SA 4224  
**Nutrition for Exotic Animals**
This course deals with the special nutritional problems posed by wild animals in captivity. Zoos contain hundreds of species, each representing a digestive strategy for a specific ecological niche. Adapting a substitute diet to meet these varied needs is a challenge. Students will combine information on natural history, historical records, and domestic animal models to design feeding programs for captive wildlife. Prerequisites: CH 2003 Principles of Organic Chemistry or CH 2120 Organic Chemistry I. 2 hours Lecture and 3 hours Laboratory—3 credits

SA 4225  
**Small Animal Research Techniques**
Students are introduced to all phases of research from literature search, planning and performing experiments, to the writing of a research paper. Further experience is gained in anesthesia, surgical techniques, and animal models of human disease. Transgenic technology is discussed extensively and techniques are introduced in the laboratory. Techniques that reduce the number of animals used in research are stressed. Prerequisites: Required: SA 4121 Small Animal Management, DS 3118/3222 Anatomy and Physiology I & II or BY 2223 Comparative Anatomy and BY 4257 Comparative Physiology, or Permission of Instructor. Recommended: SA 4222 Reproduction of Small Animals. Spring semester. 2 hours Lecture and 3 hours Laboratory—3 credits

**Employment Program**

SA 2370  
**Employment Program**
Each student is required to spend 500 hours in approved employment related to the student’s major. Registration for each Employment Program must occur prior to the beginning of a relevant experience. Registration materials are available from the Office of Career and Life Education, located in Segal Hall. - 4 credits

*All or part of the course will be taught at the Elmwood Park Zoo in Norristown, PA. Students must provide their own transportation to the zoo.*

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**ANIMAL SCIENCE - LARGE (AS)**

**AS 1000**  
**Survey of Animal Agriculture**
Large Animal Science students, matriculating from approved High School Vo-Ag programs, may receive 3 elective credits at the end of their freshman year at Delaware Valley College. Contact the Large Animal Science Department for application procedures. 3 credits

**AS 1006**  
**Introduction to Animal Science**
The lectures present an overview of management and production practices for dairy, beef, horses, sheep, swine, and poultry. The associated laboratories acquaint the student with working procedures in common practice. 2 hours Lecture and 3 hours Laboratory—3 credits

**AS 1045**  
**Livestock Industries and Careers**
A course emphasizing the variety of production systems and careers which exist in the beef cattle, sheep, swine, poultry, and horse industries. This overview provides the basis for students selecting production courses in their senior year and aids in developing a career focus. Required of Large Animal Science students. Elective for other students. 2 hours Lecture—2 credits

**AS 1101**  
**Stable Management**
An introductory level course designed to emphasize the management and practical care of equine facilities and horses. Required management participation involves time commitments in addition to regularly scheduled class hours. 3 hours Lecture and 2 hours Laboratory—3 credits

**AS 2116**  
**Livestock Evaluation**
This course emphasizes the factors that contribute to livestock utility. The relationship between the live animal and the carcass is covered as well as an introduction to livestock judging and oral reason presentation. The various systems of production, testing and grading are also given prominence. 2 hours Lecture and 3 hours Laboratory—3 credits
## Course Descriptions

### AS 3000, 4000
**Selected Topics I and II**
Special projects designed to meet individual needs of students in the specialized fields of agriculture. Projects will be arranged on a one-to-one basis with a department faculty member and with the approval of the Department Chairperson. Total Selected Topics credits accepted toward graduation is limited to 2 credits. 3 hrs of student/faculty instruction per week, 1 credit each.

### AS 3123
**Animal Husbandry Techniques**
The course presents an overview of techniques associated with handling, restraint, injections, and identification of livestock. Additional management techniques are performed on college livestock as livestock production schedules require. 1 hour Lecture and 3 hours Laboratory—2 credits

### AS 3209
**Advanced Selection of Livestock**
This course is designed to instruct the student in the comprehensive judging and selection of livestock, as well as live animal pricing and grading. The student will also receive an in-depth study of reasons, preparation and presentation. Prerequisite: Livestock Evaluation or Permission of Instructor. 3 hours Laboratory—1 credit

### AS 3210
**Mare and Foal Management**
An advanced course involving the care and management of breeding, pregnant and foaling mares. Care of newborn foals during the first six months of life are emphasized. Prerequisite: Horse Breeding Management. Time outside of regular class hours is required. 3 credits

### AS 4014
**Beef Science**
This course provides an in-depth review of the beef industry and includes cow-calf, stocker, and feedlot production. Included is a study of the theory and practice of feeding, breeding and overall management of beef cattle. Prerequisites: Animal Feeding and Nutrition, Physiology of Reproduction and Livestock Genetics. Time commitment required outside of regularly scheduled class hours. 2 hours Lecture and 3 hours Laboratory—3 credits

### AS 4016
**Seminar (Animal Science)**
The study of recent research and development in the field of Animal Science with special emphasis on oral presentations. Prerequisite: Speech. 1 hour of Lecture and Discussion—1 credit

### AS 4027
**Sheep Science**
This is a comprehensive introduction to the feeding, breeding, housing, care and management of sheep. While the lectures focus on current practices employed in both large and small operations, the laboratories offer opportunities to apply management practices and to visit a variety of commercial operations in the area. Prerequisites: Animal Feeding and Nutrition and Genetics of Livestock. Two of Lecture and three hours of Laboratory—3 credits

### AS 4028
**Swine Science**
This course provides a thorough introduction to all aspects of swine production and management. The lectures cover current practices regarding nutrition, breeding, housing, and health care, while laboratories provide opportunities to apply management techniques. Time commitment required outside of regularly scheduled class hours. 2 hours Lecture and 3 hours Laboratory—3 credits

### AS 4029
**Poultry Science**
This course is a broad study covering the breeds and varieties of poultry used commercially for meat and eggs. It includes the production methods, management practices, marketing procedures, processing systems and techniques commonly current in the poultry industry. Time commitment required outside of regularly scheduled class hours. 2 hours Lecture and 3 hours Laboratory—3 credits

### AS 4041
**Senior Research**
Selected seniors engage in supervised investigations involving library work and laboratory or field experiments related to Animal Science. Requirement: Permission of Department Chairperson. 1-3 credits
AS 4051  
*Current Topics*
This is a research and discussion course that emphasizes topics of current interest to the animal and dairy industries. May be repeated to a maximum total of 2 credits. 1 hour Lecture and Discussion—1 credit

AS 4106  
*Principles of Animal Nutrition*
A study of the principles and fundamentals of nutrition in livestock. Emphasis is placed on comparative relationships of good nutrients to metabolic processes in domestic animals and on current research and development in the field of animal nutrition. Prerequisite: Introduction to Animal Science, Principles of Organic Chemistry or Organic Chemistry 1. Permission of Instructor. 2 hours Lecture and 3 hours Laboratory—3 credits

AS 4111  
*Yearling Horse Sale Management*
An advanced course involving the management of yearling horses including sales preparation, development of a consignment, sales advertising, video taping sales horses, and working a yearling sale. Prerequisite: Horse Breeding Management. Time outside of regular class hours is required. 2 credits

AS 4130  
*Advanced Livestock Judging*
This course provides intensive training in selection of livestock using subjective and objective measurements as well as the use of oral reasons to explain and defend decisions. An intercollegiate Livestock Judging Team will be selected from students taking this course. Due to considerable travel and time required, enrollment is limited and a 2.2 academic average is required. In addition, the course begins one week prior to the start of the Fall Semester. Prerequisite: Advanced Selection of Livestock. 3 hours Laboratory—1 credit

AS 4214  
*Animal Diseases*
A study of prevention, recognition, and treatment of diseases in animals, with emphasis on domestic livestock and consequences of disease to production agriculture and human health. Prerequisites or corequisite: Anatomy and Physiology. 3 hours Lecture—3 credits

AS 4219  
*Horse Breeding Management*
A course designed to acquaint the student with the operation of a horse breeding farm. Teasing, breeding, foaling, mare and stallion care, and foal care are emphasized. Students manage the College’s breeding facility. Required management participation requires time commitments in addition to regularly scheduled class hours. 2 hours Lecture and 3 hours Laboratory—3 credits

AS 4221  
*Equine Exercise Physiology*
This course involves a survey and the critical evaluation of the current concepts regarding the physiological and environmental factors associated with exercise in the horse. Prerequisite: DS 3118/321 Anatomy and Physiology or ES 3217 Equine Anatomy and Physiology and permission of the Animal Science Department Chair. This course is offered on the campus of Rutgers University, New Brunswick, NJ as part of a credit exchange program. Elective for full-time Delaware Valley College students only. 3 hours Lecture—3 credits

AS 4223  
*Advanced Equine Nutrition*
An advanced course in equine feeding and nutrition emphasizing current research being conducted in the field and the application of research findings to current problems associated with feeding the equine athlete. This course is offered on the campus of Rutgers University, New Brunswick, NJ as part of a credit exchange program. Elective for full-time Delaware Valley College students only. 3 hours Lecture—3 credits

AS 5000  
*Hartpury Exchange*
A semester exchange with the Hartpury College in Gloucestershire, Great Britain for qualified Large Animal Science Majors. Students will pursue coursework in Animal Science and Livestock Production from the British perspective. Spring semester of Junior year. Minimum 3.0 GPA and permission of the Department. Contact the Large Animal Science Department for application procedures. 18 credits
Course Descriptions

Employment Program

AS 2370
Employment Program
Each student in Animal Science (Large) is required to spend 24 weeks (500 hours) in approved jobs related to the student’s major. Registration for each Employment Program must occur prior to the beginning of a relevant experience. Registration materials are available from Career Services, located in Segal Hall. 24 weeks of On-the-Job-Training—4 credits

BIOLOGY

BY 1113, 1214
Biology I and II
An introduction to biology. These two courses emphasize the organization, structure and basic principles governing the lives of all organisms at the molecular, cellular, tissue and organ system, organism and population levels. The courses are a continuum and are to be taken in sequence. Biology I includes cytology, energetics, genetics, kinds of organisms, and nervous and circulatory systems. Biology II continues with organ systems of animals and plants, reproduction, development, behavior, ecology and evolution. The laboratory involves a dynamic study of these principles with the use of living materials as much as is feasible. Biology I is a prerequisite for Biology II. This is the introductory biology sequence required for Biology majors. 3 hours Lecture & 3 hours Laboratory each—4 credits each

BY 1116, 1217
Biological Science I and II
An introduction to the study of life featuring: molecular and cellular biology; genetics; metabolism; survey of the animal kingdom; animal organ systems and embryology; survey of the botanical kingdoms; seed plant structure, function, and development; behavior; evolution; and ecology. Biological Science I is a prerequisite for Biological Science II. This is the introductory biology sequence for majors other than Biology majors. Permission of Department Chairperson is required for Biology majors. 2 hours Lecture and 3 hours Laboratory each—3 credits each

BY 2001
Botany
Plant structure, function, and development are studied in this course, followed by a survey of the botanical kingdoms, stressing reproductive cycles and evolution. Laboratory slides and specimens are complemented by field work. Prerequisite: Biology II or Biological Science II. 3 hours Lecture and 3 hour Laboratory—4 credits

BY 2003
Genetics
This course includes a study of Mendelian principles, population genetics, and the modern molecular concepts of the gene and its action. An emphasis is placed upon relating modern developments in this science to basic principles as well as applying those principles in the analysis of genetic data derived from selective breeding experiments, pedigree analyses, population studies, and studies of the molecular system that stores, transmits, and translates inherited information. Prerequisite: Biology I or Biological Science I. 3 hours Lecture—3 credits

BY 2004
Genetics Laboratory
An introduction to classical and current molecular genetics techniques for studying reproduction and inheritance patterns in living organisms. Designed to provide the “hands-on” experience to facilitate understanding of genetic phenomena. The format is flexible to allow adequate time for the needs of the organisms and procedures. Required of Biology majors. Can be scheduled anytime concurrent with or after passing BY 2003 Genetics. 3 hours Laboratory—1 credit

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