

Discipline: Agriculture	Sub-discipline: Animal Science
General Course Title: Animal Breeding and Reproduction	Min. Units: 3 Semester
Proposed Suffix: L	
<p>Course Description:</p> <p>The study of basic genetic principles combined with the study of the anatomical and physiological aspects of reproduction as they relate to animal species significant to agriculture. Genetic principles emphasized include; basic inheritance, selection techniques, mating systems, heterosis, and performance evaluation. Reproductive aspects include endocrinology, estrous cycles, mating behaviors, gametogenesis, conception, gestation, parturition, and maternal behaviors. Artificial insemination, embryo manipulation, and current innovations in productive biotechnology are examined. Laboratory required.</p>	
Required Prerequisites or Co-Requisites ¹	
Advisories/Recommended Preparation ²	
<p>Course Objectives: <i>At the conclusion of this course, the student should be able to:</i></p> <ul style="list-style-type: none"> • Discuss the concepts of gene frequency, alleles, homozygosity, heterozygosity, dominance, co-dominance, and recessive genes. • Compare and contrast artificial and natural selection. • Determine the possible genetic and phenotypic ratios for two traits, resulting from the mating of two heterozygous individuals, by using the Punnet Square method. • Describe the effect of heritability on selection progress for individual traits. • Interpret EPD's, ratios, breeding values, and indexes for use in sire selection. • Explain the mating concepts of inbreeding, linebreeding, outcrossing, and crossbreeding. • Explain the physiological functions of the major anatomical points of the male and female reproductive tracts. • Describe the origin and function of the major hormones, both male and female, involved in reproduction. • Describe the physical and behavioral expressions of estrus. • Explain the anatomical and physiological aspects of conception, implantation, and gestation. • Compare and contrast various methods of pregnancy detection. • Describe the correct fetal position, delivery process, approximate timeline and maternal behaviors for a normal parturition. • Identify factors that may contribute to dystocia. • Explain the advantages and limitations of artificial insemination. • Analyze the significance and benefits of innovations in reproductive biotechnology, such as cloning and the splitting, sexing, storing and transfer of embryos. 	
<p>Course Content:</p> <ol style="list-style-type: none"> 1. Basic Genetic Principles <ol style="list-style-type: none"> a. Genes b. Genotype and phenotype c. Heritability d. DNA and RNA <p>Animal Breeding and Reproduction (Content Continued)</p> <ol style="list-style-type: none"> 2. Mating Concepts 	

¹ Prerequisite or co-requisite course need to be validated at the CCC level in accordance with Title 5 regulations; co-requisites for CCCs are the linked courses that must be taken at the same time as the primary or target course.

² Advisories or recommended preparation will not require validation but are recommendations to be considered by the student prior to enrolling.

- a. Purebred systems, inbreeding, linebreeding and outcrossing
 - b. Heterosis
 - c. Crossbreeding systems; two-breed, rotational, terminal, rotaterminal
3. Selection Methods
- a. Artificial and natural selection
 - b. Production and performance records
 - c. Expected progeny difference (EPD's)
4. Male Reproductive Anatomy and Physiology
- a. Male reproductive tract
 - b. Male hormones
 - c. Behavioral aspects
 - d. Semen evaluation
5. Female Reproductive Anatomy and Physiology
- a. Female reproductive tract
 - b. Female hormones
 - c. Estrous cycles and ovulation
 - d. Estrus expression
6. Gestation and Parturition
- a. Conception and implantation
 - b. Fetal development
 - c. Pregnancy detection/fetal examination
 - d. Parturition
7. Artificial Insemination
- a. Advantages and limitations
 - b. Equipment and facilities
 - c. Semen storage and quality
 - d. Techniques utilized
8. Reproductive Biotechnology
- a. Embryo manipulation
 - b. Cloning
 - c. New innovations

Laboratory Activities: Individual Laboratory Activities are designed to support course objectives.

Methods of Evaluation: Lecture Comprehensive Quizzes and Exams Written Critical Thinking Scenarios Problem Analysis and Solution Research and Term Papers	Methods of Evaluation: Laboratory Laboratory Skill Validation by Observation Laboratory Reports Laboratory Research Projects and Reports Laboratory Skill Practicum Exams
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Typical Textbooks, Manuals, or Other Support Materials
Animal Breeding, An Introduction, Harrington, Rodney B.,
 Interstate Publishers, ISBN 0-8134-3010-0
Reproduction in Farm Animals, 6th ed., Hafez, E.S.E.,
 Lea & Febiger, 1993

Statewide Articulation: CPSLO-ASCI 211, CPP-AVS 404*, CSUF-A SCI 71, UCD-ANS 120, other universities as lower division elective (*upper division – subject matter competency determined by university advisor)

FDRG Lead Signature:

Date:

Mark E. Bender, PhD CSU Stanislaus

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