



# **ANSC\*6470 Advanced Animal Nutrition and Metabolism I**

Fall 2023  
Section(s): C01

Department of Animal Biosciences  
Credit Weight: 0.50  
Version 1.00 - August 25, 2023

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## **1 Course Details**

### **1.1 Calendar Description**

A systematic review of key aspects of energy, protein, amino acid and carbohydrate utilization and metabolism in farm animals.

### **1.2 Course Description**

The purpose of the course is to provide students a core background and recent advances in understanding of key aspects of nutrient utilization and metabolism in animals. As the part I of the two series of courses, this course focuses on three sub-modules of advances in understanding utilization and metabolism of proteins and amino acids, carbohydrates, and energy. Each week will consist of two 80-min class sessions, which will involve group discussions. Ideally, in the first class session of each of the three sub-modules (protein and amino acids, carbohydrates, energy), the instructor and invited speakers will present a brief overview and relevant background information. For the other class sessions, students will be assigned to lead the discussion on pertinent research papers that are chosen by students and are approved by the instructor. It is essential that all students read the papers that will be discussed in upcoming class meetings. When presenting research papers, the student will need to provide some carefully selected background information on the topic (potentially from other sources than the paper itself), followed by a description of key methodology and results, a critical assessment of the conclusions, the conceptual contribution of the papers to our understanding of the field, and strengths and weaknesses of the paper. The instructor will clarify research methodology and concepts and direct discussions when appropriate. Students will be asked to write a short review paper (approximately 10 pages) in their chosen topic area for each of the three sub-modules. The instructor will provide guidelines on student research paper presentations and how students' presentations will be evaluated. The instructor will also provide guidelines on writing the mini-review papers at the beginning of

the course semester.

### 1.3 Timetable

Mon/Wed; 1:00 pm - 2:20 pm; room ANNU #101. Please also see WebAdvisor for the latest information.

**COVID-19 Disclaimer:** please be aware that the information on course delivery, accessibility and examinations presented in this outline were developed based on current University guidelines. However, due to the continuously evolving situation and resulting changes in public health recommendations, the format and delivery of this course may be revised with limited notice.

### 1.4 Final Exam

There is no final exam for this course.

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## 2 Instructional Support

### 2.1 Instructional Support Team

<b>Instructor:</b>	Ming Fan
<b>Email:</b>	mfan@uoguelph.ca
<b>Telephone:</b>	+1-519-824-4120 ext. 53656 (office)
<b>Office:</b>	ANNU #224

### 2.2 Communicating with your Instructor

During the course, your instructor will interact with you on various course matters on the course website using the following ways of communication:

- **Announcements:** The instructor will use **Announcements** on the Course Home page to provide you with course reminders and updates. Please check this section frequently for course updates from your instructor.
- **Ask Your Instructor Discussion:** Use this discussion forum to ask questions of your instructor about content or course-related issues with which you are unfamiliar. If you encounter difficulties, the instructor is here to help you. Please post general course-related questions to the discussion forum so that all students have an opportunity to review the response. To access this discussion forum, select **Discussions** from the **Tools** dropdown menu.

- **Email:** If you have a conflict that prevents you from completing course requirements, or have a question concerning a personal matter, you can send your instructor a private message by email. The instructor will attempt to respond to your email within 24 hours.
  - **Video Call:** If you have a complex question you would like to discuss with your instructor, you may book a video meeting on Zoom (or Virtual Classroom on the CourseLink). Video meetings depend on the availability and are booked on a first come first served basis.
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## 3 Learning Resources

### 3.1 Other Resources

Course syllabus, guidelines and other class related information will be posted on the course site as PDF files by the course instructor through using D2L. Student original research papers to be used for class presentation and discussions will be circulated to class students via email by the course instructor.

### 3.1 Course Technologies

#### **CourseLink System Requirements**

You are responsible for ensuring that your computer system meets the necessary system requirements. Use the browser check tool to ensure your browser settings are compatible and up to date. (Results will be displayed in a new browser window).

<http://spaces.uoguelph.ca/ed/system-requirements/>

<https://courselink.uoguelph.ca/d2l/systemCheck>

#### ***Course Technologies***

## **CourseLink**

*This course is being offered using CourseLink (powered by D2L's Brightspace), the University of Guelph's online learning management system (LMS). By using this service, you agree to comply with the University of Guelph's Access and Privacy Guidelines. Please visit the D2L website to review the Brightspace privacy statement and Brightspace Learning Environment web accessibility standards.*

*<http://www.uoguelph.ca/web/privacy/> <https://www.d2l.com/legal/privacy/>  
<https://www.d2l.com/accessibility/standards/>*

## **Technical Support**

*If you need any assistance with the software tools or the CourseLink website, contact CourseLink Support.*

*Email: [courselink@uoguelph.ca](mailto:courselink@uoguelph.ca)*

*Tel: 519-824-4120 ext. 56939 Toll-Free (CAN/USA): 1-866-275-1478*

***Support Hours (Eastern Time):***

*Monday thru Friday: 8:30 am–8:30 pm*

*Saturday: 10:00 am–4:00 pm*

*Sunday: 12:00 pm–6:00 pm*

### **3.1 Additional Course Technology**

#### **Zoom**

While this course is scheduled on site in the classroom; in case of public health regulatory changes, this course may be delivered virtually via Zoom. Check your system requirements to ensure you will be able to participate in.

<https://opened.uoguelph.ca/student-resources/system-and-software-requirements>

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## 4 Learning Outcomes

### 4.1 Course Learning Outcomes

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

1. Literacy - Students will be required to develop an understanding of key review articles, interpret peer-reviewed original research papers and present ideas and research findings to the class orally. Students are expected to be actively involved in class discussions. Students' scientific writing skills will be improved through writing short and focused mini-review papers during the semester. Students are asked to follow the guidelines and requirements to prepare and carry out oral presentations and mini-review writing assignments.
2. A sense of historical development - The history of nutrient discovery, nutritional concept development and development of techniques to evaluate nutritional adequacy (i.e., nutrient bioavailability and requirements of essential nutrients) of diets & rations will be weaved into the course material.
3. Understanding of forms of inquiry - Various experimental approaches in the nutritional sciences and their interpretation will form an important part of discussions in class.
4. Depth and breadth of understanding - Aside from covering detailed aspects of the cellular

and molecular mechanisms of nutrient transformation (e.g., biosynthesis and catabolism) in the body, students will be encouraged to develop a facility with the philosophy that whole - animal function can be explained by appealing to cellular metabolism at the molecular level.

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## 5 Teaching and Learning Activities

### 5.1 Lecture

**Mon, Sep 11**

**Topics:** First class meeting

**Wed, Sep 13**

**Topics:** Lecture – "Advances in protein and amino acid nutrition and metabolism"

Dr. Ming Z. Fan, Department of Animal Biosciences,  
University of Guelph

#### **Sub-module 1: "PROTEINS AND AMINO ACIDS" Begins**

**Mon, Sep 18**

**Topics:** Topic of amino acid and protein bioavailability: student presentations

**Wed, Sep 20**

**Topics:** Topic of amino acid and protein bioavailability: student presentations

**Mon, Sep 25**

**Topics:** Topic of amino acid and protein requirements: student presentations

**Wed, Sep 27**

**Topics:** Topic of amino acid and protein requirements: student presentations

**Mon, Oct 2**

**Topics:** Topic of amino acid and protein utilization and metabolism: student presentations

**Wed, Oct 4**

**Topics:** Topic of amino acid and protein utilization and metabolism: student presentations

**Mon, Oct 9**

**Topics:**

Holiday - No **Class Scheduled!**

**Wed, Oct 11**

**Topics:** Topic of amino acids in signalling metabolism: student presentations

**Mon, Oct 16**

**Topics:** Guest Lecture – "Advances in carbohydrate nutrition and metabolism focusing on monogastric food animals"

Dr. Elijah Kiarie, Department of Animal Biosciences,  
University of Guelph

**Sub-module 2: "CARBOHYDRATES" Begins**

**Wed, Oct 18**

**Topics:** Topic of carbohydrate digestion and absorption: student presentations

**Mon, Oct 23**

**Topics:** Topic of carbohydrate digestion and absorption: student presentations

**Wed, Oct 25**

**Topics:** Topic of carbohydrate and productivity and health &



wellbeing: student presentations

**Mon, Oct 30**

**Topics:** Topic of carbohydrate and productivity and health & wellbeing: student presentations

**Wed, Nov 1**

**Topics:** Topic of sugar homeostasis and metabolism: student presentations

**Mon, Nov 6**

**Topics:** Topic of sugars & metabolites in signalling metabolism and gene expression: student presentations

**Wed, Nov 8**

**Topics:** Guest Lecture – "Advances in energy nutrition and metabolism research with emphasis on inflammation aspects in pigs"

Dr. Lucas Rodrigues, Discovery Researcher, Zinpro Corporation, Eden Prairie, MN, USA

**Sub-module 3: "ENERGY" Begins**

**Mon, Nov 13**

**Topics:** Topic of energy bioavailability (i.e., DE, ME and NE systems) in feedstuffs: student presentations

**Wed, Nov 15**

**Topics:** Topic of energy bioavailability (i.e., DE, ME and NE systems) in feedstuffs: student presentations

**Mon, Nov 20**

**Topics:** Topic of energy needs for various body functions: student presentations

**Wed, Nov 22**

**Topics:** Topic of energy needs for various body functions: student presentations

**Mon, Nov 27**

**Topics:** Topic of cellular & molecular events in energy expenditure: student presentations

**Wed, Nov 29**

**Topics:** Topic of cellular & molecular events in energy expenditure: student presentations

## 6 Assessments

Academic leadership in discussion, presentation of research papers and writing scientific mini-reviews will be marked. Students will also be evaluated for participation in class discussions. The instructor will make efforts in posting students' individual sub-module marks upon completing each sub-module.

### 6.1 Marking Schemes & Distributions

Name	Scheme A (%)
Preparation for and participation in class discussions	10
Oral presentations (3 x 15 marks) of original research articles	45
Writing up mini-review papers (3 x 15 marks each for about 10 pages excluding the reference listing section)	45
Total	100

### 6.2 Assessment Details

**Preparation and participation to class discussions (10%)**

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

**Oral presentations (3 x 15 marks) of research articles (45%)**

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

**Mini-review papers (3 x 15 marks each for 10 pages excluding listed references) (45%)**

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

Students' mini-review assignments in Word files for the sub-module-1 are due for submission onto Dropbox on CourseLink site **Oct. 16, 2023**.

Students' mini-review assignments in Word files for the sub-module-2 are due for submission onto Dropbox on CourseLink site on **Nov. 20, 2023**.

Students' mini-review assignments in Word files for the sub-module-3 are due for submission onto Dropbox on CourseLink site on **Dec. 05, 2023**.

## 6.3 Additional Notes

Specific written guidelines for presenting original research papers and writing up mini-review papers will be provided and discussed in the first class meeting by the course instructor.

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# 7 Course Statements

## 7.1 Grading Policies

Students' Power point presentation files will be submitted onto the Dropbox on the CourseLink site after class presentations for class posting and sharing. Students' finalized mini-review assignments are to be prepared in a MS Word file will be submitted onto the Dropbox on the CourseLink site by following the suggested due dates.

## 7.2 Course Policy on Group Work

Not applicable.

## 7.3 Course Policy regarding use of electronic devices and recording of lectures

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

By enrolling in a course, unless explicitly stated and brought forward to their instructor, it is assumed that students agree to the possibility of being recorded during lecture, seminar or other "live" course activities, whether delivery is in-class or online/remote.

If a student prefers not to be distinguishable during a recording, they may:

1. turn off their camera
2. mute their microphone
3. edit their name (e.g., initials only) upon entry to each session
4. use the chat function to pose questions.

Students who express to their instructor that they, or a reference to their name or person, do not wish to be recorded may discuss possible alternatives or accommodations with their instructor.

## **Online Behaviour**

**Inappropriate online behaviour will not be tolerated. Examples of inappropriate online behaviour include:**

- Posting inflammatory messages about your instructor or fellow students
- Using obscene or offensive language online
- Copying or presenting someone else's work as your own
- Adapting information from the Internet without using proper citations or references
- Buying or selling term papers or assignments
- Posting or selling course materials to course notes websites
- Having someone else complete your quiz or completing a quiz for/with another student
- Stating false claims about lost quiz answers or other assignment submissions
- Threatening or harassing a student or instructor online
- Discriminating against fellow students, instructors and/or TAs
- Using the course website to promote profit-driven products or services
- Attempting to compromise the security or functionality of the learning management system
- Sharing your user name and password

- Recording lectures without the permission of the instructor

## 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>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

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

### 8.3 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>

### 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 make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

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>

## 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>

## 8.9 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.

## 8.10 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).

## 8.11 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.

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