

DEPARTMENT OF ANIMAL SCIENCES



Office in Animal Sciences Building, Room 140
(970) 491-6672
agsci.colostate.edu/ansci (<https://agsci.colostate.edu/ansci>)

Professor Patrick Doyle, Department Head

Undergraduate Majors

- Animal Science (<https://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/animal-sciences/animal-science-major/>)
- Equine Science (<https://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/animal-sciences/equine-science-major/>)
- Livestock Business Management (<https://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-resource-economics/livestock-business-management-major/>)
 - Animal Sciences Concentration (<https://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-resource-economics/livestock-business-management-major/animal-sciences-concentration/>)
 - Livestock Marketing and Trade Concentration (<https://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/agricultural-resource-economics/livestock-business-management-major/livestock-marketing-and-trade-concentration/>)

(<https://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/animal-sciences/equine-science-major/>) Veterinary Medicine Interest

Students interested in animal or equine sciences and considering veterinary medicine as a career path are encouraged to visit with their academic advisor about simultaneously completing the admission requirements for the professional veterinary medical programs. The Food Animal Veterinary Career Incentive Program (FAVCIP) ([https://vetmedbiosci.colostate.edu/degree-programs/veterinary-professional-](https://vetmedbiosci.colostate.edu/degree-programs/veterinary-professional-program/dvm-program/food-animal-veterinary-career-incentive-program/)

[program/dvm-program/food-animal-veterinary-career-incentive-program/](https://vetmedbiosci.colostate.edu/degree-programs/veterinary-professional-program/dvm-program/food-animal-veterinary-career-incentive-program/)) is available for Animal Science majors.

Graduate Graduate Programs in Animal Sciences

The department offers graduate programs leading to the Master of Science and the Doctor of Philosophy degrees. Students interested in graduate work should refer to the Graduate and Professional Bulletin (<https://catalog.colostate.edu/general-catalog/graduate-bulletin/>), and the department's website (<https://agsci.colostate.edu/ansci/>).

Master's Programs

- Master of Science in Animal Sciences, Plan A (<https://catalog.colostate.edu/general-catalog/colleges/agricultural-sciences/animal-sciences/plan-a-ms/>)

Ph.D.

- Ph.D. in Animal Sciences*

*Please see department for program of study.

Courses

Subjects in this department include: Animal Sciences (ANEQ) and Livestock Business Management (LBM).

Animal Sciences (ANEQ)

ANEQ 101 Food Animal Science Credits: 4 (3-3-0)

Course Description: Development, organization, trends and management of the livestock industry; emphasis on applying science to the production of food and fiber.

Prerequisite: None.

Registration Information: Required field trips.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 102 Introduction to Equine Science Credits: 4 (3-2-0)

Course Description: Equine physiology, production systems and management systems as it pertains to the equine industry and management.

Prerequisite: None.

Registration Information: Must register for lecture and laboratory. Required field trips.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 103 Introduction to Animal Science Credits: 3 (3-0-0)

Course Description: Introduction to the livestock industries with emphasis on food and fiber animals. Overviews of the industry structures, and historical and future trends. Product quality evaluation and factors influencing animal performance such as management, nutrition, genetics, and reproduction are presented.

Prerequisite: None.

Registration Information: Non-Animal Sciences majors only. Offered as an online course only.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 105 Introduction to Large Animal Anatomy Credit: 1 (0-2-0)

Course Description: Basic gross animal anatomy.

Prerequisite: None.

Registration Information: Animal Science or Equine Science majors only. Sections may be offered: Online.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 115 Applied Equine Behavior Credits: 2 (1-2-0)

Course Description: Understanding ethology, the science of animal behavior, will be a key component to evaluating horse behavior. Topics are instinctive, learned, social and reproductive behaviors as well as sensory perception and behavioral neuroanatomy important to equine health and welfare.

Prerequisite: ANEQ 102.

Registration Information: Must register for lecture and laboratory.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 193 Student Seminar--Exploring Student Success Credit: 1 (0-0-1)

Course Description: Learn about various academic topics and opportunities within the university. Become knowledgeable in several aspects of student success resources and opportunities in the Department of Animal Sciences, while building an inclusive community and finding belonging within the major. Introduction to exploring educational goals and aligning those goals with achieving desired professional goals.

Prerequisite: None.

Restriction: Must be a: Undergraduate.

Registration Information: Credit not allowed for both ANEQ 180A2 and ANEQ 193.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 200 Applied Horsemanship and Equitation Credits: 2 (0-4-0)

Course Description: Foundation and advancement of horsemanship, on the ground and on horseback.

Prerequisite: ANEQ 115.

Registration Information: Sophomore standing. Written consent of instructor.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 201A Preparation of Horses for Competition: Western Credits: 2 (0-4-0)

Course Description: Development of skills to prepare and present horses in competitions aimed at enhancing their value.

Prerequisite: None.

Registration Information: Written consent of instructor.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 201B Preparation of Horses for Competition: English Credits: 2 (0-4-0)

Course Description: Development of skills to prepare and present horses in competitions aimed at enhancing their value.

Prerequisite: None.

Registration Information: Written consent of instructor.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 203 Equine Management Credits: 2 (1-2-0)

Course Description: Equine management and care techniques with hands-on experience.

Prerequisite: ANEQ 102.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 204 Equine Facilities Management Credits: 3 (2-2-0)

Course Description: Understanding of all aspects required to manage an equine facility coupled with hands-on experience.

Prerequisite: ANEQ 102.

Registration Information: Must register for lecture and laboratory.

Required field trips.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 205 Equine Assessment, Evaluation and Retraining Credits: 2 (0-4-0)

Course Description: Skills in assessing, evaluating, and training horses in transitional phases of their lives, including, but not limited to horses with a history of non-use, previous trauma, compliance issues, and other problematic concerns.

Prerequisite: ANEQ 115.

Registration Information: Written consent of instructor. Credit not allowed for both ANEQ 205 and ANEQ 280A2.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 220 Feeds and Feeding Credits: 2 (2-0-0)

Course Description: Advantages and limitations of feedstuffs; nutrients and their functions; and feed practices for all physiological stages of livestock.

Prerequisite: ANEQ 101 or ANEQ 102.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 230 Farm Animal Anatomy and Physiology Credits: 3 (3-0-0)

Course Description: Basic concepts of farm animal anatomy and physiology; emphasis on growth, digestion, and reproduction.

Prerequisite: LIFE 100 to 199 - at least 3 credits.

Registration Information: Credit not allowed for both ANEQ 230 and ANEQ 305.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 249 Introduction to the Trail Riding Industry Credit: 1 (0-2-0)
Course Description: Emphasis on horse care, regulations, first aid, health, training, and hosting a trail ride.
Prerequisite: None.
Registration Information: Written consent of instructor.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

ANEQ 250 Live Animal and Carcass Evaluation Credits: 3 (1-4-0)
Course Description: Growth, development, and value-determining characteristics of market animals.
Prerequisite: ANEQ 101 or ANEQ 102.
Registration Information: Must register for lecture and laboratory.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

ANEQ 286 Livestock Practicum Credits: 2 (0-0-0)
Course Description: Livestock breeds and terminology; classification of feedstuffs; livestock handling and care; basic animal management techniques, hands-on experience.
Prerequisite: ANEQ 101 or ANEQ 102.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ANEQ 292 Equine Industry Seminar Credit: 1 (1-0-0)
Course Description: Overview of the equine industry and industry careers.

Prerequisite: ANEQ 102.
Registration Information: Sections may be offered: Online.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ANEQ 293 Professional Development and Career Success Credit: 1 (0-0-1)
Course Description: Designed for learners to continue to explore career opportunities as animal scientists and in other related fields. Introduction to issues in animal sciences and problem solving as an individual and in teams. Create a resume and other professional documents identifying how to effectively promote strengths and skills. Network with professionals and develop interviewing skills and confidence as lifelong learners resulting in career success.
Prerequisite: ANEQ 101 with a minimum grade of C and ANEQ 193 with a minimum grade of C.
Restriction: Must be a: Undergraduate.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ANEQ 300A Topics in Animal Sciences: Livestock Handling Credit: 1 (1-0-0)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ANEQ 300E Topics in Animal Sciences: Family Ranching Credit: 1 (1-0-0)
Course Description:
Prerequisite: ANEQ 101 or ANEQ 102.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

ANEQ 300L Topics in Animal Sciences: Quality Assurance Credits: 2 (2-0-0)
Course Description: Explore the components of food animal quality assurance programs. Discover how these programs and guidelines address consumer concerns about livestock production, and understand how program guidelines are applied and verified on farms and ranches across the country.
Prerequisite: ANEQ 101 or ANEQ 102.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ANEQ 300N Topics in Animal Sciences: Seedstock Management and Merchandising Credits: 3 (3-0-0)
Course Description: Overview of beef seedstock industry, including selection, management, and marketing of livestock.
Prerequisite: ANEQ 101 and ANEQ 330, may be taken concurrently.
Restriction: Must be a: Freshman, Sophomore.
Registration Information: Junior standing. Course required to apply for seedstock team. Required field trips.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

ANEQ 300R Topics in Animal Sciences: Ruminant Parturition and Neonatal Care Credits: 2 (1-2-0)
Course Description: Proper management techniques for pregnant livestock, assistance with birth, and care of neonatal animals. Includes a combination of in-class learning, hands-on participation.
Prerequisite: (ANEQ 310) and (ANEQ 478 or ANEQ 510).
Restriction: Must not be a: Freshman, Sophomore, Junior.
Registration Information: Senior standing. Required field trips.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

ANEQ 300U Topics in Animal Sciences: Seedstock Sale Management-- Sale Planning Credit: 1 (0-2-0)
Course Description: Plan and promote a purebred livestock sale.
Prerequisite: ANEQ 300N and ANEQ 330.
Restriction: Must be a: Freshman, Sophomore.
Registration Information: This is a partial semester course. Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ANEQ 300V Topics in Animal Sciences: Seedstock Sale Management-- Sale Management Credit: 1 (0-2-0)
Course Description: Planning and executing a purebred livestock sale.
Prerequisite: ANEQ 300U.
Restriction: Must not be a: Freshman, Sophomore.
Registration Information: This is a partial semester course. Required field trips.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ANEQ 303 Equine Digital Photography Credits: 3 (2-2-0)

Course Description: Basics of photographic principles and DSLR cameras with a focus on equine subjects.

Prerequisite: ANEQ 102.

Registration Information: Sophomore standing. Must register for lecture and laboratory. Credit not allowed for both ANEQ 303 and ANEQ 380A4.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 305 Functional Large Animal Physiology Credits: 3 (3-0-0)

Course Description: Introduction to the basic concepts of farm animal physiology with emphasis on concepts relating to relevant topics in the fields of food animal and equine science.

Prerequisite: (CHEM 107 with a minimum grade of C or CHEM 111 with a minimum grade of C) and (LIFE 100 to 199 with a minimum grade of C - at least 3 credits).

Restriction: .

Registration Information: Sections may be offered: Online. Credit not allowed for both ANEQ 230 and ANEQ 305.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 310 Animal Reproduction Credits: 3 (3-0-0)

Course Description: Anatomy and physiology of the reproductive system; causes of reproductive failure in farm animals; methods of improving reproductive performance.

Prerequisite: (ANEQ 101 with a minimum grade of C- or ANEQ 102 with a minimum grade of C-) and (ANEQ 230 with a minimum grade of C- or ANEQ 305 with a minimum grade of C- or BMS 300 with a minimum grade of C-).

Registration Information: Sections may be offered: Online.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 312 Animal Ultrasonography Credits: 2 (1-2-0)

Course Description: Fundamentals and application of using ultrasound in farm animals; basic reproductive technologies; utilizing ultrasound as a management tool.

Prerequisite: (ANEQ 230 or ANEQ 305) and (ANEQ 310).

Registration Information: Must register for lecture and laboratory.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 313 Prevention and Control of Livestock Diseases Credits: 3 (3-0-0)

Course Description: Common ailments of livestock; sanitation and disease prevention and control.

Prerequisite: (ANEQ 230 with a minimum grade of C or ANEQ 305 with a minimum grade of C or BMS 300 with a minimum grade of C) and (ANEQ 310 with a minimum grade of C, may be taken concurrently and ANEQ 320 with a minimum grade of C).

Registration Information: Junior standing. Credit not allowed for both ANEQ 313 and VS 313.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 315 Equine Behavior Credits: 2 (1-2-0)

Course Description: Equine behaviors related to training and learning.

Prerequisite: ANEQ 102.

Registration Information: Sophomore or higher standing. Must register for lecture and laboratory.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 320 Principles of Animal Nutrition Credits: 3 (2-2-0)

Course Description: Understanding of nutrients and nutrient function required to support animal life through all physiological states.

Prerequisite: (ANEQ 230 with a minimum grade of C or ANEQ 305 with a minimum grade of C or BMS 300 with a minimum grade of C or BMS 360 with a minimum grade of C) and (CHEM 100 to 199 with a minimum grade of C - at least 3 credits and MATH 117 to 499 with a minimum grade of C - at least 3 credits).

Registration Information: Must register for lecture and laboratory.

Sections may be offered: Online. Required field trips.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 321 Principles of Applied Animal Nutrition Credit: 1 (1-0-0)

Course Description: Application of basic understanding of nutrients and their use in various classes of animals to elucidate practical feeding regimens for the major species of animals, including both livestock and companion animals.

Prerequisite: ANEQ 320.

Registration Information: This is a partial semester course.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 322 Pet Nutrition Credits: 2 (2-0-0)

Course Description: Nutrients, nutrient requirements, feeding practices, food sources and management for companion animals (dogs, cats, birds, fish, reptiles, etc.).

Prerequisite: ANEQ 320 or ANEQ 345 or FSHN 350.

Registration Information: Offered as a correspondence or online course only.

Terms Offered: Fall, Spring, Summer.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

ANEQ 323 Zoo Nutrition Credits: 2 (2-0-0)

Course Description: Unique nutritional requirements of mammalian, avian, and reptile captive wild animals; management protocols needed.

Prerequisite: ANEQ 320 or ANEQ 345 or FSHN 350.

Registration Information: Offered as a correspondence or online course only.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 324 Principles of Applied Equine Nutrition Credit: 1 (1-0-0)

Course Description: Principles of applied equine nutrition. Nutritional applications in feeding horses in different physiological states to promote health and well-being.

Prerequisite: ANEQ 320.

Registration Information: This is a partial semester course.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 325 Equine Exercise Physiology Credits: 2 (2-0-0)

Course Description: Overview of the main aspects of equine exercise physiology.

Prerequisite: ANEQ 230 or BMS 300 or ANEQ 305.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 328 Foundations in Animal Genetics Credits: 3 (3-0-0)

Course Description: Foundational information to understand animal genetics: genomes, molecular genetics, transmission-Mendelian inheritance, pedigree, population genetics, and introduction to quantitative genetics.

Prerequisite: (ANEQ 101 or ANEQ 102) and (LIFE 100 to 199 - at least 3 credits).

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 330 Principles of Animal Breeding Credits: 3 (3-0-0)

Course Description: Genetic principles underlying animal improvement; elementary population genetics; heritability; selection response; mating systems; DNA markers.

Prerequisite: (ANEQ 328 with a minimum grade of C- or BZ 350 with a minimum grade of C- or SOCR 330 with a minimum grade of C-) and (STAT 200 to 279 with a minimum grade of C- - at least 3 credits or STAT 300 to 379 with a minimum grade of C- - at least 3 credits).

Registration Information: Sections may be offered: Online.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 334 Principles of Equine Genetics Credits: 3 (2-2-0)

Course Description: Application of Mendelian, molecular, and quantitative genetic principles for understanding the transmission and expression of qualitative and quantitative traits in animals using important examples from the horse. Topics include the physical and biochemical basis of inheritance, connection of genotype to phenotype, mechanisms of gene action, genetic interactions, selection, and genetic improvement.

Prerequisite: (ANEQ 101 with a minimum grade of C- or ANEQ 102 with a minimum grade of C-) and (ANEQ 230 with a minimum grade of C- or ANEQ 305 with a minimum grade of C- or BMS 300 with a minimum grade of C- or BMS 360 with a minimum grade of C-) and (ANEQ 328 with a minimum grade of C- or BZ 350 with a minimum grade of C- or SOCR 330 with a minimum grade of C-).

Restriction: Must not be a: Freshman.

Registration Information: Sophomore standing. Must register for lecture and laboratory. Sections may be offered: Online.

Terms Offered: Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 340 Horse Training and Sale Preparation I Credits: 3 (0-6-0)

Course Description: Practical training skills using a yearling or two year old: in-hand, restraint, ground driving, lungeing, first rides, stable management.

Prerequisite: None.

Registration Information: Written consent of instructor.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 341 Horse Training and Sale Preparation II Credits: 3 (0-6-0)

Course Description: Skills in training for specific riding maneuvers, conditioning, and fitting for sale.

Prerequisite: ANEQ 340.

Registration Information: Additional time outside of class required on weekends.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 344 Principles of Equine Reproduction Credits: 3 (3-0-0)

Course Description: Principles of reproduction and reproductive management of the mare and stallion.

Prerequisite: (ANEQ 102 with a minimum grade of C) and (ANEQ 230 with a minimum grade of C or ANEQ 305 with a minimum grade of C or BMS 300 with a minimum grade of C).

Registration Information: Sophomore standing. Sections may be offered: Online.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 345 Principles of Nutrition: Equine Applications Credits: 3 (3-0-0)

Course Description: Principles of nutrition; application in feeding horses in different physiological states to promote health and wellness.

Prerequisite: (ANEQ 102 with a minimum grade of C) and (ANEQ 230 with a minimum grade of C or ANEQ 305 with a minimum grade of C or BMS 300 with a minimum grade of C) and (CHEM 100 to 199 - at least 3 credits and MATH 100 to 499 - at least 3 credits).

Registration Information: Sections may be offered: Online.

Terms Offered: Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 346 Equine Disease Management Credits: 4 (3-2-0)

Course Description: Normal and abnormal body structures and functions of major systems of the horse. Recognition of main diseases, causes, prevention and treatments.

Prerequisite: (ANEQ 102 with a minimum grade of C) and (ANEQ 230 with a minimum grade of C or ANEQ 305 with a minimum grade of C or BMS 300 with a minimum grade of C).

Registration Information: Must register for lecture and laboratory.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 349 Packing and Outfitting Credits: 2 (1-2-0)

Course Description: Business aspects of outfitting/packing the horse; hitches, knots, horse care; planning pack trips, setting up camp.

Prerequisite: ANEQ 102.

Registration Information: Written consent of instructor. Must register for lecture and laboratory. Required field trips (Overnight pack trip).

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 351 Techniques in Therapeutic Riding Credits: 2 (1-2-0)

Course Description: Equine assisted activities; therapeutic horseback riding, hippotherapy, driving/vaulting, mental health treatments, programs for youth at risk.

Prerequisite: ANEQ 102.

Registration Information: Must register for lecture and laboratory.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 352 Introduction to Horse Evaluation Credits: 2 (0-4-0)

Course Description: Criteria and techniques for evaluation of horses; development of logical decision processes for establishing comparative value.

Prerequisite: ANEQ 102.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 353 Advanced Horse Evaluation Credits: 3 (0-6-0)

Course Description: Advanced criteria/techniques for horse evaluation; logical decision process development to establish comparative value; intercollegiate competition.

Prerequisite: ANEQ 352.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 354 Introduction to Livestock Evaluation Credits: 3 (0-6-0)

Course Description: Criteria and techniques for evaluation of livestock; development of logical decision processes for establishing comparative value.

Prerequisite: ANEQ 101.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 355 Advanced Livestock Evaluation Credit: 1 (0-9-0)

Course Description: Advanced criteria and techniques for evaluation of livestock; establishing comparative value; participating in intercollegiate competition.

Prerequisite: ANEQ 354.

Registration Information: Course may be taken twice for a maximum of 2 credits.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 356 Introduction to Dairy Evaluation Credits: 3 (0-6-0)

Course Description: Criteria and techniques for evaluation of dairy cattle; development of logical decision processes for establishing comparative value.

Prerequisite: None.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 357 Advanced Dairy Evaluation Credits: 2 (0-4-0)

Course Description: Advanced criteria and techniques for evaluation of dairy cattle; establishing comparative value; participating in intercollegiate competition.

Prerequisite: ANEQ 356.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 358 Equine Event and Sales Management Credits: 2 (2-0-0)

Course Description: Skills necessary to produce, organize, and promote equine related events.

Prerequisite: ANEQ 102.

Registration Information: Credit not allowed for both ANEQ 358 and ANEQ 300T.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 359 Equine Sales Production Credits: 2 (0-4-0)

Course Description: Emphasizes skills necessary to host and evaluate an equine sale.

Prerequisite: ANEQ 358.

Registration Information: Written consent of instructor.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 360 Principles of Meat Science Credits: 3 (3-0-0)

Course Description: Structure, composition, and biology of muscle and associated tissues; wholesomeness, nutritive value, and palatability of beef, pork, and lamb.

Prerequisite: CHEM 100 to 199 - at least 3 credits and ANEQ 101 with a minimum grade of C.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 361 Introduction to Meat Product Evaluation Credits: 3 (0-6-0)

Course Description: Criteria and techniques for evaluation of meat products; development of logical decision processes for establishing comparative value.

Prerequisite: None.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 362 Advanced Meat Product Evaluation Credit: 1 (0-4-0)

Course Description: Criteria and techniques for evaluation of meat products; establishing comparative value; participating in intercollegiate competition.

Prerequisite: ANEQ 361.

Registration Information: Course may be taken twice for a maximum of 2 credits.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 363 Introduction to Wool and Fiber Evaluation Credit: 1 (0-2-0)

Course Description: Criteria and techniques for evaluation of wool; development of logical decision processes for establishing comparative value.

Prerequisite: None.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 364 Advanced Wool and Fiber Evaluation Credit: 1 (0-2-0)

Course Description: Criteria and techniques for evaluation of wool; establishing comparative value; participating in intercollegiate competition.

Prerequisite: ANEQ 363.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 365 Principles of Teaching Therapeutic Riding Credits: 3 (2-2-0)

Course Description: Practical experiences and knowledge of the techniques to be a professional certified therapeutic riding instructor.

Prerequisite: ANEQ 351.

Registration Information: Written consent of instructor. Must register for lecture and laboratory. Required field trips.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 366 Animal Welfare Evaluation Credits: 2 (1-2-0)

Course Description: Criteria and techniques for evaluating animal welfare generally and for specific species based on the selected focus (specific species differ by year but include farm, companion, lab, working, and exotic animal species). Development of logical decision processes for establishing comparative value between cases.

Prerequisite: ANEQ 101 or ANEQ 102.

Registration Information: Must register for lecture and laboratory. Required field trips. Credit not allowed for both ANEQ 366 and ANEQ 380A3.

Term Offered: Spring (even years).

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 382A Study Abroad--Europe: Equine Sciences in Europe Credit: 1 (0-0-1)

Course Description: Exploration of European culture and history through immersion in the European equine industry. International focus on breeding, showing, managing, and marketing of the horse.

Prerequisite: None.

Term Offered: Summer (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 384 Supervised College Teaching Credits: Var[1-5] (0-0-0)

Course Description:

Prerequisite: None.

Registration Information: Written consent of instructor. A maximum of 10 combined credits for all 384 and 484 courses are counted toward graduation requirements.

Terms Offered: Fall, Spring, Summer.

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

ANEQ 386A Equine Practicum: Equine Training and Management Credits: 2 (1-2-0)

Course Description:

Prerequisite: ANEQ 102.

Registration Information: Must register for lecture and laboratory.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

ANEQ 386B Equine Practicum: Equine Reproductive Management Credits: 2 (1-2-0)

Course Description:

Prerequisite: ANEQ 344.

Registration Information: Must register for lecture and laboratory.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: Yes.

ANEQ 386C Equine Practicum: Equine Farrier Management Credit: 1 (0-2-0)

Course Description:

Prerequisite: ANEQ 102.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: Yes.

ANEQ 400 Exploring Meat Export Opportunities Credits: 2 (2-0-0)

Course Description: Introducing future CSU leaders to the importance of trade to US agriculture and to the greater US economy.

Prerequisite: None.

Restriction: Must not be a: Freshman, Sophomore.

Registration Information: Junior standing. This is a partial semester course. Credit not allowed for both ANEQ 400 and ANEQ 480A2.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 401 Issues Management in the Food Animal Industry Credit: 1 (1-0-0)

Course Description: Examine how the US livestock industry navigates major issues, challenges, and crises. Case studies, including real-world events over the past three decades using the US beef industry as a model, convey the approach industry trade organizations have taken to handle crises.

Prerequisite: ANEQ 101.

Restriction: Must not be a: Freshman.

Registration Information: Sophomore standing. This is a partial semester course. Required field trips. Credit not allowed for both ANEQ 401 and ANEQ 480A3.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 410 Applied Food Animal Behavior Credits: 3 (3-0-0)

Course Description: Principles of animal behavior applied to food animal species; the importance of understanding, observing, and assessing animal behavior in relation to food animal production; farm animal species specific behavior patterns.

Prerequisite: ANEQ 305 with a minimum grade of C.

Term Offered: Fall (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 420 Applied Nutrition--Computer Diet Formulation Credits: 3 (3-0-0)

Course Description: Comparative diet formulation strategies for cattle (beef and dairy), equine, swine, and poultry. Utilizing advanced computer software to formulate diets, predict performance, and manage ingredient inventory.

Prerequisite: ANEQ 320 or ANEQ 345.

Registration Information: Junior standing.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 440 Equine Industry and Issues Credits: 3 (3-0-0)

Course Description: For students planning a career in the horse industry; management of facilities, production systems, personnel, marketing, and biological systems.

Prerequisite: ANEQ 344 and ANEQ 345 or ANEQ 334 and ANEQ 344 or ANEQ 345 and ANEQ 346 or ANEQ 334 and ANEQ 345 or ANEQ 334 and ANEQ 346 or ANEQ 344 and ANEQ 346.

Registration Information: Any two of the following: ANEQ 334, ANEQ 344, ANEQ 345, ANEQ 346.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 441 Integrated Equine Science Credits: 2 (2-0-0)

Course Description: Describe, understand and integrate the newest scientific principles in equine sciences with equine management.

Prerequisite: ANEQ 334 with a minimum grade of C and ANEQ 345 with a minimum grade of C and ANEQ 344 with a minimum grade of C or ANEQ 334 with a minimum grade of C and ANEQ 344 with a minimum grade of C and ANEQ 346 with a minimum grade of C or ANEQ 346 with a minimum grade of C and ANEQ 344 with a minimum grade of C and ANEQ 345 with a minimum grade of C or ANEQ 334 with a minimum grade of C and ANEQ 345 with a minimum grade of C and ANEQ 346 with a minimum grade of C.

Registration Information: Junior standing.

Terms Offered: Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 442 Riding Instructor Training Credits: 2 (0-4-0)

Course Description: Teaching techniques; theory; handling of large mounted groups, beginner through advanced levels.

Prerequisite: ANEQ 102.

Registration Information: Written consent of instructor.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 443 Applied Equine Nutrition Credits: 2 (1-2-0)

Course Description: Applying principles of nutrition to feeding horses in different physiological states in an effort to promote their health and well-being.

Prerequisite: ANEQ 345.

Registration Information: Required field trips.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 444 Equine Business Management Credits: 2 (2-0-0)

Course Description: Real life" equine industry experience and the ins and outs of managing an equine facility/business.

Prerequisite: ANEQ 440.

Registration Information: Required field trips.

Terms Offered: Fall, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 445 Foaling Management Credits: 2 (1-3-0)

Course Description: Management of the foaling mare and newborn foal; monitoring techniques, preventative and emergency care procedures.

Prerequisite: ANEQ 344.

Registration Information: ANEQ 344 or PVM sophomore standing. Must register for lecture and laboratory.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 448 Sustainable Animal Agriculture Credits: 3 (3-0-0)

Course Description: Familiarize and build competence in the economic, environmental, and social issues related to the production of animal products. Sustainability is a topic that crosses multiple scientific disciplines. By the end of the semester, understand the science underlying climate change and variability, ecosystem services, life cycle assessments, water and carbon footprints, corporate sustainability trends, and food security.

Prerequisite: (CHEM 100 to 199 - at least 3 credits) and (ANEQ 101 or ANEQ 102 or SOCR 100).

Registration Information: Credit allowed for only one of the following: ANEQ 448, ANEQ 548, SOCR 448, or SOCR 548.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 450 Processed Meats Credits: 3 (2-3-0)

Course Description: Physical, chemical and functional characteristics of meat raw materials. Science and technology of value-added processing including curing, sausage manufacture, low moisture products, and restructuring. Quality assurance and related current industry topics.

Prerequisite: ANEQ 360.

Registration Information: Must register for lecture and laboratory.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 460 Meat Safety Credits: 2 (2-0-0)

Course Description: Meat safety; food borne pathogens; hazard analysis critical control points (HACCP) and total quality management (TQM) practices.

Prerequisite: CHEM 100 to 199 - at least 3 credits.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 470 Meat Processing Systems Credits: 4 (3-2-0)

Course Description: Advanced understanding of the manufacturing, packaging, distribution, storage, and cooking of meat products.

Prerequisite: ANEQ 360.

Restriction: Must be a: Senior, Senior - Post Bachelor, Senior - Second Bachelor.

Registration Information: Senior standing. Must register for lecture and lab.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 472 Sheep Systems Credits: 3 (2-2-0)

Course Description: Sheep production under farm and ranch conditions; products, breeds, breeding, nutrition, reproduction, and management systems.

Prerequisite: None.

Restriction: Must be a: Senior, Senior - 5yr Bachelor, Senior - Post Bachelor, Senior - Second Bachelor.

Registration Information: Senior standing. Must register for lecture and laboratory.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 473 Dairy Systems Credits: 3 (2-3-0)

Course Description: Integration of nutrition, genetics, physiology, and economics for management decisions of dairy farm operations and production and marketing of milk.

Prerequisite: (ANEQ 230 with a minimum grade of C- or ANEQ 305 with a minimum grade of C- or BMS 300 with a minimum grade of C-) and (ANEQ 310 with a minimum grade of C- and ANEQ 320 with a minimum grade of C-).

Restriction: Must not be a: Freshman, Sophomore, Junior.

Registration Information: Senior standing. Must register for lecture and laboratory.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 474 Swine Systems Credits: 3 (2-2-0)

Course Description: Production of purebred and commercial swine; breeds, breeding, feeding, marketing, and management.

Prerequisite: None.

Restriction: Must be a: Senior, Senior - 5yr Bachelor, Senior - Post Bachelor, Senior - Second Bachelor.

Registration Information: Senior standing. Must register for lecture and laboratory.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 475 Travel Abroad-Animal Agriculture Credits: 2 (2-0-0)

Course Description: Onsite evaluation of international animal agriculture systems with emphasis on production, marketing, and management.

Prerequisite: None.

Registration Information: Written consent of instructor.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 476 Feedlot Systems Credits: 3 (3-0-0)

Course Description: Feedlot facilities; nutrition; procurement; merchandising; handling; processing cattle; health care; custom feeding; managerial duties.

Prerequisite: ANEQ 320 with a minimum grade of C.

Restriction: Must be a: Senior, Senior - 5yr Bachelor, Senior - Post Bachelor, Senior - Second Bachelor.

Registration Information: Senior standing.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 478 Beef Systems Credits: 3 (2-2-0)

Course Description: Beef production as related to consumer through seedstock segments. Major emphasis on cow-calf management.

Prerequisite: None.

Restriction: Must be a: Senior, Senior - 5yr Bachelor, Senior - Post Bachelor, Senior - Second Bachelor.

Registration Information: Senior standing. Must register for lecture and laboratory. Required field trips.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 486 Therapeutic Riding Instructor Practicum Credits: 2 (0-6-0)

Course Description: Mentor-guided teaching hours to students preparing for the PATH International therapeutic riding instructor certification examination.

Prerequisite: ANEQ 365.

Restriction: Must not be a: Freshman.

Term Offered: Fall.

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

ANEQ 487A Internship: Animal Credits: Var[1-6] (0-0-0)

Course Description:

Prerequisite: None.

Registration Information: Written consent of instructor. Maximum of 6 credits allowed in course.

Terms Offered: Fall, Spring, Summer.

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

ANEQ 487B Internship: Equine Credits: Var[1-6] (0-0-0)

Course Description:

Prerequisite: None.

Registration Information: Written consent of instructor. Maximum of 6 credits allowed in course.

Terms Offered: Fall, Spring, Summer.

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

ANEQ 495 Independent Study Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Registration Information: Written consent of instructor. Maximum of 6 credits allowed in course.

Terms Offered: Fall, Spring, Summer.

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

ANEQ 496 Group Study Credits: Var[1-5] (0-0-0)

Course Description:

Prerequisite: None.

Registration Information: Written consent of instructor. Maximum of 6 credits allowed in course.

Terms Offered: Fall, Spring, Summer.

Grade Modes: S/U Sat/Unsat Only, Traditional.

Special Course Fee: No.

ANEQ 500 Recent Developments Credits: Var[1-6] (0-0-0)

Course Description: Recent developments in animal science, avian science, and food technology.

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing.

Term Offered: Summer.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

ANEQ 505 Microbiome of Animal Systems Credits: 3 (2-2-0)

Course Description: Provides background knowledge, and practical skills required for analyzing microbiome data sets. Technical issues such as primer choice, sequence variant vs OTU picking, rarefaction vs CSS, and study effects are discussed.

Prerequisite: None.

Registration Information: Junior standing. Must register for lecture and laboratory. Written consent of instructor. Credit not allowed for both ANEQ 505 and ANEQ 580A5.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 510 Bovine Reproduction Management Credits: 4 (3-2-0)

Course Description: Role of reproduction in economic efficiency of cattle production systems. Causes of delayed breeding and nonpregnancy, abortion and perinatal mortality.

Prerequisite: ANEQ 310.

Registration Information: Must register for lecture and laboratory.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 522 Animal Metabolism Credits: 3 (3-0-0)

Course Description: Nutrient digestion, absorption, transport and metabolism in monogastric and ruminant domestic species as affected by physiological changes.

Prerequisite: (ANEQ 230 with a minimum grade of C or ANEQ 305 with a minimum grade of C or BMS 300 with a minimum grade of C or BMS 360 with a minimum grade of C-) and (ANEQ 320 with a minimum grade of C or ANEQ 328 with a minimum grade of C or ANEQ 345 with a minimum grade of C).

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 525 Advanced Meat Science Credits: 3 (3-0-0)

Course Description: Advanced study of fundamental and biochemical basis of meat quality.

Prerequisite: ANEQ 360 with a minimum grade of C.

Registration Information: Junior standing. Credit not allowed for both ANEQ 525 and ANEQ 581A5.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 531 Applied Bovine Respiratory Disease Management Credit: 1 (1-0-0)

Course Description: Economic significance, management and measurement of bovine respiratory disease; introduction to genetic influence on susceptibility.

Prerequisite: ANEQ 313 or ANEQ 346.

Registration Information: Written consent of instructor. Offered as an online course only. This is a partial semester course. Senior standing. Credit not allowed for both ANEQ 531 and ANEQ 580A1.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 532 Genetics of Bovine Respiratory Disease Credit: 1 (1-0-0)

Course Description: Quantitative and molecular perspectives on the genetics of susceptibility to bovine respiratory disease (BRD); genetic improvement in BRD susceptibility.

Prerequisite: ANEQ 330 and ANEQ 531.

Registration Information: Senior standing. Written consent of instructor. Offered as an online course only. This is a partial semester course. Credit not allowed for both ANEQ 532 and ANEQ 580A2.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 533 Marker and Gene Assisted Selection Credit: 1 (1-0-0)

Course Description: Approaches to including DNA marker and gene information into livestock selection decisions to improve accuracy and rate of genetic improvement.

Prerequisite: ANEQ 535 or ANEQ 575.

Registration Information: Graduate standing. Written consent of instructor. Offered as an online course only. This is a partial semester course. Credit not allowed for both ANEQ 533 and ANEQ 580A3.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 534 Markers to Gene Function - Functional Change Credit: 1 (1-0-0)

Course Description: Results of marker association analyses are expanded to how sequence polymorphisms translate into functional changes in the animal genome and variation in animal performance. Topics include an introduction to the tools used to generate multi-omics data and how these data are used in genetic evaluation and animal improvement programs.

Prerequisite: ANEQ 328.

Registration Information: Senior standing. Written consent of instructor. Offered as an online course only. This is a partial semester course. Credit not allowed for both ANEQ 534 and ANEQ 580A4.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 535 Genetic Prediction in Livestock Credit: 1 (1-0-0)

Course Description: Emphasizes approaches to genetic prediction in livestock focusing on the use of mixed models and best linear unbiased prediction.

Prerequisite: ANEQ 575.

Registration Information: Graduate standing. Written consent of instructor. Offered as an online course only. This is a partial semester course. Credit not allowed for both ANEQ 535 and ANEQ 581A1.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 536 Livestock Variance Component Estimation Credits: 1 (1-0-0)

Course Description: Emphasizes approaches to estimation of (co)variance components and genetic parameters required to solve mixed models in livestock genetics.

Prerequisite: ANEQ 535 or ANEQ 575.

Registration Information: Senior standing. Written consent of instructor. Offered as an online course only. This is a partial semester course. Credit not allowed for both ANEQ 536 or ANEQ 581A2.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 545 Molecular Methods in Animal Genetics Credits: 3 (0-6-0)

Course Description: Hands-on learning exercises to help develop technical skills and conceptual understanding for critical evaluation of animal genetics at the molecular level. Practical experience in classical and modern genetics laboratory techniques as well as an appreciation for when these techniques should be applied and how to interpret the results.

Prerequisite: ANEQ 330 or ANEQ 334.

Registration Information: Senior standing. Credit not allowed for both ANEQ 545 and ANEQ 581A3.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 548 Issues in Manure Management Credits: 4 (2-2-1)

Course Description: Manure management practices maximizing benefits to soils and crops while minimizing hazards to air and water quality and complying with regulations.

Prerequisite: CHEM 100 to 199 - at least 3 credits.

Registration Information: Credit allowed for only one of the following courses: ANEQ 448, ANEQ 548, SOCR 448, SOCR 548. Must register for lecture, laboratory, and recitation. Required field trips.

Term Offered: Fall (even years).

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 551 Field Necropsy Credits: 2 (1-2-0)

Course Description: Field necropsy techniques for collection of animal tissues for submission to a diagnostic laboratory.

Prerequisite: (ANEQ 230 or BMS 300 or ANEQ 305) and (VS 313 or ANEQ 346 or MIP 315 or ANEQ 313).

Restriction: Must be a: Graduate, Professional.

Registration Information: Junior or senior standing. Must register for lecture and laboratory.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 555 Life Cycle Assessment for Sustainability Credits: 3 (3-0-0)

Also Offered As: ESS 555.

Course Description: The quantitative and qualitative measure of cradle-to-grave impacts of products and services on the environment, the economy, and society.

Prerequisite: ANEQ 300 to 479 - at least 3 credits or BZ 300 to 479 - at least 3 credits or CHEM 300 to 479 - at least 3 credits or ENGR 300 to 479 - at least 3 credits or LIFE 300 to 479 - at least 3 credits.

Registration Information: Sections may be offered: Online. Credit allowed for only one of the following: ANEQ 555, ENGR 555, ESS 555, ENGR 581A1, or ESS 581A1.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 565 Interpreting Animal Science Research Credits: 3 (3-0-0)

Course Description: Designing, conducting, analyzing, and reporting of animal science research.

Prerequisite: (ANEQ 101 or ANEQ 102) and (STAT 100 to 499 - at least 3 credits).

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 567 HACCP Meat Safety Credits: 2 (2-0-0)

Course Description: Control of health problems in meat products through hazard analysis critical control point (HACCP) and total quality management (TQM) practices.

Prerequisite: ANEQ 460.

Registration Information: This is a partial-semester course.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 575 Computational Biology in Animal Breeding Credits: 3 (2-2-0)

Course Description: Numerical analysis and use of computers to solve problems in animal improvement.

Prerequisite: None.

Restriction: Must be a: Graduate.

Registration Information: Graduate standing or written consent of instructor. Must register for lecture and laboratory.

Term Offered: Fall (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 587 Internship Credits: Var[1-9] (0-0-0)

Course Description:

Prerequisite: None.

Registration Information: Written consent of instructor.

Terms Offered: Fall, Spring, Summer.

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

ANEQ 610 Hormonal Regulation of Growth Credits: 2 (2-0-0)

Course Description: Cellular and molecular regulation of animal growth by hormones and growth factors.

Prerequisite: BMS 501.

Restriction: Must be a: Graduate, Professional.

Term Offered: Spring (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 621 Vitamin and Mineral Metabolism Credits: 3 (3-0-0)

Course Description: Vitamin and mineral metabolism in domestic animals.

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing.

Term Offered: Spring (even years).

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 626 Animal Nutrition, Emissions, and Management Credits: 4 (3-3-0)

Course Description: Nutrients and nutrient function required to support animal life through all physiological states and assessment of the impacts on gaseous emissions from these animals.

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Must register for lecture and laboratory. Required field trips.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: Yes.

ANEQ 631 Selection Index Theory Credits: 3 (2-0-1)

Course Description: Quantitative methods for genetic evaluation: selection index theory and introduction to best linear unbiased prediction.

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing. Must register for lecture and recitation.

Term Offered: Spring (even years).

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

ANEQ 660 Topics in Meat Safety Credit: 1 (1-0-0)

Course Description: Topics of current concern in meat safety.

Prerequisite: ANEQ 567.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 699 Thesis Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Written consent of instructor.

Terms Offered: Fall, Spring, Summer.

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

ANEQ 720 Nutritional Energetics Credits: 3 (3-0-0)

Course Description: Dietary energy use to meet animal requirements for maintenance, growth, pregnancy, and lactation; environmental, nutritional, and physiological effects.

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing.

Term Offered: Spring (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 725 Rumen Metabolism Credits: 3 (3-0-0)

Course Description: Microbial degradation, transformation, and synthesis of ingested nutrients; feed particle passage kinetics in the rumen.

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing.

Term Offered: Fall (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 730 Advances in Cattle Breeding Credits: 3 (3-0-0)

Course Description: Literature and research methods in beef cattle breeding.

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing.

Term Offered: Spring (odd years).

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

ANEQ 731 Advanced Genetic Prediction Credits: 3 (3-0-0)

Course Description: Models and methods for prediction of genetic merit in livestock populations.

Prerequisite: ANEQ 575.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing.

Term Offered: Spring (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

ANEQ 784 Supervised College Teaching Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing. Written consent of instructor.

Terms Offered: Fall, Spring, Summer.

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

ANEQ 792A Seminar: General Credit: 1 (0-0-1)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

ANEQ 792B Seminar: Breeding/Genetics Credit: 1 (0-0-1)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

ANEQ 792C Seminar: Physiology Credit: 1 (0-0-1)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

ANEQ 792D Seminar: Meat Sciences Credit: 1 (0-0-1)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Graduate standing.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

ANEQ 792E Seminar: Nutrition Credit: 1 (0-0-1)**Course Description:****Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Registration Information:** Graduate standing.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** Instructor Option.**Special Course Fee:** No.**ANEQ 792F Seminar: Livestock Management Systems Credit: 1 (0-0-1)****Course Description:****Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Registration Information:** Graduate standing.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** Instructor Option.**Special Course Fee:** No.**ANEQ 792H Seminar: Livestock Behavior and Welfare Credit: 1 (0-0-1)****Course Description:** Issues in the field of livestock behavior and welfare.**Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** Instructor Option.**Special Course Fee:** No.**ANEQ 795 Independent Study Credits: Var[1-18] (0-0-0)****Course Description:****Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Registration Information:** Graduate standing. Written consent of instructor.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** S/U Sat/Unsat Only.**Special Course Fee:** No.**ANEQ 799 Dissertation Credits: Var[1-18] (0-0-0)****Course Description:****Prerequisite:** None.**Restriction:** Must be a: Graduate, Professional.**Registration Information:** Graduate standing. Written consent of instructor.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** S/U Sat/Unsat Only.**Special Course Fee:** No.

Livestock Business Management (LBM)

LBM 133 Introduction to Livestock Business Management Credit: 1 (0-3-0)**Course Description:** Introduction to the agricultural livestock industry via a learning community and quality field experiences. Engage with industry stakeholders to address a wide range of topics including an overview of contemporary production practices, challenges to the industry (aka "wicked problems"), the future of agriculture, career opportunities, and foreshadowing the relevance and applicability of concepts to industry context.**Prerequisite:** None.**Registration Information:** Required field trips.**Term Offered:** Spring.**Grade Mode:** Traditional.**Special Course Fee:** No.**LBM 233 Leadership in the Livestock Industry Credits: 2 (1-2-0)****Course Description:** Introduction and engagement with professional leaders in business and the livestock industry. Industry professionals present challenges to solve and justify decision actions in a workshop setting. Students use these experiences to identify and grow their own leadership capabilities.**Prerequisite:** LBM 133, may be taken concurrently.**Restriction:** Must not be a: Freshman.**Registration Information:** Sophomore standing. Must register for lecture and laboratory.**Term Offered:** Fall.**Grade Mode:** Traditional.**Special Course Fee:** No.**LBM 333A Livestock Business Engaged Research: Proposal Development Credit: 1 (1-0-0)****Course Description:** Introduction to the engaged research process. Develop a proposal for engaged research in livestock business management and be prepared execute the proposal.**Prerequisite:** LBM 233.**Restriction:** Must not be a: Freshman, Sophomore.**Registration Information:** Junior standing.**Terms Offered:** Fall, Spring.**Grade Mode:** Traditional.**Special Course Fee:** No.**LBM 333B Livestock Business Engaged Research: Field Experience Credit: 1 (0-0-.75)****Course Description:** Engaged research in livestock business management. Execute tasks approved in LBM 333A project proposal.**Prerequisite:** LBM 333A, may be taken concurrently.**Restriction:** Must not be a: Freshman, Sophomore.**Registration Information:** Junior standing. Requires engagement with approved industry cooperator.**Terms Offered:** Fall, Spring, Summer.**Grade Mode:** S/U Sat/Unsat Only.**Special Course Fee:** No.**LBM 333C Livestock Business Engaged Research: Communications Credit: 1 (1-0-0)****Course Description:** Communication of livestock business management engaged research. Report on the activities and findings of the student's engaged research project. Focus on both differentiation of audiences and selection and execution of appropriate communication methods.**Prerequisite:** LBM 333B.**Restriction:** Must not be a: Freshman, Sophomore.**Registration Information:** Junior standing.**Terms Offered:** Fall, Spring.**Grade Mode:** Traditional.**Special Course Fee:** No.

LBM 433 Integrated Livestock Business Mgt Workshop Credit: 1 (0-0-2)

Course Description: Integrated capstone workshop experience that serves as the catalyst in integrating the biophysical sciences and business management principles as relevant to solving problems in the livestock industry. Engage as teams in weekly workshops to address contemporary problems in livestock business management.

Prerequisite: (AREC 428, may be taken concurrently and LBM 333C) and (ANEQ 470, may be taken concurrently or ANEQ 472, may be taken concurrently or ANEQ 473, may be taken concurrently or ANEQ 474, may be taken concurrently or ANEQ 476, may be taken concurrently or ANEQ 478, may be taken concurrently).

Restriction: Must not be a: Freshman, Sophomore, Junior.

Registration Information: Senior standing.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.