



# **NUTR\*4320 Nutrition and Metabolic Control of Disease - DRAFT**

Winter 2022

Section(s): C01

Department of Human Health and Nutritional Sciences

Credit Weight: 0.50

Version 1.00 - November 10, 2021

---

## **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-Requisites:** NUTR\*3210, (1 of BIOM\*3200, HK\*3810, 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**

Scheduled lecture times are Tues/Thurs 2:30 - 3:50 PM. The course lectures will be offered in-person (i.e., the traditional lecture format). Students who have not submitted their vaccination status to the university portal or have not received an exemption (with regular testing) to be on campus are not eligible to register in any course with a required in-person component or assessment.

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email

## 1.4 Final Exam

Exam Date and Location TBD. Please see WebAdvisor for the latest information.

---

## 2 Instructional Support

### 2.1 Instructional Support Team

Instructor: To Be Determined .

### 2.2 Teaching Assistants

Teaching Assistant (GTA): To Be Determined .

---

## 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.

---

## 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 and obesity-associated cancer
  - Inflammatory competence and opportunistic infections

### 5.2 Important Dates

- January 11, 2022, First Class
- February 11, 2022 – Assignment 1 due and must be posted to both the Dropbox and Discussion Board in Courselink by 11:59PM (optional assignment)
- February 21-25, 2022 – Winter Break – NO CLASSES
- February 25, 2022 - Data Extraction Assignment Due to the Dropbox (optional assignment)
- Midterm Exam – March 1, 2022 - IN CLASS scheduled time
- March 25, 2022 – Nutrition and COVID-19 Assignment Due to the Dropbox
- April 1, 2022– Assignment 2 due and must be posted to both the Dropbox and Discussion Board in Courselink by 11:59PM (optional assignment)
- April 8, 2022 – Last Day of Classes
- Final Exam - To Be Announced

## 6 Assessments

### 6.1 Marking Schemes & Distributions

There are 3 assignments in this course that are OPTIONAL (Assignment #1, Assignment #2 and the Data Extraction Assignment). Students may decide to complete any combination of these assignments or elect to not complete any of these optional assignments based on their schedules and workloads during the semester. **If you decide to not complete all 3 optional assignments your final grade will be calculated according to Distribution Scheme E.**

The assignments represent a way to reduce the weight of the final exam towards your final grade in the course.

Name	Scheme A (%)	Scheme B (%)	Scheme C (%)	Scheme D (%)	Scheme E (%)
Assignment 1 (optional)	2.5	2.5	0	2.5	0
Midterm Exam	35	35	35	35	35
Assignment 2 (optional)	2.5	2.5	2.5	0	0
Final Exam	35	45	37.5	37.5	50
Data Extraction Assignment (optional)	10	0	10	10	0
Nutrition & COVID-19	15	15	15	15	15

Name	Scheme A (%)	Scheme B (%)	Scheme C (%)	Scheme D (%)	Scheme E (%)
Assignment					
Total	100	100	100	100	100

## 6.2 Assessment Details

### Midterm Exam (35%)

**Due:** Tue, Mar 1, Online in Courselink - during scheduled lecture time (2:30 -3:50pm)

**Learning Outcome:** 1, 2, 3, 4, 6, 7

Course content: First half of the course only.

Midterm exam will use Respondus Lockdown software

### Final Exam (35%)

**Date:** Online Exam in Courselink

**Learning Outcome:** 1, 2, 3, 4, 5, 6, 7

Course content: The last half of the course (i.e. content NOT tested on the midterm exam).

The Final Exam will use Respondus Lockdown software.

This is a 2 hour final exam.

Final Exam date and time will be announced.

### Nutrition & COVID-19 Assignment (15%)

**Due:** Fri, Mar 25, 11:59 PM, Submit to the Dropbox

**Learning Outcome:** 2, 4, 6, 7

The purpose of this assignment is to increase students understanding and appreciation of the role of nutrition in supporting immune function and influencing susceptibility to viral infections. The emphasis of the assigned readings are related to COVID-19, however, students will be required to consider and justify both the relevance and applicability of information related to other types viral infection as it pertains to nutritional science.

Students will complete the assigned readings posted on Courselink and will write a 2 page (single spaced, 12 point font) reflective summary paper that will identify i) key new information they learned from the readings, ii) a critical assessment of the relevance and applicability of the available evidence related to nutritional status and COVID-19, and iii) reflective comments identifying current knowledge or research gaps related to this topic.

Students are free to access other primary literature outside of the assigned readings that relates to any topic of interest related to any aspect of nutritional status and COVID-19. Please cite the literature (both assigned and unassigned) in the body of your reflective summary as per the referencing style in the Journal of Nutrition.

### Assignment 1 (optional) (2.5%)

**Due:** Fri, Feb 11, Post to Courselink Discussion Board AND Submit to the Dropbbox by 11:59 PM

**Learning Outcome:** 1, 2, 4, 7

The assignment uses only course content that will be tested on the midterm exam.

The assignment is optional - students who decide to not complete this assignment will have the weight of this assignment (2.5%) added to their final exam and their final grade will be calculated according to Distribution Scheme C.

**Assignment 2 (OPTIONAL) (2.5%)**

**Due:** Fri, Apr 1, Post to Courselink Discussion Board AND Submit to the Dropbox by 11:59 PM

**Learning Outcome:** 1, 2, 3, 4, 5, 7

The assignment uses only course content that will be tested on the final exam.

The assignment is optional - students who decide to not complete this assignment will have the weight of this assignment (2.5%) added to their final exam and their final grade will be calculated according to Distribution Scheme D.

**Data Extraction Assignment (OPTIONAL) (10%)**

**Due:** Fri, Mar 25, 11:59 PM, Submit to the Dropbox

**Learning Outcome:** 1, 6, 7

This assignment is OPTIONAL and any students who do not complete this assignment will have their final grade in the course calculated according to Distribution Scheme B in the course outline.

Full details will be posted on Courselink but a brief outline of the assignment is as follows:

- The purpose of this assignment is to i) gain experience accessing and interpreting original research papers, ii) practice integrating information from multiple sources in an organized and logical manner, iii) practice and improve your written communication skills, and iv) provide an opportunity for students to pursue an area of interest that may not align with the course content.
- Select a chronic disease or health condition of interest (that is not covered in this course) and a dietary component (or bioactive) that has been shown to modulate the disease phenotype (this can be a beneficial or adverse outcome).
- Research 5 papers that are related to the selected topic and summarize each article in a data extraction table (discussed in class and in more detail in the instructions on Courselink).
- Write a 2 page maximum (single-spaced) summary that integrates the research findings from the 5 papers related to your topic. The page limit does

not include references or the data extraction table (which does not have to fit onto one page)

### 6.3 Assignments 1 & 2

- 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. **NOTE: You will submit your assignment in 2 places**

- First submit BOTH the practice multiple choice question/answers & the practice short answer question/answers key to the Dropbox (this will be graded)
- Secondly submit your practice multiple choice and short answer question to the appropriate discussion board in Courselink to contribute to a class generate practice exam as follows:
  - 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 Courouselink (in the correct discussion board forum & combined in one document submitted to the Dropbox) by 11:59PM on the due date. Marks will be deducted for incomplete or late submissions.

## 6.4 Use of Respondus Lockdown Software

*Online assessments in this course (midterm and final exam) will be administered using Respondus Lockdown software with the microphone and web cam enabled.*

*Note: This course currently plans to use Respondus Lockdown software for some assessments (online midterm exam and final exam). Your instructors are aware that some students have expressed concerns about the use of this exam invigilation software. The University Administration is currently evaluating the matter of Respondus Lockdown software and other online monitoring platforms that use artificial intelligence for remote invigilation. Your instructors are committed to an equitable and accessible assessment experience and will adapt, based on guidance provided from the University Administration.*

*Note: The use of Respondus Lockdown software is to maintain academic integrity for all online assessments. Without the use of Respondus students would be writing an open book style of exam, which would require additional exam questions (to be completed within the same time allotment for the exam) and the removal of the ability to review questions (i.e., to go back and review previous exam pages during the test) in order to maintain academic integrity.*

## 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.

## 7.2 Use of Respondus Lockdown Software

This course currently plans to use Respondus Lockdown software for some assessments. Your instructors are aware that some students have expressed concerns about the use of this exam invigilation software. The University Administration has approved the use of Respondus Lockdown software and other online monitoring platforms that use artificial intelligence for remote invigilation. Your instructors are committed to an equitable and accessible assessment experience, please contact your instructor if you have concerns.

Online assessments (midterm and final exam) in this course will be administered using Respondus Lockdown software with the microphone and web cam enabled. Respondus LockDown Browser is a locked browser that prevents you from printing and copying; using other operating software; using search engines (e.g., going to another URL); communicating via instant messaging; and it blocks non-web-related software (e.g., Adobe PDF, Microsoft Word).

Respondus Monitor is a companion application for LockDown Browser that uses webcam and video technology to ensure academic integrity during online exams. The software captures video during the exam and allows the instructor to review the video once the exam is completed.

In order to use Respondus LockDown Browser and Monitor, you must meet the following technical requirements so that you can take the practice test and midterm exam:

1. Operating Systems: Windows 10, 8, 7; Mac OS X 10.10 or higher.
2. Memory: Windows 2 GB RAM; Mac 512 MB RAM.
3. For Mac users: Safari must function properly on the computer.
4. Mac users must have Adobe Flash Player installed to Safari, even if a different browser is normally used.
5. Functioning webcam and microphone. The webcam and microphone can be built into your computer or can be the type that plugs in with a USB cable. (You will be required to do an environment scan of your room, so please ensure you can move your computer, laptop or webcam for this scan.)
6. A broadband Internet connection. It is recommended that you access the Internet via a wired connection.

If you have any concerns about meeting system requirements, contact CourseLink Support. They will work with you to find alternative solutions or make alternative arrangements.

## 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.selfregulationskills.ca/>

## 8.4 Personal information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) <http://www.e-laws.gov.on.ca/index.html>. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies please see the Undergraduate Calendar.

(<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml>)

## 8.5 Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning as they become available.

# 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>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

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

### 9.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic 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>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.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.

For Guelph students, information can be found on the SAS website

<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website

<https://www.ridgetownc.com/services/accessibilityservices.cfm>

### 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>

## 9.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

## 9.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

## 9.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campus/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campus/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.

---