

# NFS485H1 F – Diet, Microbiome & Health

## OVERVIEW AND LEARNING OUTCOMES

This course provides an integrated approach to how prokaryotes modulate nutrient availability and how they interact with the host to impact human health from a molecular perspective.

The course will provide fundamentals of food microbiology, information on the gut microbiota and its impact on host metabolism and examples of nutritional strategies to modulate its composition.

At the end of this course students will be able to:

1. Explain which microorganisms can be found in food and are important for its manufacture and spoilage
2. Discuss the role played by the gut microbiome in body health
3. Understand how gut microbiome dysbiosis relates to gastro-intestinal diseases or influences metabolism
4. Suggest nutritional strategies to modulate gut microbiome composition so to impact body health
5. Understand regulatory issues related to food microorganisms

## CLASSES AND INFORMATION

**Mode of delivery:** In Person; the course requires attendance at a specific time and location (Tuesdays, 1-4 pm; MSB 4279) for some of the activities.

**Instructor:** **Dr Elena Comelli**, Dept. of Nutritional Sciences  
1 King's College Circle, Medical Sciences Building room 5354A  
- email: elena.comelli@utoronto.ca  
- office hour: immediately after each lecture or by appointment.

**Guest lecturers**  
**Dr Krista Power**, University of Ottawa  
**Dr Amel Taibi**, Dept of Nutritional Sciences, UofT  
**Dr Dana Philpott**, Dept of Immunology, UofT  
**Dr Williams Turpin**, Mount Sinai Hospital, Joseph and Wolf Lebovic Health Complex, Zane Cohen Centre for Digestive Diseases  
**Dr David Jenkins, University Professor**, Depts of Nutritional Sciences and Medicine, UofT

**Teaching Assistant** **Celine Cuinat, MSc, PhD candidate**  
Dept. of Nutritional Sciences  
1 King's College Circle, Medical Sciences Building  
email: celine.cuinat@mail.utoronto.ca

## MATERIALS

There are no required or recommended textbooks. Material will be provided during the term and posted on Quercus in "Course materials".

## ANNOUNCEMENTS

Announcements are posted on Quercus. Announcements are used to inform students of new course content, due dates, release of grades and other relevant matters. It is the responsibility of the student to check the Announcements regularly.

**COMMUNICATION WITH INSTRUCTOR AND TA**

Students are expected to communicate with the instructor and the TA electronically. Two discussion boards are available on Quercus, one to be used for questions related to course content and the other to be used for questions related to the assignments. Please post your questions through the appropriate discussion board. Questions related to the course and the course content, including the assignments, will not be answered via email.

The use of email is limited to questions of a personal nature.

**COURSE OUTLINE****Week 1. Sept 12.**

Introduction to Diet, Microbiome and Health. Biochemistry of fermentation. Introduction to microbial ecology. Explanation of course goals and expectations.

**Week 2. Sept 19.**

Microorganisms endogenous to the host that modulate nutrient availability and metabolism. Oral and gut microbiome.

**Week 3. Sept 26.**

Gut microbiota: mechanisms of intestinal colonization and establishment. Molecular techniques in intestinal microbiology.

**Week 4. Oct 3.**

Probiotics and nutritional programming: **Guest lecture Dr Celine Cuiat** (in class).

Diet and gut microbiome interplay: production of toxic products and cancer. **Guest lecture Dr Krista Power (video)**.

Prebiotics (in class).

**Week 5. Oct 10.**

Malnutrition and the microbiome. Metabolic syndrome.

**Week 6. Oct 17. Mid-term test.****Week 7. Oct 24. Guest lecture: Dr Dana Philpott.**

Intestinal epithelium responses to non-pathogenic bacteria. Role of the gut microbiome in the mucosal barrier.

**Week 8. Oct 31. Guest lecture: Dr Amel Taibi.**

Microorganisms utilized for food manufacturing (processing and preservation) or implicated in food spoilage. Fermented foods. Regulatory issues.

Gastro-intestinal infections and foodborne diseases.

**Reading week Nov 6 - 10****Week 9. Nov 14. In class written quiz.**

Microbiome and the metabolic syndrome.

Dietary modulation of gut microbiota composition. Probiotics, synbiotics and postbiotics. Regulatory issues, claims.

**Week 10. Nov 21. Infographic due. Guest lecture: Dr Williams Turpin.**

Inflammatory bowel disease, diet and the microbiome.

**Week 11. Nov 28. Guest lecture: Dr David Jenkins.**

Gut microbiome, fiber and cardiovascular disease.

**Week 12. Dec 5. End of term test.**

**EVALUATION**

The course will contain the following evaluations:

<b>Evaluation</b>	<b>Date</b>	<b>Weight</b>
Mid-term test (weeks 1 - 5)	17 Oct 2023	35%
In class written quiz (weeks 7 - 8)	14 Nov 2023	15%
Written assignment (infographic)	Due on 21 Nov 2023, 4 pm EST	25%
End of term test (weeks 1 - 11)	5 Dec 2023	25%
<b>Total</b>		<b>100%</b>

**Mid-term (35%) and end of term (25%) tests**

These may include definitions, true and false, short answers and essay-type questions.

**In class written quiz (15%)**

This may include definition, true and false and short answers.

**Written assignments – infographic (25%)**

Students will design an infographic contrasting fermented foods and probiotics-containing foods.

The assignment will be submitted as a PDF through Quercus. Due date: Tue Nov 21, 2023, 4 pm EST.

**POLICIES****University's plagiarism detection tool**

"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 web site (<https://uoft.me/pdt-faq> )."

The University's plagiarism detection tool is integrated into Quercus. Instructions are provided here:

<https://q.utoronto.ca/courses/46670/pages/student-plagiarism-detection-tool>

Please make sure that you are using your University of Toronto issued email address, as required by the University of Toronto policy concerning email addresses. Please [check and update your email address](#) .

If you have problems that prevent you from submitting to the University's plagiarism detection tool, please contact Dr. Comelli to discuss alternatives. All students are expected to either submit to the University's plagiarism detection tool, which is voluntary, or provide an alternative. Failure to do so could result in a grade of ZERO for the assignment.

Those who do not submit to the University's plagiarism detection tool will be expected to meet with Dr. Comelli 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.

**Missed term tests and quiz**

Except for compelling reasons such as illness or personal distress, all students will be given a grade of ZERO if they miss the term test. There are NO MAKE-UPS and NO EXTENSIONS. If you miss a term test or quiz for compelling reasons, its respective weight will be redistributed among the other assessments. If you miss both the mid term and the end of term tests, for compelling reasons, you will be required to meet with Dr Comelli for an oral examination covering the entire course content.

You are required to provide a brief explanation for missing a term test or quiz (illness, personal distress, family emergency etc). All information is kept confidential. In addition, please refer to the “Policy for verification of illness (VOI) and other documented absences” at the end of this document.

*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 and consider contacting Accessibility Services (see below).*

### **Late submission of the written assignment - infographic**

Any assignment of this type submitted later than the due date and time will be considered late and a 10% reduction in the grade will be given every day that it is late (including weekends). No email submissions will be accepted.

Note: Submitting your assignment by e-mail as “proof” of its timely completion is NOT acceptable; timely completion includes the final submission via Quercus.

### **Regrading of the written assignment: infographic**

1. Students must submit a written proposal to the Teaching Assistant explaining why a regrade is warranted. The Teaching Assistant may or may not choose to regrade - it will depend on how well each student presents their case.

**NOTE: REGRADE PROPOSALS MUST BE SUBMITTED VIA EMAIL (DEADLINE FOR REGRADE PROPOSAL-TO BE ANNOUNCED)**

2. Students accept that their paper will be regraded by Dr. Comelli. The combined average grade of Dr. Comelli and the TA will be taken as the **final grade**. Thus, **the grade may increase or decrease**. Students requesting that their infographic be regraded are accepting the risk that they may end up with a lower grade if they submit a regrade request.
3. If students want to meet with us to just discuss their infographic or to obtain clarification about the TA's written comments, a formal proposal is not required. Students just need to email the Teaching Assistant to request to meet and an in-person or Zoom meeting will be scheduled.

### **Lecture material, video recordings, and intellectual property**

Parts of this course will be pre-recorded on video and will be available to students in the course for viewing remotely and after each session.

Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation, and are protected by copyright. Do not download, copy, or share any course or student materials or videos without the explicit permission of the instructor.

### **Academic Integrity**

Students are expected to conduct themselves with academic integrity.

Academic misconduct at the University of Toronto is defined by the [Code of Behaviour on Academic Matters](#).

All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments, collaborating with fellow students, and writing tests and exams. Ensure that the work you submit for grading represents your own honest efforts. Plagiarism—representing someone else's work as your own or submitting work that you have previously submitted for marks in another class or program—is a serious offence that can result in sanctions. Speak to me or your TA for

advice on anything that you find unclear. To learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at <http://www.writing.utoronto.ca>. Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see <http://www.artsci.utoronto.ca/osaj> and <http://academicintegrity.utoronto.ca>.

**Students: please review “how not to plagiarize” website <https://advice.writing.utoronto.ca/using-sources/how-not-to-plagiarize/>.** It is your responsibility to know the rules and that the University expects all work to be completed in accordance with the [Code](#). Please ensure your work complies with the rules before submitting any course assignments.

### **Accessibility and Accommodations Needs**

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the beginning of the academic year by visiting <http://www.studentlife.utoronto.ca/as/new-registration>. Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition with any instructor, and your instructors will not reveal that you are registered with AS.

### **WRITING AND LANGUAGE SUPPORT IN ARTS AND SCIENCE**

A wide range of resources is available at the Faculty of Arts and Science for writing support ([www.writing.utoronto.ca](http://www.writing.utoronto.ca)). You can find information about college writing centres at: <http://www.writing.utoronto.ca/writing-centres/arts-and-science>. The teaching approach of the college writing centres is described at: <http://www.writing.utoronto.ca/writing-centres/learning>. Many Advice files on all aspects of academic writing are available at: [www.writing.utoronto.ca/advice](http://www.writing.utoronto.ca/advice). Printable PDF versions are listed at: <http://www.writing.utoronto.ca/about-this-site/pdf-links-for-students>. Must read: "How Not to Plagiarize" at: [www.writing.utoronto.ca/advice/using-sources](http://www.writing.utoronto.ca/advice/using-sources).

Students interested in the English Language Learning program (ELL) are encouraged to visit their website at: <http://www.artsci.utoronto.ca/current/advising/ell>. A useful activity for this course is “Reading eWriting”, an online program that helps students “to strengthen the speed and ease with which you read, reason, and write”.

### **POLICY FOR VERIFICATION OF ILLNESS (VOI) AND OTHER DOCUMENTED ABSENCES**

Students who are absent from academic participation for **any reason** (e.g., COVID, cold, flu and other illness or injury, family situation) and who require consideration for missed academic work should report their absence through the online absence declaration. The declaration is available on [ACORN](#) under the Profile and Settings menu. Students should also advise their instructor of their absence.

Please also refer to the following FAQ: <http://www.illnessverification.utoronto.ca/Frequently-Asked-Questions.php> and see at: <https://www.artsci.utoronto.ca/covid19-artsci-student-fags#fw2021-absence-declaration-accordion-1>

### **Resources & supports**

If you or someone you know is in distress and there is an immediate risk, call 911.

The following includes supports available to students on all three campuses:

- [U of T St. George \(Downtown Toronto\)](#)
- [U of T Scarborough](#)
- [U of T Mississauga](#)

Additionally, students have access to [U of T My Student Support Program](#) (My SSP) | 1-844-451-9700 24/7. Outside of North America, call 001-416-380-6578.

Culturally-competent mental health and counseling services in 146 languages for all U of T students.