

ANIMAL GENETICS (ANG)

College of Agricultural & Environmental Sciences

ANG 101 – Animal Cytogenetics (3 units)

Course Description: Principles and techniques of cytogenetics applied to animal systems; chromosome harvest techniques, analysis of mitosis and meiosis, karyotyping, chromosome banding, cytogenetic mapping, chromosome structure and function, comparative cytogenetics.

Prerequisite(s): (BIS 101 or BIS 101V); BIS 102; or equivalent of BIS 102.

Learning Activities: Discussion/Laboratory 1 hour(s), Laboratory 6 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE).

ANG 105 – Horse Genetics (3 units)

Course Description: Coat color, parentage testing, medical genetics, pedigrees, breeds, the gene map and genus Equus. Emphasis on understanding horse genetics based on the unity of mammalian genetics and making breeding decisions based on fundamental genetic concepts.

Prerequisite(s): (BIS 101 or BIS 101V); ANS 015 recommended.

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

General Education: Science & Engineering (SE); Scientific Literacy (SL).

ANG 107 – Genetics & Animal Breeding (5 units)

Course Description: Principles of quantitative genetics applied to improvement of livestock and poultry. Effects of mating systems and selection methods are emphasized with illustration from current breeding practices.

Prerequisite(s): BIS 101 or BIS 101V.

Learning Activities: Lecture 4 hour(s), Laboratory 3 hour(s).

Enrollment Restriction(s): Pass One restricted to Animal Science or Animal Science & Management majors in senior standing.

Grade Mode: Letter.

General Education: Science & Engineering (SE).

ANG 111 – Molecular Biology Laboratory Techniques (4 units)

Course Description: Introduction to the concepts and techniques used in molecular biology; the role of this technology in both basic and applied animal research, and participation in laboratories using some of the most common techniques in molecular biology.

Prerequisite(s): BIS 002C; (BIS 101 or BIS 101V); (BIS 102 or ABI 102); (BIS 103 or ABI 103).

Learning Activities: Lecture 2 hour(s), Laboratory 6 hour(s).

Enrollment Restriction(s): Pass One restricted to Animal Science majors in Senior standing.

Grade Mode: Letter.

General Education: Science & Engineering (SE); Scientific Literacy (SL); Visual Literacy (VL); Writing Experience (WE).

ANG 185 – Science of Captive Breeding & Reintroduction (1 unit)

Course Description: Explore peer-reviewed literature surrounding the latest advances in captive breeding and reintroduction biology.

Prerequisite(s): BIS 002A; BIS 002B; BIS 002C.

Learning Activities: Lecture 1 hour(s).

Grade Mode: Letter.

ANG 198 – Directed Group Study (1-5 units)

Course Description: Selected topics relating to animal genetics.

Prerequisite(s): Consent of instructor.

Learning Activities: Variable.

Grade Mode: Pass/No Pass only.

ANG 199 – Special Study for Advanced Undergraduates (1-5 units)

Course Description: Special study for advanced undergraduates.

Prerequisite(s): Consent of instructor.

Learning Activities: Independent Study.

Grade Mode: Pass/No Pass only.

ANG 204 – Theory of Quantitative Genetics (3 units)

Course Description: Theoretical basis of quantitative genetics and the consequences of Mendelian inheritance. Concepts used to estimate quantitative genetic differences and basis for partitioning the phenotypic variance.

Prerequisite(s): ANG 107; or the equivalent.

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

ANG 206 – Advanced Domestic Animal Breeding (3 units)

Course Description: Procedures for the genetic evaluation of individuals to include selection indices and mixed model evaluation for single and multiple traits. Methods of estimating genetic trends.

Prerequisite(s): ANG 107; ANS 205; ANG 204 recommended.

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

ANG 208 – Estimation of Genetic Parameters (3 units)

Course Description: General methods for the estimation of components of variance and covariance and their application to the estimation of heritability, repeatability and genetic correlations are considered. Specific emphasis is given to procedures applicable to livestock populations under selection.

Prerequisite(s): ANG 107; ANS 205; ANG 204 and ANG 108 recommended.

Learning Activities: Lecture 3 hour(s).

Grade Mode: Letter.

ANG 211 – Genetic Engineering of Animals (2 units)

Course Description: Review of techniques for the genetic engineering of animals and their limitations and applications. Student-led discussions of recent papers in the field and possible future applications of genetically engineered animals in basic research and applied agricultural and medical research.

Learning Activities: Lecture 1 hour(s), Lecture/Discussion 1 hour(s).

Grade Mode: Satisfactory/Unsatisfactory only.

ANG 212 – Sequence Analysis in Molecular Genetics (2 units)

Course Description: Use of computer algorithms and on-line databases to analyze nucleic acid and protein sequences in molecular genetics research.

Prerequisite(s): (BIS 101 or BIS 101V); or the equivalent; graduate standing or consent of instructor.

Learning Activities: Lecture/Lab 2 hour(s).

Grade Mode: Letter.

ANG 298 – Group Study (1-5 units)

Course Description: Lectures and discussions of advanced topics in animal genetics.

Prerequisite(s): Consent of instructor.

Learning Activities: Variable.

Grade Mode: Satisfactory/Unsatisfactory only.

ANG 299 – Research in Animal Genetics (1-12 units)

Course Description: Research in Animal Genetics.

Learning Activities: Variable.

Grade Mode: Satisfactory/Unsatisfactory only.