

## **Biology (Biol)**

### ***101 Environmental Biology w/Lab* 4 credit hours**

Students will learn about human impacts on the environment, and the impacts environmental modifications have on humans.

This course will focus on the major issues of contemporary environmental science. The laboratory portion of the course will focus on the nature of science as a method of inquiry as it is applied to environmental science. Three hours lecture and two hours lab per week. This course fulfills the life science requirements for majors other than Biology, Biology Education 8-12 and Physical Education P-12 majors. (Fall and Spring)

### ***108 Plants and People w/Lab* 4 credit hours**

A survey of the uses of plants in human societies throughout the world. This course will not count toward a major or minor in biology although it will count as a laboratory core science course for non-science majors. This course taken with the lab will meet the core curriculum four-hour laboratory course requirement. (Fall)

### ***111 Principles of Biology w/Lab* 4 credit hours**

A study of the basic principles of living matter with emphasis on the cellular level. Topics of study include: the composition and properties of living matter; the cell as the structural and functional unit of life; transport systems; genetic mechanisms; energy requirements and dynamics; the concept of organism; and the diversity of living things. This course is for Biology, Biological Education 8-12, Pre-Nursing, Kinesiology, and Sports and Fitness Programs Mgmt. majors. Three lecture hours. Prereq: Successful completion of Chem 101 with a grade of "C" or better. (Fall and Spring)

### ***205 Botany w/Lab* 4 credit hours**

A study of plants as organisms. Topics of study include a survey of

the plant kingdom, representative life cycles, and taxonomy; energy transformations, cellular respiration and photosynthesis; structure and function with emphasis on the vascular plants; economic and ecologic important of plants. Three lecture hours and two laboratory hours. Prereq: Successful completion of Biol 111 plus either Chem 101 or Chem 115 with a grade of “C” or better. (Spring; Fall, as needed)

***206 Zoology w/Lab*** 4 credit hours

A study of animals as organisms. Topics will include a brief survey of the animal kingdom with representative life cycles and classification; the concept of species; a systematic approach to the study of structure and function with emphasis on the invertebrates. Three lecture hours and two laboratory hours. Prereq: Biol. 111 with a minimum grade of “C” or permission of the instructor. (Fall)

***207 Medical Terminology*** 3 credit hours

The purpose of this course is to teach students to recognize the basic design and meaning of word-composition elements of medical and scientific terminology. Topics will start from the Latin and Greek alphabets, and will continue through the basic Latin and Greek word roots through medical terms and vocabulary of the organ systems of the human body. This course is offered for science majors, especially those interested in allied health and related fields of study. Prereq: Successful completion of Biol 111 with a grade of “C” or better or permission of the instructor. (As needed).

***211-212 Human Anatomy and Physiology I-II w/Lab***

4-4 credit hours

A study of normal structure and function of the human body as a basis for understanding of the disease process. The course includes an integrated study of the major body systems. The course is designed to meet the needs of students in pre-nursing, physical

therapy, art, and physical education as well as an option for biology majors. Three lecture hours and two laboratory hours. Prereq: Successful completion of Biol 111 with a grade of “C” or better, or permission of instructor; Biol 212 has a prerequisite of successful completion of Biol 211 with a grade of “C” or better. (Fall-211; Spring-212)

***215 DNA Forensics 3 credit hours***

Students are expected to learn how scientific information such as DNA testing is interpreted by the courts. Students are expected to learn how data are collected and basic methods of data analysis. Students are expected to know laboratory standards and standards of technical training associated with DNA forensic analysis. Prereq: Biol 101, 108, or 111 with a grade of ‘C’ or better. (Spring)

***220 Molecular Biology w/Lab 4 credit hours***

An introduction to the basic concepts and techniques in molecular biology. Students will gain hands-on experience in proper use of equipment, as well as analysis of data. 3 lecture hours, 2 laboratory hours. Prereq: Biol 111, Chem 101 or 115 each with a “C” or better. (Fall/Spring, as needed)

***305 Genetics w/Lab 4 credit hours***

An introduction to the basic principles of heredity and variation in plants and animals, including classical, molecular, biochemical, and developmental and population genetics. The physical and chemical bases for heredity are stressed and applications of genetics to problems of medicine, agriculture, and evolution are examined. Three lecture hours and two laboratory hours. Prereq: Biol. 205, 206, 220 each with a minimum grade of “C” or permission of instructor. Math 250 recommended. (Spring)

***306 Microbiology w/Lab 5 credit hours***

A study of the morphology, physiology, taxonomy, and ecology of

microbes, fungi, and viruses, but with emphasis on the bacteria. Growth curves, principles and methods in immunology, and the role of microbes in medicine, industry, and agriculture will be considered. Laboratory methods of cultivation, examination, and identification of microbes, sterile technique, and media preparation will be included. Three lecture hours and two laboratory periods. Prereq: Biol 205 or Biol 206 each with a minimum grade of “C”. Chem 225 is recommended. (As needed)

***310 Field Biology*** 4 credit hours

The course is designed to provide for a knowledge and appreciation of the flora and fauna of the Southern Appalachian Highlands. The course is basically a field course comprised of field trips, field methods, and habitat and adaptation studies. Basic ecological principles will be studied and stressed. The class meets for two three-hour periods. Prereq: Biol 111 with a grade of “C” or better. (Fall, as needed)

***315 Advanced Physiology w/Lab*** 4 credit hours

An analysis of the structural and functional relationship of the vertebrate body at the cellular, tissue, organ, and system level, and their relationship to the maintenance, regulation, and perpetuation of the organism. Mammalian physiology will be emphasized. Prereq: Successful completion of Biol 206, 212, and Chem 116, each with a grade of “C” or higher. (Fall, as needed)

***320 Cell Biology*** 3 credit hours

The cell is the basic unit of life. This course covers biology at the cellular level with emphasis on the structure and function of eukaryotic cells. Special emphasis is placed on the structure, function and pathology of various cellular organelles, as well as signal transduction cascades. Prereq: Biol 111, 220, and Chem 116 each with a “C” or higher. Chem 225 is recommended. (Spring)

***326 Immunology*** 3 credit hours

A study of the components and protective mechanisms of the immune system. Prereq: Biol 212, Chem 226 each with a grade of “C” or higher or permission of instructor. Lecture only. (As needed)

**330 Biochemistry I** (also Chem 330) 4 credit hours

The chemistry of amino acids, proteins, lipids, carbohydrates, and nucleic acids is examined. Also included is a survey of cellular metabolic pathways and methods of energy production. Emphasis is placed on those pathways common to all life. Three lecture hours and a recitation per week. Prereq: Biol 111, Biol 205, Biol 206, and Chem 226 each with a grade of “C” or higher. (Fall)

***331 Biochemistry II*** 3 credit hours

This course is a continuation of Biol 330. Emphasis is placed on those topics not fully covered in Biol 330 including cell membranes, fatty acid and lipid metabolism, the metabolism of nitrogen-containing molecules, and protein synthesis. Recommended for students wishing to pursue pharmacy or medical degrees. Prereq: Biol 111, 205, 206, 330, and Chem 226 each with a grade of “C” or higher. (Spring)

***413 Ecology w/Lab*** 4 credit hours

Students will learn about the factors that control the distribution and abundance of populations. The focus will be on how organisms adapt to the environment. The laboratory will focus on field based analyses of diversity in local communities. Three lecture hours and a lab per week. This course is the capstone for the Biology Major. This course also provides a field experience for Biology and Biology Education majors. Prereq: Biol 205, 206, 305 each with a grade of “C” or higher, and senior standing in Biology or Biological Science Education 8-12; recommended Math 250. (Fall and Spring)

***421 Biology Research*** 1-2 credit hours

The research will consist of a field, laboratory, or library research project on a topic of mutual interest to the student and instructor. A written report and an oral presentation of the results and conclusions will be required. The research may be continued a second semester for an additional 2 credits. Prereq: Permission of and prior arrangement with instructor. (As needed)

***422 Biological Literature* 2 credit hours**

A survey of the biological literature in a field of study agreed upon by the student and the instructor. The course includes selected reading, both classical and current, and provides training in the methods, access, and use of scientific literature, the planning and conduct of research, and report writing. Prereq: Permission of and prior arrangement with instructor, and graduating seniors in their last semester. (As needed)

***451 Vertebrate Histology w/Lab* 4 credit hours**

An elective laboratory course to be offered on an occasional basis depending on the interests of the students and availability of the faculty. This course is specifically an analysis of the structural and functional relationship of the vertebrate body at the cellular, tissue, organ levels and their relationships to the maintenance, regulation, and perpetuation of the organism. Histology of mammalian tissues will be emphasized. Three lecture hours and two hours laboratory. Prereq: successful completion of Biol 111, 211, 212 and Chem 116, each with a grade of "C" or higher. (Fall, odd years, or as needed)

***460-479 Special Topics in Biology* 1-4 credit hours**

Elective courses may be offered as special topics in the biological sciences on an occasional basis depending on the availability and interests of students and faculty. Prereq: Junior standing and permission of instructor. (As needed)

***468 Essential Concepts in Biology* 1 credit hour**

This course serves as both an assessment of the ALC Biology program and as a subject matter review for graduating ALC Biology majors. The fundamental aspects of the five required biology major courses (Biol 111, 205, 206, 305, and 413) are reviewed. It is designed to measure the basic knowledge and understanding achieved by ALC students in Biology. The test results will enable the Science/Math Division to better assess and refine its curriculum, and to gauge the progress of students in comparison to similar programs at schools throughout the country. Student will be required to complete a series of review examinations and culminate with administration of the current Educational Testing Service Major Field Test in Biology. The subject matter is organized into four major areas: cell biology; molecular biology and genetics; organismal biology; and population biology, evolution, and ecology. Some of the questions within each of the major areas are designed to test examinees' analytical skills. A course fee of \$15.00 is charged. This course meets once each week. (Fall/Spring, as needed)