



ANSC*4350 Experiments in Animal Biology

Winter 2020

Section(s): C01

Department of Animal Biosciences

Credit Weight: 0.50

Version 2.00 - December 03, 2019

1 Course Details

1.1 Calendar Description

This course provides an opportunity for directed hands-on projects involving live animals and laboratory techniques. A set of selected projects will be provided by Animal Biosciences faculty within their broad fields of study, for example animal behaviour and welfare, environmental physiology, endocrinology, and reproduction.

Pre-Requisites:	ANSC*3080, ANSC*4090
Co-Requisites:	ANSC*4100, ANSC*4490
Restrictions:	Restricted to students in BSCH.ABIO, BSAG.ANSC. Instructor consent required.

1.2 Course Description

Over the course of the semester, groups of students will be involved in conducting a single experiment on agricultural animals either on campus or at one of the research stations. Students will be provided with an outline for the experiment but will develop their own hypotheses and experimental plan and execute data collection. Individual groups conducting separate projects will meet separately for the development of hypotheses, experimental design, data collection and analysis. Students will be responsible for measuring behaviour, monitoring growth, production or reproduction and collecting blood or saliva. Students will learn and practice sampling techniques and assays for measuring hormones or metabolites. They will also analyze data and interpret and present their results in written and oral format.

Students will meet weekly (Tuesday at 2:30 p.m., ANNU Room 030) for presentations on techniques used in different areas of research and to present group status reports. This will expose students to the variety of experimental approaches used in various fields of research. Students will be expected to integrate or consider the impact of these ideas in their

experimental design.

1.3 Timetable

Tuesday 2:30 p.m. - 5:30 p.m., ANNU 030, other times as required

Timetable is subject to change. Please see WebAdvisor for the latest information.

1.4 Final Exam

There is no final exam. The different groups will present their results during the final class (March 31) and individual lab reports are due the end on the final week (April 3)

2 Instructional Support

2.1 Instructional Support Team

Instructor: James Squires
Email: jsquires@uoguelph.ca
Telephone: +1-519-824-4120 x53928
Office: ANNU 146
Office Hours: By Appointment

Lab Co-ordinator: Julie Kim
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2.2 Teaching Assistants

Teaching Assistant: Midian Nascimento Dos santos
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Teaching Assistant: Lauren Hansen
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3 Learning Resources

3.1 Required Resources

Required Texts (Textbook)

None

3.2 Recommended Resources

Recommended Texts (Textbook)

None

3.3 Additional Resources

Lab Manual (Lab Manual)

project descriptions and lab protocols are posted on Course Link

Other Resources (Other)

Lecture notes and additional information pertinent to the course are posted on CourseLink

3.4 Additional Course Information

Project 1 – Piglet feed management during the post-weaning period

Background

Piglets experience a post-weaning growth lag that is related to poor feed intake, limited gut capacity, exposure to novel pathogens, introduction of feed allergens (e.g. soybean meal), and social stressors (i.e. establishment of a new social hierarchy). To combat this post-weaning growth lag, nutritionists and producers often feed very expensive and highly digestible diets to promote feed consumption.

It is common for nursery piglets to be fed multiple phases of diets with decreasing nutrient density and digestibility. Based on mathematical models, we estimate the optimum body weight to conduct feed switches. However, the piglet itself may be more effective at eating to its nutrient requirements given the choice between high and low nutrient density diets.

Additionally, when piglets are mixed into new social groups (i.e. litter mates are often separated) piglets are preoccupied with establishing new social hierarchies in the first several hours after weaning. During this time, piglets often do not explore the feeders or consume any feed. Adding feeders and feed after the initial social hierarchy is established may promote increased exploratory behaviour and an overall greater feed intake within the first 24 hours of weaning.

Objectives and overview

The objectives of this project are to determine the effects of various feed management strategies after weaning on feed intake, piglet growth, and feeding and social behaviour. Sixty four piglets will be obtained at the Arkell Swine research station on the day of weaning and randomly assigned to 1 of 16 identical nursery pens (ensuring that equal numbers of littermates are present in each pen). One of many different feed management strategies can be studied. For example:

1. Timing of feed introduction - In half of the pens feeders will be pre-filled with nursery diet (standard practice; control group). In the remaining pens feeders and feed will not be provided until 4-6 hours after mixing (treatment group). Behaviour will be monitored immediately after mixing and 4-6 hours later (when feeders are added to treatment pens). Collect saliva samples for cortisol analysis throughout the day. Monitor per pen daily feed intake and individual piglet body weights.

2. Feed selection by piglets post weaning - In half of the pens 2 feeders will be provided, one with a high and one with a low nutrient density feed (treatment). In the remaining pens, two feeders will be provided with a standard ration (control; nutrient composition is the average of the treatment diets). Monitor feeding behaviour, piglet growth rates, and feed disappearance from each of the feeders.

3. Test different feed additives to maximize feed intake and growth after weaning (e.g., flavours, exogenous enzymes, new feed ingredients like insect meal).

References:

Bruni A, Quinton VA, Widowski TM. 2007. The effect of feed restriction on belly nosing behaviour in weaned piglets. *Appl. Anim. Behav. Sci.* 110:203-215.

Colson V, Martin E, Orgeur P, Prunier A. 2012. Influence of housing and social changes on growth, behaviour and cortisol in piglets at weaning. *Physiol. Behav.* 107:59-64.

Dybkjaer L, Jacobsen AP, Togersen FA, Poulsen HD. 2006. Eating and drinking activity of newly weaned piglets: Effects of individual characteristics, social mixing, and addition of extra zinc to the feed. *J. Anim. Sci.* 84: 701-711.

Ettle T, Roth FX. 2005. Dietary preferences for feeds varying in threonine concentration by the piglet. *Physiol. Behav.* 85:289-295.

Ferguson NS, Nelson L, Gous RM. 1999. Diet selection in pigs: choices made by growing pigs when given foods differing in nutrient density. *Anim. Sci.* 68: 691-699.

Pluske JR. 2013. Feed- and feed additives-related aspects of gut health and development in weanling pigs. *J. Anim. Sci. Biotech.* 4:1-7. (Review paper)

Widowski TM, Torrey S, Bench CJ, Gonyou HW. 2008. Development of ingestive behaviour and the relationship to belly nosing in early-weaned pigs. *Appl. Anim. Behav. Sci.* 110:109-1027.

3.4 Additional Course Information

Laboratory Project 2. Highly processed soybean as alternatives to antimicrobial growth promoters in broiler chickens

Background:

There is increasing consumer demand for birds raised on feeding programs without or with reduced antimicrobial growth promoters (AGP) in conjunction with evolving specialty products such as organic, all vegetable and pasture feeding regimens. The primary concerns

of these developments are increased incidences of enteric diseases such as coccidiosis, necrotic enteritis, impaired nutrients digestion and absorption ultimately leading to poor feed efficiency, increased mortalities and condemnation at the processing plant. Key element in successful chicken nutrition is a healthy gastrointestinal tract to maximize nutrients digestion and absorption.

Soybean meal (SBM) is a major source of protein and amino acid diets in poultry diets around the world (NRC 1994). However, due to variation in processing (oil extraction and heating), residual trypsin inhibitors, carbohydrate complexes, and antigens can cause digestive disturbances (Ravindran et al. 2014; Kiarie and Mills 2019). Further processing of SBM through enzymatic and microbial treatments has been demonstrated to improve nutrients utilization in SBM fed to pigs and poultry (Kim et al. 2018; Yáñez et al. 2019). Soybeans are also rich sources bioactives with antimicrobial effects (Dhayakaran et al. 2016). Processed soybean meal with reduced anti-nutritional factors that are commonly used in piglet pre-starter diets may be helpful in bolstering post-hatch gut resiliency to luminal challenges in chicks.

Objectives and overview

The objective of this experiment is to investigate effects of processed SBM (AlphaSoy 530) and yeast fermented SBM on gut development and growth performance in broiler chickens (day 0 to 56). This experiment will be part of an ongoing study at Arkell Poultry Research Station (AUP #3521). Lead Researcher, Mohsen Mohammadigheisar mmohamm@uoguelph.ca.

Ross 708 – male broilers 1 day old will be group housed, with wood shavings bedding in Brooder rooms 2 to 5 (Arkell Poultry Research Station). There are 4 different treatments with 12 replicates per treatment and 20 birds per replicate.

Treatments:

	T1	T2	T3	T4
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Pre-starter-d0-6	SBM	AS530 150 kg/ t	ASG 150 kg/ t	ASG 150 kg/ t
Starter – d7-15	SBM	AS530 50 kg/ t	ASG 50 kg/ t	ASG 50 kg/ t
Grower–d16-28	SBM	SBM	SBM	SBM / HY 2kg/ t
Fin 1–d29-42	SBM	SBM	SBM	SBM / HY 2kg/ t
Fin 2–d43-56	SBM	SBM	SBM	SBM / HY 2kg/ t

Diets will be fed in 4 phases; pre-starter (d 0-6) (d 7-15), grower (d 16-28), finisher1 (d 29-42) and finisher2 (d43-56); Fine crumbles for starter, coarse crumbles for grower and pellets for finisher phases. Diets are corn-soy-based and should not include any prebiotic, probiotic, anticoccidial or antimicrobial growth promoting substance. No animal by-products (pork meal, poultry by-products etc), any yeast type products and mycotoxin binders.

University of Guelph Coccidiosis challenge model will be used, all birds will be challenged with 25,000 *E. acervullina* and 5,000 *E. maxima* sporulated oocysts on day 10 of age (Leung et al. 2018).

Performance; BWG, FI and FCR (corrected and uncorrected for mortality) will be measured on a per pen basis on Day 6, 15, 28, 42 and 56. Organ weights (gizzard, small intestine, ceca, liver, spleen, liver bursa) - 1 bird per pen will be measured on Day 15 and 56. Jejunal histology will be assessed on Day 15 and 56, Breast yield at day 56 and litter samples (Moisture), foot pad lesion scores at Day 42, day 56.

Students could also assess suitable indicators of stress and behaviours among the different treatments.

References

Dhayakaran, R., Neethirajan, S., and Weng, X. 2016. Investigation of the antimicrobial activity of soy peptides by developing a high throughput drug screening assay. *Biochemistry and Biophysics Reports* **6**: 149-157.

Kiarie, E.G., and Mills, A. 2019. Role of Feed Processing on Gut Health and Function in Pigs and Poultry: Conundrum of Optimal Particle Size and Hydrothermal Regimens. *Frontiers in Veterinary Science* **6** [Review] [English].

Kim, E., Rho, Y., O'Neill, H.M., Schulze, H., and Kiarie, E. 2018. Standardized ileal digestibility of amino acids and apparent metabolizable energy in processed soybean meal (Alpha-Soy) fed to broiler chicks. *Proc. Annual Poultry Association Meeting*. San Antonio, TX. *Poult. Sci.*

Leung, H., Yitbarek, A., Snyder, R., Patterson, R., Barta, J.R., Karrow, N., and Kiarie, E. 2018. Responses of broiler chickens to *Eimeria* challenge when fed a nucleotide-rich yeast extract¹. *Poultry Sci* **98**: 1622-1633.

NRC. 1994. *Nutrient Requirements of Poultry*. 9th revision ed. National Academy of Sciences

Press, Washington, D.C.

Ravindran, V., Abdollahi, M.R., and Bootwalla, S.M. 2014. Nutrient analysis, metabolizable energy, and digestible amino acids of soybean meals of different origins for broilers. *Poultry Sci* **93**: 2567-2577.

Yáñez, J.L., Woyengo, T.A., Jha, R., Van Kempen, T.A.T.G., and Zijlstra, R.T. 2019. Nutrient digestibility of soybean products in grower-finisher pigs¹. *Journal of Animal Science* **97**: 4598-4607.

3.4 Additional Course Content

Laboratory Projects 3 and 4.

The Behaviour and Physiology of Sows and Piglets in Different Farrowing Environments

Background

Neonatal mortality accounts for significant losses to the swine industry and crushing by the sow is most often the cause of these losses during the first week postpartum. Farrowing crates were developed to prevent crushing; they restrict the sows' movements, which deters the sows from rolling over on the piglets. Because piglets require a much higher temperature than sows, supplemental heat is used in the farrowing environment to provide piglets with a comfortable thermal environment. The supplemental heat source may be located some distance from the sow's udder, which attracts piglets away from the sow and may also reduce crushing.

On the day before farrowing sows are highly motivated to engage in nest-building behaviour. Farrowing crates are criticized on animal welfare grounds because they prevent nest-building behaviour and may increase stress in the sow. Their design may also impair the sow's ability to perform the movement required for normal postural adjustments (i.e. changing from lying to standing and vice-versa) and the resulting stress can impair lactation. Alternative farrowing systems furnished with straw provide more space to the sow and allow sows to perform nestbuilding, but they can also affect piglet thermoregulatory and suckling behaviour. There is some evidence that performing behaviours associated with nesting is more important than the availability of nesting material. Therefore, small modifications to the crate (e.g., the addition of cloth tassels) may improve sow welfare while the piglets are still protected through the crate structure. Enriched farrowing environments have also been shown to affect behaviour of piglets.

Objectives and overview

The objectives of this experiment are to examine the effects of farrowing accommodation, environmental enrichment, and/or sow feed management on the behaviour and physiology of sows and their piglets. One group will focus on sow behaviour and physiology, the other group will focus on piglets. Groups will share access to twelve sows beginning several days before farrowing. Six of the sows will be kept in standard farrowing crates; six will be kept in pens supplied with enrichments. The behaviour of sows and piglets can be measured using

live observation and video recordings. Routine management practices such as teeth clipping and castration will be done by animal care staff, and piglets' behavioural and physiological responses to these practices can be compared in the different housing systems. Body weights, growth rates and mortality of piglets can be measured. Endocrine changes associated with parturition and onset of lactation or stress response can be analyzed from saliva samples collected from the sows. Measures of immune response can be made in the sows or piglets.

There are a couple of different approaches that groups can use to address this topic. For example you can:

- Compare nest-building behaviour, stress response and immune status of sows and/or gilts in the two farrowing environments
- Assess the effect of farrowing environment on thermoregulatory behaviour, suckling behaviour, growth rates and immune response of piglets
- Compare the standing and lying behaviour of sows and/or gilts in the two farrowing environments in relation to risk of crushing piglets
- Compare pre- and post-partum sow feed intake in different farrowing environments and using different feeding strategies (e.g. stepwise increases in feed allowance versus ad libitum feeding from day 1 after farrowing or versus ad libitum feeding from 1 week prior to farrowing until weaning) on sow eating behaviour (feed intake), behaviour time budgets, piglet behaviour and growth
- Compare the responses of piglets to teeth clipping, tail docking or castration in the different housing systems

References:

Cronin, G.M. and J.A. Smith, 1992. Suckling behaviour of sows in farrowing crates and straw-bedded pens. *Appl. Anim. Behav. Sci.* 33:175-189.

Cronin, G.M., J.A. Smith, F.M. Hodge and P.H. Hemsworth, 1994. The behavior of primiparous sows around farrowing in response to restraint and straw bedding. *Appl. Anim. Behav. Sci.* 39: 269-280.

Hrupka, B.J. et al., 1998. The effect of farrowing crate heat lamp location on sow and pig patterns of lying and pig survival. *J. Anim. Sci.* 76:2995-3002.

Jarvis, S., Calvert, D.M. Weary, E.A Pajor, D. Fraser and A.M. Honkanen 1996. Sow body movements that crush piglets: a comparison between two types of farrowing accommodation. *Appl. Anim. Behav. Sci.* 49: 149-158.

Jarvis, S., D'Eath, R. B., Robson, S. K., and A.B, Lawrence. 2006. The effect of confinement during lactation on the hypothalamic-pituitary-adrenal axis and behaviour of primiparous sows. *Physiol. & Behav.* 87, 345-352.

McGlone, J.J., T.M., Widowski, K.D., Stricklen, D. Mitchell, S.E., Curtis. 1996. Sow access to tassel pre-farrowing: preliminary evidence of stillbirth rate. *J. Anim. Sci.* 74 (1), 127, Suppl.

Sulabo, R. C., J. Y., Jacela, M. D., Tokach, S. S., Dritz, R. D., Goodbrand, J. M., DeRouchey, and J. L., Nelssen. 2010. Effects of lactation feed intake and creep feeding on sow and piglet performance. *J. Anim. Sci.* 88: 3145-3153.

von Borell, et al. 2009. Animal welfare implications of surgical castration and its alternatives in pigs. *Animal* 3:1488-1496.

Vanheukelom, V., B. Driessen and R. Geers, 2012. The effects of environmental enrichment on the behaviour of sucklings piglets and lactating sows: A review. *Livestock Science* 143:116-131.

Widowski, T.M., S.E., Curtis. 1990. The influence of straw, cloth tassel or both on the pre-partum behavior of sows. *Appl. Anim. Behav. Sci.* 27, 53-71.

4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. Specific Learning Outcomes:

The goal of this course is to introduce you to the world of independent research.

By the end of the course, you will:

1. be familiar with issues of animal care and safety in the laboratory
 2. be familiar with the development of hypotheses and the design of experiments
 3. be exposed to laboratory techniques used in different areas of animal biology research.
 4. develop skills for observing and measuring animals' behavioural and endocrine responses to the physical, social or nutritional environment
 5. be able to organize your group time to perform experiments, collect and analyse data
 6. critically evaluate and interpret your results to integrate various measures of response in order to deepen understanding of biological function
 7. write a scientific paper and present your results to the class
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5 Teaching and Learning Activities

5.1 Lecture

Topics:

PLEASE NOTE THIS SCHEDULE IS BY WEEK- CLASS IS ALWAYS ON THE TUESDAY BUT YOU MUST SCHEDULE ADDITIONAL TIME TO COMPLETE LAB WORK.

Week of	Lecture	Lab Work
Jan. 6	Introduction	Organize groups, choose topic and discuss/plan the literature review
Jan. 13	Behaviour data collection techniques	Develop hypotheses and work schedule
Jan. 20	Presentation of research protocols	Set up experiments
Jan. 27	Animal Care (Dr. Anna Bolinder) Farm and Lab Safety (Christi Cooper, EHS)	Data and sample collection
Feb. 3		Data and sample collection

Feb. 10	Groups present status reports	Data and sample collection
Feb. 17	Winter break	Winter break
Feb. 24	Hormone assay validation	Validation study Data and sample collection
Mar. 2	Groups present status reports	Hormone assays
Mar. 9		Hormone assays completed
Mar. 16	Discussion of data analysis and report preparation	Data analysis
Mar. 23	Draft report for comments	
Mar. 30	Lab report due and presentation of projects	

5.2 Lab

Topics:

The class will be divided into groups, with each group conducting a different project at either Arkell Poultry or Arkell Swine Research Stations. Students will focus on measuring performance, behaviour and endocrine

changes in the animals.

The potential projects are:

Project 1. Piglet feed management during the post-weaning period

Project 2. Highly processed soybean as alternatives to antimicrobial growth promoters in broiler chickens

Projects 3 and 4. The Behaviour and Physiology of Sows and Piglets in Different Farrowing Environments

Each group of students will conduct one experiment and individuals within each group will receive training and be assigned responsibility for animal handling, sample collection and hormone analysis. Sample and data collection and analytical procedures will be conducted both during and outside of scheduled lab time as arranged by the groups. Each group member is expected to do their fair share of the work and to participate in group meetings. Evaluations of all individual group members will be conducted at the end of the course. Technical assistance will be provided as needed. Schedules vary with experiment but all animal measurements and sampling will be completed by early March.

Each member of the group will receive a complete data set for their experiment and will write an individual lab report in the format of a journal paper (*Journal of Animal Science*). **Please refer to links under “Writing Up your Report” posted on CourseLink for instructions, format and help guides.**

Each group will present their experimental results in the last week of the semester. The format of the presentation may be similar to that of the lab report.

6 Assessments

6.1 Assessment Details

Course Assignments and Tests (0%)

Assignment or Test	Due Date	Contribution to Final Mark (%)	Learning Outcomes Assessed
Literature review, development of hypotheses and experimental design	January 21	15% Individual mark	2, 3, 4, 5
Presentation of research protocol	January 21	10% Group mark	2, 3, 4, 5, 6
Refinement of wet lab protocol	March 3	5% Individual mark	1, 3, 5
Laboratory report Journal format	April 3	40% Individual mark	4, 5, 7, 8
Presentation of results	March 31	20% Group mark	4, 5, 6, 7
Participation and contribution for group work		10% Individual mark	6

Final Exam (0%)

There is no final exam for this course. Final presentations will be completed on March 31. Final papers will be due April 3.

7 Course Statements

7.1 Grading Policies

Hard copies of the assignments should be submitted at my office ANNU room 146 or directly to the TAs by 4:30 p.m. on the due date. Late penalties of 2 % per day will be assessed for late submissions.

7.2 Course Policy on Group Work

All groups will determine and agree to expectations for themselves and their fellow group members using a contract with terms given below. At the end of the semester, group members will provide a review of themselves and their fellow group members regarding compliance with the expectations and contract. 10% of the course mark will reflect each student's participation and contribution to the group.

Group Contract

List Group members:

Expectations (grade) for major project:

Five Processes for Effective Teams:

1. How will we make decisions? (e.g. consensus, leader dictates)
2. How do we make sure that everyone gets a chance to discuss or raise concerns?
3. How will we handle differences amongst us?
4. How will we ensure the completion of our work?
5. How will we change things that are not producing results?

Signatures:

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 book their exams at least 7 days in advance and not later than the 40th Class Day.

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>
