

**COMPOSITION, FUNCTIONAL
AND NUTRITIONAL PROPERTIES OF FOODS
HNSC 2150**

Department: Food and Human Nutritional Sciences (Course Number: 2150)

Academic Session: Winter 2023 (Credit Hours: 3)

Prerequisites and how they apply to this course:

(Undergraduate level 030 120 Minimum Grade of C or Undergraduate level HNSC 1200 Minimum Grade of C) and (Undergraduate level 030 121 Minimum Grade of C or Undergraduate level HNSC 1210 Minimum Grade of C) and Undergraduate level CHEM 1100 Minimum Grade of C or (Undergraduate level CHEM 1101 Minimum Grade of C) or (Undergraduate level CHEM 1300 Minimum Grade of C or Undergraduate level CHEM 1301 Minimum Grade of C)

Classroom Location (Animal Science Building Room 219): Following the University of Manitoba's recommendations, this course will be offered in person (Jan-10 to April-12/ 2023).

Meeting Days and Class Hours: **TR 10:00-11:15 am; Room 219 Animal Science Building**

Lab Location: NA; **Lab/Hours:** NA

Department Office location: Human Ecology Building

Learning management system for this course: Desire 2 Learn (D2L)

Instructor Information:

Name & Title: Michel Aliani; PhD. Professor.

Office Location: St. Boniface Hospital Research Center, R4024

Office Phone Number: 235-3048

Office Hours: by appointment. To make an appointment please use D2L email system

(Michel.Aliani@umanitoba.ca)

Students' Learning Responsibilities

- ✓ Students are required to arrive on time and to be prepared to learn. Please do not use your personal electronic devices during lectures unless you are using them to take lecture notes.
- ✓ If you do arrive late, please **take your seat quietly**.
- ✓ Please be respectful to others present in the lecture room. For more information regarding a respectful work and learning environment please visit the following link:
http://umanitoba.ca/admin/governance/governing_documents/community/230.html
- ✓ I will be present in the lecture room 10-15 minutes prior to the class and will be available immediately after the class to answer any questions you may have.
- ✓ Your active participation during the lecture is greatly encouraged. I will be asking questions throughout the lectures to initiate active dialogues. Your participation will ensure a deep understanding of the discussed subjects.
- ✓ A Zoom link will be shared via D2L prior to each lecture for all remote lectures

- ✓ The PowerPoint slides will be uploaded to D2L prior to each lecture.
- ✓ PowerPoint presentations will summarize the required knowledge content of this course however; students are encouraged to read other suggested textbooks to acquire a deep understanding of subjects covered in this course.

What you can expect from me?

- ✓ You can expect me to be on time and prepared for all lectures.
- ✓ You can expect me to be available for consultation regularly.
- ✓ Email is the preferred method of communication and you can expect to receive a response to any email within 48 hours on weekdays.
 - Please email me if you require more time to discuss your course-related questions.

Why this course is useful?

This course will provide a unique insight into foods, their chemical structure, and their functionality. I will use research case studies to ensure a thorough understanding of the course content. This course will provide basic needed information related to food and nutrition.

Who should take this course?

This is a required course for all students in the Human Nutritional Sciences. Students from other programs with the necessary background are also welcome to take this course.

Course Description/Objectives

This course covers the composition, functionality, and nutritional properties of foods. The main objectives of this course are:

1. To learn about the major components in foods, their structure and functional properties.
2. To familiarize students with food composition tables and database programs.
3. To develop an understanding of the implications of processing on nutritional quality.

Foundational Knowledge Content Areas for Dietetics Education:

This dietetic education program is an accredited program recognized by the Partnership for Dietetic Education and Practice (PDEP) and prepares students for eligibility for registration with a provincial dietetics regulatory body.

Highest level achieved 1 = demonstrate broad knowledge; 2 = demonstrate comprehension; 3 = analyze, interpret and apply knowledge

Content Area	Foundational Knowledge	Cognitive Complexity Level
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Food	Physical properties and chemical composition of food	2
	Food preservation, storage and packaging	1
	The role of ingredients and their interaction in food preparation	3
	Household food preparation	3
	Food modification to address therapeutic, textural or other needs	2
	Sensory evaluation of food	3
	Food labeling	2
	Food-borne illness	2
Food Service Systems	Recipe development, standardization and evaluation	3
	Quantity food production and distribution	2
	Hazard Analysis and Critical Control Points (HACCP)	2
Human Nutrition across the Lifespan	Ingestion, digestion, absorption, metabolism and excretion of nutrients	3
	Nutrient and energy requirements	3
	Nutrition recommendations and guidelines	3
	Effect of deficiencies and toxicities of nutrients	3
	Food sources of nutrients and dietary supplements	3
	Role of nutrients and other food components in health	3
Nutrition Assessment	Food and nutrient intake of individuals and populations	3

Course Outline

1. **THE NATURE OF FOOD** - Proximate analysis of foods.
2. **THE NATURE & INTEGRITY OF DIETARY DATA BASES** - Their availability and what information they provide.
3. **FOOD COMPONENTS - MAJOR**
 - 3.1 **WATER**- structure, properties, and role in foods.
 - 3.2 **PROTEINS**- structure, properties and role in foods.
 - 3.3 **CARBOHYDRATES**- structure, properties and role in foods.
 - 3.4 **LIPIDS**- structure, properties and role in foods.
4. **FOOD COMPONENTS - MINOR**
 - 4.1 **ENZYMES** - nature, properties and role in foods.
 - 4.2 **PIGMENTS** - nature, properties and role in foods.
 - 4.3 **VITAMINS** - nature, properties, and role in foods.
 - 4.4 **MINERALS** - nature, properties, and role in foods.
 - 4.5 **TOXIC FACTORS** - nature, properties, and methods of inactivation.
5. **PROCESSING**
 - 5.1 effects on food stability and nutritional value.
6. **SENSORY EVALUATION OF FOODS**

Table 1: Lecture Outline

DATE	LECTURE	TOPIC
10/01/2023	Lecture 01	COURSE OUTLINE + INTRODUCTION + PROXIMATE ANALYSIS 1
12/01/2023	Lecture 02	PROXIMATE ANALYSIS 2
17/02/2023	Lecture 03	WATER 1
19/02/2023	Lecture 04	WATER 2
24/02/2023	Lecture 05	PROTEINS 1
26/02/2023	Lecture 06	PROTEINS 2
31/02/2023	Lecture 07	CARBOHYDRATES 1
02/02/2023	Lecture 08	CARBOHYDRATES 2
07/02/2023	MID-TERM Test (30%)	<i>Lectures (1 to end of Carbohydrates)</i>
09/02/2023	Lecture 09	LIPIDS 1
14/02/2023	Lecture 10	LIPIDS 2
16/02/2023	Lecture 11	LIPIDS 3
20-24/02/2023	<i>Winter Break no Lectures</i>	
28/02/2023	Lecture 12	BROWNING REACTIONS 1
02/03/2023	Lecture 13	BROWNING REACTIONS 2 + ENZYMES 1
07/03/2023	Lecture 14	ENZYMES 2
09/03/2023	Lecture 15	PIGMENTS
14/03/2023	Lecture 16	VITAMINS 1
16/03/2023	Lecture 17	VITAMINS 2
21/03/2023	Lecture 18	VITAMINS 3
23/03/2023	Lecture 19	TOXICANTS
28/03/2023	Lecture 20	PROCESSING EFFECTS
30/03/2023	Lecture 21	SENSORY EVALUATION
04/04/2023	Lecture 22	To Be Determined
<u>April/TBA/2023</u>	<u>Final Test</u> 70%	<u>From Lipids to the End</u>

Grade Evaluation

Table 2: Midterm and Final Tests

Examination	Date	%	Lectures
Mid-term Test Room TBA	07/02/2023	30%	Lectures 1-End of Lipids
Final Exam	TBD 2023	70%	Lectures (From Browning Reactions to the End)
Attendance		Extra 2%	
Total		100%	

Standardized grades used are those followed by the Human Nutritional sciences

Table 3: Letter grades will be assigned as follows:

Grade	% Total
A ⁺	90-100
A	80-89
B ⁺	70-79
B	65-69
C ⁺	60-64
C	55-59
D	50-54
F	< 50

Assessment

a) Description of Examinations:

Mid-term and final exams will be comprised of **multiple-choice questions** with only one correct answer.

b) Class Participation:

- ✓ Attendance **is mandatory** for this course.
- ✓ Students who attend all lectures will be rewarded with **2% additional marks**. Please note that the total cannot exceed 100%. Any absence will have to be justified with original documents in order to claim the full additional 2%.
- ✓ Please note that **0.2% will be deducted from the final 2% allocated to attendance for every non-justified absence**.

Important Dates

Last day to drop the course (with refund): January 20, 2023

Voluntary Withdrawal Deadline: March 22, 2023

Texts, Readings, Materials

There are no required textbooks for this course. PowerPoint Slides will be posted on D2L by the instructor prior to each lecture.

Supplementary Reading: A number of helpful references are available on-line or in the University of Manitoba Libraries. They include:

THE FOLLOWING BOOKS COVER THE CONTENT OF THE COURSE. SOME OF THESE BOOKS MAY BE AVAILABLE ON GOOGLE WITH FREE ACCESS:

Toxicants occurring naturally in foods

By National Research Council (U.S.). Food Protection Committee

Vitamins in foods

By G. F. M. Ball

Foods, Facts and Principles

By N Shakuntala Manay, M Shadaksharaswamy

Flavor chemistry of lipid foods

By David B. Min, Thomas H. Smouse, Stephen S. Chang, American Oil Chemists' Society. Meeting

Starch in food, Structure, function and applications

By Ann-Charlotte Eliasson

Functionality of proteins in food

By Joseph F. Zayas

Carbohydrates in food

By Ann-Charlotte Eliasson

Food chemistry

By Owen R. Fennema

Physical properties of foods

By Serpil Sahin, Servet Gülüm Sumnu

Food preservatives

By Nicholas J. Russell, Grahame Warwick Gould

The Maillard reaction

By H. E. Nursten, Royal Society of Chemistry (Great Britain)

Meat and meat products

By A. H. Varnam, Jane P. Sutherland

Lawrie's meat science

By Ralston Andrew Lawrie

Biochemistry of Foods, 3rd Edition

By M. Eskin and F. Shahidi

Food Science An Ecological Approach

By Sari Edelstein

Course Policies

Make up exams or absence:

Arrangements should be made with:

- 1) The professor for excused absences or in the case of **missed mid-term exam**.
- 2) If you miss **the final exam**, you must contact your home faculty to apply for a deferred exam.

Policy on Class Communication

The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit: <https://umanitoba.ca/registrar/student-email-policy>

Please note that all communication between me and you as a student must comply with the electronic communication with student policy

(http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html). You are required to obtain and use your U of M email account for all communication between yourself and the university.

Recording Class Lectures

Dr. Michel Aliani and the University of Manitoba hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission of Dr. Michel Aliani. Course materials (both paper and digital) are for the participant's private study and research.

Using Copyrighted Material

Please respect copyright. We will use copyrighted content in this course. I have ensured that the content I use is appropriately acknowledged and is copied in accordance with copyright laws and University guidelines. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, unless an exception to the *Copyright Act* applies or written permission has been confirmed. For more information, see the University's Copyright Office website at <http://umanitoba.ca/copyright/> or contact um_copyright@umanitoba.ca.

Plagiarism and Cheating

Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university). Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room (e.g., crib notes, pagers or cell phones). Exam cheating can also include exam personation. (Please see [Exam Personation](#), found in the Examination Regulations section of the General Academic Regulations). A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty.

https://www.umanitoba.ca/student/resource/student_advocacy/academicintegrity/students/a-to-i-what-is-academic-integrity.html.

To plagiarize is to take ideas or words of another person and pass them off as one's own. In short, it is stealing something intangible rather than an object. Plagiarism applies to any written work, in traditional or electronic format, as well as orally or verbally presented work. Obviously, it is not necessary to state the source of well-known or easily verifiable facts, but students are expected to appropriately acknowledge the sources of ideas and expressions they use in their written work, whether quoted directly or paraphrased. This applies to diagrams, statistical tables and the like, as well as to written material, and materials or information from Internet sources. To provide adequate and correct documentation is not only an indication of academic honesty but is also a courtesy which enables the reader to consult these sources with ease. Failure to provide appropriate citations constitutes plagiarism. It will also be considered plagiarism and/or cheating if a student submits a term paper written in whole or in part by someone other than him/herself, or copies the answer or answers of another student in any test, examination, or take-home assignment.

Working with other students on assignments, laboratory work, take-home tests, or on-line tests, when this is not permitted by the instructor, can constitute Inappropriate Collaboration and may be subject to penalty under the Student Discipline By-Law.

An assignment which is prepared and submitted for one course should not be used for a different course. This is called "duplicate submission" and represents a form of cheating because course requirements are expected to be fulfilled through original work for each course.

When in doubt about any practice, ask your professor or instructor.

The Student Advocacy Office, 519 University Centre, 474-7423, is a resource available to students dealing with Academic Integrity matters.

Student Accessibility Services

If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services <https://umanitoba.ca/student-supports/accessibility>

520 University Centre

204 474 7423

Student_accessibility@umanitoba.ca

Other Student Services

Writing and Learning Support:

The Academic Learning Centre (ALC) offers services that may be helpful to you throughout your academic program. Through the ALC, you can meet with a learning specialist to discuss concerns such as time management, learning strategies, and test-taking strategies. The ALC also offers peer supported study groups called Supplemental Instruction (SI) for certain courses that students have typically found difficult. In these study groups, students have opportunities to ask questions, compare notes, discuss content, solve practice problems, and develop new study strategies in a group-learning format.

You can also meet one-to-one with a writing tutor who can give you feedback at any stage of the writing process, whether you are just beginning to work on a written assignment or already have a draft. If you are interested in meeting with a writing tutor, reserve your appointment two to three days in advance of the time you would like to meet. Also, plan to meet with a writing tutor a few days before your paper is due so that you have time to work with the tutor's feedback.

These Academic Learning Centre services are free for U of M students. For more information, please visit the Academic Learning Centre website at: <http://umanitoba.ca/student/academiclearning/>

You can also contact the Academic Learning Centre by calling 204-480-1481 or by visiting 201 Tier Building.

University of Manitoba Libraries (UML):

As the primary contact for all research needs, your liaison librarian can play a vital role when completing academic papers and assignments. Liaisons can answer questions about managing citations, or locating appropriate resources, and will address any other concerns you may have, regarding the research process. Liaisons can be contacted by email or phone, and are also available to meet with you in-person. A complete list of liaison librarians can be found by subject or by name: <http://bit.ly/1tJ0bB4>. In addition, general library assistance is provided in person at 19 University Libraries, located on both the Fort Garry and Bannatyne campuses, as well as in many Winnipeg hospitals. For a listing of all libraries, please consult the following: <http://bit.ly/1sXe6RA>. When working remotely, students can also receive help online, via the Ask-a-Librarian chat found on the Libraries' homepage: www.umanitoba.ca/libraries.

Student Counselling Centre (SCC):

Contact SCC if you are concerned about any aspect of your mental health, including anxiety, stress, or depression, or for help with relationships or other life concerns. SCC offers crisis services as well as individual, couple, and group counselling. *Student Counselling Centre:*

<http://umanitoba.ca/student/counselling/index.html>

474 University Centre or S207 Medical Services

(204) 474-8592

Student Support Case Management:

Contact the Student Support Case Management team if you are concerned about yourself or another student and don't know where to turn. SSCM helps connect students with on and off campus resources, provides

safety planning, and offers other supports, including consultation, educational workshops, and referral to the STATIS threat assessment team.

Student Support Intake Assistant <http://umanitoba.ca/student/case-manager/index.html>

520 University Centre

(204) 474-7423

For 24/7 mental health support, contact the Mobile Crisis Service at 204-940-1781.

University Health Service:

Contact UHS for any medical concerns, including mental health problems. UHS offers a full range of medical services to students, including psychiatric consultation.

University Health Service <http://umanitoba.ca/student/health/>

104 University Centre, Fort Garry Campus

(204) 474-8411 (Business hours or after hours/urgent calls)

Health and Wellness:

Contact our Health and Wellness Educator if you are interested in information on a broad range of health topics, including physical and mental health concerns, alcohol and substance use harms, and sexual assault.

Health and Wellness Educator <https://umanitoba.ca/student-supports/health-wellness>

Katie.Kutryk@umanitoba.ca

469 University Centre

(204) 295-9032

Live Well @ UofM:

For comprehensive information about the full range of health and wellness resources available on campus, visit the Live Well @ UofM site:

<http://umanitoba.ca/student/livewell/index.html>

Your Rights and Responsibilities:

As a student of the University of Manitoba you have rights and responsibilities. It is important for you to know what you can expect from the University as a student and to understand what the University expects from you. Become familiar with the policies and procedures of the University and the regulations that are specific to your faculty, college or school. The [Academic Calendar](#)

<http://umanitoba.ca/student/records/academiccalendar.html>

is one important source of information. View the sections *University Policies and Procedures* and *General Academic Regulations*.

While all of the information contained in these two sections is important, the following information is highlighted.

- If you have questions about your grades, talk to your instructor. There is a process for term work and final **grade appeals**. Note that you have the right to access your final examination scripts. See the Registrar's Office website for more information including appeal deadline dates and the appeal form <http://umanitoba.ca/registrar/>
- You are expected to view the General Academic Regulation section within the Academic Calendar and specifically read the **Academic Integrity** regulation. Consult the course syllabus or ask your instructor for additional information about demonstrating academic integrity in your academic work. Visit the Academic Integrity Site for tools and support <http://umanitoba.ca/academicintegrity/> View the **Student Academic Misconduct** procedure for more information.
- The University is committed to a respectful work and learning environment. You have the right to be treated with respect and you are expected to conduct yourself in an appropriate respectful manner. Policies governing behavior include:

Respectful Work and Learning Environment

http://umanitoba.ca/admin/governance/governing_documents/community/230.html

Student Discipline

http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html and,

Violent or Threatening Behaviour

http://umanitoba.ca/admin/governance/governing_documents/community/669.html

- If you experience **Sexual Assault** or know a member of the University community who has, it is important to know there is a policy that provides information about the supports available to those who disclose and outlines a process for reporting. The **Sexual Assault** policy may be found at: http://umanitoba.ca/admin/governance/governing_documents/community/230.html More information and resources can be found by reviewing the Sexual Assault site <http://umanitoba.ca/student/sexual-assault/>
- For information about rights and responsibilities regarding **Intellectual Property** view the policy http://umanitoba.ca/admin/governance/governing_documents/community/235.html

For information on regulations that are specific to your academic program, read the section in the Academic Calendar and on the respective faculty/college/school web site <http://umanitoba.ca/faculties/> Contact an **Academic Advisor** within our faculty/college or school for questions about your academic program and regulations <http://umanitoba.ca/academic-advisors/>

Student Advocacy:

Contact Student Advocacy if you want to know more about your rights and responsibilities as a student, have questions about policies and procedures, and/or want support in dealing with academic or discipline concerns.

<http://umanitoba.ca/student/advocacy/>

520 University Centre

204 474 7423

student_advocacy@umanitoba.ca

Additional Comments

If you have any conflict with these scheduled lectures, activities, etc talk to the professor now (that is, at the beginning of the semester). Please don't wait until the exam time to present your conflict.

If you are struggling with coursework or any of life's other challenges, please familiarize yourselves with the resources available to you by visiting the Student Affairs website at <http://umanitoba.ca/student/index.html>.

The site contains helpful general information as well as links to webpages for the Aboriginal Student Centre, the International Centre for Students, the Academic Learning Centre, Student Advocacy & Accessibility, the Student Counselling & Career Centre, and University Health Service.