

FDSC 6123
Food carbohydrate chemistry

Spring 2007

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

Catalog Description: FDSC 6123 - Food Carbohydrate Chemistry (SP, Odd years). Focus is on carbohydrate chemistry including molecular structures and physical properties, production and food applications, analytical methods for food carbohydrates, and interactions among food polysaccharides. Lecture 3 hours per week. Prerequisites: FDSC 4304 or consent of instructor.

Textbook: No required textbook. Handbook will be provided.

References:

1. Carbohydrate chemistry for food scientists. 1997. R.L. Whistler and J.N. BeMiller.
2. Food polysaccharides and their applications. 1995. A. Stephen.
3. Carbohydrates in food. 1996. A.-C. Eliasson
4. Starches. 1999. D.J. Thomas and W.A. Atwell.
5. Essentials of carbohydrate chemistry. 1998. J.F. Robyt.

Course Objectives:

1. To understand the molecular structures of carbohydrates and their properties, functionalities, and applications.
2. To study the carbohydrate derivatives via chemical, physical, and enzymatic modifications.
3. To study the analytical methods to characterize carbohydrates.
4. To introduce various areas of research and research techniques employed in carbohydrate chemistry.

Class Procedure: Two 80-min lectures per week.

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

Special Topic Assignment:

Each student is required to select one or two polysaccharide for study and presentation from a list of polysaccharides provided by the instructor. Each student is expected to work with the instructor to fully understand the topic to be able to prepare for the presentation. The

presentation will include handout, power point presentation, and demo to explain the structure and properties of the chosen polysaccharide(s). The demo products need be prepared by the student in the lab to illustrate their unique properties. The detailed format will be provided by the instructor.

Evaluation Methods:

All homework, special topic assignment 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. Extra credits may be given to active class participation and perfect attendance.

Two midterm exams - 20% each	40%
One comprehensive final exam	30%
Special topic assignment	20%
Homework	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

Attendance: Every student is expected to attend and participate in class. The student is responsible for obtaining notes and materials for the class he/she missed.

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 575-3871 (work) or by e-mail at yjwang@uark.edu.

Academic honesty: The University policy for academic honesty will be followed. It is our intention that no student will receive a credit if a dishonest act on his or her part is evident relative to the work assigned. Students are expected to work independently on term papers.

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

Lecture Topics and Tentative Schedule:

Week	Date	Topics
1	Jan. 15-19	1. Introduction 2. Monosaccharides
2	Jan. 22-26	2. Monosaccharides 3. Disaccharides
3	Jan. 29-Feb. 2	4. Mono- and di-saccharides: Analysis 5. Mono- and di-saccharides: Chemical reactions
4	Feb. 5-9	6. Mono- and di-saccharides: Properties and applications 7. Oligosaccharides
5	Feb. 12-16	8. Sugar alcohols 9. Cyclodextrins
6	Feb. 19-23	10. Fatty acid esters and polyesters of saccharides Review
7	Feb. 26-Mar. 2	1 st exam 11. Polysaccharides
8	Mar. 5-9	12. Starch: Sources, isolation, structure, and organization
9	Mar. 12-16	13. Fractionation and characterization of starch components
10	Mar. 19-23	Spring break
11	Mar. 26-30	14. Starch: Properties and applications
12	Apr. 2-6	15: Starch hydrolysates 16. Modified starches
13	Apr. 9-13	16. Modified starches 17. cellulose Review
14	Apr. 16-20	2 nd exam 18. Pectin 19. Seed galactomannan
15	Apr. 23-27	20. Agar Special topic presentation
16	Apr. 30-May 4	Special topic presentation and review
17	May 7-11	Final exam

