

EQN*4020 - Advanced Equine Nutrition

Winter 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.

Personal land acknowledgement from Professor Shoveller: *I acknowledge that I completed a BSc in Animal Biology, a Post Doctoral Fellowship in Companion Animal Nutrition and currently live and work in the City of Guelph which resides on the treaty lands and territory of the Mississauga of the Credit. I grew up in Cayuga on the banks of the Grand River and home to the Six Nations of the Grand River which unifies all Haudenosaunee peoples under the Great Tree of Peace. Every summer I spend time at our camp on the traditional lands of the Atikameksheng Anishnawbek and the Wahnapiatae First Nation. I attended the University of Alberta in Edmonton which resides on the Treaty 6 Territory and respects the history, languages, and cultures of the First Nations, Metis, Inuit and all First Peoples of Canada. I offer my ongoing commitment to meaningful reconciliation work to the First Nations, Inuit and Metis peoples whose lived relationships with the land are time honoured.*

Calendar Description

This course focuses on the nutrition of horses at peak levels of performance or endurance. The use of real-world, case-study scenarios allows for the evaluation of practical feeding programs across a range of equine performance situations.

Department(s): Department of Animal Biosciences

Course Description

A course in which students will learn about nutrient requirements and nutritional idiosyncrasies of horses, formulation and manufacturing of horse feed and supplements, and be introduced to the principles of clinical nutrition of horses and important health issues that are related to nutrition and/or treated through nutritional approaches.

Students should have an established understanding of the general principle of animal nutrition and physiology. The material in the course will build on this background to enhance the understanding of nutrient metabolism and requirements in performance horses.

Lecture Schedule

MonWed 1pm-2:20pm in MCKN*029 (1/6 to 4/21)

standard | append

Instructor Information

Anna Shoveller

Teaching Assistants

Scarlett Burron

email: sburron@uoguelph.ca

Taylor Richards

email: tricha16@uoguelph.ca

Learning Resources

Electronic Notes

Electronic copy of course slides and additional material will also be posted on a weekly basis on the course website. Copies of course notes are not intended to be the sole source of information but guide an academic discussion on course material. **Students are expected to utilize other materials, such as scientific literature and recommended textbooks to further enhance their learning.**

Additional Resources

None, but there are a number that will be valuable as you put together your assignments. These will be discussed in class, but please use the library and Web of Science/Google Scholar/Medline etc.

Students are encouraged to follow up lecture material with reading. Some good texts and white papers have been added if you are interested in enhancing your learning.

Course Website

This course is being offered using CourseLink (<https://courselink.uoguelph.ca/shared/login/login.html?target=%2fd2l%2fhome>) (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 (<http://www.uoguelph.ca/web/privacy/> <https://www.d2l.com/legal/privacy/>) and Brightspace Learning Environment web accessibility standards (<https://www.d2l.com/accessibility/standards/>).

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
Formulation spreadsheets	Required	\$0 as instructor and graduate students have established, coded, and validated the linear programming feed formulation spreadsheet.
Scientific papers	Required and information found in course topics	\$0 as accessible through library services. Students in 4th year science should be familiar with finding scientific papers. If you are not, please visit the library and ask for support.

Students are advised that prices are often determined by the publisher or bookstore and may be subject to change.

Course Learning Outcomes

1. Critical thinking and creative thinking: Inquiry of analysis, problem solving, creativity and breadth of understanding
2. Literacy: Information literacy, quantitative literacy, technological literacy, visual literacy
3. Communicating: Oral communication, written communication, reading comprehension, integrative communication
4. Professional and ethical behaviour: Teamwork, ethical reasoning, leadership, personal organization, and time management

Schedule of Topics and Assignments

Week of	Topic	Activities	Due
1/6	Introduction and Equine digestive anatomy and physiology	Establish group of 3-5 people, must have one BBRM and one ABSc student	

1/13	Equine digestive anatomy and physiology Socioecology of horses	Additional reading: Arias-Esquivel et al. Investigating the gastrointestinal physiology of mature horses with and without a history of cribbing behaviour in response to feeding a digestive support supplement. doi: https://doi.org/10.1016/j.jevs.2023.104964
1/20	The role of the microbiome in gastrointestinal function- Scarlett Burron, PhD candidate Feeding behaviour of horses	Additional reading: Hanis et al. Effect of feed modification on the behaviour, blood profile, and telomere in horses exhibiting abnormal oral behaviours. https://doi.org/10.1016/j.jveb.2022.12.002
1/27	Equine energy metabolism and predicting energy requirements and energy intake Calculations associated with predicting energy requirements and energy intake and a discussion about management	Additional reading: Guo et al. Effects of dietary energy level on antioxidant capability, immune function and rectal microbiotica in late gestation donkeys. https://doi.org/10.3389/fmicb.2024.1308171
2/3	Equine carbohydrate metabolism and requirements Calculations associated with predicting starch and fiber intake and how to adjust when feeding different horses and a discussion about management	Additional reading: Martin et al. Effect of high starch or high fiber diets on the energy metabolism and physical performance of horses during an 8-week training period. https://doi.org/10.3389/fphys.2023.1213032
2/10	Equine protein and amino acid metabolism and protein and amino acid requirements Calculations associated with protein intake and amino acid sufficiency and a discussion about management	
2/17		Winter Break
2/19		Winter Break
2/24	Equine lipid and fatty acid digestion and metabolism and fatty acid requirements MIDTERM- February 26th	IN CLASS MIDTERM, February 26th
3/3	Using different amounts of oils and what to consider Fat soluble vitamin metabolism, requirements and dietary sources and discussion of practical situations where dietary vitamin supplementation should be considered	
3/10	Water soluble vitamin metabolism, requirements and dietary sources and discussion of practical situations where dietary vitamin supplementation should be considered Mineral digestion and metabolism and how to consider in formulation of diets and consideration of supplements	Formulation Assignment #1 due on Friday by midnight; however, no marks will be deducted prior to Monday morning at 9am.
3/17	The importance of water and how to manage appropriately Consideration of electrolytes for performance horses	Ration formulation #2 due on Friday, but no marks will be deducted until Monday morning at 9am
3/24	Antinutritional factors in horse feeds	

3/31 Feeding horses to reduce reactivity or
improve trainability- Scarlett Burron, PhD
candidate
Nutritionally related equine diseases

Final group white paper due and peer
evaluation

4/7 Personal reflection due

Assessment Breakdown

Description	Weighting (%)	Due Date
Personal reflection (individual)	5%	April 9th, 9am
Midterm exam	30%	February 26th in class. If you are a SAS student please book the SAS center for your exam and write there. I always plan to run over to SAS in the library to address your questions after you read the instructions and questions.
Formulation assignment 1 and 2 (individual)	20% each (40% total)	#1: March 14th at midnight and no later than March 17th at 9am #2: March 21st at midnight and no later than March 24th at 9am
Group white paper and peer evaluation	25%	April 7th, 9am

Assessment Details

Assignment

Group establishment and agreement that will be tied to reflection

0%

Students are asked to find 3 or 4 other students and include at least one BBRM and one Animal Biology student. The remainder of the individuals can duplicate or include other degree programs. Ensuring individuals from different programs will bring a new understanding of ways of working, promote peer support networks outside of friend groups, and provide diversity of opinion to all assignments.

This group will complete the infographic together, at minimum, and are encouraged to work together throughout the semester. At minimum, if a student in a group cannot attend lecture, then the group should be responsible for providing notes and supporting that students' learning journey.

Students are encouraged to seek input from Shoveller at the beginning of the semester to help you navigate your team work and to provide practical guidance. Students also must present a professional and positive mindset and seek to find learning opportunities and provide critical introspection on how they plan to tackle the class. Individual students should reflect on whether the group contract will support their personal learning objectives, those of the course and those of the university. This contract and introspection among group members should be revisited for the final personal reflection, but on an individual basis.

Course Learning Outcomes Assessed: 4

Formulation assignment 1 and 2

40%

Students will have two formulation assignments which will build on each other, starting with simple calculations to determine intake of hay and nutrients and then building in complexity with an added concentrate to meet requirements of performance horses.

Further details will be provided as material is taught to students.

Course Learning Outcomes Assessed: 1, 4

Group Presentation

White paper

25%

Students must contact the teaching assistant prior to February with their group and a topic they will cover.

This last assignment focuses on a topic of interest to the horse community and done as a white paper or article, you chose based on your groups skill set. Students will work in groups of 4 or 5, groups established the first day of class, and complete a review of the literature on the scientific papers that you intend to use to support the information shared in the white paper/article on the feed ingredient. Students will be graded on depth of research

and accuracy of interpretation and on the extent to which the paper/article provides a summary in an easy to understand and scientifically accurate format. Creativity is a plus!

Your paper should be less than 2,000 words and should explain the ingredient, the forms of the ingredient available, the nutrient content of the ingredient and how processing may affect nutrient content, and the environmental impact of the ingredient. How the ingredient is used in equine diets and whether this is supported by publicly available data should be discussed. Finally, if there is information lacking on the ingredient in horses, point that out as a limitation and suggest what research could fill the gap.

NOTE that in addition to handing in the group assignment, every student will submit a peer evaluation for each of their group members and a self-evaluation. This is required as it will provide a weighting for your final mark for the group assignment. For example, the overall group assignment receives a final grade of 80%. Then on the peer evaluation, student 1 receives an overall group evaluation of 8/10, student 2 receives 6/10, student 3 receives 10/10, and student 4 receives 3/10, resulting in a total of 27 marks granted by peer evaluation. The the total group project marks is $80\% \times 4 = 320$. To calculate the individual final mark for study #1 = (peer evaluation mark/total peer evaluation marks*total marks for group) = $8/27 \times 320 = 95\%$. Their final grades will be 95%, 71%, 100%, and 36%.

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

Reflective Activities

Personal reflection

5%

Each student is to write a reflection that discusses, in 500 words or less, why the student took the course and then the thinking, learning and work required in the course and whether this helped to achieve your own, the course specific, and the university specific goals. In addition, reflecting on how the team was put together and agreed upon a contract and then followed or amended that contract should also be discussed as part of students overall reflection of the semester of work. This is not meant to be a course evaluation, it is meant to be a wholistic reflection understanding you are one individual in a large group and that everyone is unique. While every exercise cannot be catered to every student, if you were to take the course again, how may you change your ways of working or maybe you are happy and your approach worked well and if so, why did your approach work?

Academic reflective writing requires critical and analytic thought, a clear line of argument, and the use of evidence through examples of personal experiences and thoughts and often also theoretical literature. You should aim for a balance between personal experience, tone, and academic practice and rigor.

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

Last Day to Drop Course

The final day to drop Winter 2025 courses without academic penalty is the last day of classes: April 04

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 Standard Statements

Email Communication

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

Grading Policies

Assignments will be graded in a timely fashion (within 10 days) and they will be returned to the students with personalized feedback and/or general feedback in class to highlight some of the shortcomings in the students' work or understanding of the concepts.

Group Work

Assignments are expected to be unique work. All group members will receive the same grade for group work assignment unless otherwise approved by the Instructor. Any problems associated with group work should be brought to the attention of the instructor as soon as possible.

Dropbox Submissions

Assignments should be submitted electronically via the online Dropbox tool. When submitting your assignments using the Dropbox tool, do not leave the page until your assignment has successfully uploaded. To verify that your submission was complete, you can view the submission history immediately after the upload to see which files uploaded successfully. The system will also email you a receipt. Save this email receipt as proof of submission.

Be sure to keep a back-up copy of all of your assignments in the event that they are lost in transition. In order to avoid any last-minute computer problems, your instructor strongly recommend you save your assignments to a cloud-based file storage (e.g., OneDrive), or send to your email account, so that should something happen to your computer, the assignment could still be submitted on time or re-submitted.

It is your responsibility to submit your assignments on time as specified on the Schedule. Be sure to check the technical requirements and make sure you have the proper computer, that you have a supported browser, and that you have reliable Internet access. Remember that technical difficulty is not an excuse not to turn in your assignment on time. Don't wait until the last minute as you may get behind in your work.

If, for some reason, you have a technical difficulty when submitting your assignment electronically, please contact your instructor or CourseLink Support. (<http://spaces.uoguelph.ca/ed/contact-us/>)

Standard Statements for Undergraduate 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/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-misconduct/>) is outlined in the Undergraduate 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.

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 10 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 Accommodations of Religious Obligations (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/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

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 undergraduate students 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 the Undergraduate Calendar - Dropping Courses (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/dropping-courses/>).

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 Undergraduate Calendar for information on regulations and procedures for Academic Consideration. (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-consideration-appeals-petitions/>)