



Genetics of domestic animals

ANS 3384C

Fall 2024

Lecture

Tuesday & Thursday

9:35 AM – 10:25 AM

156 ANS

Lab

Section 1

Friday, 9:35 AM – 11:30 AM

155 ANS

Section 2

Friday, 11:45 AM - 1:40 PM

155 ANS

Instructor

Dr. Fernanda Rezende

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Teaching Assistants

Graduate: Giovanni Ladeira, Luana Alvares, Andres Alvarado, Castle Cavender

Undergraduate: Anahi Gutierrez, Collin Felty, Isabel Sierra, Isabella Lopez, Isabelle Best, Paige Scullin, Zeny Blanco

Office Hours

Open Door policy

OR by appointment -- contact Dr. Rezende to set up an appointment

Course Objective

To understand the principles of animal breeding and genetics and their application in the improvement of animals.

Credits: 3

Course Description

Basic principles of Mendelian, population and quantitative genetics as applied to improvement of domestic animals. Selection, inbreeding and crossbreeding strategies for genetic improvement of livestock.

Course Objectives

To understand the principles of animal breeding and genetics and their application in the improvement of animals.

By the end of the semester, the student should be able to:

1. Be familiar with the principles of Mendelian inheritance
2. Understand the principles of recombination, mutation, selection, and non-random mating as they apply to the inheritance of simple traits and their effect on populations
3. Comprehend the different breeding approaches for simple and polygenic traits
4. Understand the genetic model for quantitative traits
5. Apply statistics to the characterization of quantitative traits and genetic prediction
6. Understand the nature and use of heritability and repeatability
7. Comprehend the factors affecting the rate of genetic change
8. Be familiar with the mechanisms of large-scale genetic evaluation
9. Be familiar with mating systems and mating strategies
10. Understand the concept of hybrid vigor as it relates to systems of crossbreeding
11. Recognize applications of biotechnology to animal breeding

Text

No formal text is required. Students will be provided handouts, which are current and relevant to topics discussed in class. Optional references include:

Buchanan, Clutter, Northcutt, and Pomp. 1993. Animal Breeding: Principles and Applications
VanVleck, L.D., E.J. Pollak, E.A.B. Oltenacu. 1987. Genetics for the Animal Sciences

Course organization

The course is organized in weekly Modules in Canvas. Each weekly Module will open **Tuesday 7 am**. Lecture handouts will be provided for each lecture and a printed copy will be provided in class to help follow along and take notes.

Lecture Question Sets

Following each lecture, you will have to review the material covered during the lecture and formulate 2 questions (and include the correct answer). Each question will be worth 2 points and to receive full credit the questions have to be posted on time on Canvas. They will be due **the next day at 9 am**. Use proper sentence structure, grammar, etc. Formulate questions you would not mind seeing on the quiz or exam. Once you post your questions, you will have access to everyone's questions/answers. They can be used as a Study Guide for the quizzes and exams.

Quizzes

There will be 11 quizzes worth 10 points each. The quizzes will be available online on Canvas and will be taken online – they will be due **Friday before 9 am**. They will consist of short questions: multiple choice, true/false, fill in the blank or short answer, from the lectures covered that particular week. Each quiz will be made available on **Thursday after class** and will remain open until Friday morning. However, you will have a limited time to take it once you start the quiz (10

minutes) – so it is important that you study the lectures before you start to take the quiz. Please try to take these quizzes before Friday and make sure you have a secure internet connection (if you lose the internet connection your quiz will end, and you will not be allowed to take it again). Quizzes are set up to be graded automatically, and, especially for short-answer type of questions, your answer is very likely to be slightly different than the correct one and the question will be counted wrong. We will re-grade quizzes manually, but we will do it when all quizzes are in, after the due day/time. Please wait until **5 pm Monday** after the deadline and if you still have questions about your grade then feel free to contact me.

Laboratory periods

The Friday periods constitute a two-hour laboratory. There will be 8 problem sets worth 15 points each to be completed during the laboratory period. The **Problem Set** will be handed out on Friday and the bulk of the work on problem sets should be accomplished during the laboratory period. A **Practice Problem** set will be first discussed and instructions on how problems are to be approached and solved will be provided in this first part of the laboratory. Students will be allowed to work on the Problem set in groups, and the instructor and TAs will be available for questions and guidance. The completed Problem Sets could be **handed out at the end of the laboratory period on Friday or uploaded on Canvas before 5 pm the following Monday.**

Self-guided Practice Problems

There will be 2 self-guided practice problems worth 20 points each for weeks 8 and 9. The Self-guided Practice Problem set will be made available online on Canvas on Thursday after class and will remain open for uploading completed Practice Problems on Canvas until **5 pm the following Monday.**

Exams

There will be 4 exams worth 100 points each. The final exam is not comprehensive. The material covered in the exam will be detailed prior to each exam (*see important dates*).

Bonus (extra) Credit

You may earn a maximum of 50 bonus points in this category. These points will be derived from unannounced short quizzes during lectures and other opportunities to award extra points as appropriate. To receive bonus points, students must attend for the entire lecture. There will be no "make-up" for extra credit.

The iClicker system will be used in this class for in-class bonus questions. You can use iClicker Reef or iClicker remotes. It is your responsibility to follow the steps below to properly get added to my iClicker course and/or register your iClicker remote in a timely fashion. **It is also your responsibility to regularly check your iClicker records for any discrepancies and bring them to my attention within 48 h.** You must create an iClicker student app account by downloading the mobile app via the App Store or Google Play, or by visiting the [iClicker student web app](#) to ensure grades appear in Canvas gradebook. If you already have an iClicker student app account, you should use the existing account for all new courses. Do NOT create a duplicate account. Click on this [link](#) for more information.

Attendance Policy

All exam information will be covered during the course of the lectures. **Attendance is strongly encouraged, and students are responsible for all material covered in lecture.** It is highly recommended that you attend class if you expect to obtain a satisfactory grade.

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

The instructor will be available for students. Please make arrangements to visit at your convenience. If you call and I am not available, leave your name and telephone number or e-mail address and you will be contacted as soon as the message is received. **The best method to reach me is through e-mail. DO NOT WAIT UNTIL EXAMINATION TIME!**

Please ask questions in class and do not be apprehensive about concepts that might not be clear. It is important to keep up and not fall behind. Get started on the first day of class – do your homework on time – attend class – get help when you need it – and remember there is no substitute for **DAILY PREPARATION. It is much easier on all of us if you get answers to questions one or two days after class rather than one or two days before an exam.**

Grading Policy

25 Lecture Question Sets	100 pts	13.0%
11 Quizzes	110 pts	14.3%
8 Lab Problem Sets	120 pts	15.6%
2 Self-guided Problem Sets	40 pts	5.2%
4 Exams	<u>400 pts</u>	<u>51.9%</u>
	770 pts	100%

Letter grades will be assigned based upon the following scale:

A 93-100%	B- 80-82.9%	D+ 67-69.9%
A- 90-92.9%	C+ 77-79.9%	D 63-66.9%-
B+ 87-89.9%	C 73-76.9%	D- 60-62.9%-
B 83-86.9%	C- 70-72.9%	E 60% and Below

The scale may be lowered but will not be raised.

Policy on Missed Examinations

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Policy on Late Problem Sets

Lab exercises and self-guided problems are due on **Monday by 5 pm**. They may be handed in late (with no penalty) **only** if it is arranged with the instructor. Otherwise, there will be a **4 point penalty** per day.

Policy on the use of formulas during exam

All formulas necessary for the completion of an exam will be provided with the exam. Students are not required to memorize these formulas, but it is important to know which formula to use and how to use them.

Your Responsibilities

1. Show respect in the classroom to your classmates and teacher.
2. Be on schedule. You are expected to have done the assigned reading *before* class or lab.
3. Participate in class.

4. Write coherently – think before you write and read what you wrote afterwards to make sure it makes sense. Test will not be graded for writing, but poorly written answers inevitably receive worse scores than well written ones.
5. Be academically honest. Anything you submit must represent *your individual understanding*. Any material you submit must be *in your own words*.

Academic Honesty

On days when a quiz or an exam is completed, students will be required to exhibit behavior that leaves no question about their intent to be honest. For example, **no cell phone, books, papers, or other items** will be allowed at students' desks during a class session when a test is administered. Students will be asked to **remove hats or caps** that cover/hide their eyes to ensure that there is no appearance of cheating.

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."* The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions.

Students will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g., assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

Recordings

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under [UF Regulation 4.040 Student](#)

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see [Notification to Students of FERPA Rights](#).

Lecture Schedule (Note: This schedule is subject to revision as the course progresses.)

Lecture 1	Intro to Anim. Genetics	Lecture 14	Regression
Lecture 2	Revisiting Mendel	Lecture 15	Heritability
Lecture 3	Probabilities	Lecture 16	Repeatability
Lecture 4	Exceptions to Mendel’s ratios	Lecture 17	Relationships
Lecture 5	Exceptions to Mendel’s ratios	Lecture 18	Selection - EBV
Lecture 6	Hypothesis Testing	Lecture 19	Selection - Accuracy
Lecture 7	Population Genetics	Lecture 20	Predicting Selection Response
Lecture 8	Mutation and Migration	Lecture 21	Correlated Response
Lecture 9	Non-random Mating	Lecture 22	Mating Systems
Lecture 10	Natural Selection	Lecture 23	Crossbreeding I
Lecture 11	Artificial Selection	Lecture 24	Crossbreeding II
Lecture 12	Quantitative Traits	Lecture 25	Genomic Selection
Lecture 13	Covariance and Correlation		

The instructor reserves the right to modify the syllabus during the semester with verbal or written announcements in class. It is the student’s responsibility to stay informed of such announcements.

Important Dates

No classes on:

October 11: ANS Grad Symposium

October 18: Homecoming

November 25-30: Thanksgiving

Exams

Exam 1: Sep. 20

Exam 2: Oct. 24

Exam 3: Nov. 15

Exam 4 (Final): Friday, Dec 13, 10:00 AM – 12:00 PM

General information

Services for Students with Disabilities

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://disability.ufl.edu>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Grades and Grade Points

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Attendance and Make-up Work

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Online course evaluation process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at: <https://gatorevals.aa.ufl.edu/public-results/>

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center*, 3190 Radio Road, 352-392-1575, <http://www.counseling.ufl.edu/>
Counseling Services, Groups and Workshops, Outreach and Consultation, Self-Help Library
Wellness Coaching
- U Matter We Care, www.umatter.ufl.edu/
- *Career Connections Center*, First Floor JWRU, 392-1601, <https://career.ufl.edu/>
- Student Success Initiative, <http://studentsuccess.ufl.edu>

Student Complaints

For information see <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>