

NFS485H1 S – Nutritional Microbiology

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 endogenous gut microbiota in body health
3. Understand how gut microbiota dysbiosis relates to gastro-intestinal diseases or influences metabolism
4. Suggest nutritional strategies to modulate gut microbiota composition so to impact body health
5. Understand regulatory issues related to food microorganisms

CLASSES AND INFORMATION

Lectures: Tuesday, 1-4 pm in MS 2172

Instructor: **Dr Elena Comelli**, Dept. of Nutritional Sciences
150 College Street, FitzGerald Building room 308A
- phone: 416 978-6284, email: elena.comelli@utoronto.ca
- office hour: immediately after each lecture or by appointment

Guest lecturers **Dr David Jenkins, University Professor**, Depts of Nutritional Sciences and Medicine, UofT
Dr Dana Philpott, Dept of Immunology, UofT
Dr Krista Power, Research Scientist, Agriculture and Agri-Food Canada

Teaching Assistant: **Christopher Villa**, Dept. of Nutritional Sciences
150 College Street, FitzGerald Building room 70
email: christopher.villa@mail.utoronto.ca

MATERIALS

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

COURSE OUTLINE**Week 1, Jan 12**

Introduction to Nutritional Microbiology. Biochemistry of fermentation. Bacteria in the food industry.

Assignment: explanation of goals and expectations.

Week 2, Jan 19

Bacteria exogenous to the host utilized for food manufacturing (processing and preservation) or implicated in food spoilage. Regulatory issues.

Assignment: students choose topic in class (list of topics will be posted on blackboard before the lecture) and familiarize with their group members.

Week 3, Jan 26

Bacteria endogenous to the host that modulate nutrient availability and metabolism. Oral and gut microbiota.

Assignment: students prepare an outline of the review and organize their group work.

Week 4, Feb 2

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

Assignment: students discuss their readings list and start working on their tables.

Weeks 5, Feb 9. Dr D. Philpott. First peer evaluation due.

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

Assignment: students work on their drafts.

Week 6, Feb 23 Mid-term exam**Week 7, March 1.**

Gastro-intestinal infections.

Assignment: students work on their drafts.

Week 8, March 8 Dr D. Jenkins

Gut microbiota as a metabolic organ: nutrients generation.

Dietary fiber and non-digestible oligosaccharides. Short-chain fatty acids.

Assignment: students work on their drafts.

Week 9, March 15 Dr K. Power

Diet and gut microbiota interplay: production of toxic products and cancer.

Assignment: students work on their drafts.

Week 10, March 22

The emerging role of gut bacteria in intestinal and extra-intestinal diseases and the metabolic syndrome.

Assignment: students finalize their reviews.

Week 11, March 29. Assignment: “Critical Review” final written assignment due. Second peer evaluation due.

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

Week 12, April 5

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

EVALUATION

The course will contain the following evaluations:

1. Mid-term exam (35%)
2. Written assignment (25%)
 - i. 5%: Peer evaluation
 - ii. 20%: Instructor and TA evaluation
3. Final examination (40%)

Mid-term exam (35%) February 23, 2016

This test will include all topics covered during weeks 1 to 5. Questions for this test may consist of definitions, true-false, short answer and essay type.

Missed term test

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. If you miss the term test (worth 35%), for compelling reasons, your final exam will be worth 75% of your final grade (35% + 40%). If you miss the term test, please contact Dr. Comelli IMMEDIATELY.

Any documentation related to a missed test or late assignment should be submitted to Dr. Comelli personally during office hours or lecture or left in a sealed envelope (to preserve your privacy) in the main office of the Fitzgerald building, FG 316, 150 College St (advise Dr. Comelli by e-mail that your documents are there).

“Critical Review” Written assignment (25%) March 29, 2016

Students will have to write a critical review on a topic of choice that is related to Nutritional Microbiology; choice will be made from a list of topics proposed by the instructor and which will be available in class on Jan 19, 2016. There will be 10-15 topics available to choose from; thus, students will come together as groups which are determined by their own topic choice (no more than 5 students per topic/group will be allowed). Students who will not have chosen a topic during the Jan 19th lecture, will be assigned to a group by the instructor based on availability.

Each group will produce one critical review. The essay will have to be formatted according to the Instructions to Authors of the journal “Critical Reviews in Food Science and Nutrition”. These can be found at the journal website, which is accessible through your UofT account. In addition, the following applies:

- 10-15 pages, excluding the title page, tables, figures and references
- typewritten, 12-points Times New Roman, double-spaced; numbered pages and 1” margins
- the first page of your review (title page) has to be formatted as per the above journal guidelines. The text must be organized with the following headings: Abstract (max 200 words), Introduction, Conclusions, Future Perspectives and References; headings pertaining to the main section of the review (to be inserted between Introduction and Conclusions) will be chosen by the students as appropriate; sub-headings are allowed.

References must be inserted using a program such as EndNote, which can be accessed through the U of T website: <http://guides.library.utoronto.ca/endnoteweb>. A minimum of 25 references must be used.

Peer evaluation, worth 5%, will be submitted for the written assignment. Rubrics will be provided to you and will be confidential. The first peer evaluation will be due February 9th, 2016 and the second will be submitted along with your final assignment on March 29th, 2016. Peer evaluations are due at the beginning of class.

Two copies of the assignment are to be submitted at the beginning of class on March 29, 2016. To conserve paper, please print double-sided (learn how at: printdoublesided.sa.utoronto.ca). NO EMAIL SUBMISSIONS WILL BE ACCEPTED.

Regrading of assignment:

1. Students must submit a written proposal (typed using the same formatting as the term paper) to Dr. Comelli explaining why a regrade is warranted. Dr. Comelli 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 BY FRIDAY April 15th BY 4PM.

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, decrease, or stay the same.** Students requesting that their paper 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 paper 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.

Final exam (40%)

A final examination will take place during the allotted time in examination week. It will cover the entire course content, but emphasis will be placed on topics covered during weeks 7-12. The format will be similar to the mid-term exam.

POLICIES**Turnitin**

“Normally, students will be required to submit their course essays to Turnitin.com 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 Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.”

In order to submit your assignments to Turnitin you will first need to set up an account. If you have not already done so, here are the instructions: https://www.turnitin.com/newuser_type.asp?lang=en_us

A 1-page document that provides the basic steps for students to set up their own accounts and submit papers is available at: <http://teaching.utoronto.ca/ed-tech/teaching-technology/turnitin/a-guide-for-students>

You will need the following information to set up your account and submit assignments: Class ID: **11273293**
Password: **NFS4852016**

If you have problems that prevent you from submitting to Turnitin, please contact Dr. Comelli to discuss alternatives. All students are expected to either submit to Turnitin, 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 Turnitin 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.

Late submission of assignment

Any assignment 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. If you cannot submit the assignment on time during class please leave it in the main office in the FitzGerald building, room 316 following the procedure below:

- 1) Have your assignment stamped “received” and marked with date AND time in the main office of the Department of Nutritional Sciences (FG 316, 150 College, hours 9am-4:45pm) and then
- 2) Email the TA, the same day, so they know your assignment is available in FG316.

Note: **The hard copy of your assignment is the only version which will be graded.** Submitting your assignment to Turnitin or by e-mail as “proof” of its timely completion is NOT acceptable; timely completion

includes the budgeting of travel time to ensure you can submit your hard copy.

Lecture material, audio recordings, and intellectual property

Lecture presentations and course materials are the intellectual property of the instructor. All students enrolled in NFS485 are permitted to use the material for personal study. You may also make audio recordings of the lecture for personal use. Note that if you bring a recording device to the front of the classroom, you do so at your own risk. These devices do get lost or stolen.

A forum has been set up on the course discussion board called “Lecture Recordings” and students who are willing to share their audio recordings with their classmates can post audio files there. Students are NOT permitted to post these audio files in any other public location without the permission of Dr Comelli.

Academic Integrity

Students are expected to conduct themselves with academic integrity.

The Code of Behaviour clearly describes activities that are considered academic misconduct:

<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>

Students should regularly review the code as ignorance of the rules is not an acceptable excuse.

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: <http://www.accessibility.utoronto.ca>

Verification of student illness or injury

If needed, students should use the official UofT form that can be found at:

<http://illnessverification.utoronto.ca/index.htm>

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). 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>. More than 60 Advice files on all aspects of academic writing are available at: www.writing.utoronto.ca/advice. Printable PDF versions are listed at: <http://www.writing.utoronto.ca/about-this-site/pdf-links-for-students>. Specific files of interest will be suggested by the instructor and the TA. Must read: "How Not to Plagiarize" at: 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”.