

NFS386H1F - Food Chemistry

2022 Fall Term

Tuesday, 9 am-12 pm.

MP 202

Course Description

This course deals with the chemical composition of food, physical, chemical, and biochemical reactions, and the impact of these reactions on food quality during postharvest/post-mortem processing, storage, and utilization.

Prerequisites: CHM138H/CHM139H/CHM135H/CHM136H or equivalent 1st-year university chemistry course

Recommended preparation: NFS284H

Learning Objectives

By the end of this course, the students will be able to:

- Describe the relationship between the chemical composition of food and food quality
- Explain why certain ingredients are used in foods
- Explain the rationale for specific food processes.

Course instructor: Dr. Amel Taibi

Department of Nutritional Sciences
1 King's College Circle, MSB 5354B
Email: amel.taibi@utoronto.ca

Office hours: Offered virtually (online) over Microsoft Teams OR in-person; available by appointment. Consultations are welcomed and highly encouraged. Please contact your instructor by email to arrange a meeting.

Class activities

- Lectures: Weekly; In-person delivery in McLennan Physical Laboratories MP202 at 255 Huron Street.
- The classes will be held on Tuesdays from 9:00 am to 12:00 noon, beginning September 13, 2022
- The instructor, teaching assistants, and students will be expected to follow the University's policy and the provincial guidelines for in-person attendance and interaction during class hours.

Course materials

There is no required textbook for this course. Some introductory texts that you might find helpful, as references for your assignments are available online from the library:

Belitz HD, Grosch W, Schieberle P. 2008. Food Chemistry. Springer-Verlag.

<https://books-scholarsportal-info.myaccess.library.utoronto.ca/en/read?id=/ebooks/ebooks0/springer/2010-02-11/2/9783540699347#page=1>

Clark, S ; Jung, S ; Lamsal, B. 2014. Food processing: principles and applications. Wiley Blackwell.

<https://books-scholarsportal-info.myaccess.library.utoronto.ca/en/read?id=/ebooks/ebooks3/wiley/2014-07-31/1/9781118846315>

Coulate, T. P. (2009). Food - The Chemistry of its Components (5th Edition). Royal Society of Chemistry. Online version available at:

https://app.knovel.com/web/toc.v/cid:kpFTCCCE001/viewerType:toc//root_slug:food-chemistry-its-components

Hui Y. H. (ed). (2006). Food biochemistry and food processing 1st ed. Blackwell Publishing Professional.

<https://books-scholarsportal-info.myaccess.library.utoronto.ca/en/read?id=/ebooks/ebooks2/wiley/2011-12-13/1/9780470277577>

Nielsen, S. S. 2010. Food analysis. Springer.

<https://books-scholarsportal-info.myaccess.library.utoronto.ca/en/read?id=/ebooks/ebooks2/springer/2011-04-28/5/9781441914781>

Ramaswamy, H. S and Marcotte, M. 2006. Food processing: principles and applications. CRC Press.

<https://books-scholarsportal-info.myaccess.library.utoronto.ca/en/read?id=/ebooks/ebooks2/taylorandfrancis/2013-03-25/2/9780203485248>

Vaclavik VA, Christian EW, Campbell T. 2020. Essentials of Food Science. Springer

<https://link-springer-com.myaccess.library.utoronto.ca/book/10.1007%2F978-3-030-46814-9>

Course Overview and Assessment

Course Outline

Date	Topic
Week1: Sept 13	<u>Lecture 1</u> Course Overview Concepts in food science and technology Food Processing
Week2: Sept 20	<u>Lecture 2:</u> Discussion of Course Assignments Sensory Evaluation
Week3: Sept 27	<u>Lecture 3:</u> In-person only. The lecture slides will be posted on Quercus (no recording) Water
Week4: Oct 4	<u>Lecture 4-part 1:</u> Carbohydrate Chemistry: Monosaccharides, disaccharides, artificial sweeteners, polyols, polysaccharides
Week5: Oct 11	TERM TEST: In-person (multiple choice-open books)
Week6: Oct 18	<u>Lecture 4-part 2:</u> Carbohydrate Chemistry concluded
Week7: Oct 25	<u>Lecture 5-part 1:</u> Lipid chemistry: fatty acid chemistry; commercially-important fats and oils; manufacture of regular and calorie-reduced margarine; oxidation and rancidity; emulsions and emulsifiers; salad dressing; fat replacers
Week8: Nov 2	<u>Lecture 5-part 2:</u> Lipids concluded
Week9: Nov 8	Fall Reading Week–NO CLASS
Week10: Nov 15	<u>Lecture 6-part 1:</u> Protein chemistry: amino acid chemistry; peptides; flavor enhancers; hydrolyzed vegetable protein; browning reactions; milk proteins; casein and casein micelles; whey proteins; fluid milk and pasteurization; yogurt and cheese; egg proteins; sweet proteins
Week11: Nov 22	<u>Lecture 6-part 2:</u> Protein chemistry concluded Meat products: post-mortem changes; myoglobin pigments and the curing of meats; comminuted meat products
Week12: Nov 29	<u>Lecture 7:</u> Plant products: major cereal grains; legumes; vegetable pigments and flavoring compounds; fruits and the ripening process; coffee and tea
Week13: Dec 6	<u>Lecture 8:</u> Technologies in the vitamin and mineral fortification of food

Assessment breakdown

Assessment	Value (%)	Due Date
Food Chemistry Reading paper: Online Quiz	1	Fri Sep 30 (9 am)
Assignment Question: online submission	2	Fri Oct 7 (9 am)
Term Test (Open Book-multiple choice–on all material covered up to the end of Week 4, including Food Chemistry Reading Assignment) In-person test	23	Tues Oct 11 (9:15 am)
Annotated bibliography: online submission	3	Tues Oct 18 (9 am)
Participation: In class	1	Tues Sep 12-Dec 6
Research Paper: online submission	30	Tues Nov 15 (9 am)
Final Exam (Open book-multiple choice-covers all lecture material, ~90% of the final exam will be on lectures after the term test). In-person exam	40	Dec exam period
Total	100	

The term test and exam in this course will be held in person, in class. The test and exam will be open-book multiple choices. You can bring any information, on paper, into the test that you feel will assist you; this can be course materials from Quercus, e.g., PowerPoint slides, your notes, publications, textbooks, dictionaries, etc. To prepare for your exam, you should concentrate on understanding the lecture topics and study sufficiently to be able to recall most of the course information, in a way that is no different from a conventional test or exam. The advantage of the open-book exam is that you have the ability to double-check information and you won't blow a question just because you can't recall a specific fact. But to exploit this advantage fully, you have to organize the material that you bring into the test room in a way that will allow you to find information quickly. If you can't find information quickly, you will run out of time. Also, don't get lulled into a false sense of security. You won't have time to check every single question; you still need to know your stuff!

Important course policies:

NO ASSIGNMENT WILL BE ACCEPTED after the due date and time for online submission except for compelling reasons such as illness, personal distress, or family emergency. Please contact Dr. Taibi by email (amel.taibi@utoronto.ca) to request an extension, before the due date, if possible. You will be asked to provide a reason for the request. This can be a written explanation from you or a medical certificate <http://www.illnessverification.utoronto.ca/index.php>. Verbal explanations can also be provided. All discussions are treated as confidential. Students dealing with intense or ongoing personal distress or chronic illness, who may need special and continuing accommodation, may be asked for additional documentation and are advised to discuss their situation with their college registrar.

Please note that poor time management, having several assignments due at the same time, having to study for term tests, etc are generally NOT compelling reasons for an extension. Students are expected to complete their assignments as best they can, hand them in on time, even if incomplete, and accept that they may not get as high a grade as they would like.

If you feel you have a compelling reason that cannot be easily documented or are uncertain if your reasons are compelling, you should ideally discuss this with Dr. Taibi before the assignment due date. If this is not possible then **FIRST** hand in as much of the assignment as you possibly can on the due date and **THEN** contact Dr. Taibi to discuss your situation.

Missed term test.

Except for compelling reasons such as those described in the policy regarding late assignments, all students will be given a grade of ZERO if they miss the term test. There are NO MAKE-UPS. If you miss the term test (worth 23%), for compelling reasons, your final exam will be worth 63% of your final grade (23% +40%). If you miss the term test, please contact Dr. Taibi IMMEDIATELY. You will be asked to provide an explanation for your absence; see the description above, in late assignments section, for ways to do this.

Reassessment of assignment grades:

If you have concerns about the grades on any of your assignments, you may request a re-read. Details on how to do this are described in the assignment handout.

Missed final exam:

Policy regarding a missed final exam is determined by the Faculty of Arts and Science. If you have compelling reasons for missing your final exam, contact your college registrar to file a petition. Do this quickly; there are deadlines. You must provide documentation to support your petition. If your petition is accepted, you will be permitted to write a deferred exam. For NFS386, these exams usually take place during Reading Week. A deferred exam fee (approximately \$70) must be paid.

Plagiarism detection tool (PDT)

“Normally, students will be required to submit their course essays to the University’s plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool’s reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University’s use of this tool are described on the Centre for Teaching Support & Innovation website (<https://uoft.me/pdt-faq>)”

A link for submitting assignments to PDT will be available on Quercus. If you have problems that prevent you from submitting to PDT, please contact Dr. Taibi to discuss alternatives. All students are expected to either submit to PDT, which is voluntary, or provide an alternative. Failure to do so could result in a grade of ZERO for the assignment. For those who do not submit to PDT, as an alternative, you will be expected to meet with Dr. Taibi for a short oral test during which you will be asked questions about the writing of the assignment and its content. Your assignment grade may be changed based on how well you answer these questions. Dr. Taibi and/or the teaching assistants review the PDT submissions and will e-mail students if there are any concerns about their writing.

Lecture material, audio recordings, and intellectual property

Lecture presentations and course materials are the intellectual property of the instructor. All students enrolled in NFS386 are permitted to use the material for personal study only. You may also make

audio recordings of the lecture for personal use. Posting of audio or visual lecture material online, outside of the course website on Quercus at U of T, however, is not permitted without the permission of the instructor.

Mental health

The well-being of the students is the University's highest priority. Nothing is more important than your mental health. Please let your instructor know if you need support or connect with the wellness support for students <https://mentalhealth.utoronto.ca/>

Accessibility Needs

The University of Toronto is committed to accessibility. If you require accommodations for a disability or have any accessibility concerns about the course, the classroom, or course materials, please contact Accessibility Services as soon as possible: <https://studentlife.utoronto.ca/department/accessibility-services/>

Academic Integrity

Students are expected to conduct themselves with academic integrity. The Code of Behavior clearly describes activities that are considered academic misconduct:

<https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019>.

Students are urged to regularly review the code as ignorance of the rules is not an acceptable excuse.