

## 2011-13 Cal Poly Catalog

### Animal Science Department

#### ASCI-ANIMAL SCIENCE

##### ASCI 101 Introduction to the Animal Sciences (2) (CR/NC)

Economic, environmental and societal impact of the livestock, poultry and horse industries. Basic terminology, anatomy, and physical requirements of animals. Career and academic planning. Co-curricular, extra-curricular, and post-graduate opportunities. Required of all first-time students in the Animal Science Department. Credit/No Credit grading only. 2 lectures.

##### ASCI 112 Principles of Animal Science (4)

~~Economic and environmental roles of animal production and companionship to society. Introductory nutrition, genetics, reproduction, behavior, growth and development, animal products, biosecurity, and food processing and safety of animals. Comparative physiology of digestive, endocrine, and reproductive systems in animals. Principles of nutrition, genetics, growth and development, behavior, food processing/safety of animals. Current issues in animal agriculture including biosecurity, animal welfare, and governmental safeguards for animal and human health.~~ 4 lectures. Fulfills GE B2 except for ASCI and AGSC majors. *Corrected Summer 2015*

##### GE B2

##### ASCI 200 Special Problems for Undergraduates (2-3) (CR/NC)

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 4 units, with a maximum of 3 units per quarter. Credit/No Credit grading only. Prerequisite: Consent of instructor.

##### ASCI 203 Animal Parasitology (3)

Identification, life cycles, prevention and control of the common external and internal parasites causing economic loss in livestock. 3 lectures. Prerequisite: BIO 111 or BIO 161.

##### ASCI 211 Meat Science (4)

Muscle food processing methods and operations. Conversion of muscle to meat. Meat inspection, grading, composition, curing, preservation, food safety and related topics. Carcass beef, pork, and lamb processed into consumer ready products. 3 lectures, 1 laboratory.

##### ASCI 212 Livestock Show Management (3)

Application of the management and operations of Cal Poly's Western Bonanza Livestock Show. Principles and procedures in planning, organizing, financing, promoting and managing a major livestock show and the fair industry. Total credit limited to 6 units. 1 lecture, 2 activities. Not open to students with credit for ASCI 412 or ASCI 413.

##### ASCI 214 Equine Management (2)

Application of safety, risk reduction, horsemanship skills. Develop a working equine/human relationship. Selection and application of nutrition, equipment, preventive health and farrier program, and equitation skills. 2 laboratories. Prerequisite: Consent of instructor.

##### ASCI 216 Meat Grading and Evaluation (2)

Factors related to carcass quality and yield. USDA meat grading principles and practices. Judging of carcass and wholesale cuts. Field trip to meat packing plants required. 1 lecture, 1 laboratory. Prerequisite: ASCI 211.

##### ASCI 220 Introductory Animal Nutrition and Feeding (4)

Nutrient digestion and absorption; basic functions of major nutrient classes; NRC feed classification and feedstuff characteristics; Van Soest system of fiber analysis and practical applications; feed processing: effects on feeds and nutrient availability; nutrient requirements of animals; diet formulation techniques. 3 lectures, 1 laboratory. Prerequisite: ASCI 112.

##### ASCI 221 Introduction to Beef Production (4)

Survey of industry characteristics, breeds, market classes, production systems, and current issues facing the beef industry. 3 lectures, 1 laboratory. Prerequisite: ASCI 112.

##### ASCI 222 Systems of Swine Production (4)

Structure of the pork industry in the U.S.; production standards and new technologies; breed systems. Market classification, product quality and quality assurance. Swine behavior and husbandry systems; biosecurity, health and feeding systems and management. 3 lectures, 1 laboratory. Prerequisite: ASCI 112.

##### ASCI 223 Systems of Sheep Management (4)

Sheep industry overview, populations, trends, cultural implications, breed identification, nutritional, reproductive, health, and marketing management of sheep. 3 lectures, 1 laboratory. Prerequisite: ASCI 112.

##### ASCI 224 Equine Science (4)

History, status of the horse industry, breeds. Application of management skills, safety, conformation evaluation, hoof and leg conformation and care. Understanding equine behavior. Insurance and tax ramifications. Pedigree analysis. Alternate therapies. 3 lectures, 1 laboratory. Prerequisite: ASCI 112.

##### ASCI 225 Introduction to Poultry Management (4)

Introduction to modern techniques in poultry production, processing, marketing and price discovery. Consumption trends, breeds and consumer grades. Laboratory application of management skills, health care, keeping of production and accounting records and processing techniques. 3 lectures, 1 laboratory.

##### ASCI 226 Livestock Evaluation (3)

Utilization of objective and subjective estimation measures in establishing economic worth of domestic animals of the three meat animal species and horses. 1 lecture, 2 laboratories.

##### ASCI 227 Companion Animal Science (4)

Companion animal anatomy and physiology, reproduction, nutrition, behavior, management, common parasites, and infectious diseases. Scientific method in studying the human-animal bond. Application of biological concepts to problems related to companion animals. Trends in pet industry including animal welfare issues. 3 lectures, 1 laboratory. Prerequisite: ASCI 112.

*Corrected (5/24/12)*

##### ASCI 228 Equine Evaluation (2)

Appraisal of equine breeds at halter and in performance classes. Evaluate horse classes, decide their order of placement, and then orally justify these decisions to a judge. The relationship of equine anatomy and physiology on competitive performance. 2 laboratories.

##### ASCI 229 Anatomy and Physiology of Farm Animals (4)

Comprehensive overview of the principal systems of farm animals using an integrative, systemic approach to learning the homeostasis of mammalian organisms so the information can be applied to their daily care and management. 3 lectures, 1 laboratory. Prerequisite: BIO 111 or BIO 161.

*Corrected (5/24/12)*

##### ASCI 232 General Animal Science Laboratory (1)

Basic handling skills of livestock; introductory selection of livestock; basic feedstuff identification and processing; and health care practices. 1 laboratory.

##### ASCI 260 Preparation of Livestock for Shows and Sales (3)

Techniques, equipment and knowledge necessary in order to properly condition, groom, and present beef cattle or horses for evaluation and merchandising. 3 activities.

##### ASCI 265 Equine Behavior and Training (3)

Training of weanling and yearling horses at halter. Selection of proper attire for the handler and equipment for the horse. Application of safe, behavioral training techniques enabling the horse to accept handling, farrier and health care. 3 activities.

##### ASCI 270 Selected Topics (1-4)

Directed group study of selected topics. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1 to 4 lectures. Prerequisite: Open to undergraduate students and consent of instructor.

##### ASCI 290 Animal Production and Management Enterprise (1-5) (CR/NC)

Beginning field experience in animal production systems. May include health, nutrition, reproduction, management, processing, budgeting, and/or marketing exercises. Total degree credit for ASCI 290/ASCI 490 limited to 6 units. Credit/No Credit grading only. 1-5 lectures. Prerequisite: Consent of instructor.

##### ASCI 304 Animal Genomics (3)

Application of genetic principles for domestic animal improvement. Improving animal performance and health through use of genetic markers and diagnostics, gene mapping, and related current technologies. 3 lectures. Prerequisite: BIO 302 or BIO 303 or BIO 351.

##### ASCI 305 Game Bird Propagation and Management (3)

Habitat needs, management and propagation of North American game bird species in the wild and in captivity. Reproduction, nutrition and maintenance of flock health as practiced by commercial game bird operations. 3 lectures. Prerequisite: ASCI 225.

**ASCI 310 Technical Veterinary Skills (4)**

Restraint and handling of animals, physical examination, necropsy procedure, basic wound management, applied pharmacology. Reproduction and herd health programs. 3 lectures, 1 laboratory. Prerequisite: ASCI 229.

**ASCI 311 Advanced Beef Cattle System Management (4)**

Management principles for the sustainability of commercial beef cattle operations. Systems approach for goal setting, financial analysis, range management, breeding systems, nutrition, health programs, marketing, and production practices to enhance profitability of commercial cow-calf operations. 3 lectures, 1 laboratory. Prerequisite: ASCI 221 or consent of instructor.

**ASCI 312 Production Medicine (3)**

Basic disease concepts. Fundamentals of immunology and therapeutics. Disease prevention principles, infectious and non-infectious. Pre-harvest food safety and milk and meat quality assurance. Herd health management programs for production efficiency and product quality. 3 lectures. Prerequisite: ASCI 221 or ASCI 223; ASCI 225 or ASCI 222; ASCI 224 or ASCI 227; and ASCI 229.

**ASCI 315 Equine Biomechanics (4)**

Anatomy and physiology of the equine hoof and limb. An understanding of the art and science of the farrier's work. Evaluation of proper hoof care, trimming, and shoeing. Foot and leg conformation as it relates to sound locomotion. 3 lectures, 1 activity. Prerequisite: ASCI 224 or equivalent. Recommended: ASCI 229.

**ASCI 320 Physiological Chemistry of Animals (4)**

Interactions between the biological and chemical reactions in livestock. Physiology explained at the organ, tissue and cellular level as it relates to the whole animal system. 4 lectures. Prerequisite: CHEM 312 or CHEM 316, ASCI 229.

**ASCI 321 Zoonoses and Veterinary Public Health Concerns (4)**

Public health concerns including: animal and bird diseases which may be transmitted to people; pre-harvest food safety and handling concerns; and environmental public health hazards. 3 lectures, 1 activity. Prerequisite: BIO 111 or BIO 161.

**ASCI 324 Advanced Equine Evaluation (2)**

Appraising the relative merit of individual horses in halter and performance through the application, development and refinement of deductive and inductive logical processes. Oral and written expression of the selection rationale. 2 laboratories. Prerequisite: ASCI 228 or consent of instructor.

**ASCI 325 Egg Production, Processing and Distribution (4)**

Management of replacement pullets and laying hens including flock scheduling, vaccination and handling procedures, nutrition management, costs of operation and production projections. Quality determination, processing, sales and distribution of shell eggs and egg products. 3 lectures, 1 laboratory. Prerequisite: ASCI 225.

**ASCI 326 Advanced Livestock Evaluation (2)**

Application of deductive and inductive logical processes in appraising the relative merit of individual animals within a group sample. Oral expression of the selection rationale. 2 laboratories. Prerequisite: ASCI 226.

**ASCI 329 Principles of Range Management (4)**

Characteristics, history and multiple uses of rangeland. Principles of range plant physiology and ecology in relation to range condition, trend, utilization and improvement practices. Principles of proper grazing practices and nutrition of livestock. 3 lectures, 1 laboratory. Prerequisite: Junior standing or consent of instructor.

**ASCI 330 Poultry Meat Production and Processing (4)**

Modern production techniques for the poultry meat industry. Management of hatcheries, broiler and/or turkey meat production, processing and further processing. 3 lectures, 1 laboratory. Prerequisite: ASCI 225.

**ASCI 333 Equine Reproduction (5)**

Management of the breeding farm, breeding problems, diseases, study of estrus cycles, servicing the mare, handling stallions. Breeding systems, teasing, embryo transfer, ultrasound pregnancy diagnosis, new developments in breeding technology. 4 lectures, 1 laboratory. Prerequisite: ASCI 224 and ASCI 229.

**ASCI 339 Internship in Animal Science (1–12) (CR/NC)**

Selected Animal Science students will spend up to 12 weeks with an approved agricultural firm engaged in production or related business. Time will be spent applying and developing production and managerial skills and abilities. One unit of credit may be allowed for each full week of completed and reported

internship. Degree credit limited to 6 units. Credit/No Credit grading only.

Prerequisite: Consent of internship instructor.

**ASCI 342 Poultry Business Management (4)**

Organization and management of vertically integrated poultry operations. Personnel management, cash flow analysis, cash vs. accrual accounting, structuring of financial statements, projecting product outputs and cash flow needs, employee benefit programs and insurance needs for poultry companies. 4 lectures. Prerequisite: ASCI 225 or consent of instructor.

**ASCI 344 Equine and Human Communication (3)**

Behavior of the horse and its relationship with people. Learning, motivation, social behavior and communication with techniques to improve the safety and understanding between people and horses. 3 activities. Prerequisites: ASCI 214, or consent of instructor.

**ASCI 345 Equine Behavior Modification (5)**

Advanced principles of equine behavior modification for training young horses under saddle. Identifying differences in individual horse's attitudes, techniques to teach horses to respond to different stimuli, management of young equine athlete. 5 activities. Prerequisite: ASCI 344 and consent of instructor.

**ASCI 346 Equine Nutrition (4)**

Equine digestion, diet development considerations and evaluations, nutritional management, and the relationship of respective topics to recommended feeding practices, research data, and nutritional portfolios. Information is based on recent advances in horse nutrition and the National Research Council's Nutrient Requirements for Horses. 3 lectures, 1 laboratory. Prerequisite: ASCI 220 and ASCI 224.

**ASCI 347 Equine Exercise Physiology (3)**

Applied physiology of the exercising horse. Examine different physiological systems: muscular, cardiovascular, respiratory, and nutritional. Gait analysis, lameness, and treatment. The athletic horse: sports medicine, conditioning, drugs, and necropsy evaluation. A distance learning course. 3 lectures. Prerequisite: ASCI 224 and ASCI 229 or consent of instructor.

**ASCI 350 Applied Nonruminant Nutrition (4)**

Comparison of nonruminant and ruminant digestive systems, nutrient requirements, risk management for ingredients, formulation and nutritional management. Influence of growth and production curves, consumption patterns, and feeding management in commercial poultry and swine industries. Feed manufacturing and governmental regulations. 3 lectures, 1 laboratory. Prerequisite: ASCI 220.

**ASCI 351 Reproductive Physiology (4)**

Reproductive anatomy of male and female farm animals. General endocrinology and systemic physiology. Endocrine system effects on the various aspects of reproduction, such as: gametogenesis, estrus, gestation, parturition, mothering and seasonality. Introduction to reproductive biotechnology and embryo manipulation. 3 lectures, 1 laboratory. Prerequisite: ASCI 229.

**ASCI 355 Ruminant Nutrition (4)**

Digestive physiology and nutrition of ruminants. Anatomy and physiology of the digestive tract. Rumen microbial fermentation. Nitrogen utilization and metabolism. Energy partitioning. Net energy system. Range livestock and feedlot nutrition. Supplementation. Common metabolic and nutritional dysfunctions. Diet formulation. 3 lectures, 1 laboratory. Prerequisite: ASCI 220; ASCI 320 or CHEM 313 or CHEM 371.

**ASCI 363 Undergraduate Seminar (2)**

Major developments in the chosen field of the student. Discussion of new developments, policies, practices, and procedures. Each individual is responsible for the development and presentation of a topic in the chosen field, résumé, and cover letter. 2 seminars. Prerequisite: Junior standing.

**ASCI 366 Veterinary Pharmacology (4)**

Investigation of pharmacological principles applied to animal systems. Overview of drugs acting on the nervous, endocrine, circulatory, urinary systems, and reproductive systems, specialty areas of pharmacology, and pharmacogenomics of livestock and companion animals. 3 lectures, 1 activity. Prerequisite: CHEM 111 or CHEM 127, and ASCI 229.

**ASCI 384 Processed Meat Products (4)**

Physical, chemical and functional characteristics of meat food 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. 3 lectures, 1 laboratory. Prerequisite: ASCI 211 and junior standing.

**ASCI 400 Special Problems for Advanced Undergraduates (2–4) (CR/NC)**

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 4 units, with a maximum of 4 units per quarter. Credit/No Credit grading only. Prerequisite: Consent of instructor.

**ASCI 403 Applied Biotechnology in Animal Science (5)**

Coverage of current resources, techniques and methodologies used in animal research and biotechnology as well as experimental design, model assessment, and data interpretation with application to an experimental setting in the laboratory. 3 lectures, 2 laboratories. Prerequisite: BIO 161, BIO 162, upper division genetics course (BIO 302 or BIO 303 or BIO 351 or ASCI 304) or consent of instructor.

**ASCI 405 Domestic Livestock Endocrinology (4)**

Endocrine system and its role in the homeostasis of the animal. Use of hormones in increasing productivity of domestic animals. Endocrinology of reproduction, growth, metabolism and immunology. Discussions of cost-benefit relationships in the use of hormones. 4 lectures. Prerequisite: ASCI 229.

**ASCI 406 Applied Animal Embryology (5)**

Technology of promoting oocyte development, fertilization, culturing, cryopreservation and micromanipulation of embryos. Mouse, cattle and horse embryos used for learning the techniques involved in embryology. 3 lectures, 2 laboratories. Prerequisite: ASCI 229 and ASCI 351.

**ASCI 410 Applied Animal Behavior Science (4)**

Principles of behavior applied to animals in managed environments. Observation and measurement of behavior, including sampling and recording methods. Learning, including training and operant conditioning. Discussion of issues related to behavioral welfare. Etiology and management of maladaptive behavior. 3 lectures, 1 laboratory. Prerequisite: ASCI 320, or CHEM 313 or CHEM 371, and ASCI 221, or ASCI 222, or ASCI 223, or ASCI 224, or ASCI 225, or ASCI 227.

**ASCI 412 Advanced Livestock Event Planning (3)**

Organization and planning for the Western Bonanza Junior Livestock Show. Establishment of committee assignments and show manager responsibilities. Corporate partnerships established and fund raising begun. Planning for activities and guest speakers and new student recruitment. Total credit limited to 6 units. 1 lecture, 2 activities. Prerequisite: ASCI 212, AGB 314 and consent of instructor.

**ASCI 413 Advanced Livestock Event Management (1)**

Student management of the Western Bonanza Junior Livestock Show. Leadership skills, team building, media relations, use of computer applications, livestock and fair industry contacts and mentoring to new students. Application of knowledge learned in ASCI 412. Total credit limited to 2 units. 1 activity. Prerequisite: ASCI 412 and consent of instructor.

**ASCI 415 HACCP for Meat and Poultry Operations (3)**

Using Hazard Analysis and Critical Control Point (HACCP) principles to develop regulatory inspection plans for meat and poultry operations; development and use of prerequisite programs; microbiological and process overviews. 3 lectures. Prerequisite: ASCI 211 or consent of instructor.

**ASCI 420 Animal Metabolism and Nutrition (3)**

Metabolism of proteins, carbohydrates, lipids, minerals, vitamins and water, and the relationship of nutrient utilization to animal production. 3 lectures. Prerequisite: ASCI 220; ASCI 320 or CHEM 313 or CHEM 371.

**ASCI 425 Meat Industry Study Tour (2)**

Study tour of commercial meat businesses. Livestock harvest and carcass fabrication, further meat processing, retail and food service operations. Personnel, processing procedures, regulatory standards, industry specifications and current issues. Travel for 4 days. 2 activities. Prerequisite: ASCI 211 or consent of instructor.

**ASCI 430 Animal Feed Processing (4)**

Management of feed manufacturing for poultry/swine, dairy/beef, and companion animals. General operation of a processing facility including process flow, raw materials receiving, particle reduction, mixing, pelleting, packaging and delivery. State and federal regulations. 3 lectures, 1 laboratory. Prerequisite: ASCI 112 or consent of instructor.

**ASCI 438 Systemic Animal Physiology (4)**

Homeostatic relationships of organ systems. Cardiovascular, respiratory, urogenital and neuro-endocrinological functions. 3 lectures, 1 laboratory. Prerequisite: ASCI 229, CHEM 313 or CHEM 371, or ASCI 320.

**ASCI 440 Immunology and Diseases of Animals (4)**

Introduction to immune system, including innate and acquired immunity of domesticated animals. Application of immunological analyses and examination of current disease issues in domesticated animals. 3 lectures, 1 laboratory. Prerequisite: ASCI 229. Recommended: ASCI 320, CHEM 371 or equivalent.

**ASCI 450 Computer Applications in Animal Science: Spreadsheet Analysis (4)**

Development of spreadsheets relating to livestock production. Integration of database and analytical techniques. Cost-benefit analyses of livestock production systems. 2 lectures, 2 activities. Prerequisite: CSC 110.

**ASCI 455 Advanced Equine Reproductive Technologies (4)**

Assisted reproductive technologies in horses; use of gametes from normal and sub-fertile horses; manipulation of sub-fertile horses, donor and recipient mares; manipulation of endocrine system; embryo utilization; cryobiology of gametes and embryos; assessment of high-risk mare, fetus, and neonate. 3 lectures, 1 laboratory. Prerequisite: ASCI 333; ASCI 351; recommended: ASCI 405 and ASCI 406.

**ASCI 470 Selected Advanced Topics (1–4)**

Directed group study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1 to 4 lectures. Prerequisite: Consent of instructor.

**ASCI 471 Selected Advanced Laboratory (1–4)**

Directed group laboratory study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1 to 4 laboratories. Prerequisite: Consent of instructor.

**ASCI 476 Issues in Animal Agriculture (3)**

Exploration of social, political and environmental forces which will affect livestock production in the future. Roles played by advocacy groups and the media in influencing consumer demands and management practices. 3 seminars. Prerequisite: Upper division standing.

**ASCI 477 Senior Project – Research Experience in Animal Science (3)**

Independent research experience in a specific area of animal science conducted under faculty supervision. Minimum 90 hours required. Prerequisite: Senior standing, ASCI 363 and consent of instructor; one course in statistics recommended.

**ASCI 478 Senior Project – Advanced Internship Experience in Animal Science (3)**

Independent internship experience conducted under faculty supervision focusing on a discipline area of animal science. Completion of a project as a component of the internship. Minimum 90 hours required. Prerequisite: ASCI 363 and senior standing.

**ASCI 479 Senior Project – Current Topics in Animal Science (3)**

Critical evaluation and formal presentation of current issues facing animal agriculture. Evaluation of current topics, analysis of supporting evidence and logic, and synthesis and formal presentation of the resulting perspectives on different approaches to current challenges. 3 lectures. Prerequisite: Senior standing and ASCI 363 or consent of instructor.

**ASCI 480 Advanced Integration of Livestock and Meat Production (4)**

Integration of domestic livestock systems and meat production. Advanced concepts in science and technology of animal management, growth enhancement, harvest and processing related to product safety and quality. 3 lectures, 1 laboratory. Prerequisite: ASCI 211 and ASCI 221; or equivalent course.

**ASCI 490 Advanced Animal Production and Management Enterprise (1-5) (CR/NC)**

Advanced field experience in animal production systems. May include health, nutrition, reproduction, management, processing, budgeting, and/or marketing exercises as well as management decision-making opportunities. Total degree credit for ASCI 290/ASCI 490 limited to 6 units. Credit/No Credit grading only. 1-5 lectures. Prerequisite: Consent of instructor.

**ASCI 500 Individual Study in Animal Science (1–6)**

Advanced independent study planned and completed under the direction of a member of the Animal Science faculty. Total credit limited to 6 units. Prerequisite: Consent of department head, graduate advisor and supervising faculty member.

**ASCI 503 Advanced Molecular Techniques in Animal Science (4)**

Advanced molecular laboratory techniques in animal science. Topics include analyses of cellular and metabolic regulation, gene expression, gene activation and regulation, gene construct design, transgenesis, knockout animal models. 2 lectures, 2 laboratories. Prerequisite: ASCI 403 or equivalent course.

**ASCI 520 Comparative Animal Nutrition (4)**

Advanced problem-based presentation of animal nutrition case studies. Emphasis on nutrients, clinical nutrition disorders and species not commonly considered in production animal nutrition. Analytical and problem-solving skills will be utilized to develop solutions to complex animal nutrition management issues. 3 lectures, 1 activity. Prerequisite: ASCI 320, or CHEM 313 or CHEM 371, and one of the following: ASCI 346 or ASCI 350 or ASCI 355 or DSCI 301, or consent of instructor.

**ASCI 530 Advanced Molecular Nutrition (3)**

In-depth analysis of molecular signaling mechanisms and events related to nutrient metabolism using examples from the current literature in animal science and nutrition. 3 lectures. Prerequisite: ASCI 320 or ASCI 420 or CHEM 372 or graduate standing and consent of instructor.

**ASCI 540 Advanced Immunology and Diseases of Animals (4)**

In-depth analysis of the immune system, including molecular basis for immunity of domesticated animals. Application of immunological assays, and application of scientific method to examine immunity and disease in domesticated animals. Not open to students with credit in ASCI 440. 3 lectures, 1 laboratory. Prerequisite: ASCI 229; ASCI 320 or CHEM 371 or equivalent; STAT 218 or equivalent; or consent of instructor. Corequisite: ASCI 541.

**ASCI 541 Advanced Animal Immunology Laboratory (1)**

Laboratory complement to ASCI 540. Independent research projects, including hypothesis development, experimental design, data collection and analyses, and written and oral presentations. 1 laboratory. Corequisite: ASCI 540.

**ASCI 555 Advanced Equine Reproductive Technologies (4)**

Assisted reproductive technologies in horses; use of gametes from normal and sub-fertile horses; manipulation of sub-fertile horses, donor and recipient mares; manipulation of endocrine system; embryo utilization; cryobiology of gametes and embryos; assessment of high-risk mare, fetus, and neonate. 3 lectures, 1 laboratory. Prerequisite: Graduate standing.

**ASCI 570 Selected Topics in Animal Science (1-4)**

Directed group study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 12 units. 1 to 4 seminars. Prerequisite: Graduate standing or consent of instructor.

**ASCI 571 Selected Advanced Laboratory (1-4)**

Directed group laboratory study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1-4 laboratories. Prerequisite: Graduate standing or consent of instructor.

**ASCI 581 Graduate Seminar in Animal Science (1-4) (CR/NC)**

Current findings and research problems in the field and their application to the industry. Credit/No Credit grading only. Total credit limited to 12 units.-1-4 seminars. Prerequisite: Graduate standing and consent of instructor.

**ASCI 593 Stem Cell Research Internship (5)**

Supervised graduate research in stem cell science and engineering. Provides students with an off-campus industrial or university research internship. Total credit limited to 10 units. Prerequisite: Graduate standing in the Specialization in Stem Cell Research for the MS in Biological Sciences or for the MS in Biomedical Engineering, or the Animal Science Specialization in the MS in Agriculture, and BMED 510, BMED 545, BMED 515, and BIO 534. *Crosslisted as ASCI/BIO/BMED 593.*

**ASCI 594 Applications in Stem Cell Research (2)**

Transfer of skills and knowledge gained through ASCI/BIO/BMED 593, in an applied setting at Cal Poly. Demonstration of technical, problem solving, and presentation skills, and familiarity with current research. Part of the culminating experience for the Specialization in Stem Cell Research for the MS in Biological Sciences or for the MS in Biomedical Engineering, or the Animal Science Specialization in the MS in Agriculture. 1 seminar and supervised work. Prerequisite: ASCI/BIO/BMED 593 *Crosslisted as ASCI/BIO/BMED 594.*