



NUTR*4320 Nutrition and Metabolic Control of Disease

Winter 2019

Section(s): C01

Department of Human Health and Nutritional Sciences

Credit Weight: 0.50

Version 1.00 - December 20, 2018

1 Course Details

1.1 Calendar Description

This course provides a discussion of disorders of metabolism, either inherited or acquired, in which nutrition plays a major role in the etiology, pathogenesis, or treatment. The nutritional control of the affected metabolic pathways and the interaction of nutrition with exercise, drugs and gene therapy will be presented.

Pre-Requisite(s): NUTR*3210, (1 of BIOM*3200, HK*3810, HK*3940, ZOO*3210, ZOO*3620)

1.2 Course Description

This course deals with metabolic diseases most of which can be described in biochemical terms. These anomalies produce symptoms, or structural abnormalities, which impair the fitness, quality of life or potentially lead to death of the individual. The attention is focused on the mechanism(s) thought to participate in disease development, the affected metabolic pathways and the clinical manifestations which lead to disease symptoms. The role of nutrition both in prevention of disease development and as part of the therapeutic strategy to diminish symptoms or reverse pathology are examined along with classical treatment strategies involving lifestyle modification, drugs, and supplements provided as nutraceuticals or functional foods.

1.3 Timetable

MACN 105 Tues/Thurs 2:30-3:50 PM

1.4 Final Exam

April 15, 2018. 11:30am - 1:30pm. Location to be announced.

Exam time and location is subject to change. Please see WebAdvisor for the latest

information.

2 Instructional Support

2.1 Instructional Support Team

Instructor: Dr. Jennifer Monk
Email: jmonk02@uoguelph.ca
Telephone: +1-519-824-4120 x56967
Office: ANNU 371B

Office Hours:

- Weekly Office Hours: Tuesdays and Thursdays 1:00 - 2:00pm in ANNU 371B
- Available after each class
- Additional review sessions will be held prior to the midterm and final exam
- TA Support: Sophie Grapentine (sgrapent@uoguelph.ca) - available by appointment

3 Learning Resources

There are NO required textbooks for this course, however, students are encouraged to review key concepts from the course pre-requisites or seek out additional background information to understand the course content if needed.

3.1 Required Resource(s)

Courselink (Website)
<https://courselink.uoguelph.ca>

- Outlines of lecture notes will be available on the CourseLink website.
- Lecture notes in a timely manner (i.e. the evening prior to each class at the latest).
- The intention of the lecture notes is NOT to provide the student with a complete set of notes, but to provide a guide or outline of the lecture to provide students with a better opportunity to understand the lecture content as it is presented.
- Students are encouraged to review the lecture material prior to class and encouraged to review the course content throughout the semester.

- Attendance of ALL CLASSES is highly recommended.
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4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Describe and understand how functional defects in metabolism can influence disease development and progression
2. Identify how the microbiota and various nutritional interventions influence host gut physiology, mucosal immune function and chronic disease susceptibility
3. Describe the interrelationship between dietary components, the gut microbiota and the intestinal epithelial barrier and understand the mechanisms through which modulating any of these factors could influence susceptibility to various chronic diseases
4. Identify the common mechanisms through which chronic inflammation can influence metabolic signaling, disease progression or susceptibility to opportunistic infection.
5. Compare and contrast different metabolic diseases to identify common mechanisms that could be susceptible to dietary and pharmaceutical interventions
6. Interpret data in graphic and tabular form in class discussions, case studies and exams, in order to assess how dietary components can influence microbiota and host intestinal function
7. Have improved scientific writing skills

8. Develop professional behaviours, including organizational skills, time management skills, the ability to work collaboratively and effectively in small groups and to integrate different perspectives and ideas to write a focussed literature review

5 Teaching and Learning Activities

5.1 Outline of Course Content

Subject to Change

- ABNORMALITIES OF CARBOHYDRATE AND AMINO ACID METABOLISM

- Lactase deficiency/lactose intolerance
 - Discussion of osteoporosis
- Celiac disease
- THE GUT MICROBIOTA
 - Introduction and background
 - Effect of the microbiota on host metabolism and immune function
 - Introduction to diseases associated with epithelial barrier permeability
- DISEASES WITH MULTIPLE METABOLIC DEFECTS
 - Osteoporosis
 - Obesity
 - Type 2 Diabetes
 - Inflammatory bowel disease
 - Cancer
 - Obesity-associated cancer

5.2 Important Dates

- January 8, 2019 - First Class
- February 15, 2019 – Assignment 1 due and must be posted to Courselink by 11:59PM
- February 18-22, 2019 – Winter Break – NO CLASSES
- February 28, 2019 – in class MIDTERM examination
- March 8, 2019 – 40th day of class. Last day to drop W18 semester courses.
- March 26, 2019 – Short Paper Assignment DUE IN CLASS (printed copy)
- April 2, 2019– Assignment 2 due and must be posted to Courselink by 11:59PM
- April 4, 2019 – Last Class

6 Assessments

6.1 Marking Schemes & Distributions

Name	Scheme A (%)
Assignment 1	2.5
Midterm Exam	35
Short Paper Assignment	25

Name	Scheme A (%)
Assignment 2	2.5
Final Exam	35
Total	100

6.2 Assessment Details

Assignment 1 (2.5%)

Due: Fri, Feb 15, Post to Courselink by 11:59 PM

Learning Outcome(s): 1,2,4,7

Course content: First half of the course only

Midterm Exam (35%)

Date: Thu, Feb 28

Learning Outcome(s): 1,2,3,4,6,7

Course content: First half of the course only

Short Paper Assignment (25%)

Due: Tue, Mar 26

Learning Outcome(s): 1,2,4,5,6,7,8

Topic of the paper is flexible and based on student's personal interests

Assignment 2 (2.5%)

Due: Tue, Apr 2, Post to Courselink by 11:59 PM

Learning Outcome(s): 1,2,3,4,5,7

Course content: Last half of the course only

Final Exam (35%)

Date: TBA, TBA

Learning Outcome(s): 1,2,3,4,5,6,7

Course content: Focus on the last half of the course

6.3 Assignments 1 & 2

- Detailed assignment instructions and rubric will be posted on Courselink
- Assignment 1 and 2 are designed to achieve the following outcomes:
 - Encourage students to begin reviewing the lecture material in advance of the examinations
 - To promote stronger understanding and retention of critical lecture material
 - To serve as a class generated sample practice exam (posted on courselink)
- For both Assignment 1 and Assignment 2 students are required to review the lecture material and generate 1 multiple choice question (with possible answers)

A, B, C, D and E). There must be only ONE possible correct answer for each question and the answer for each question must be provided. Students must also indicate in point form why the other 4 possible answers provided are incorrect.

- Additionally, students must generate one short answer question worth 4 possible marks and provide a detailed answer key in response to the short answer question that identifies how marks should be awarded for the correct response. This question can have a part A and part B if you desire to set up your question this way; however, it must total 4 marks.

Submission Details:

- Students will access the appropriate discussion board forum in Courselink (for either assignment 1 or assignment 2):
 - e.g. “Assignment 1: Practice Exam Multiple Choice Questions” and “Assignment 1: Practice Exam Short Answer Questions”.
- Step 1: Each student will separately post their multiple choice practice question AND short answer practice question in the appropriate forum on the Discussion Board in Courselink.
- Step 2: Each student MUST REPLY to each of their questions with the correct answer.
- This way each student can click through the practice questions and test themselves as a study tool in preparation for either the midterm or final exam.
- Assignment questions are to be posted on Courselink (in the correct discussion board forum) by 11:59PM on the due date. Marks will be deducted for incomplete or late submissions.

6.4 Short Paper Assignment

- Detailed assignment instructions and rubric will be posted on Courselink
- Students will select a chronic disease of interest and write a short review paper that describes the disease phenotype and discusses how a dietary component (or bioactive) has been shown to attenuate the disease phenotype with a specific focus on identifying the mechanisms of action (e.g. to say that a dietary component is anti-inflammatory is insufficient, instead explain the mechanism of HOW that dietary component elicits an anti-inflammatory effect).
- Part 1 – identify and describe the disease phenotype (key features, clinical symptoms etc.). Students may use review articles published in peer-reviewed

journals for this part of the assignment.

- Part 2 – discuss how a dietary component of your choice/interest has been shown to modulate critical aspects of the disease phenotype. Indicate if these findings have been shown in cell culture models, animal models or in humans. Use primary literature sources from original research papers only in this section of the paper. Discuss and summarize the key findings (including a brief summary of the experimental design/model) from a minimum of 4 original research papers. If you identify conflicting findings from different research papers you can discuss this aspect in Part 3 of your paper.
- Part 3 – to the best of your ability/background experience and understanding, identify what type of experiment or future direction should be pursued in research to advance our understanding of how your nutritional component of interest can modulate or attenuate your disease of interest.
- The short paper should be a minimum of 2 pages double-spaced, 12 point font, and standard margins. You may include a summary diagram (properly cited) if this is helpful. Students will be graded on organization, clarity and complexity of their explanation of the disease phenotype, explanation of the original research papers used in Part 2 and format of the paper [including proper referencing (APA style)].
- The purpose of this assignment is to gain experience accessing and interpreting original research papers, practice and improve your written communication skills and provide an opportunity for students to pursue an area of interest that may not align with the course content.
- Students will work in groups of 2-3 to complete Assignment 3. Each student in the group will receive the same mark.

7 Course Statements

7.1 Copyright Notice

All content within this course is copyright protected. Third party copyrighted materials (such as book chapters and articles) have either been licensed for use in this course, or have been copied under an exception or limitation in Canadian Copyright law. The fair dealing exemption in Canada's Copyright Act permits students to reproduce short excerpts from copyright-protected materials for purposes such as research, education, private study, criticism and review, with proper attribution. Any other copying, communicating, or distribution of any content provided in this course, except as permitted by law, may be an infringement of copyright if done without proper license or the consent of the copyright owner. Examples of infringing uses of copyrighted works would include uploading materials to a commercial third party web site, or making paper or electronic reproductions of all, or a

substantial part, of works such as textbooks for commercial purposes. Students who upload to CourseLink copyrighted materials such as book chapters, journal articles, or materials taken from the Internet, must ensure that they comply with Canadian Copyright law or with the terms of the University of Guelph's electronic resource licenses.

8 Department of Human Health and Nutritional Sciences Statements

8.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. [B.Sc. Academic Advising](#) or [Program Counsellors](#)

8.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. <http://www.learningcommons.uoguelph.ca/>
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: <http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help> and <http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help>

8.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. <https://www.uoguelph.ca/counselling/>
- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one

sessions related to stress management and high performance situations.
<http://www.uoguelph.ca/~ksomers/>

9 University Statements

9.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

9.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

9.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for course registration are available in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

9.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

9.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared

responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

More information can be found on the SAS website
<https://www.uoguelph.ca/sas>

9.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community—faculty, staff, and students—to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

9.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

9.8 Resources

The Academic Calendars are the source of information about the University of Guelph's

procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>
