



ANSC*6370 Quantitative Genetics and Animal Models

Fall 2019
Section(s): C01

Department of Animal Biosciences
Credit Weight: 0.50
Version 1.00 - September 03, 2019

1 Course Details

1.1 Calendar Description

The course covers quantitative genetics theory associated with animal models; linear models applied to genetic evaluation of animals; estimation of genetic parameters for animal models; and computing algorithms for large datasets.

1.2 Course Description

In this graduate course graduate students will learn to develop linear statistical models for evaluating the additive genetic merit of animals, learn to apply models and interpret results from mixed model methodology in order to make genetic change in populations and become comfortable with R.

1.3 Timetable

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

Tuesday/Thursday 1:00pm - 2:20pm, Rm. ANNU 030

1.4 Final Exam

There is no final exam for this course.

2 Instructional Support

2.1 Instructional Support Team

Instructor: Larry Schaeffer
Email: lrs@uoguelph.ca
Telephone: +1-519-824-4120 x 53645
Office: ANNU 120
Office Hours: Thursdays from 3:00-4:00 pm

Course Co-ordinator: Flavio Schenkel
Email: schenkel@uoguelph.ca
Telephone: +1-519-824-4120 x58650
Office: ANNU 121

3 Learning Resources

3.1 Additional Resources

The Animal Models' book by Dr. Larry Schaeffer will be used during the course (Textbook)

- Students are advised to take their own notes during lectures
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4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. Understand basic matrix algebra notation and operations
2. Integrate quantitative genetics and linear model methodology to genetically evaluate livestock
3. Accurately and effectively communicate scientific analyses in written form
4. Perform and understand data analyses using linear models in livestock
5. Appreciate differences among alternate statistical models
6. Discuss the relative merits of linear models used for estimation of genetic values and genetic parameters
7. Have a proficient command terminology common in quantitative genetics and breeding values prediction
8. Integrate knowledge of quantitative genetics and linear models to estimate covariance

components and genetic parameters

5 Teaching and Learning Activities

5.1 Lecture Content

Week	Topics
1	Review matrix algebra, R; History of models
2	Model elements; Pedigrees and Relationships
3	Animal model, MME; Estimation of Variances
4	Repeated Records Model; Multiple Traits
5	Maternal Traits; Random Regression Models
6	RRM, Lactation Production; RRM, Growth
7	RRM, Survival; Selection
8	Better Sires in Better Herds; Masking Selection
9	Nonrandom Progeny Groups; Selection
10	Genomics; Sire-Dam Models
11	Non-Additive Genetic Effects; Threshold Models
12	Computing Ideas

6 Assessments

6.1 Assessment Details

Assignments week 1 (0%)

Date: Week 1

Learning Outcome: 1, 2

Assignments week 2 (0%)

Date: Week 2

Learning Outcome: 1, 2

Assignments week 3 (0%)

Date: Week 3

Learning Outcome: 3, 4, 5, 6, 7, 8

Assignments week 4 (0%)

Date: Week 4

Learning Outcome: 3, 4, 5, 6, 7, 8

Assignments week 5 (0%)

Date: Week 5

Learning Outcome: 3, 4, 5, 6, 7, 8

Assignments week 6 (0%)

Date: Week 6

Learning Outcome: 3, 4, 5, 6, 7, 8

Assignments week 7 (0%)**Date:** Week 7**Learning Outcome:** 3, 4, 5, 6, 7, 8**Assignments week 8 (0%)****Date:** Week 8**Learning Outcome:** 3, 4, 5, 6, 7, 8**Assignments week 9 (0%)****Date:** Week 9**Learning Outcome:** 3, 4, 5, 6, 7, 8**Assignments week 10 (0%)****Date:** Week 10**Learning Outcome:** 3, 4, 5, 6, 7, 8**Assignments week 11 (0%)****Date:** Week 11**Learning Outcome:** 3, 4, 5, 6, 7, 8**Assignments week 12 (0%)****Date:** Week 12**Learning Outcome:** 3, 4, 5, 6, 7, 8

6.2 Grading scheme

The final grade will be totally based on the assignments. The assignments are always due at start of next class.

3 points for each assignment problem (3=perfect, 2=correct, not perfect, 1=not correct, 0=not done, late)

A total of 45 problems in the assignments

135 total points

Examples of final grades:

80% is 108 points.

70% is 95 points.

7 Course Statements

7.1 Grading Policies

The final grade will be totally based on the assignments. **The assignments are always due at start of next class at 1 pm.**

3 points for each assignment problem, graded as follows:

3=perfect

2=correct, not perfect

1=not correct

0=not done, late

7.2 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.

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>
