ANSC*4560 - Pet 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.

Land acknowledgement of 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 Haudenosuanee 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 Wahnapitae 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 covers nutrient requirements, feed formulation and nutritional idiosyncrasies for dogs, cats, and exotic pets. **Department(s):** Department of Animal Biosciences

Course Description

This course covers nutrient requirements, feed formulation, and nutritional idiosyncrasies of dogs and cats.

Course Fit Within Program/Curriculum

An unrestricted elective that provides 32 hours of lecture material on dogs and cats and is focused on providing a deep understanding of the unique approach to formulating and marketing dog and cat foods. In addition to lecture material, students will spend out of class time understanding a commercial product, attempting to formulate that product, and thinking about ingredient selection.

Lecture Schedule

TuTh 11:30am-12:50pm in LA*204 (1/6 to 4/21)

Lab / Seminar Schedule

My apologies for adding the lecture schedule to the lab/seminar section, but this software would only allow sentences and paragraphs in the lecture schedule section.

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Week	Topic/Lecturer	Activity
1	Introduction to instructor, teaching assistants, and the learning objectives and activities of the course, ANSC*4560 Pet Nutrition- Dr. Kate Shoveller *Diet selection and team to be discussed in class. Team will consist of a graduate student in companion animal nutrition to lead management and evaluation of team members. Team will start to discuss the roles and responsibility and set ground rules for collaboration. History of the pet food industry-Dr. Gail Kuhlman	Diet selection and discussion of how to accomplish this assignment
2	A brief overview of regulations in the pet food industry- Dr. Shoveller and Nav Ghandi, MSc student and BarkOn Intern A comparison of the gastrointestinal anatomy and physiology of the dog and cat- Dr. Kate Shoveller	Podcast- Lisa Schole, Evole Consulting Group, on product development and diet formulation insections with quality and regulatory constraints. https://www.youtube.com/watch? v=i3xFL_bnGho
3	The role of the microbiome in digestion, metabolism and behaviour of the dog and cat- Lindsey Rummel, PhD Student Energy metabolism and requirements- Dr. Kate Shoveller	Podcast- Dr. Sophia Nixon and Caitlin Donohue on protiotics and postbiotics https://www.youtube.com/watch? v=mNZC0o8XhyM Podcast- Dr. Angela Rollins on veterinary weight loss programs. https://www.youtube.com/watch?v=X- U96ookM30
4	Calculations associated with predicting energy requirements and energy intake and a discussion about management, guest speaker at end: Dr. Dan Tulpan, Applying machine learning to accelerate innovation in companion animal health Protein and amino acid metabolism and requirements- Dr. Kate Shoveller	
5	Calculations associated with protein and amino acid intake as it pertains to protein quality and discussion about when and where protein or protein quality needs to be altered- Dr. Kate Shoveller Carbohydrate metabolism, from starch to fiber- Dr. Kate Shoveller	Podcast- Dr. Kate Shoveller and Sydney Banton on formulation considerations of the sulfur amino acids https://www.youtube.com/watch? v=_7QXMTOhukg Podcast- Dr. George Fahey on the benefit of feeding different fibers. https://www.youtube.com/watch? v=IGOVHmYP1Eg
6	Calculations associated with carbohydrate and fiber intake and discussion about limitations in analyses to meet these claims- Dr. Kate Shoveller Lipid metabolism and fatty acid requirements- Dr. Dennis Jewell	Group assignment: FACTSHEET on a single ingredient used in pet food
7	READING WEEK	Midtorm over IN OLACO
8	Catch up hold and/or exam preparation MIDTERM EXAM IN CLASS	ivilaterm exam in CLASS
9	Fat soluble vitamin metabolism and requirements- Dr. Kate Shoveller Water metabolism and requirements- Dr. Kate Shoveller	Product overview due



10	Water soluble vitamin metabolism and requirements- Taylor Richards, PhD Candidate Mineral metabolism and requirements- Dr. Kate Shoveller	
11	Mineral metabolism and requirements- Dr. Kate Shoveller Feeding behaviour of dogs and cats, the importance of managing feeding and the environment it is done in Dr. Kate Shoveller	Blog: https://whatyourcatwants.com/does- warming-your-cats-food-increase-its-appeal Formulation assignment due
12	Pet food ingredients Dr. Kate Shoveller Manufacturing pet food: Ingredient quality and processing techniques Dr. Kate Shoveller	
13	Weight control in dogs and cats- Dr. Adronie Verbrugghe Senior cat considerations- Dr. Kate Shoveller	Reflection due

Instructor Information

Anna Shoveller Email: ashovell@uoguelph.ca

Additional Support

Sanjana Anan, PhD Candidate

Hannah Godfrey, PhD Candidate

Textbooks

Group	Title	Author	ISBN
Recommended	Canine and Feline Nutrition, 3rd Edition, Mosby, Inc., St. Louis, MO.	Linda Case	https://ebookcentral- proquestcom.subzero.lib.uoguelph.ca/
	(Textbook)		lib/uoguelph/detail.action?

Learning Resources

Required Resources

The formulation spreadsheet is uploaded to course content and to be used for the third assignment that will have students formulate the commercial product that they reviewed in assignment 2.

Course Resources

The Mark Morris Institute (MMI). Small Animal Clinical Nutrition, 5th Edition (Textbook) http://www.markmorrisinstitute.org/sacn5_chapters.html

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 UNIVERSITY of <u>GUELPH</u>

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
Canine and Feline Nutrition, 3rd Edition, Mosby,	Recommended	Free on-line version listed above. Dr. Shoveller
Inc., St. Louis, MO. (Textbook)		also has copies that she is willing to lend
		students who prefer hard copy.

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

Course Level Learning Outcomes

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

1. Building on your fundamental nutrition knowledge, develop an understanding of the different needs of dogs and cats.

2. Develop an understanding of the basic digestive, physiological and metabolic processes of dogs and cats as they relate to nutrition.

3. Be aware about the relationship between companion animal nutrition, environment, welfare and health.

4. Compare approaches for establishing nutrient requirements, nutritional specifications, and feed formulation guidelines and be able to discuss some of the limitations and implications of these approaches. Learn about some of the methods and protocols commonly used in pet nutrition research.

5. Learn about feed ingredients, their origin, and the factors affecting their quality and nutritive value.

6. Learn about formulation and manufacturing pet foods (pet feeds) and the regulatory issues related to pet foods.

7. Be exposed to current and emerging issues in the pet food industry.

8. Learn about available commercial and unconventional pet foods

9. Acquire some of the skills needed to be able to effectively gather, integrate and analyze scientific information to make informed decisions related to the nutrition and health of companion animals and be able to develop a critical view of nutritional claims and statements found in technical and commercial pet food documentation and advertising.

10. Understand that optimal feeding of healthy companion animals is important for the prevention of disease

Assessment Breakdown

Description	Weighting (%)	Due Date
Group contract and personal learning objectives to revisit for personal reflection	0%	NA
Ingredient factsheet, group assignment	15%	Friday February 14th, but no late marks deducted until Monday, February 17th at 9am.
Midterm IN CLASS * Please book SAS if applicable	20%	Thursday, February 27
Product overview assignment	30%	Friday, March 7th, but no late marks deducted until Monday, March 10th
Formulation assignment	30%	Friday, March 21, but no late marks deducted until Monday, March 24th
Reflection	5%	Friday, April 4th, but no late marks deducted until Monday April 7th

Exam

Midterm exam

The midterm will assess your understanding of material by presenting you data from published studies and asking you pointed questions about how to interpret the data based on the knowledge shared in lecture and the accompanied listening, video, or reading material. Midterm is intended to take 50 minutes to write.

Course Learning Outcomes Assessed: 3, 4, 5, 6, 7, 8, 9, 10

Assignment

Product development assignment

The project will focus on the selection of current commercial diets (nutrient levels, ingredients utilized, and claims made) and a summary of the scientific support for that type of diet. The students will choose one of the diets presented in the diet selection list <u>the first week of class</u>. The diet list will be available as a poll for selection on the first class and the class will be encouraged to complete while in class. A commercial product must be chosen from the list of options available, which will additionally predict the final groups for group project, which is to write a factsheet on one of your current ingredients. Students should look at what claims appear on the food package that relate to the formulation and seek to understand whether scientific support exists to substantiate these claims. Understanding the ingredient selection to meet the guaranteed analyses is critical and underpins attempts to match the formula using the formulation spreadsheet. Understanding the support required for on bag and website claims needs to be demonstrated. For more details on how these will be evaluated please see the individual rubric on CourseLink.

But just following our posted example and replacing it with information on your selected diet is not adequate to get marks over 80 where at the senior level you should be able to demonstrate application of knowledge learned and curiosity. Examples of higher level application would include understanding how the feeding guidelines are determined, pointing out structure and function claims vs. diet specific claims, identifying key science that supports the diet formulation and many more.

Course Learning Outcomes Assessed: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Formulation assignment

Formulation assignment

Students will use software developed by former teaching assistant Ilona Parenteau, MSc (currently industrial nutritionist) and Professor Shoveller, and updated by Whitney Van Straten (currently pet product innovator) and Professor Julia Pezzali (Kansas State), to try and duplicate the diet researched. We encourage you to consider new nutritional technologies **that would improve the carbon footprint of your diet** from the scientific peer-reviewed literature to incorporate into your product and "tell your story". You will need to provide a scientifically supported rationale for this ingredient change. Above and beyond stretch goals are attempts to improve diets and provide scientific or patent support to demonstrate a thorough understanding of the formulation approach. You will be required to properly calculate moisture and metabolizable energy content of the foods and you should put your guaranteed analyses together based on your predicted macronutrient and micronutrient content. Finally, the type of animal and feeding instructions should be provided. For more details on how these will be evaluated please see the individual rubric on CourseLink.

Course Learning Outcomes Assessed: 1, 5, 6, 7, 8, 9, 10

Paper

Factsheet

Students within a group of diets have been given an ingredient from that diet that they need to write a factsheet on. Your factsheet 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 pet food formulations and whether this is supported by publicly available data should be discussed. Finally, if there is information lacking on the ingredient in dogs or cats, point that out as a limitation and suggest what research could fill the gap.

Course Learning Outcomes Assessed: 4, 5, 6, 7, 9, 10

Reflective Activities

Reflection

Personal reflection should start with you considering your personal learning objectives for the course and how you think you will navigate the midterm, individual assignments and the group Factsheet. At the end of the semester you should revisit what you thought at the beginning and consider.

1. Introduction

Why did you chose the course and what you expected to gain from it.

15

5

30

20

30

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2. Content and Learning
Describe any new knowledge or skills gained during the course.
3. Engagement and Challenges
Discuss your participation in class (e.g., discussions, group work, presentations).
Identify challenges you faced (e.g., complex concepts, time management).
Explain how you overcame these challenges or areas where improvement is needed and how you will approach that personal development.
4. Personal Growth
Reflect on how the course impacted your perspective on the subject.
Mention any ways it influenced your academic, personal, or professional goals.
Identify soft skills developed, such as critical thinking, teamwork, or communication.
5. Application of Knowledge
Provide examples of how you applied what you learned outside the classroom.
Discuss the relevance of the course to your major, career path, or real-world issues.
6. Feedback and Suggestions
Offer constructive feedback for improving the course or sharing what worked well.
7. Conclusion
Summarize the key takeaways from the course.
Express gratitude (if applicable) to instructors or peers.
Look ahead to how you will build on this experience in the future.
Tips for Writing
Be honest and self-reflective but maintain a respectful tone.
Use specific examples to illustrate points.
Balance discussing positives with areas of growth or constructive criticism.
Keep the reflection concise and focused.

Course Learning Outcomes Assessed: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Grading Schemes

Rubrics will be posted for the Factsheet on an ingredient, Product Development, Food Formulation, and reflection.

For the Factsheet, students will also have students peer evaluate and distribute effort among team members. Peer evaluation will influence the grade through compared effort and contribution using the peer evaluation mark. **These evaluations must be completed to complete the course.**

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* 4=320. To calculate the individual final mark for study #1= (peer evaluation mark/total peer evaluation marks*total marks for group)= 8/27 * 320= 95%. Their final grades will be 95%, 71%, 100%, and 36%.

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 Grading Policies

Submission of Assignments

There is a flexible deadline approach in this class to acknowledge that everyone gets assignments done at different times and at a different pace. Providing a flexible deadline can be considered a universal design principle to improve accessibility.

Late Assignment

Late assignments will have 10% deducted per day.

Course Standard Statements

Course Policies

All requests regarding grading should be directed to the teaching assistant responsible for the assignment prior to coming to Professor Shoveller. While students are encouraged to discuss topics and evaluations with teaching assistants and the instructor requests for remarks will be for the entire midterm or assignments and may result in a decrease in your mark. Assignments or midterms will not be remarked without a written rationale submitted by the student.

Course Policy on Group Work

Working in groups is challenging, but certainly a "real life" experience. Please show compassion, consideration and respect for each other.

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.

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/)