



NUTR*3210 Fundamentals of Nutrition

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 is the foundation course for the study of nutrition. The occurrence, uptake and metabolic role of nutrients will be discussed in relation to growth, reproduction and longevity in human subjects, domestic animals and other species.

Pre-Requisite(s): BIOC*2580

1.2 Timetable

Lectures: Tuesdays and Thursdays, 11:30am-12:50pm, Rozanski Hall (ROZH) 104

1.3 Final Exam

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. David Mutch
Email: dmutch@uoguelph.ca
Telephone: +1-519-824-4120 x53322
Office: ANNU 348

Office Hours:

- Drop-in office hours every week on Thursday (2:00-3:00pm) in ANNU348
- or Immediately after class

- or Email me for appointment

2.2 Teaching Assistant(s)

Teaching Assistant: Chenxuan (Kira) Wang
Email: chenxuan@uoguelph.ca

Office Hours:

- Email for appointment

3 Learning Resources

3.1 Required Resource(s)

Courselink (Website)

Basic course material will be available on the Courselink website. I will be adding information in class (i.e., fill in the blanks) to supplement the basic course material. This additional information will be tested on both the midterm and final exams.

3.2 Additional Resource(s)

Advanced Nutrition and Human Metabolism (Textbook)

- Title: Advanced Nutrition and Human Metabolism (5th and 6th Editions)
 - Authors: Sareen S. Gropper and Jack L. Smith
 - There will be copies of these texts on reserve (both editions are suitable). It is not essential to buy this text and you will find that it goes beyond the level of detail that I teach in lecture and require you to know for examinations. If you want to purchase a copy of this textbook, then the 6th edition would be suitable and may be found used or ordered on Amazon. All the material required for the course will be presented in lecture and in the lecture notes, but the text may prove useful to further understand the lecture material. It will also be helpful for students continuing on to more advanced nutrition courses. The lectures follow the sequence of chapters in this text book, with chapters 1-3 covering material from prerequisite biochemistry (which you will need to remember!), chapters 4-8 covering macronutrients and energy metabolism, and chapters 9-13 covering micronutrients. If you find areas of disagreement between the text and lecture (which can happen), please email me for clarification.
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4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. Define the compounds and elements of nutritional importance to human beings and animals and to show how they are digested and absorbed
 2. Document the metabolic fate of absorbed nutrients and describe the metabolic basis of their essentiality
 3. Illustrate the role of nutrients in integrated physiological and metabolic processes of intact humans and animals
 4. Describe the abnormalities exhibited by humans or animals ingesting diets containing either deficient or excessive quantities of specific nutrients or energy
 5. Communicate a nutritional concept of your choosing in a manner that is suitable for the general public
 6. Develop professional behaviors, including the reconciliation of different perspectives, social skills to work effectively in teams, the ability to provide feedback and accept peer critique
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5 Teaching and Learning Activities

5.1 Lecture

~ 1 lecture

Topic(s):

Welcome and Introduction to Nutrition

- Discussion of course objectives, organization and method of assessment
- Classes of nutrients and concept of dietary essentiality
- The importance of water

~ 1 lecture

Topic(s):

Food/Feeds Composition Analysis

- Proximate analysis: Modern techniques applied to a longstanding scheme

~ 1 lecture

Topic(s):

Major Types of Digestive Tracts in Animals

- Overview of digestive systems
- Digestibility

~ 1 lecture**Topic(s):** Energy

- Partitioning of feed energy for maintenance and production: gross energy (heat of combustion), digestible energy, metabolizable energy
- Physiological fuel values and the chemical basis for the differences among macronutrients in terms of energy density
- Calorimetry: energy expenditure

~ 3 lectures**Topic(s):** Carbohydrates, including Fibre

- Classification and structure
- Digestion and absorption in monogastric and ruminant animals
- Metabolism and function, importance of carbohydrates in metabolism

~ 3 lectures**Topic(s):** Lipids

- Chemical structure of dietary lipids
- Essential fatty acids
- Digestion and intestinal absorption
- Metabolism, including the problem of transporting lipids in an aqueous medium

Topic(s): IN CLASS MIDTERM**~ 3 lectures****Topic(s):** Proteins

- Classification and properties
- Dietary essential amino acids
- Protein quality
 - evaluation methods
 - examples of some common feedstuffs
- Nitrogen metabolism in ruminants
- Digestion and absorption
- Metabolism and function
 - transamination and nitrogen excretion; utilization of carbon skeletons for energy

~ 1 lecture

Topic(s): Integrative Metabolism of Macronutrients

- Integrative metabolism of dietary carbohydrates, fats, and proteins in relation to nutritional status

~ 8 lectures

Topic(s): Vitamins and Minerals

- Characteristics of compounds classified as vitamins
- Classification of essential mineral elements:
 - 7 macrominerals, 10 trace minerals
- Dietary sources, known biochemical and physiological functions, deficiency and toxicity signs/symptoms:
 - Vitamin A and provitamin A
 - Vitamin K
 - Vitamin D and the macrominerals calcium and phosphorus
 - Vitamin E and the trace mineral selenium
 - Water-soluble vitamins:
 - Vitamin C, vitamin B6, folate, vitamin B12, pantothenic acid, biotin, niacin, riboflavin, thiamin.
 - Other trace minerals:
 - Iron, copper, cobalt, zinc, iodine, fluoride, magnesium, manganese.
- Metabolic Integration

~ 1 lecture

Topic(s): Introduction to Nutrigenomics

- Bonus lecture (i.e., will only happen if time permits)
- Diet-gene interactions and their impact on health endpoints

5.2 Important Dates

- JANUARY 8 (Tues): First Lecture in ROZH 104 (11:30am – 12:50pm)
- FEBRUARY 12 (Tues): Midterm Examination (in class)

- FEBRUARY 18 – 22: WINTER BREAK (no classes or office hours)
 - MARCH 28 (Thurs): Group Assignment Due
 - APRIL 4 (Thurs): Peer Evaluation must be completed (online)
 - TBD: Final Examination
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6 Assessments

- The midterm and final exam will be multiple choice format. The questions will be designed to probe understanding of concepts and mechanisms, and will present some scenarios for interpretation.
- Important note: There will be separate exams for Section 1 and the DE course, as the courses are structured slightly differently.

6.1 Assessment Details

Midterm Exam (35%)

Date: Tue, Feb 12, 11:30 AM - , 12:50 PM, In class

- If you are ill for the midterm or have a conflict, please contact me before the in-class midterm to make alternative arrangements (the sooner you contact me, the better). I will do my best to accommodate you. If you contact me after the start of the midterm (i.e., after 11:30am on Thursday, Feb 7th, 2019), then no alternate midterm will be offered to you.
- If you don't write the midterm exam, the final exam will be worth 85%
- An alternate weighting of 25% Midterm / 60% Final will be automatically applied and each student will receive the higher of the two final grades.
- Learning Outcomes associated with this assessment: 1, 2, 3, 4

Group Assignment (10%)

Date: Thu, Mar 28, 4:00 PM

- Students will form groups of five. Student groups will be made directly on Courselink, which will help facilitate Peer Evaluation. If you don't join a group by a certain date (tbd), then you will randomly be placed into a group by the Instructor. Groups will be required to develop a 1-page Infographic about a nutrient and a related health outcome. Note that your Infographic could be designed for a human health endpoint or an animal health endpoint. Short videos about the "do's and don'ts" of Infographic design will be posted on

Courselink. A grading scheme will be provided to students on Courselink.

- Groups will have ~6 weeks to complete the Infographic. If a group does not have any contact (post on Courselink, email, Facebook chat, etc) with a group member by Thursday, March 14th, please email Dr. Mutch to let him know. Students who do not connect with their group by this date will automatically receive 50% of the mark obtained by the group on the Infographic. For example, if a group receives 16/20 on the Infographic, then the student who didn't contact their group by the deadline will receive 8/20.
- Infographics will be submitted through your group Dropbox on Courselink by 4pm on March 28th. A penalty of 10% will be applied every 24 hours after this due date and time.
- The Group Assignment grade will be given per group, not per student. The Group Assignment will comprise 10% of your final grade.
- Learning Outcomes associated with this assessment: 1, 2, 3, 4, 5, 6

Peer Evaluation (5%)

Date: Thu, Apr 4, 11:59 PM, Online PEAR software

- Students in a group will evaluate each other with regards to their ability to work effectively within a team. Groups will generally consist of 5 students; therefore each student will be required to complete 4 peer evaluations. Peer evaluations will remain confidential and will not be handed back to students. One evaluation will take ~5 minutes to complete. Peer evaluations will be performed online through PEAR (Peer Evaluation, Assessment, and Review) and must be completed before midnight on April 4th. Students who do not complete peer evaluations by this time will automatically receive a grade of 0, irrespective of what your group members give you as a grade. The Peer Evaluation grade will correspond to the average grade given by your group members. Grades will be given per student, not per group. The Peer Evaluation will comprise 5% of your final grade.
- Learning Outcomes associated with this assessment: 5, 6

Final Exam (50%)

Date: TBD, TBD

- Final Exam is on entire course, but weighted so that approximately 70% of the exam is on material covered after the midterm exam
- If you don't write the midterm exam, the final exam will be worth 85%
- An alternate weighting of 25% Midterm / 60% Final will be automatically

- applied and each student will receive the higher of the two final grades.
- Learning Outcomes associated with this assessment: 1, 2, 3, 4
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7 Department of Human Health and Nutritional Sciences Statements

7.1 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](#)

7.2 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>

7.3 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/>

8 University Statements

8.1 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.

8.2 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>

8.3 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>

8.4 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.

8.5 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>

8.6 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>

8.7 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.

8.8 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>
