Food Chemistry
FDSC 4304, FDSC 5304, FDSC 4304L and 5304L
Course Syllabus: Fall Semester 2017

Lecture: TuTh 11:00 a.m. to 12:15 p.m. Location: FDSC D2
Lab: Tuesday or Thursday 1:30 p.m. to 4:20 p.m. Location: FDSC C5
4 credit hours

Instructor: Dr. Philip Crandall Office: FDSC N-213
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Lab instructor Jeff Clark Office: FDSC B 10
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The best way to connect with Mr. Clark or Dr. Crandall is by e-mail, or you may call or see him after class to arrange an appointment.

This syllabus may seem long but please read thoroughly!
The information included will help you succeed in this class.

Catalog description
You will learn how the components in food affect the quality and safety. You will gain an understanding of how water, carbohydrates, lipids, proteins, vitamins, and minerals in foods; biochemical and functional properties, enzymes, food additives (emulsifiers, pigments, colors, flavors, preservatives, and sweeteners) and texture related to properties in food systems and are modified during processing.

Lecture two 90 minute lectures and one 3 hour laboratory per week.
Corequisite: You must enroll in the lab component.

Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L or (CHEM 3603 and CHEM 3601L).

Course outcomes
Students will be able to identify the structure of food constituents, relate this structure to the constituents' function and describe the constituents' roll in respect to food quality, nutrition, safety, processing, etc. Students will also be able to differentiate chemical interactions, reactions of food components, their effect on sensory, nutritional and functional properties of foods and how processing influences these reactions. The student will be able to explain how environmental factors such as temperature, pH, ionic characteristics and strength, bonding, light, etc. effect chemical changes in food systems and be able to adjust these conditions to improve or minimize chemical and biochemical deterioration of food systems. In your professional career, you will be able to integrate chemistry and biochemistry principles into real-world food science, engineering, microbiological and nutritional problems.

Required Text

Food Chemistry, 4th Edition. 2008. S. Damodaran, K.L. Parkin, O.R. Fennema Eds. CRC Press, Boca Raton, FL

The 5th Edition. 2017. Has just been released. If you plan on keeping this as a reference book, I'd highly recommend spending the extra money on the 5th ed.

Recommended Supplemental Reading

Extra reading material will be posted on Blackboard for most lectures. This material may be used for in class questions and exercises and some questions on exams may come from this material. You may also use this material as references for your laboratory pre lab questions or on lab reports. If you use this material for references please remember to site it properly. All laboratory and lecture notes and materials are the intellectual property of the instructors and may NOT be copied or sold.

Attendance

Attendance at the lectures and laboratory exercises is mandatory. Attendance and participation assessments are part of this class. Absences should be justified and you should contact the instructor prior to the class period you will miss.

Exams

A total of three (3) exams will be administered over the course of the semester during the lecture period. There is no comprehensive final for this class. Each exam will be worth 13% of the final grade. The tentative exam schedule is as follows:

Exam 1: Tuesday, September 26, 2017
Exam 2: Thursday, November 2, 2017
Exam 3: Thursday, December 7, 2017

The exams will be taken in Blackboard and you must have the Lockdown Browser software downloaded onto your laptop prior to the first exam. If you do not have a laptop inform the instructor at the first opportunity. If it is known ahead of time that you need to miss an exam, please see the instructor to make the proper arrangements.

Use of computers and cell phones during class

Students are strongly encouraged to use a laptop computer to take notes in class. **Laptops are required for exams.** Students caught using computers for things other than taking class notes, researching an in class assignment or taking an exam will be asked to leave class and will lose in-class computer privileges for the remainder of the semester. Cell phones are to be used in class only during the designated mid-lecture break. Students whose phones ring may be asked to leave class. Students using a cell phone for other purposes in class (other than a designated emergency as described in a further section) will be considered in violation of academic honesty rules and will be

reported for sanctions. These policies have been developed on the recommendations of previous students who found the inappropriate behavior distracting to their learning.

Evaluation method

All assignments and answers on exams will be expected to be of professional quality. Laboratory reports are due generally two weeks after the lab exercise or as noted on the lab syllabus. No late assignments will be accepted without prior approval from the instructor. The grade for this course will be determined as follows:

Category	**Weight**
Exams (3)	39%
Attendance and participation (lecture)	11%
Laboratory	50%

Final grades will be determined according to composite score by the grading system approved by UAF campus faculty:

93-100 =	A
90-92 =	A-
87-89 =	B+
83-86 =	B
80-82 =	B-
77-79 =	C+
73-76 =	C
70-72 =	C-
67-69 =	D+
63-66 =	D
60-62 =	D-
< 60 =	F

Academic Integrity

As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each University of Arkansas student is required to be familiar with and abide by the university's Academic Integrity Policy at honesty@uark.edu . Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor. Using another (previous) students laboratory write-up; selling your notes or the Instructor's Power Points is strictly forbidden.

Need for Special Services

If you are eligible for services through special campus services, Campus Access, including services for learning disabilities, you need to inform the instructor within the first two weeks of class so that he can institute services for you.

Weather and Flu Policy

The class will be held whenever possible. However, in the event of bad weather conditions which make it impossible for the instructor to come to class, class will not be held. Please listen to media outlets and check the University web page for closures. If the Fayetteville School System or the University are closed due to bad weather we will not have class or lab and your absence will not count against you. If the instructor cannot get to class he will attempt to email your UARK account to cancel class. This means it is your responsibility to keep your inbox cleaned out so you can receive messages. You also have a right to make a personal decision to not attend class; if it is dangerous for you to do so due to weather conditions where you will be commuting from, then stay home.

If you are sick with the flu or other illness, please stay home and do not expose your fellow students or the instructors. E-mail and let us know how you are doing.

Emergency Procedures

The following information has been provided to us from the Provost's office.
Many types of emergencies can occur on campus; instructions for specific emergencies such as severe weather, active shooter, or fire can be found at emergency.uark.edu

Severe Weather (Tornado Warning):

- Follow the directions of the instructor or emergency personnel
- Seek shelter in an interior room or hallway on the lowest floor, putting as many walls as possible between you and the outside
- If you are in a multi-story building, and you cannot get to the lowest floor, pick a hallway in the center of the building
- Stay in the center of the room, away from exterior walls, windows, and doors

Violence / Active Shooter (CADD):

- CALL-9-1-1
- AVOID-If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.
- DENY-Barricade the door with desk, chairs, bookcases or any items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police its safe.
- DEFEND-Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.

Proposed lecture schedule (subject to change):

Date	Lecture #	Topic	Reading assignment
Aug. 22	1	Introduction, review	
Aug. 24	2	Water	pp. 18-41 Ch. 2
Aug. 29	3	Water activity	pp. 41-48, 65-77 Ch. 2
Aug 31	4	Gels, emulsions, foams	pp. 784-787, 809-810 Ch. 13
Sept. 5	5	Introduction to carbohydrates	pp. 84-106 Ch. 3
Sept. 7	6	Starch carbohydrates	pp. 108-134 Ch. 3
Sept. 12	7	Other carbohydrates	pp. 135-151 Ch. 3
Sept 14	Guest speakers from the food industry		
Sept. 19	8	Browning reactions	pp. 860-867 Ch. 14
Sept. 21	9	Lipid components	pp. 156-164 Ch. 4
Sept. 26	EXAM 1 (Lectures 1-8 & labs)		
Sept. 28	10	Properties of lipids	pp. 164-176 Ch. 4
Oct. 3	11	Lipid process, functionality	pp. 178-186 Ch. 4
Oct. 5	12	Lipid deterioration	pp. 186-208 Ch. 4
Oct. 10	13	Amino acids, protein structure	pp. 219-246 Ch. 5
Oct. 12	14	Protein denaturation & functionality	pp. 247-296 Ch. 5
Oct. 17	FALL BREAK		
Oct. 19	15	Protein processing & modification	pp. 296-323 Ch. 5
Oct. 24	16	Milk & meat proteins	pp. Ch. 15, 16
Oct. 26	17	Enzymes I	pp. 332-361 Ch. 6
Oct 31	18	Enzymes II	pp. 361-426 Ch. 6
Nov. 02		EXAM 2 (Lectures 9-18 & labs)	
Nov. 07	19	Vitamins	Ch. 7
Nov. 09	20	Minerals	Ch. 8
Nov. 14	21	Pigments and natural colors	pp. 572-616, Ch. 9
Nov. 16	22	Color additives	pp 619-632, Ch. 9
Nov. 21	23	Flavors	Ch. 10
Nov. 23	THANKSGIVING		
Nov. 28	24	Additives	pp. 690-714 Ch. 11
Nov. 30	25	Additives-sweeteners & fat replacers	pp. 715-722, 727-729 Ch. 11
Dec. 05	26	Bioactive compounds	Ch. 12
Dec. 07	EXAM 3 (Lectures 18-26)		