ANIMAL SCIENCE 3443
GENERAL INFORMATION
FOR THE FALL OF 2021

COURSE TITLE: Genetics of Livestock
INSTRUCTOR: John M. Langdon, II (325-486-6925; jlangdon@angelo.edu)

PREREQUISITES: Some foundational bit of understanding, and a strong interest in the application of genetic principles to livestock breeding, with the use of some basic statistics concepts.

DESCRIPTION: Application of genetic principles and concepts to livestock breeding. Consideration of breeding objectives, breed characteristics, pedigree relationship, inbreeding, gene (allele) frequency, detection of heterozygotes, use of pedigree and progeny information for selection, hybrid vigor, crossbreeding, genotype-environment interactions, selection criteria, heritability, direct and correlated response to selection, and genetic evaluation and prediction.

OBJECTIVES: To present concepts associated with genetics, in the context of livestock breeding. Application of these concepts in the production of both purebred and commercial livestock will be emphasized.

EXAMINATIONS: I – Tentatively, Oct. 7
II – Tentatively, Nov. 4
III – Tentatively, Dec. 2
IV – Final; Tentatively, Dec. 7

GRADES: Lab = 1 / 4
I = 1 / 6
II = 1 / 6
III = 1 / 6
IV = 1 / 4

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‡ The final exam (IV) will be optional for students with no unauthorized absences, who turn in all assignments on time (a reasonable amount of extra time will be granted if the assignment is late coming in, due to an authorized absence). Students with two or less unauthorized absences will be eligible for a curve in the curse. So, upon opting out of the final, lab then becomes 1/3, and your lecture exam average is then 2/3 of your final grade for the course.

RECOMMENDED TEXT: Understanding Animal Breeding, by Richard M. Bourdon. (Optional)
LECTURE OUTLINE

I. Introduction (1)
   a. Basis for grading
   b. Establishing objectives
   c. Types of characters
   d. Principles of animal breeding

II. Structure of the livestock breeding industry (1)

III. Genetic Relationship (4)
   a. Measures of relationship and inbreeding
   b. Effects of inbreeding on relationship
   c. Variability in genetic similarity among relatives

IV. Selection for quantitatively inherited traits (4)
   a. Gene frequency and selecting against recessive genes
   b. Detecting heterozygotes for recessives
   c. Parental determination and verification
   d. The use of markers and/or molecular probes

V. Breeding systems and the utilization of breeds (6)
   a. Commercial straightbreeding
   b. Crossbreeding systems, including composites
   c. Seedstock breeding programs

VI. Selection for quantitatively inherited traits (5)
   a. Genotype-environment interactions
   b. Selection criteria
   c. Transmitting ability and heritability
   d. Factors affecting selection response
   e. Correlated traits
   f. Selection for female productivity and efficiency
   g. Monitoring unwanted correlated response

VII. Linebreeding (1, the last lecture of the semester)
LAB OUTLINE

I. Breeds (1)

II. Genetic relationship (2)

III. Hog color inheritance (1)

IV. Genetic abnormalities and progeny testing for recessive genes (1)
   a. Probability of detecting a heterozygote
   b. Probability of being homozygous dominant

V. Horse color inheritance (1)

VI. Performance of crossbreds (2)

VII. Relationship covariance averaging (1)

VIII. Cattle color inheritance (1)

IX. Genetic prediction for quantitatively inherited traits (2)
   a. Information used in genetic predictions
   b. Expectations in the progeny due to genetics
      i. Means
      ii. Variability
   c. Precision (standard error) and accuracy of genetic prediction

X. Miscellaneous (1)
   a. Across breed genetic predictions
   b. Horns in sheep
   c. Horns in cattle
   d. Inheritance of the Callipyge condition in sheep
OTHER IMPORTANT INFORMATION

General Policies Related to This Course
All students are required to follow the policies and procedures presented in these documents:

• Angelo State University Student Handbook

• Angelo State University Catalog

Academic Integrity
Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university’s Statement of Academic Integrity.

Accommodations for Students with Disabilities
ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student’s responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the Student Disability Services website. The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112
Incomplete Grade Policy

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures, for more information.

Plagiarism

Plagiarism is a serious topic covered in ASU’s Academic Integrity policy, in the Student Handbook. Plagiarism is the action or practice of taking someone else’s work, idea, etc., and passing it off as one’s own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality. Resources to help you understand this policy better are available at the, ASU Writing Center.

Student Absence for Observance of Religious Holy Days

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for Observance of Religious Holy Day for more information.

Title IX at Angelo State University

The University prohibits discrimination based on sex, which includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including: sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency, interpersonal violence (domestic violence and/or dating violence), and stalking. As a faculty member, I am a Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am notified of to the Office of Title IX Compliance.

Students are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator at:

Michelle Miller, J.D.
Special Assistant to the President and Title IX Coordinator
Mayer Administration Building, Room 210
325-486-6357
michelle.boone@angelo.edu

You may also file a report online 24/7.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345.

For more information, visit the Title IX website.