

FS542- Food Chemistry II: minor components and food additives

Instructor: <PROF_FULL_NAME>, 344 chenoweth lab., office phone: <PHONE>

Email: <PROF_EMAIL> Office hour: by appointment

Expected Outcomes:

1. To develop an understanding of the fundamental chemistry of food minor components (e.g. minerals, vitamins, nutraceuticals), direct food additives (e.g. colors, flavors, preservatives, texture modifiers & stabilizers), incidental food additives (e.g. processing aids, chemical toxins), intentional adulterants, allergens etc.
2. To develop an understanding of the key functional attributes of minor food components, direct and incidental food additives of how they contribute to the overall quality attributes such as nutrition, flavor, texture, stability, and appearance and safety attributes.
3. To be able to utilize knowledge of food chemistry to improve the quality, diversity, convenience, safety, and healthfulness of the food supply.

Expected Knowledge:

Organic chemistry is required and FS541-Food chemistry I is preferred.

Textbooks:

Introductory Food Chemistry (optional). John W. Brady. 2013. Cornell University Press.
ISBN-13978-0-8014-5075-4.

Fennema's Food Chemistry (optional). S. Damodaran, K.L. Parkin, O.R. Fennema (2007), 4th Edition, CRC Press, ISBN: 9780849392726.

Chemistry of food additives and preservatives (optional). Titus A M Msagati; Oxford ; Ames, Iowa : Wiley-Blackwell, 2013.

Free ebooks through UMass online

Food: The Chemistry of its Components (recommended). T.P. Coultate (2009)., 2nd Edition, Royal Society of Chemistry, ISBN 978-0-85404-111-4.

https://umass.worldcat.org/title/food-the-chemistry-of-its-components/oclc/773924197&referer=brief_results

Essential guide to food additives. Victoria Emerton; Eugenia Choi. Leatherhead, Surrey : Leatherhead Food International ; Cambridge, U.K. : Royal Society of Chemistry, 2008.

https://umass-worldcat-org.silk.library.umass.edu/title/essential-guide-to-food-additives-4th-edition/oclc/985274935&referer=brief_results

Food stabilisers, thickeners, and gelling agents. Author:A Imeson; Wiley InterScience Ames, Iowa : Blackwell Pub., 2010.

<https://onlinelibrary-wiley-com.silk.library.umass.edu/doi/book/10.1002/9781444314724>

Chemical food safety. Leon Brimer. Wallingford, Oxfordshire ; Cambridge, MA : CABI, 2011.
https://umass-worldcat-org.silk.library.umass.edu/title/chemical-food-safety/oclc/826490386&referer=brief_results

Grading:

The grade for this course will be determined by four online quizzes (10% each, 40%), homework and in-class discussions (10%), middle exam (20%), final exam (30%), and bonus points (max 3%)

Online quizzes: there will be 4 online quizzes on moodle. Each quiz will be open for 48 hours. Late submission will have 50% off. Overdue 3 days will receive 0.

Homework - (deadline 11/3, 11:59pm)

Find a package of your favorite food (ingredient list no less than 15) and list the function(s) of all the ingredients. If you find the food additives that are not covered in the class. Please list chemical name of the additive, its function, chemistry, and applications in food products.

Homework will be discussed and graded in class by peers. You must attend the class to receive the grade. If you are not able to attend the class due to excusable reasons, you need to inform the instructor ahead of time.

Exams: middle and final exams are both online open book exam at designated time (48 hours). For students that are not able to attend at the designated time due to excusable reasons (such as being sick with a doctor's note, or having 4 other exams during the 48 hours with instructor's proof), upon approval, make-up exams will be scheduled with a set of different questions. You need to inform the instructor ahead of time.

Middle exam: Oct 21th (10:10am)-Oct 23th (10:10am), Late submission will have 50% off. Overdue 3 days will receive 0.

Final exam: Dec 12th (10:10am) to Dec 14st (10:10am), Late submission will have 50% off. Overdue 3 days will receive 0.

Bonus points- (deadline 12/8, 11:59pm)

Optional -- Find a food package with a special food additive in the label and share it in class. The specific food additives for bonus points will be released in the class. You will present the food products (not photo) during the 12/9 class time. You must attend the class to receive the bonus point. If you are not able to attend the class due to excusable reasons, you need to inform the instructor ahead of time.

Accommodation Policy Statement:

The University of Massachusetts Amherst is committed to providing an equal educational opportunity for all students. If you have a documented physical, psychological, or learning disability on file with Disability Services (DS), Learning Disabilities Support Services (LDSS), or Psychological Disabilities Services (PDS), you may be eligible for reasonable academic

accommodations to help you succeed in this course. If you have a documented disability that requires an accommodation, please notify me within the first two weeks of the semester so that we may make appropriate arrangements.

Academic Honesty:

It is expected that all graduate students will abide by the Graduate Student Honor Code and the Academic Honesty Policy (available at the Graduate Dean's Office, the Academic Honesty Office (Ombud's Office)) or online at:

(http://www.umass.edu/gradschool/handbook/univ_policies_regulations_a.htm).

Sanctions for acts of dishonesty range from receiving a grade of F on the paper/exam/assignment or in the course, loss of funding, being placed on probation or suspension for a period of time, or being dismissed from the University. All students have the right of appeal through the Academic Honesty Board.

Course Schedule:

Overall introduction 9/7

Minerals 9/9, 9/12

Vitamins 9/14, 9/16

Nutraceuticals 9/19, 9/22, 9/24

Online quiz-1 9/26

Colors 9/28, 9/30

Flavors 10/3, 10/5, 10/7

Preservatives 10/12, 10/14

Online quiz-2 10/17

Review for middle exam 10/19

Online Middle Exam 10/21

Stabilizers & thickeners & gelling agents 10/24, 10/26,

Emulsifiers 10/28

Fat replacer 10/31

Flour treatment agents 11/2

In class group discussion on homework-1 11/4 (deadline 11/3, 11:59pm)

Processing aids 11/7

Pesticides in food 11/9, 11/14, 11/16

Organic food vs regular food 11/18

Online quiz-3 11/21

No class on 11/22

Food allergens 11/28

Engineered nanomaterials 11/30

Food adulteration 12/2

Online quiz-4 12/5

Review for final exam 12/7

In class bonus point presentation 12/9 (deadline 12/8, 11:59pm)

Final Exam

University scheduled time:

12/19/2022, Monday	10:30AM - 12:30PM
Make-up	

The final exam will be open between

12/12/2022 10:10am to 12/14/22 10:10am (48 hours)