



University of Manitoba
Faculty of Agricultural and Food Sciences
Department of Animal Science



ANSC4280 APPLIED ANIMAL GENETICS

The University of Manitoba campuses are located on original lands of Anishinaabeg, Cree, Oji-Cree, Dakota, and Dene peoples, and on the homeland of the Métis Nation. We respect the Treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to move forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration.



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This schedule is only a guide and is subject to change as circumstance may dictate.

COURSE DETAILS

Course Title & Number:	ANSC4280 Applied Animal Genetics
Number of Credit Hours:	3.0
Class Times & Days of Week:	11:30 – 12:20 on Monday, Wednesday and Friday
Location for classes	108 Animal Science
Prerequisites:	ANSC3500 Principles of Animal Genetics

Instructor Contact Information

Instructor(s) Name:	George Nhamo Gozho Ph.D
Preferred Form of Address	George (pronouns: he/him/his) or Dr. Gozho are both fine
Office Location:	226 Animal Science Building
Office Hours or Availability:	I have no office hours, but you can drop in any time. I have put all the information on the outlook calendar to help you with my availability. Search for my calendar (under George Gozho). All times that I am busy are blocked – you can set up a time that works for you or just come to the office
Office Phone No.	204-474-9443
Email:	<p>George.gozho@umanitoba.ca</p> <p>All email communication must conform to the Communicating with Students university policy. (Please familiarize yourself with the policy).</p> <p>Use the subject line to state the reason for your email and add the course number. This will help me to determine which emails need urgent attention quickly. Please. I may need to screen emails based on the subject line and salutation and respond within 48 hours during the week. I do not regularly check my work email over the weekend so expect some delayed response if you email during the weekend.</p>

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Course Description

This course explores the application of principles of animal breeding. It introduces students to modern methods, techniques, and programs for cattle, sheep, and swine genetic improvement.

The prerequisite for this course is ANSC3500 (Principles of Animal Genetics), which introduces students to our knowledge of genetics and the procedures used to generate the information required for the computation of breeding values, expected progeny differences, or similar genetic variables.

General Course Information

Applied animal genetics introduces students to how our knowledge of genetic principles can help us decide which animals to keep as breeding stock. This involves understanding how to develop sound breeding objectives, influencing the main traits to select. Understanding correlations among traits and the effects of the environment on genetic response are all critical factors that will be discussed in the course. Additionally, the breeding organization for each livestock sector will be characterized. The process that generates selection aids that includes data collection and processing will be described for each of the three main livestock sections.

Course Goals

The goals of the courses are:

- a) To introduce students to the procedures that go into animal selection through developing appropriate breeding objectives
- b) To ensure that students have a thorough understanding of the impact of relationships and inbreeding on animal performance.
- c) To ensure that students appreciate the role of resources (environment) and genetic makeup on genetic response.
- d) To introduce students to the role of bioinformatics in animal genetics.
- e) To give students a general overview of the animal breeding structure in the main livestock species farmed in Canada, characterizing the importance of various classes of animals for each species

Intended Learning Outcomes

At the end of the course, students will be able to:

- a) Develop breeding objective/ selection index for simple multiple trait selection scenarios.
- b) Predict which would be the most economically important trait in a breeding objective
- c) Choose the most important and appropriate selection aids for different livestock species
- d) Evaluate the impact of correlations among traits on genetic progress
- e) Interpret genetic information given in sire proofs and other genetic summaries
- f) Recognize the importance of crossbreeding in genetic under certain situations
- g) Describe the role of bioinformatics in animal genetics

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- h) Identify the main steps in genetic improvement of livestock of various species

Using Copyrighted Material

Please respect copyright. The content used in this course is appropriately acknowledged and is copied in accordance with copyright laws and university guidelines. Copyrighted works, including those created by me, are made available for private study and research, and must not be distributed in any format without permission.

Class Lectures and Notes

Lecture notes will be posted on UMLearn. Material posted on UMLearn will be available throughout the semester. I, the Instructor, hold copyright over the course materials, presentations, lectures, and labs which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part, without my permission. Course materials (both paper and digital) are for your private study and research only.

Textbook, Readings, Materials

Recommended Reference Materials

1. **Bourdon, Richard, M. 2000.** Understanding Animal Breeding, 2nd ed. Prentice-Hall. {SF 105 B67 2000}
2. **Nicholas, F.W. 2000.** Introduction to Veterinary Genetics, Oxford Univ Press. {SF 756.5 N52 2000}
3. **Van Vleck, L.D., E.J. Pollak and E.A.B. Oltenacu. 1987.** Genetics for the animal sciences. W.H. Freeman and Company. {QH 432 V36 1987}

Online resource

1. **Online Mendelian Inheritance in Animals.** This Australian site contains descriptions of an ever-growing database of referenced inherited characteristics of animals, which can be browsed by species, inherited disorder, or other keywords.

Course Technology

Lecture notes will be posted on Umlearn. Assignments must be completed electronically and submitted to an assignment folder that I will make for each assignment on UMLearn.

Class Communication

The University requires all students to activate an official University email account. For full details of Electronic Communication with Students, please visit:

<https://catalog.umanitoba.ca/undergraduate-studies/policies-procedures/electronic-communication-students/electronic-communication-students.pdf>

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Please note that all communication between you and myself must comply with the electronic communication with student policy:

(http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html). You are required to obtain and use your U of M email account for all communication between yourself and the University.

Expectations: I Expect You To

- a) Attend class on time.
- b) Ask for help.
- c) Work together on assignment problems other than exams (but prepare your answers independently)
- d) To have the prerequisite background, i.e., basic genetics, knowledge of Excel spreadsheet functions, and basic understanding of statistics.
- e) To act in a civil, respectful, and responsible manner toward all members of the U of M community

Academic Integrity:

Plagiarism or any other form of cheating in the final examination, term tests or academic work is subject to severe academic penalty. Cheating in examinations or tests may take copying from another student or bringing unauthorized materials into the exam room. Exam cheating can also include exam impersonation. A student guilty of cheating in examinations or term assignments is also subject to a serious academic penalty. Students should acquaint themselves with the University's policy on plagiarism, cheating, exam impersonation and duplicate submission:

<https://umanitoba.ca/student-supports/academic-supports/academic-integrity>

For assignment work, students are encouraged to work in groups on problems – the purpose of assignments is to understand the material. Students completed assignment work for grading must be in their own words. If the Internet or published material is used in preparing such work, it must be appropriately referenced.

Students Accessibility Services

Student Accessibility Services

If you are a student with a disability, please get in touch with SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services <https://umanitoba.ca/student-supports/accessibility>

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520 University Centre
 204 474 7423
Student_accessibility@umanitoba.ca

Expectations: You Can Expect Me To

- a) Attend and deliver lectures on time.

A large part of my teaching practice includes using PowerPoint presentations in class.

- b) Help you to understand the content and subject matter related to this course.

I expect students to either interrupt me or come and see me immediately after the lecture if there is anything that is not clear. I will help you as much as I can to succeed in this course.

Class Schedule

This schedule is subject to change at the Instructor's discretion and based on the learning needs of the students, but such changes are subject to Section 2.8 of the – [ROASS](#)- Procedure.

#	TOPIC
0	Course Overview
1	Approach to choosing breeding stock
2	Breeding objectives
3	Selection Response
4	Resource Allocation
5	Multiple trait selection
	Test 1 (October 3, 2022)
6	Relationship and inbreeding
7	Crossbreeding
8	Introduction to Bioinformatics
9	Quantitative trait loci
	Test 2 (November 4, 2022)
10	Genetic improvement in the following livestock species
	a) Beef cattle
	b) Dairy cattle
	c) Swine
	d) Sheep

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Course Evaluation Methods

Students will be assessed using term tests, assignments and a final examination. Tests will comprise multiple-choice, fill-in blanks or short answers to questions

Missed Exams

A missed exam will receive a zero score unless the student provides a medical certificate for missing the exam.

Assessment Tool	Value of Final Grade
Midterm test 1	25%
Midterm test 2	25%
Assignments	15%
Final Examination	35%

Grading

Indicate your grading scale. A sample is given below that you can adjust to your course expectations.

Letter Grade	Percentage out of 100	Grade Point Range	Final Grade Point
A+	92-100	4.25-4.5	4.5
A	84-91	3.75-4.24	4.0
B+	77-83	3.25-3.74	3.5
B	70-76	2.75-3.24	3.0
C+	65-69	2.25-2.74	2.5
C	60-64	2.0-2.24	2.0
D	50-59	Less than 2.0	1.0
F	Less than 50		0

Assignment Descriptions

Assignments will be short exercises that may include simple calculations to reinforce concepts covered in lectures

Assignment Due Dates

Assignments are passed out at the end of each section, and due dates are assigned and stated on each assignment.

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Assignment Grading Times

Assignments are submitted online as per the deadline. If you cannot complete the assignment by the due date, let me know in advance if possible.

Assignment Extension and Late Submission Policy

Late Assignments

All students are encouraged to complete all assignments because they contribute to the final grade. Late assignments will be graded if an extension has been sought and granted by me. Otherwise, failure to communicate the need for an extension and not submitting your work in a timely manner is interpreted to mean that you do not intend to complete the assignment

Missed Assignments

Assignments that are not submitted will be given a score of zero, and that zero scores will be used to calculate the overall average for assignments.
