UF | IFAS Extension
UNIVERSITY of FLORIDA

GENETICS

FLORIDA INTERNATIONAL DAIRY ACADEMY
DEPARTMENT OF ANIMAL SCIENCES

Class Periods: Online and three lectures per part

Instructor:
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Course Description

The course is offered using CANVAS on the IFAS Extension Online Learning platform.

This is an 8-part course which consists of three 50-minute lectures. The lectures can be viewed at the student's convenience. The Genetics course is designed to cover different aspects involved in the genetic improvement of dairy cattle, providing both theoretical and practical understanding of the biological principles and genetic concepts direct bearing on dairy cattle breeding programs. Students will gain insights in how to bring the genetic progress from the breeding program to the farmer.

Although this course is open to everyone, it is particularly useful for who have worked or are looking for career opportunities in artificial insemination (AI) companies, private breeding companies, dairy production facilities, private dairy corporations, national dairy herd information associations (DHIA), dairy breed associations, consultancy companies, dairy extension offices and genetic testing companies, and are looking to increase their knowledge or want a refresher and some up-to-date information on dairy cattle genetics.

Course Objectives

At the end of this course, students will be acquainted with the scientific basis, skills and tools to make effective genetic-driven management, selection and mating decisions to accelerate the genetic gain and improve the profitability and sustainability of commercial dairy herds. This knowledge will be gained by 1) understanding how genetics contributed to transforming the dairy industry, 2) learning the basics of genetic selection, 3) understanding dairy cattle genetic improvement programs, 4) understanding selection for multiple traits, 5) learning from fundamentals to field of genomic selection, 6) understanding changes in sire genetic evaluations, 7) learning how to use genomics to make informed decisions and, 8) exploring recent advances and future opportunities in dairy breeding.

Course Schedule

Part 1:

- Genetics contribution to the success of the dairy industry
- DNA as carrier of genetic information
- Complex traits inheritance

Part 2:

- Genetic principles behind dairy cattle transformation
- Principles of genetic selection
- Basics of animal breeding

Part 3:

- Dairy cattle breeding program structure
- Dairy cattle genetic evaluations
- Understanding the output of genetic evaluations

Part 4:

- The importance of sire selection in dairy herds
- Basics of dairy sire selection
- Impacts of changes in genetic evaluation on sire ranking

Part 5:

- Dairy production is a complex system
- Strategies for multiple traits selection
- Dairy cattle inbreeding and crossbreeding

Part 6:

- Traditional versus genomic selection
- Genetic basics behind genomic selection
- Boosting genetic gain with genomic selection

Part 7:

- Breeding strategies using genomics
- Breeding for disease resistance
- New phenotypes, sustainability, profitability and productivity in dairy cattle

Part 8:

- The genetics beyond DNA variations
- Genomic testing: practical results
- Economic impacts of genomic selection in dairy cattle

Lectures can be viewed at students' convenience.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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 (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor.

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. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Certificate of Completion

A Certificate of Completion will be awarded upon successful completion of all modules and viewing of all required videos. This course is designed for self-paced learning, allowing students to progress through the material at their own speed. Students will have indefinite access to the course, enabling them to revisit the content at any time for continued learning and reference. We encourage students to engage with the material thoroughly to maximize their understanding of information provided.

Dairy AdvanCE Continuing Education

Students earning continuing education credit through Dairy AdvanCE will be awarded credit only after course has been 100% completed. Please allow time for processing. Contact fida@ifas.ufl.edu for any questions or concerns.

This course will award 16 CEUs.