

COURSE OUTLINE
FDSC 4113: Food Analysis

Instructor: Ya-Jane Wang, Ph.D.
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Office hours: You may make an appointment or just drop in.

Catalog Description: FDSC 4113 - Food Analysis (SP) Methods of analysis, instrumentation, and laboratory techniques for measuring the chemical composition of raw and value-added products. Lecture 3 hours, laboratory 3 hours per week. Corequisite: FDSC 4111L - Laboratory exercises providing students with experience of analytical techniques and instrumentation used in food analysis. Laboratory exercise in Food Analysis. Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L.

Textbook: Nielsen, S.S. (ed.) 2010. "Food Analysis" 4th Ed. Springer. ISBN: 978-1-4419-1477-4.

References: Official Methods of Analysis of AOAC International 18th Ed. 2005.

Course Objectives:

1. To learn the basic principles of gravimetric, colorimetric, titrimetric, chromatographic and spectrometric analyses as applied to foods
2. To gain knowledge about food constituents and characteristics important in quality control and research laboratories
3. To gain experience in searching the literature, evaluating data, problem-solving and writing scientific reports as related to food composition and analysis

Class Procedure: Two 75-min lectures per week in Room D2.

Assignments: Students will be assigned homework problems to reinforce discussions. Students are encouraged to work with other students in the class.

Evaluation Methods: All assignments and exams will be expected to be professional quality. No late work will be accepted without prior approval from the instructor. No make-up exams will be given unless if there is advanced permission and justifiable reason for missing the exam. Make-up exam will be comprehensive and taken during the final week. The grade for this course will be mainly determined as the follows. However, changes may be made to accommodate additional assignments.

<u>Category</u>		
Undergraduate:	2 midterm exams – 25% each	50%
	Final exam – comprehensive	30%
	Quiz and assignment	15%
	Participation & attendance	5%
Graduate:	2 midterm exams – 25% each	50%
	Final exam – comprehensive	25%
	Quiz	15%
	Teaching assignment	10%

<u>Composite Score</u>	<u>Grade</u>
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-
Below 60	F

Graduate Students: Graduate students taking this course for graduate credits will be required to work on an additional assignment. Each graduate student will be required to give a presentation on a topic assigned by the instructor.

Attendance: Every student is expected to attend and participate in class because attendance and participation strongly affect class performance. The student is responsible for obtaining notes and materials for the class he/she misses.

Class cancellation: Class will be cancelled as a result of inclement weather if the University is closed. If other emergencies occur, students will be notified as soon as possible. You can contact Dr. Ya-Jane Wang by calling 479-575-3871 (work) or by e-mail at yjwang@uark.edu.

Academic honesty: 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' which may be found at <http://provost.uark.edu/245.php>

There are companies that will try to lure you into selling the notes you take in this class. Don't let these companies take advantage of you. Selling my notes to any commercial service I will consider a violation of my intellectual property rights and/or copyright law as well as a violation of the U of A's academic integrity policy. Continued enrollment in this class signifies intent to abide by the policy. Any violation will be reported to the Office of Academic Initiatives and Integrity.

Students with disability: If you need an accommodation due to a disability, please make arrangements to discuss this with the instructor during the first two weeks of the semester.

Emergency Procedures: 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 the basement or 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 it's safe.
- **DEFEND-** Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.

Lecture and Lab Topics and Tentative Schedule:

Week	Lecture Topics	Laboratory Topics
1 Jan. 19	Chapters 1-5 Introduction, Nutrition labeling Evaluation of analytical data Sampling and sample preparation	Lab overview: guidelines, safety, and report Introduction of lab facility
2 Jan. 26	Chapter 13 Standard solution pH and Titratable acidity	Lab 1: Review of basic operations
3 Feb. 2	Chapter 6 Moisture and total solid analysis	Lab 2: Acids, bases, pH, and Titratable acidity
4 Feb. 9	Chapters 7 & 12 Ash analysis Mineral analysis	Lab 3: Sample preparation Moisture analysis and dry ashing
5 Feb. 16	Chapters 12 & 9 Mineral analysis and Protein analysis	Lab 4: Mineral analysis
6 Feb. 23	Chapters 15 & 8 Protein separation and characterization Fat analysis Review	Lab 5: Protein analysis
7 Mar. 2	Exam 1 Chapter 14 Fat characterization	Lab 6: Crude fat analysis
8 Mar. 9	Chapter 10 Carbohydrate analysis	Lab 7: Fat characterization
9 Mar. 16	Chapters 11 & 16 Vitamin analysis Enzyme-catalyzed reaction	Lab 8: Carbohydrate analysis
10 Mar. 23	Spring break	Spring break
11 Mar. 30	Chapters 21 & 22 Principles of spectroscopy Review	Lab 9: Total dietary fiber Glucose determination by enzymatic assay
12 Apr. 6	Exam 2 Chapters 22 & 23 UV-Vis and fluorescence spectroscopy	Lab 10: Ascorbic acid analysis Infrared spectroscopy demo
13 Apr. 13	Chapters 23 & 24 IR, AA and AE Spectroscopy	Lab. 11 Analytical Lab tour or GC/HPLC/DSC demo
14 Apr. 20	Chapters 27 & 28 Principle of Chromatography and HPLC	Lab. 12 Problem solving in food analysis – Team project
15 Apr. 27	Chapters 29 & 31 GC and Thermal analysis	Lab. 12 Problem solving in food analysis – Team project
16 May 4	Review	Project presentation
17 May 11	Final Exam (~50% new materials after Exam 2 and ~50% materials from Exams 1 & 2)	