

## Course Descriptions

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.

### **AS 2370**

#### ***Employment Program***

Each student in Animal Science 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 and 3 hours Laboratory each — 4 credits each

### **BY 1115, 1216**

#### ***Natural Science I and II***

Natural Science I introduces some of the basic physical and chemical principles that affect our world and then concentrates on the biological principles that pertain to living things in general and human beings in particular. The concepts build from the cellular level to the systems level and then to the organism as a whole. Natural Science II is a continuation of Natural Science I and begins with a study of basic ecological concepts. It builds to an examination of the roles humans have played in creating some of the problems we face today as well as the roles we may play to help alleviate them. Topics include population growth, energy sources, and air, water, solid waste, and toxic waste pollution. Natural Science I (or permission of the Department Chairperson) is a prerequisite for Natural Science II. Not available to Biology majors and does not substitute for an introductory biology course. 3 hours Lecture each — 3 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 con-

cepts 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

**BY 2010**

***Introduction to Aquaculture***

An introduction to the science of aquaculture. The course reviews the history of the science and examines both warm and cold water species. Different rearing systems are studied for the various species. Production, nutrition, diseases, and marketing are also examined. Prerequisite: High School Biology and Chemistry required, Introductory College Biology and Chemistry preferred. 3 hours lecture — 3 credits

**BY 2108**

***Ecology***

A study of the characteristics of populations and how populations of different organisms are integrated to form natural communities. Emphasis is placed on freshwater and terrestrial ecology. The laboratory is concerned with methods used to collect and evaluate ecological data. Prerequisite: Biology II or Biological Science II. 3 hours Lecture and 3 hours Laboratory — 4 credits

**BY 2223**

***Comparative Anatomy***

This course presents a comparative study of the structure and evolution of vertebrate organ systems. The laboratory involves a detailed anatomical study of the lamprey, shark, perch, necturus, frog, turtle, pigeon, and cat. Prerequisite: Biology II or Biological Science II. 3 hours Lecture and 3 hours Laboratory — 4 credits

**BY 2235**

***Plant Communities***

A study of the components, structure, integration, interactions, habitats and requirements of native plant communities with emphasis on those of the Mid-Atlantic region. Laboratory includes identification and vegetation analysis of local plant communities. Prerequisite: Biological Science 1. 2 hours Lecture and 3 hours Laboratory — 3 credits

**BY 2240**

***Ornithology***

A review of the biology of birds, including their evolutionary history, anatomy, physiology, and, especially, their behavior. Special attention will be paid to the plight of endangered species and related conservation measures. Students will learn to identify many of the common bird species of eastern North America through slides and frequent bird walks on or near the campus. There will be up to two Saturday field trips. In addition to the textbook and field guide, binoculars will be required. 3 hours Lecture — 3 credits

**BY 3002**

***General Microbiology***

An introduction to microorganisms, including their classification, life processes, and ecology. Emphasis is placed on the procaryotic forms of life such as the bacteria. The laboratory involves the study of representative microorganisms as well as the demonstration and use of microbiological techniques. Prerequisites: One semester of Organic Chemistry and Biochemistry; Biology II or Biological Science II. 3 hours Lecture and 3 hours Laboratory — 4 credits

**BY 3007**

***Entomology***

An introduction to the study of insects, focusing on their uniqueness and importance to the terrestrial biosphere. Topics include systematics, morphology, physiology, and ecology with an emphasis on adaptation. The laboratory work includes the creation of a collection of locally occurring insects and their relatives. Prerequisite: Biology II or Biological Science II. 2 hours Lecture and 3 hours Laboratory — 3 Credits

**BY 3008**

***Introduction to Earth and Space Science***

This course develops an appreciation and understanding of the scope and organization of the solar system, Milky Way galaxy and the Universe. The study includes geological, oceanic and meteorological phenomena that continue to shape the planet

## Course Descriptions

Earth and maintain it as a habitat for life. Prerequisites: Chemistry II and Biology II or Biological Science II. 2 hours Lecture and 3 hours Laboratory — 3 credits

### **BY 3105**

#### ***Introduction to the Biology and Ecology of Algae***

This course investigates the classification, physiology and ecology of the major algal groups. It includes practical experience with isolation of specimens from their natural habitats, culture, identification, and microscopic examination. Prerequisite: Botany. 2 hours Lecture and 3 hours Laboratory — 3 credits

### **BY 3106**

#### ***Introduction to the Biology and Ecology of Fungi***

An investigation of fungal organization, classification, culture, physiology, ecology and biotic associations. This course provides practical experience with the culture, growth, reproduction and microscopic examination of fungi. Prerequisite: Botany. 2 hours Lecture and 3 hours Laboratory — 3 credits

### **BY 3123**

#### ***Invertebrate Zoology***

A study of the invertebrates with emphasis on their adaptations relating to morphology, physiology, behavior, and life history. The systematic relationships among these animals based on evolution is stressed. A collection of locally occurring invertebrates is required for the laboratory. Prerequisite: Biology II or Biological Science II. Offered in Fall Semester of odd-numbered years. 2 hours Lecture and 3 hours Laboratory — 3 credits.

### **BY 3126**

#### ***Limnology***

This course is designed to acquaint the student with the basic biological and physical principles of limnology. Field investigations take advantage of the varied freshwater environments in the area. Plankton and benthos samples, various chemical parameters and physical data are taken in the field, evaluated in the laboratory and discussed in class to help demonstrate these principles. Thus, the student is not only exposed to theory, but also to the practical aspects of field data collection and evaluation. Prerequisite: Biology II or Biological Science II. 3 hours Lecture and 3 hours Laboratory — 4 credits

### **BY 3203**

#### ***Taxonomy of Vascular Plants***

An introduction to the systematics of vascular plants and principles of identification, nomenclature, and classification. Special emphasis is placed upon rela-

tionships among principal orders, families and genera. Prerequisite: Botany. Offered in Spring Semester of odd numbered years. 2 hours Lecture and 3 hours Laboratory — 3 credits

### **BY 3208**

#### ***Vertebrate Embryology***

This course covers basic development principles, emphasizing frog and chick embryos and their comparison with amphioxus and mammals. Laboratory involves a three-dimensional microscopic study of frog and chick embryos. Prerequisites: Biology II or Biological Science II and (or concurrent with) Comparative Anatomy. Offered in Spring Semester of even-numbered years. 3 hours Lecture and 3 hours Laboratory — 4 credits

### **BY 3221**

#### ***Apiculture***

A study of the biology and the keeping of the honey bee. Many pertinent aspects of beekeeping, including establishment of colonies, seasonal management, bee diseases, and queen rearing are discussed in lecture and practiced in the laboratory. The College apiary and extraction facilities are utilized as an integral part of the course. Prerequisite: Biology II or Biological Science II. Offered in Spring Semester of odd-numbered years. 2 hours Lecture and 3 hours Laboratory — 3 credits

### **BY 3229**

#### ***Immunology***

A comprehensive study of the current underlying principles of immunology (which includes an appreciation of the contributions made by genetics, cellular and molecular biology), with special emphasis placed on human and murine systems. This course is especially designed to explore both classical and modern methods of investigation and analysis, and their direct application in the examination of the step-by-step development of both humoral and cell-mediated immunity. Prerequisite: Genetics. Offered in the Spring Semester of odd numbered years. 3 hours Lecture and 3 hours Laboratory — 4 credits

### **BY 3250**

#### ***Tropical Ecology***

A study of tropical ecosystems and various conservation and management practices. Students travel to Costa Rica for two weeks over winter break and spend time in páramo, cloud forest, mid-elevation rain forest, lowland rain forest, coastal rain forest, and mangrove forest ecosystems. Students experience the vast ecological and agricultural diversity of Central

America and are taught by international scientists at different biological field stations. Students are required to attend meetings during the fall semester prior to the trip, but do not register until the spring semester. The course work is completed during the spring semester. Prerequisite: Ecology — 4 credits

**BY 4041**

***Senior Research in Biology***

This program is designed for seniors who express a serious desire and have demonstrated the potential to undertake a research problem. The research project is performed under the supervision and with the approval of a member of the Biology Department. Permission of Department Chairperson and approval of the Faculty Research Committee are also required. 1-3 credits in the senior year

**BY 4110**

***Seminar (Biology)***

Topics of contemporary biological interest are presented and discussed by the students. Students are encouraged to use the principles learned in previous courses as a basis for critical discussion. Required of senior Biology majors. 1 hour Discussion — 1 credit

**BY 4132**

***Human Physiology***

In this course the systems of the human body are examined at the cellular, tissue, and organ levels from a functional perspective. General physiological principles and relationships, rather than clinical aspects of physiology, are emphasized. With the exception of exercises on neurophysiology and muscle physiology, students serve as experimental subjects in the laboratory. Prerequisite: Biology II or Biological Science II and Comparative Anatomy. 3 hours Lecture and 3 hours Laboratory — 4 credits

**BY 4152, 4253**

***Selected Topics I and II***

Special projects are undertaken to meet individual needs of students in the biological field of major interest, as arranged with a member of the departmental faculty and with the approval of Chairperson of the Department. Electives for Biology juniors and seniors. 3 hours scientific effort and conference each — 1 credit

**BY 4155**

***Molecular Biology***

A review of macromolecular structure followed by detailed study of genetic control mechanisms and recent developments in recombinant DNA technology. The laboratory includes experience with bacterial and viral populations and molecular immunology as well as several exercises on the chemistry of DNA. Prerequisite: General Microbiology. 3 hours Lecture and 3 hours Laboratory — 4 credits

**BY 4206**

***Determinative Microbiology***

An advanced study of microorganisms, with emphasis on the characteristics of bacteria. The laboratory provides instruction in the techniques of microbial isolation, cultivation and identification. Prerequisite: General Microbiology. Offered in Spring Semester of even-numbered years. 3 hours Lecture and 3 hours Laboratory — 4 credits

**BY 4218**

***Histology***

This course emphasizes the study of the microanatomy of mammalian organ systems with particular attention to humans. The structure and function of cellular and tissue components is a primary focus, and their relationship to organ and system functions is explored. The laboratory section includes the examination of cell and tissue components, and students are exposed to current histological techniques. Prerequisites: Biology II or Biological Science II and Comparative Anatomy. 3 hours Lecture and 3 hours Laboratory — 4 credits

**BY 4250**

***Virology***

This course will introduce students to the field of virology. Upon completion of the course the student should have a basic understanding of the general structure and molecular biology of viruses, the classification of viruses, the interaction of viruses with their host cells and viral diseases. Prerequisites: Genetics and General Microbiology. Offered in the Spring Semester of odd-numbered years. 3 hours lecture — 3 credits

**BY 4257**

***Comparative Physiology***

This course features an examination of physiological and associated anatomical adaptations in selected invertebrates and vertebrates living in a variety of aquatic and terrestrial environments. Prerequisite: Biology II or Biological Science II. Offered in Spring

## *Course Descriptions*

Semester of odd-numbered years. 3 hours Lecture and 3 hours Laboratory — 4 credits

### **Specialized Methods and Techniques**

Each major department offers a series of courses designed to acquaint the student with various applications of the professional specialty. In the Biology program this requirement is fulfilled by satisfactory completion of one of the following Biology electives: BY 2001 Botany; BY 2223 Comparative Anatomy; BY 2004 Genetics Laboratory.

### **Employment Program**

#### **BY 2370**

##### ***Employment Program***

Each student in Biology is required to spend 500 hours in approved jobs related to the student's major. Registration for the Employment Program must occur prior to the beginning of the relevant experience. Registration materials are available from the Office of Career and Life Education, located in Segal Hall. 24 weeks of On-the-Job-Training — 4 credits

## ***Biotechnology (BT)***

#### **BT 3000**

##### ***Introduction to Biotechnology***

An interdisciplinary course designed to provide increased familiarity with the concepts, objectives, techniques, ethical and regulatory considerations in the developing areas of biotechnology. Topics include molecular genetics, bacteria, viruses, and applications in biological, medical, food, plant and animal sciences. Prerequisites: Biology II, or Biological Science II, and Biochemistry. Meets the requirements for certification in Education, General Science and Biology minors. Does not substitute for Molecular Biology. Offered in Fall Semester. 3 hours Lecture and Discussion — 3 credits

#### **BT 3001**

##### ***Introduction to Biotechnology Laboratory***

This is a one credit laboratory course offered in conjunction with BT 3000. Laboratory sessions provide students with hands-on experiences with commonly used methods and procedures in biotechnology. This experience is designed to improve employment opportunities for the students and to enhance their understanding of the lecture material. Prerequisites: BT 3000 Introduction to Biotechnology taken previously or concurrently. Spring semester. 3 hours Laboratory — 1 credit

## ***BUSINESS ADMINISTRATION (BA)***

#### **BA 1005**

##### ***Introduction to Business***

This course is designed to give the student a basic overview of the organization and management of the enterprise. The course includes a study of the characteristics of economic systems; the nature and functions of management; and the basic organizational functions of finance, marketing, operations, and human resources. 3 hours Lecture and Discussion — 3 credits

#### **BA 1009**

##### ***Management Concepts***

An introductory course in the study of business management and the various managerial skills necessary to make the decision-making process work. The course will focus on the different aspects of the business environment and concentration on the basic skills required of managers. 3 hours Lecture and Discussion — 3 credits

#### **BA 2008**

##### ***Macroeconomics***

Course provides students with a background to understand the nature, forces, behaviors and institutions that comprise the US economic system. The student is introduced to economic thinking, concepts, principles, laws and models found in the field of macroeconomics. Students explore macroeconomics through topics and their related issues. Some topics studied are: economic systems, market system, demand and supply, functions of private and public sectors in the US economy, National Income Accounting, Business Cycle: unemployment, inflation, and growth, Employment Theory, Fiscal Policy, money and banking and monetarism. 3 hours Lecture and Discussion — 3 credits

#### **BA 2017**

##### ***Principles of Marketing***

Management of the marketing functions, including marketing research, product planning, distribution channels, pricing, promotion, personal selling and advertising. New techniques and trends in marketing, as well as governmental rules and regulations will be examined. Emphasis is on consumer and industrial markets. Prerequisite: Junior Status. 3 hours Lecture and Discussion — 3 credits