
ANSC*6470 - Advanced Animal Nutrition and Metabolism I

Fall 2025 Course Outline

Section: 01

Credits: 0.50

Land Acknowledgement: Guelph

The University of Guelph resides on the ancestral lands of the Attawandaron people and the treaty lands and territory of the Mississaugas of the Credit. We recognize the significance of the Dish with One Spoon Covenant to this land and offer respect to our Anishinaabe, Haudenosaunee and Métis neighbours. Today, this gathering place is home to many First Nations, Inuit, and Métis peoples and acknowledging them reminds us of our important connection to this land where we work and learn.

Calendar Description

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

Department(s): Department of Animal Biosciences

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.

Lecture Schedule

MonFri 8:30am-9:50am in ALEX*309 (9/4 to 12/12)

Instructor Information

Wendy Pearson

Email: wpearson@uoguelph.ca

Office: ANNU 240

Learning Resources

Required Resources

There are no required textbooks required for this course. All students are required to read each of the research papers that will be discussed in class.

Campus Resources

If you are concerned about any aspect of your academic program: Make an appointment with a Program Counsellor (<https://www.uoguelph.ca/uaic/programcounsellors/>) in your degree program. If you are struggling to succeed academically: There are numerous academic resources offered by the

Learning Commons (<https://www.lib.uoguelph.ca/using-library/spaces/learning-commons/>) including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills.

Cost of Textbooks and Learning Resources

Textbook / Learning Resource	Required / Recommended	Cost
NA		

Course Learning Outcomes

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's 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.

Schedule of Topics and Assignments

Week of	Topic	Activities	Due
9/8	MONDAY - Course introduction; considering species when interpreting research - W. Pearson FRIDAY - CARBOHYDRATES: Digestion, absorption, and role in animal productivity and health - H. Godfrey		
9/15	MONDAY - Carbohydrate digestion and absorption: Student Presentations FRIDAY - Carbohydrate digestion and absorption: Student Presentations		
9/22	MONDAY - Carbohydrates in animal productivity and health - Student Presentations FRIDAY - Carbohydrates in animal productivity and health - Student Presentations		
9/29	MONDAY - Comparative carbohydrate nutrition - Student Presentations FRIDAY - Comparative carbohydrate nutrition - Student Presentations		
10/6	MONDAY - Protein and Amino Acids: bioavailability, requirements, utilization, metabolism, growth - AK Shoveller FRIDAY - Protein and Amino Acids: bioavailability - Student Presentations		
10/13	Thanksgiving Holiday		
10/17	FRIDAY - Protein and Amino Acids: requirements - Student Presentations		

10/20	MONDAY - Protein and Amino Acids: requirements - Student Presentations FRIDAY - Protein and Amino Acids: utilization and metabolism - Student Presentations
10/27	MONDAY - Protein and Amino Acids: growing animals vs adults - Student Presentations FRIDAY - Protein and Amino Acids: growing animals vs adults - Student Presentations
11/3	MONDAY - Energy: bioavailability, needs for body functions, cellular and molecular events in energy expenditure - L. Huber FRIDAY - Energy: bioavailability in feedstuffs - Student Presentations
11/10	MONDAY - Energy: bioavailability in feedstuffs - Student Presentations FRIDAY - Energy: bioavailability in feedstuffs - Student Presentations
11/17	MONDAY - Energy: needs for bodily functions - Student Presentations FRIDAY - Energy: needs for bodily functions - Student Presentations
11/24	MONDAY - Energy: cellular and molecular events in energy expenditure - Student Presentations FRIDAY - Energy: cellular and molecular events in energy expenditure - Student Presentations

Teaching and Learning Activities

Weekly Activities

Attendance at all classes is mandatory. Students are expected to come prepared to discuss papers that will be presented at scheduled classes. Preparation includes reading assigned papers, writing a short (~250 words) lay summary of the papers that will be discussed, and preparing at least 2 questions per paper they will ask of the presenting student about the paper. Summary, questions, and answers to the questions will be submitted to dropbox at the end of each Student Presentations class.

Assessment Breakdown

Description	Weighting (%)	Due Date
Paper summaries, questions and answers	20%	End of each student discussion class
Oral presentations (2 x 22.5 marks) / discussion of original research articles	45%	as per schedule posted on courselink
Writing up mini-review papers (3 x 15 marks each for about 10 pages excluding the reference listing section)	35%	One week after each sub-module

Assessment Details

Assignment

Research Summaries

20%

Students will prepare a lay summary (200-300 words) of each paper to be presented during Student Presentations classes, together with 4 questions to ask of the Presenters. Submitted to dropbox by 11:59pm the day prior to presentations.

Grade:

Show up - 5%

Written summary plus questions (clearly summarizes the rationale, methods, and results of paper, and provides clear statement of the implications of the study to animal nutrition; questions demonstrate thoughtful review of the paper) - 10%

Participates in discussion - 5%

Course Learning Outcomes Assessed: 1, 2, 3, 4

Presentation

Oral Presentations

45%

Students will present their selected paper to the class. Maximum of 3 powerpoint slides may be used. Clearly summarize the research rationale, methods, results, implications to animal nutrition, and identify a knowledge gap that is revealed by the study (ie. what questions arise from this new knowledge). Student then leads the class in discussion of the paper. Presentation time: 10 min. Discussion time: 10-12 min.

Grades:

Clarity and quality of slides: 10%

Clarity, quality and accuracy of presentation; stays on time: 10%

Actively engages the class in discussion; demonstrates knowledge beyond the paper in answering questions of classmates: 25%

Course Learning Outcomes Assessed: 1, 2, 3, 4

Literature Review

Mini-Reviews

35%

Students will prepare a mini-review for each module (ie. carbohydrates, proteins/amino acids, energy). Students may select any aspect of the module that is of interest to them. Review must include the most recent primary research available and should demonstrate knowledge of the state-of-the-art in the selected area, in context with key historical development research. Papers should be 4000-5000 words, excluding references, and will be submitted to dropbox.

Due one week after completion of each module as follows:

Carbohydrates: Friday October 10, 11:59pm

Protein/Amino Acids: Friday November 7, 11:59pm

Energy: Friday Dec 5, 11:59pm

Grades:

Papers will be graded according to their clarity, focus, and how well they present relevant historical context of subject while focusing on the most recent (last 5 years) research on the topic; paper is arranged in an organized and coherent manner; writing style is clear and avoids "one-paper-one-paragraph" construct; free of grammatical and spelling errors; incorporates a minimum of 10 primary research papers

Course Learning Outcomes Assessed: 1, 2, 3, 4

Last Day to Drop Course

The final day to drop Fall 2025 courses without academic penalty is the last day of classes: November 28

After this date, a mark will be recorded, whether course work is completed or not (a zero is assigned for missed tests/assignments). This mark will show on the student's transcript and will be calculated into their average.

Course Grading Policies

Submission of Assignments

All assignments will be submitted to dropbox on our Courselink site.

Late Assignment

Late assignments will not be accepted without approval from the instructor BEFORE the assignment due date. Approval will only be provided under exceptional circumstances.

Use of Artificial Intelligence (AI) in Course Assignments

Policy of the University of Guelph on use of AI can be found here <https://news.uoguelph.ca/2023/03/university-of-guelph-statement-on-artificial-intelligence-systems-chatgpt-academic-integrity/>.

Please note in particular: **"Unauthorized student use of AI systems undermines student learning, the achievement of learning outcomes and violates the University's academic misconduct policies."**

All submitted written work is expected to be the work of each individual student; any approved use of AI (eg. to correct grammar) must be declared, and the student's original version (prior to AI-corrections) must be submitted in addition to the AI-corrected version.

Standard Statements for Graduate Courses

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 discourages misconduct. 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.

The Academic Misconduct Policy (<https://calendar.uoguelph.ca/graduate-calendar/general-regulations/academic-misconduct/>) is outlined in the Graduate Calendar.

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.

Use of the SAS Exam Centre requires students to make a booking at least 10 business days in advance, and no later than the first business day in November, March or July as appropriate for the semester. Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time. For students at the Guelph campus, information can be found on the SAS website. (<https://www.uoguelph.ca/sas/>)

Accommodation of Religious Obligations

If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements.

See the Academic calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations (<https://calendar.uoguelph.ca/graduate-calendar/general-regulations/academic-accommodation-religious-obligations/>)

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.

Drop Date

Courses that are one semester long must be dropped by the end of the last day of classes; two-semester courses must be dropped by the last day of classes in the second semester. The regulations and procedures for Dropping Courses (<https://calendar.uoguelph.ca/graduate-calendar/general-regulations/registration/>) dropping courses are available in the Graduate Calendar (<https://calendar.uoguelph.ca/graduate-calendar/general-regulations/registration/>).

Email Communication

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

Health and Wellbeing

The University of Guelph provides a wide range of health and wellbeing services at the Vaccarino Centre for Student Wellness (<https://wellness.uoguelph.ca/>). If you are concerned about your mental health and not sure where to start, connect with a Student Wellness Navigator (<https://wellness.uoguelph.ca/navigators/>) who can help develop a plan to manage and support your mental health or check out our mental wellbeing resources. (<https://wellness.uoguelph.ca/shine-this-year/>) The Student Wellness team are here to help and welcome the opportunity to connect with you.

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).

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.

Resources

The Academic Calendars (<http://www.uoguelph.ca/registrar/calendars/?index>) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

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. See the Graduate Calendar for information on regulations and procedures for Academic Consideration (<https://calendar.uoguelph.ca/graduate-calendar/general-regulations/grounds-academic-consideration/>).