I. INTRODUCTION

A. This course is designed to give the students a basic knowledge of principles of genetics, types of matings, animal selection, hybrid vigor, pedigree, animal reproductive systems, and principles of artificial insemination and pregnancy testing (no practice).

B. Animal improvement is accomplished through improvement of the animals and the environment surrounding them. This course deals specifically with improvements of the animal through breeding and selection.

C. This course can be taken as an elective for any of the certificate or associate degree programs in the department. It is a required course for the Associate in Applied Science - Agriculture Production and Equine Management Specialization.

D. This course is occupationally related and will prepare students for careers in Animal Science, including any position involving Animal Husbandry, etc.

II. LEARNING OUTCOMES

Upon successful completion of this course, Animal Breeding, the student will be able to:

A. Draw, label, and describe the function of each part of the animal reproductive system. C3, C5, C6, C7, C15, C17, C18, F1, F2

B. List the different ways that genes express themselves. C5, C6, C15, F1, F2, F3, F5, F9, F12

C. List the hereditary characteristics on which selection of livestock is based. C1, C2, C3, C5, C6, C7, C15, C18, F3, F7, F8, F10, F12, F17

D. Define the meaning of and list the advantages and disadvantages of inbreeding, line-breeding, outcrossing, and cross-breeding. C5, C6, F1, F2

January 2007
E. List and explain the purpose and advantages of assisted breeding including artificial insemination and embryo transfer. C2, C3, C4, C5, C6, C7, C18, C19, C20, F1, F7

III. INSTRUCTIONAL MATERIALS

The instructional materials identified for this course are viewable through www.ctcd.edu/books

IV. COURSE REQUIREMENTS

A. Reading Assignments: Will be made to coincide with class lectures and activities. Information from the assigned reading will be important material for exams.

B. Term Report: Will be assigned in a form that will coincide with course work, student interest, as well as the practical value of the information to the industry. The report will be graded as a major exam and failure to complete the report will result in a grade of zero.

C. Class Performance: Work to be turned in for a grade that is missed due to absence may be made up on the student’s time and at the convenience to the instructor. Work, including exams, missed due to an absence, must be made up before the second class meeting after the student returns to class. Students absent will be responsible to get class notes missed from another student or from the textbook. Any work and exam not made up will be assigned a grade of zero. All makeup work policy is up to the discretion of the instructor.

D. Daily Class work: Class work assignments will be made periodically throughout the semester. These will be averaged and counted as an exam grade.

V. EXAMINATIONS

Three major exams excluding the final will be given. The first will be given about the fifth week, the second about the tenth week, and the third during the fifteenth week. The exams will be mainly objective type, to be graded by the instructor and returned to the student. A review will be given prior to the final exam. Procedure for taking make-up exams was given in Class Performance above.
VI. SEMESTER GRADE COMPUTATION

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<tr>
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<th>Weight</th>
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<td>Second major exam</td>
<td>100</td>
<td>800 - 899</td>
<td>B</td>
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<tr>
<td>Third major exam</td>
<td>100</td>
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<td>C</td>
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<td>600 - 699</td>
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VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM COURSE INSTRUCTOR

A. Course Withdrawal: It is the student's responsibility to officially withdraw from a course if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file a Central Texas College Application for Withdrawal (CTC Form 59). The withdrawal form must be signed by the student.

CTC Form 59 will be accepted at any time prior to Friday of the 12th week of classes during the 16-week fall and spring semesters. The deadline for sessions of other lengths is:

- 10-week session: Friday of the 8th week
- 8-week session: Friday of the 6th week
- 5-week session: Friday of the 4th week

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

A student who officially withdraws will be awarded the grade of "W" provided the student's attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the College before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for nonattendance.

B. Administrative Withdrawal: An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on CTC Form 59 for submission to the registrar.

C. Incomplete Grade: The College catalog states, "An incomplete grade may be given in those cases where the student has completed the majority of the coursework but, because of personal illness, death in the immediate family, or
military orders, the student is unable to complete the requirements for a course..." Prior approval from the instructor is required before the grade of "I" for Incomplete is recorded. A student who merely fails to show for the final examination will receive a zero for the final and an "F" for the course.

D. **Cellular Phones And Beepers**: Cellular phones and beepers will be turned off while the student is in the classroom or laboratory.

E. **American’s With Disabilities Act (ADA)**: Disability Support Services provide services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Explore the website at www.ctcd.edu/disability-support for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

F. **Instructor Discretion**: The instructor reserves the right of final decision in course requirements.

G. ** Civility**: Individuals are expected to be cognizant of what a constructive educational experience is and respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion.

**VIII. COURSE OUTLINE**

A. **Lesson One**: Basis of Heredity

1. **Learning Outcomes**: Upon successful completion of this lesson the student will:
   
a. Draw an animal cell and label each part of it.
b. List the function of each part of the cell as it relates to heredity.
c. Diagram on paper how genes separate and recombine.

2. **Learning Activities**:
   
a. Classroom lecture/discussion
b. Instructor will draw a typical cell on the chalk board and label all parts.
c. Instructor will discuss the functions of the parts of the animal cell as they relate to reproduction.
d. Instructor will explain by diagram how genes are transferred from parent to offspring.
e. Instructor will diagram how genes separate and recombine in animal breeding.
3. **Lesson Outline:**
   
a. Parts of the cell.
b. Functions of parts of the cell.
c. Function of genes.
d. Gene separation and recombination.

B. **Lesson Two:** Basis of Selection

1. **Learning Outcomes:** Upon successful completion of this lesson the student will:
   
a. Definition both natural and artificial selection.
b. List and define the criteria on which selection of superior breeding stock is based.
c. List and give predicted percentage of heritability for the economically important traits of livestock.

2. **Learning Activities:**
   
a. Classroom lecture/discussion.
b. Instructor will explain the difference between artificial and natural selection.
c. Students will be asked to outline from the text the systems of selection for different kinds of gene action.
d. Instructor will explain and use examples of the methods of selection for superior breeding stock.

3. **Materials:** Production records, pedigrees, and performance of animals

4. **Lesson Outline:**
   
a. Selection defined.
b. Selection for different traits.
c. Basis of selection for superior breeding stock.

C. **Lesson Three:** Inbreeding, Linebreeding, Outcrossing, and Crossbreeding

1. **Learning Outcomes:** Upon successful completion of this lesson the student will:
   
a. Define inbreeding and list the advantages and disadvantages of it in livestock breeding.
b. Define line breeding and list the advantages and disadvantages of it
in livestock breeding.
c. Define out crossing and list the advantages and disadvantages of it in livestock breeding.
d. Define crossbreeding and list the advantages and disadvantages of it in livestock breeding.

2. **Learning Activities:**
a. Classroom lecture/discussion.
b. Instructor will explain the practice of, give examples, and show the practical application of inbreeding, linebreeding, outcrossing, and crossbreeding in livestock production.

3. **Lesson Outline:**
   a. Inbreeding
   b. Linebreeding
   c. Outcrossing
   d. Crossbreeding

D. **Lesson Four:** Assisted Breeding

1. **Learning Outcomes:** Upon successful completion of this lesson the student will:
   a. Label and explain the function of the reproductive anatomy of both mail and female livestock.
   b. List the advantages of assisted breeding including Artificial Insemination (A.I.) and Embryo Transfer (E.T.).
   c. Define and explain the processes of A.I. and E.T.

2. **Learning Activities:**
   a. Classroom lecture/discussion.
   b. Instructor will explain and discuss the processes including anatomy, A.I., and E.T.

3. **Lesson Outline:**
   a. Reproductive anatomy.
   b. Artificial insemination.
   c. Embryo transfer.