. Course Grade
There will be four forms of assessment: a take home mid-term exam, weekly assignments, attendance/participation, and a final project

A. Examination (15% of final grade): A take home essay exam will be assigned and will require an analysis and integration of material from the first five weeks of class. It will be distributed at the end of the fifth week and is due at the end of the seventh week.

B. Weekly Activities (50% of final grade):
1. Preview Summaries (30% of final grade) Ten weekly preview (not “review”) summaries will be graded of the 12 available. These previews will be due at the beginning of the first class for each of the applicable weeks (see Course Outline below). They will be 2-3 page summaries of the assigned readings for the upcoming week, and should include a brief section of bulleted “key points” and bulleted “questions raised.” Each preview will count for 2% of the final course grade. These assignments will be graded on the basis of full credit (3 points), half credit (1.5 points) or zero
credit. Students can skip 2 of the 12 preview assignments without penalty. Alternatively, if all preview summaries are turned in, the lowest two scores will be discarded in the calculation of a student’s final course grade.

2. **Weekly Lab Reports (20% of final grade).** As a lab-based honors course, student preparation and participation is a critical aspect of this course. Student attendance, participation, and engagement will be monitored and graded via lab reports (as documented in a laboratory notebook) and self-assessment tools.

**C. Final Projects and Reports (35% of final grade)**

Each student will carry out a practical project in groups of 2-3 to connect some aspect of cooking to science. The results of these projects will be presented at a Science of Cooking Showcaser, to be held on the last few class sessions. Each student group will create and present a poster describing scientific principle(s), draft a Science of Cooking Brochure detailing their recipe and the scientific cooking process, and will give a cooking demonstration; this will form the basis for grading (details to be provided). The faculty will grade the projects for how well students connect science and cooking. In addition, this “Science of Cooking Fair” will be open to the WSU community and the wider public and, if possible, a panel of local chefs and scientists. Prizes will be awarded to the top groups.

**D. Grading Scale**

The course grade will be assigned according to the scale indicated below:

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V. Course Outline:

**NOTE:** The readings listed below correspond to the food science part of the lectures. We will assign additional readings from the laboratory manual and other sources for the basic science as we go along. Materials taken outside of the course texts (*The Science of Cooking* and *The Kitchen as Laboratory*) will be provided in hardcopy handouts and/or via the course website.

**Week 1: Introduction and Historical Overview**

**Tuesday**
- Readings: *The Science of Cooking* Chps. 1, 2 and 3; *On Food and Cooking* “A Chemistry Primer” (pgs. 811-818)
- Overview of course
- Molecular Gastronomy

**Thursday**
- Section/Lab: Review of basic concepts
- Molecular Gastronomy. Food components: Monomers and polymers and energy
- Three basic components to food: proteins, carbohydrates and fats
- Carbohydrates are polymers of sugars. Proteins are polymers of amino acids
- Enzymes break down polymers into smaller units. Food contains energy
- Sensation and Perception: How we taste and smell
- **Mini Experiment:** Olfactory polymorphisms and abilities; human variation in taste receptor count

**Week 2: The physics of heating and eating**

**Tuesday**
- Methods of heating foods and the importance of cooking material (e.g. metal vs. ceramic)
- Timescale for heating different foods. Heat transfer and heat transfer coefficients.
- Critical temperatures for phase transitions (egg, meat, chocolate). Manipulating temperatures for optimal physical properties.
- **Mini-experiment:** The perfect potato

**Thursday**
- **Recipe of the Week:** *Fresh Herbed Halibut Prepared Sous Vide*
Week 3: Electrostatic Interactions
Tuesday
- **Readings:** *On Food and Cooking, Chp. 1 “Milk and Dairy Products”* (pgs.3-11, 19-23)
- Milk Composition and Interactions between Food Biomolecules
- Protein Denaturation/Aggregation
- **Mini Experiment:** *Homemade Butter, Clarification process (ghee)*

Thursday
- **Recipe of the Week:** *Garlic-Roasted Roma Tomato & Chèvre Bruschetta*

Week 4: Bacterial Metabolism
Tuesday
- **Readings:** *On Food and Cooking, Chp. 1 “Milk and Dairy Products”* (pgs.31-36)
- Acid as a byproduct of bacterial metabolism
- *Streptococcus* (buttermilk) versus *Lactobacillus* (yogurt/sour cream) microbes
- **Mini Experiment:** *Bacterial fermentation of glucose, sucrose, and lactose*

Thursday
- **Recipe of the Week:** *Yogurt Parfaits*

Week 5: pH and its Influences on Protein Aggregation
Tuesday
- **Readings:** *On Food and Cooking, Chp. 1 “Milk and Dairy Products”* (pgs.36-53; *The Kitchen as Laboratory, Chp 1 “The Science of a Grilled Cheese Sandwich”* (pgs. 7-10)
- Lipids and Micelle Formation
- pH and the control of electrostatic molecular interactions
- Calcium-Protein Crosslinks
- **Mini Experiment:** *Milk micelle formation, surface tension, and equilibrium*

Thursday
- **Recipe of the Week:** *Sautéed Onion and Two-Cheese Grilled Sandwiches*
**Week 6: Muscle Structure and Food Preservation**

**Tuesday**
- Readings: *The Science of Cooking, Chps. 6 & 7; On Food and Cooking Chp. 3 “Meat”* (pgs. 82-105)
- Muscle Structure
- Connective Tissue
- Influences of Gravity/Buoyancy on Muscle Structure and Composition
- **Mini Experiment:** *Methods for deboning chicken and fish; tendon, muscle, bone structure*

**Thursday**
- Means of Food Preservation
- **Recipe of the Week:** *Grava lox*

**Week 7: Browning Reactions**

**Tuesday**
- Readings: *The Science of Cooking, Chp. 6* (pgs. 88-90); *The Kitchen as Laboratory, Chp 13 “Maximizing Food Flavor by Speeding up the Maillard Reaction”* (pgs. 91-99)
- Chemical transitions occur at target temperatures
- Carmelization, the Maillard Reaction.
- pH influence on browning reactions
- **Mini Experiment:** *Carmelizing onion vs. carrot in differing pH conditions*

**Thursday**
- Heat and Chemistry can be controlled in subtle ways to manipulate food texture and flavor.
- **Recipe of the Week:** *Steak and Carmelized Leeks with Gorgonzola*

**Week 8: Gluten**

**Tuesday**
- Readings: *The Science of Cooking, Chp 8; The Kitchen as Laboratory, Chp 28 “Innovate: Old World Pizza Crust with New World Ingredients”* (pgs. 224-232); *On Food and Cooking, “Bread, Doughs and Batters”* (pgs. 273-280, 282-313)
- What is Gluten?
- Starch and Protein Composition in Flours
- Flour products of varying textures
Chemical and Physical Influences on Gluten Formation

Mini-Experiment: Heat and fluid effects on flour clumping

Thursday
Recipe of the Week: Margherita Pizza

Week 9: Chemical, Physical and Biological Means of Gas Production
Tuesday
Readings: The Science of Cooking, Chps 10 & 12; On Food and Cooking “Bread, Doughs and Batters” (pgs. 280-282, 300-303); On Food and Cooking “Sauces” (pgs. 327-348);
Biological versus Chemical leavening
Influences on Gas Production by Microbes and Baking Powder/Soda
Mini Experiment: The impact of eggs and variable baking powder on leavening
Thursday
Starch-based Thickening Agents
Viscosity versus Elasticity
Protein-Based and Other Thickening Mechanisms
Recipe of the Week: Dark Chocolate Soufflé with Orange Sauce

Week 10: Air in Foams and as an Insulator
Tuesday
The Structure of Foams
Foam Stabilization
Mini Experiment: Ephemeral milk foams
Thursday
Recipe of the Week: Baked Alaska
Week 11: Emulsification and Gelation
Tuesday
- Readings: The Science of Cooking, Chp.9; The Kitchen as Laboratory, Chp 20 “Taste and Mouthfeel of Soups and Sauces” (pgs.148-154 ) On Food and Cooking, “Sauces” (pgs. 348-366)
- Processes of Gelation, Chemistry and Physics. Chemical Gels (e.g. Using Transglutaminase); Physical gels (e.g. Alginate, Gelatin); How Gelation Can be Tuned.
- Chemical Spherification
- Advanced gelation agents (e.g. transglutaminase [aka:Meat glue])
- Advanced methods for stabilizing foams and emulsions using phase change/gelation.
- Emulsions are mixtures of materials that do not want to mix. Two methods for stabilizing emulsions: (i) vinaigrette solution, kinetic slowing down; (ii) the mayonnaise solution; molecular stabilization. Emulsifiers: egg yolk, lecithin.
- Mini Experiment: Mango Spheres

Thursday
- Recipe of the Week: Salsa Discs with Cilantro Mayonnaise

Week 12: Freezing Point Depression
Tuesday
- Readings: The Kitchen as Laboratory, Chp 17 “Ice Cream Unlimited: The Possibilities of Ingredient Pairing” (pgs. 123-133 ); On Food and Cooking Chp. 1 “Milk and Dairy Products”( pgs. 23-31)
- Crystalization
- Chemical Influences on Ice Crystal formation
- Mini Experiment: The impact of the oil-water coefficient on freezing (alcohols, sugars, and fats)

Thursday
- Recipe of the Week: Flavored Frozen Custards (Cook’s Choice)

Week 13: Neurogastronomy: Sensing Pleasure from Food; Final Projects
Tuesday
- The Kitchen as Laboratory, Chp 31 “The Pleasure of Eating: The Integration of Multiple Senses” (pgs. 254-263); On Food and Cooking “Digestion and Sensation” (pgs. 559-574)
- Auditory, Visual and Olfactory Sensations
• Satiation
• The Neuroscience of ‘Pleasure’
• Mini Experiment: *Aesthetic food plating*

Thursday
• Presentation of final projects

**Week 14: Final Projects**
Tuesday
• Presentation of final projects.
Thursday
• Presentation of final projects; closing remarks

**VI. Additional Information**

**A. Attendance**
Attendance is required for this class and will be monitored. Students will not be penalized for missing 4 of the 28 class sessions. **IF you miss class, there are two things you can do to get the material you missed. You may look on Canvas for the relevant powerpoints and readings, and you may get notes from a classmate. **DO NOT email us or come to our offices to ask what you missed.** It is your responsibility to attend class or, if you cannot, contact a classmate to catch up. Please DO email us or come to our offices for any other purpose if you think we can be of help.

**B. Class Contact**
Often it is necessary to miss a part or all of class. When that happens, or when you have questions that you cannot answer on your own, it is helpful to have the name and number of another student in class that you can contact. Please use the space below to write down the name, email, and phone number of at least two students in this class. AND you can use Canvas to email anyone in the class. Also, be aware that you can email any of your classmates via Canvas.
CONTACT INFORMATION FOR CLASSMATES:

Name: ________________________________ Phone or Email: ________________________________

Name: ________________________________ Phone or Email: ________________________________

C. Class Courtesy
Please be courteous of others when coming late to or leaving early from class. Do not make a habit of arriving late or leaving early as many (including me) find it very distracting. The following behaviors are rude when they take place during class time: a) holding private conversations, b) sleeping, c) reading other material, or d) doing other work.

**POLICY FOR ELECTRONIC DEVICES:** ALL ELECTRONIC DEVICES ARE TO BE OFF AND OUT OF SIGHT/REACH DURING CLASS AND TESTS. Any disruptive behavior will be addressed immediately, and if the behavior does not cease, you will be asked to leave class. Students repeatedly engaging in rude behavior will be counseled to drop the course.

D. Grade Appeals
If, after receiving an exam/assignment back during class, you think a mistake has been made in the grading of your work, please do not ask about this during class. Write/type down on a sheet of paper what your questions are, provide reference to notes in class or specific pages from the book, and turn in these questions to the instructor at the end of the class period. You will receive a response, and any grade adjustment necessary, within one week. THIS IS THE ONLY WAY that your concerns will be addressed. ONLY written questions and comments THAT YOU SUPPORT will be evaluated.

E. Academic Dishonesty/Plagarism/Cheating
I encourage students to work and study together whenever possible. **However, students must hand in their own work.** Whenever you try to pass off someone’s work that is not your own, it is cheating. If you cheat on ANY assignment, you will receive a grade of **E (Failing) for the course.** Plagiarism is when you represent someone else’s ideas or words as your own. For a very detailed description of plagiarism, please go to the web site and review the PLAGIARISM description. You are responsible for knowing what constitutes plagiarism. ANY plagiarism (even unintentional) will result in a failing grade in the course. Please refer to the following web site for a complete listing of infringements that constitute cheating:

http://documents.weber.edu/ppm/6-22.htm.
F. Completing all Work
All assignments must be completed in order for students to pass the course. **Students will receive a grade of I (incomplete) if any work is missing when the final grades are computed.** The grade of I will turn into a UW if the work is not completed in a timely fashion.

G. Students with Disabilities
Any student requiring accommodations or services due to a disability must contact Services for Students with Disabilities (SSD) in room 181 of the Student Service Center. SSD can also arrange to provide course materials (including this syllabus) in alternative formats if necessary.

H. Students’ Rights and Responsibilities
Please refer to the following web site for a complete listing of all WSU student rights and responsibilities: [http://documents.weber.edu/ppm/6-22.htm](http://documents.weber.edu/ppm/6-22.htm)

VII. Grade Record
Please keep a record of the grades you receive on each assignment. You may also access your grades using the grades tool on Canvas. Grades are updated within ~1 week of the end of assignment

NOTE: **The course syllabus provides a general plan for the course.** We are committed to following the syllabus but there is no guarantee that we will. Altering the syllabus may also mean changing the nature or timing of assignments. **By continuing in the course after reading the syllabus, you are indicating that you accept the terms of the syllabus.** xxx is the last day to drop with a W.