Department of Nutrition
University of North Carolina at Chapel Hill

NUTRITION 650/650L
Food Science and Culinary Arts
Spring 2016

I **Lecture:** Wednesdays, 10:10 AM-12:05 PM
241 Rosenau Hall, Nutrition Conference Room
Gillings School of Global Public Health

Lab: Wednesdays, 1:25-4:25 PM
241 Rosenau Hall, Kitchen/Nutrition Conference Room
Gillings School of Global Public Health

II **Professor:** Susan Wyler, MPH, RDN, LDN, wyler@email.unc.edu.
Scheduled appointments: Wednesday 12:15 to 1:00

Lab Assistant: Jaclyn Konich, jkonich@live.unc.edu

III **Course Description**

This graduate course is a core requirement for the combined dietetics program. It introduces the principles of food science and food safety in the public marketplace, in healthcare institutions and in the home kitchen. It describes government regulations and regulatory agencies. Students will learn the physiology and psychology of taste, the physical and nutrient composition of foods and the chemical changes that occur during food production, storage, and meal preparation, with emphasis on how these factors influence the quality, taste and nutrient content of the final product.

The labs will teach culinary techniques and introduce a variety of recipes, emphasizing information learned in lecture. Students will learn general principles of choosing, storing and preparing different categories of food in appropriate and appetizing ways, always with an eye to nutrition whether in a clinical healthcare, public health, or home setting. The goal is to offer some idea of the tremendous possibilities we have in the dietetics profession for using food to promote health and healing as well as to provide comfort and pleasure.

At the same time, students will preform comparative physical and sensory tests that illustrate the principles of product development and quality evaluation. Nutrient composition and cost/benefit analysis will be considered.

IV Course Objectives

The Accreditation Council for Education in Nutrition and Dietetics (ACEND) has identified foundation knowledge and skills that all entry-level dietitians should know no matter which didactic program they complete. The **Foundation Knowledge and Skills** incorporated into this course are:

1. lay and technical writing
2. media presentations
3. interpersonal communication skills
4. concepts of group dynamics
5. the scientific method
6. culinary techniques
7. food and nonfood procurement
8. food and nutrition laws, regulations and policies
9. applied sensory evaluation of food techniques
10. tools used to calculate and interpret nutrient composition of foods
11. functions of various ingredients in foods

By the end of this course, students will have demonstrated the ability to:

1. prepare basic foods and present them appropriately
2. use current information technologies
3. work effectively as a team member
4. use nutrient analysis tools to calculate and interpret the composition of foods
5. modify a recipe for nutritional or dietary purposes
6. apply appropriate techniques to conduct sensory evaluation of foods
7. understand basic culinary terms and techniques
8. use oral and written communication skills in preparing and presenting an education session for the rest of the class

V Course Guidelines and Classroom Behavior

Attendance is mandatory for both lectures and labs; 10 points will be deducted for each missed class; absences requested in advance and excused by instructor or due to illness are exempt. Students will be expected to have read required material for lecture ahead of time and to have prepared for labs where appropriate; all recipes for lab should be printed out in advance. Cell phones must be silent during class.

In lab, students are expected to work quietly and congenially in their assigned groups, showing respect for each other in an attempt to excel at the assigned tasks and complete the lab assignments on time. Long hair should be pulled back or secured with a scarf or cap. Aprons, lab coats or chef jackets are required as are closed-toe shoes. Unless someone has a diagnosed food allergy or religious prohibition, all dishes must be tasted, even if they are not swallowed. Since

sharp knifes and hot surfaces will be used, it is imperative that everyone pays attention and keeps conversation at a minimum, focused on the work at hand. Each station will work together throughout the semester to develop a nutritionally enhanced food product, with criteria to be determined in advance, accompanied by an extended abstract that details the scientific process with appropriate support materials to substantiate the premise.

VI Grading

Grading will consist of approximately 60% for lectures and 40% for labs, with a **total of 1575 points**, broken down as follows:

Lectures (935 pts):

Attendance – 5 points per class for 15 classes = **75 points**

3 Exams based on the lectures = 560 points. Exams will be multiple choice. Students are expected to know the Honor Code and to abide by it during exams.

Exam 1—February 3 = **180 points**

Exam 2 – March 9 = **140 points**

Exam 3 (final) –April 29 = **240 points**

and

*3 Assignments, worth 100 points each = **300 points***

1) Write a Recipe/ Make It Your Own (100 pts); deadline 1/23 by midnight
2) Menu and recipes for a SNAP supper (100 [points): 2/20 by midnight
3) Powerpoint on Dietary Choices/ Nutritional Consequences (100 pts); deadline 4/2 by midnight

Food Labs (640 points):

Lab attendance – 5 pts per class for 15 classes = **75 pts**

Tasting sheet with hedonic rating and critique of recipe chosen by professor explaining how you might change or improve recipe for taste or nutritional purposes (20 pts per sheet) 1 sheet per class for 14 classes = **280 pts**

Clean kitchen end of class (graded by TA) – 5 pts per class, 15 classes = **75 points**

Food science project and abstract: 200 points

Source recipe and concept for project due 4/6.

Completed abstract and shopping list for revised recipe due 4/23 by midnight.

Project presented to class 4/27

Originality of product = 40 pts

Nutritional benefit of product for targeted population = 40 pts

Taste and appetizing quality of product as judged by a panel of peers and instructor = 40 pts

Abstract writing (clarity, grammar, spelling) = 40

Support materials = 40 pts

Critique of peers: required/ **10 bonus points**

Note: The extra grading weight given to lecture is because many of the principles of the lectures are illustrated in the labs; so the multiple choice tests are the best measures of comprehension of the subject matter.

Grading Scale:

GRADUATE		UNDERGRADUATE			
1480 to 1575	H	93-100%	A	77-79%	C+
1260 to 1479	P	90-92%	A-	73-76%	C
945 to 1259	L	87-89%	B+	70-72%	C-
Below 945	F	83-86%	B	60-69%	D
		80-82%	B-	Below 69%	F

VII The Honor Code

"The Campus Code requires students to conduct themselves so as not to impair significantly the welfares or the educational opportunities of others in the University Community. As a student at UNC-CH, you have accepted a commitment to the Honor Code and the Campus Code and the principles of academic integrity, personal honesty and responsible citizenship, upon which they were founded more than 100 years ago. Academic dishonesty in any form is unacceptable, because it circumvents the purpose of the University."

The Honor Code is in effect in this class and all others at the University. As a faculty member, I am committed to treating Honor Code violations seriously and urge all students to become familiar with its terms as set out at - http://instrument.unc.edu. If you have questions, it is your responsibility to ask me about the Code's application. All exams, written work and other projects must be submitted with a statement or initials indicating you have complied with the requirements of the Honor Code in all aspects of the submitted work.

Please note that conduct impairing the welfare and classroom learning experiences of fellow students is a violation of the Honor Code. Disrespectful behaviors include intrusive noise and conversation, rudeness or lack of conversational manners, criticisms of people themselves rather than ideas you disagree with, or leaving the room before the end of class.

Course Schedule and Calendar follow:

VIII NUTR 650/650L SCHEDULE, Spring 2016

Date	Topic
1/13	**Lecture #1**: Course introduction Review of syllabus Psychology and Physiology of Taste How to Read and Write a Recipe **Reading:** Bennion & Scheule, Chapters 1 and 5 **Lab #1**: Introduction to lab procedures, kitchen basics, and cooking techniques Tasting sweet, salty, sour, bitter, umami Knife skills 101
1/20	**Lecture #2**: Food Composition All about the Egg **Readings:** Bennion & Scheule, Chapters 9 and 24 Effect of egg ingestion on trimethylamine-*N*-oxide production in humans: a randomized, controlled, dose-response study. Zeisel et al. *Am J Clin Nutr* 2014; 100:778–86. **Lab #2** Evaluation of food products and recipes Sensory grading of products with hedonic scale Egg cookery
1/23	**Assignment #1 due by midnight: Write a recipe/ Make it your own.**
1/27	**Lecture #3:** Starch, Pasta, Whole Grains and Flours Seasonings, Flavors and Food Additives **Readings:** Bennion & Scheule, Chaps. 8, 13, and 14 Association Between Dietary **Whole** Grain Intake and Risk of Mortality: Two Large Prospective Studies in US Men and Women. Wu H, Flint AJ, Qi Q, et al. JAMA Intern Med. 2015 Jan 5. doi: 10.1001/jamainternmed.2014.6283. [Epub ahead of print] http://www.ncbi.nlm.nih.gov/pubmed/25559238 **Lab #3:** Sauces thickened with roux; discussion of beurre manié, slurry, arrowroot Line test to measure thickness of sauce Whole grain and pasta dishes

Date Topic

2/3 Exam #1

Lecture #4 Food Economics and Convenience
Plant Proteins and Vegetarian Diets
Readings: Bennion & Scheule, Chapter 2 and Chapter 20, pp. 338-344
Lab #5
Cooking beans and tofu

2/10 Lecture #5:

Oils, Fats and Emulsions
Seafood
Readings: Bennion & Scheule, Chaps. 3, 10, and 27
Health benefits of seafood—Is it just the fatty acids? E.K. Lund. http://dx.doi.org/10.1016/j.foodchem.2013.01.034
Lab #4:
Oil and emulsion sauces (vinaigrette, mayonnaise, Hollandaise)
Baked, braised, sautéed and steamed fresh fish. Discuss broiled and grilled. Canned fish.

2/17 Lecture #6:

Poultry
Food Safety
Food Regulations and Standards,
Readings: Bennion & Scheule, Chaps. 3, 4 and 26
Lab #6:
Chicken around the world
How to carve a bird

2/20 Assignment #2: SNAP menu and recipes due by midnight

2/24 Lecture: #7

Cakes and Quick Breads
Heat Transfer
Readings: Bennion & Scheule, Chaps. 6. 16, and 18
Lab #7:
Layer Cake, Cup Cakes, Loaf breads
Exploring "crumb"; how to avoid common mistakes

Date Topic

3/2 Exam #2

Lecture #8

Dairy: Milk, butter, yogurt and cheese

Dairy substitutes

Food labeling and data banks

Readings: Bennion & Scheule, Chaps. 7 and 23

Influence of Dairy Product and Milk Fat Consumption on Cardiovascular Disease Risk. Peter J. Huth and Keigan M. Park. *Adv Nutr*. May 2012; 3(3): 266–285.

Lab #8:

Tasting of different milks and milk substitutes

3/9 Lecture #9

Microwave cooking

Yeast Breads

Guest lecturer: Rob Segovia-Walsh of Chicken Bridge Bakery

Readings: Bennion & Scheule, Chapters 7 and 17

Lab #9:

Pizza

3/11 Spring Break

3/23 Lecture #10

Sugar and other sweeteners, syrups and crystals

Beverages

Readings: Bennion & Scheule, Chapters 11 and 28

"Not so sweet—artificial sweeteners can cause glucose intolerance by affecting the gut microbiota" by Claire Greenhill. *Nature Reviews Endocrinology* **10**, 637 (2014).

Lab #10:

Sugar and artificial sweetener taste evaluation

Syrups

Crystallization

3/30 Lecture #11

Pastry and Biscuits

Food Preservation and Packaging

Readings: Bennion & Scheule, Chapters 19 and 29

Lab: #11

Flaky pastry, filo, puff pastry, Southern biscuits

Date Topic

4/2 Assignment #3 due by midnight. Powerpoint on Dietary Choices/ Nutritional Consequences

4/6 Lecture #12:
Meat, fresh, cured and processed
Presentation of Powerpoints on Dietary Choices
Readings: Bennion & Scheule, Chapter 25
Lab: #12
Fast and slow meat cookery: beef, pork and lamb
Recipe and Concept for Final Lab Project and Abstract due today

4/13 Lecture #13
Ice Cream and Frozen Desserts
Freezing and Canning
Readings: Bennion & Scheule, Chapters 12 and 30
Lab #13
Assembled frozen desserts
Ice cream beverages

4/20 Lecture #14
Fruits and Vegetables
Guest lecturer on Mediterranean diet and polyphenols: Dr. John B. Anderson
Readings: Bennion & Scheule, Chapters 20, 21, and 22
Diet and the Bone Marrow Niche for Stem Cell Recruitment. Xiaowe29, No. 5, May 2014, pp 1041–1042 DOI: 10.1002/jbmr.2234
Lab #14:
Compare steamed, boiled, microwaved, and roasted asparagus
Effects of acid and alkaline influences on color and texture
Salads: Tossed, composed, main course, fruit

4/23 Abstract and shopping list for Food Lab Project recipe due by midnight.

4/27 Class #15 Review for final
Prep for recipe presentation
Lab #15:
Lab Project: Food Product presented to class
Presentation of developed recipes and abstracts in lab

4/29 FINAL EXAM at 8:00 AM