

**Title of Course: Animal Breed Improvement**

**I. Catalog Description and Credit Hours:** Fundamental principles of cellular, population, and quantitative genetics applied in selection and mating systems to make improvements in farm animals. Three lectures (3).

**II. Prerequisites:** AY 101 Introduction to Animal Science

**III. Purpose or Objectives of the Course:**

At the completion of the course, the student(s) should be able to:

- A. Express the concepts of animal breeds, their genetics and mating systems.
- B. Identify, evaluate, and propose animal breeding programs

**IV. Expectations of Students:**

- A. Become familiar with the principles of animal genetics.
- B. Become familiar with the breeding methods.
- C. Compare and contrast mating methods for various farming/ranching operations

**V. Course Content or Outline:**

Topics that will be covered in class.

- A. General Introduction (Week 1)
- B. Animal Breeds (Week 2-5)
  - a. Breed Uses
    - i. Beef Cattle
    - ii. Dairy Cattle
    - iii. Horses
    - iv. Swine
    - v. Sheep
  - b. Genetic effects on animal docility
  - c. Breed Fractions
- C. Mating Systems (Week 6-9)
  - a. Random Mating
  - b. Assisted Mating
  - c. Controlled Mating
    - i. Inbreeding
    - ii. Outbreeding
    - iii. Crossbreeding
- D. Inheritance Patterns (Week 10-11)
  - a. Mendelian Genetics
  - b. Genes in Population
    - i. Quantitative Assessment
  - c. Simply Inherited Traits
  - d. Polygenic Traits
- E. Selection (Week 12-14)
  - a. Simply Inherited Traits
    - i. Quantitative Selection
    - ii. Application of Selection
  - b. Heritability and Repeatability
    - i. Rate of change
  - c. Genetic Prediction

- i. EPDs
    - ii. Sire Summaries
    - iii. Gene Prediction Programs
  - d. Large Scale Selection
    - i. Methods
    - ii. Measuring Response
  - e. Reproductive Techniques (Week 15)
    - i. Semen Evaluation
    - ii. Artificial Insemination
    - iii. Embryo Transfer
    - iv. Cryopreservation
    - v. Cloning
    - vi. Sex Selection
- F. Compiling Data (Week 15)

**VI. Textbooks and Other Required Materials:**

*Understanding Animal Breeding* .By Richard Bourdon; Prentice Hall: Upper Saddle River, NJ. Sixth Edition, copyright 2012.

Internet Resources to be provided

**VII. Basis of Student Evaluations:**

**GRADING**

**Tests:**

3 Tests will be given along with a final. The tests throughout the semester will be worth 100 points each while the final will be 200 points of the grade.

**Quizzes:**

5 quizzes will be placed on the class website. Quizzes will be available online for 1 week prior to the due date; they must be completed prior to class. Each quiz will be worth 20 points so a total of 100 points will come from quizzes.

**Forum:**

On-line forum discussion will be used occasionally to address current topics or difficult subjects, each student is to check the forum weekly and contribute to the on-line discussion. This will be a percentage of your class participation grade. If you have a topic you would like addressed please send it to the instructor.

**Participation:**

Participation is crucial to this class. Contributing to class discussions and activities will be assessed throughout the semester. Total participation points will equal 25 points towards your final grade.

**Makeup Work and Late Assignments:**

Tests missed for a school activity or documented illness can be made up within a reasonable time after missing the work. Quizzes will be open for multiple days on-line and thus there will not be make up work or late work for these assignments, if there are extenuating circumstances please let the instructor know.

**FINAL COURSE GRADING**

**Letter Grade Distinctions:**

- ≥ 90% = A
- 80%-89.9% = B
- 70%-79.9% = C
- 60%-69.9% = D

≤ 59.9% = F

**Grading:**

625 points total

300 points-Tests

200 points- Final

100 Points- Quizzes

25 points- Participation

**VII. Instructor of the Course.** The instructor of this course should have advanced study (MS or PhD in Animal Science or Veterinary Medicine (DVM)).

**Expectations and Policies**

***Attendance:***

While attendance per se cannot be required of students, there are consequences associated with absences and policies governing excused- and non-excused absences. The official statement about attendance, derived from the Undergraduate Bulletin, may be accessed at: <http://www.semo.edu/bulletin/pdf/2006Bulletin.pdf>.

Students are expected to be present at examination times. If a student is absent for an examination then a Medical Doctor's excuse is expected. If a student knows that they have an appropriate personnel issue prior to the examination, then a private discussion with the instructor may result in an alternative examination schedule. All assignments will have a substantial lead time and therefore the expectation is that all assignments will be submitted at the assigned times.

***Academic Honesty:***

The Undergraduate Bulletin defines academic dishonesty as "...those acts which would deceive, cheat, or defraud so as to promote one's scholastic record...", and states that "[v]iolations of academic honesty represent a serious breach of discipline and may be considered grounds for disciplinary action, including dismissal from the university".

The official statement about academic honesty, including plagiarism, may be accessed at: <http://www.semo.edu/bulletin/pdf/2006bulletin.pdf>.

Additional information may be accessed at: <http://www6.semo.edu/judaffairs/>

In this course, many of the assignments require students to perform work outside of the regularly assigned class schedule; therefore, in this course it is permitted that students may gather collectively to discuss and organize their study approaches and scholastic efforts. The writing of papers, projects, manuscripts, laboratory reports and allied materials must, however, be the independent work of each student.

***Civility and Harassment:***

A successful educational experience requires that all students and instructors possess a shared sense of respect for all participants. Judicial Affairs is responsible for addressing such matters and that information is available at: <http://www6.semo.edu/judaffairs/>

***Disabilities:***

Diversity in all its forms merit the respect of the faculty, and this applies equally to students with disabilities. While it is the responsibility of the student to inform the faculty of any physical or learning disabilities, the faculty should inform the students that there are policies and services available to them. Students may obtain official information about disabilities from Learning Assistance and Disability Support Services, located at: <http://www.semo.edu/cs/services/lec.htm>.

**Technology:**

Students need to be able to access and use the course website. Copies of handouts will be available on the course website. Students need to monitor the course website for updates to the Course Schedule. Students will need to use GradeA to access their scores and grades, and Forum as part of course participation.

If you do not have access to a computer or internet from your home, please inform the instructor and they will help you locate a computer lab on campus.