

## **Biology**

### **BIOL 111; 112 Human Anatomy and Physiology Fall (111) & Spring (112) Semesters; 4; 4**

*Prerequisite for BIOL 112: BIOL 111 with a grade of "C" or higher.* This course is a two-semester sequence that covers the macroscopic and microscopic structure and function of the organ systems of the human body. Some applications to pathology and health are made but the emphasis is on understanding the "normal" functions of cell types, tissues and organs, and how organ systems are integrated. The first semester coverage includes: cells, tissues, organs, respiratory system, cardiovascular system and blood, central and peripheral nervous systems, immune system, and renal/ urinary system. The second semester coverage includes: skeletal system, muscular system, skin, sense organs, endocrine system, digestive system, reproductive systems, and human genetics. Does not apply to a biology major or minor. Three lectures and one lab session per week.

### **BIOL 125 Field Natural History Offered as needed; 4**

A course intended especially for students who wish to become acquainted with the common animals of eastern North America. Emphasizes identification and habits of mammals and birds. Two lectures, one five-hour laboratory per week.

### **BIOL 130 Humans and Their Environment Spring Semester; 4**

Biological and ecological issues and choices facing society. Topics include basic environmental principles, human population dynamics, land and soil use, world food supplies and distribution, energy utilization, deforestation, solid and nuclear waste disposal, air and water pollution, and endangered species. Applies to the general education science requirement and recommended for approved teacher education certification programs. Three lectures, one video/discussion laboratory per week.

### **BIOL 140 The Human Body in Health and Disease Fall Semester; 4**

The structure and function of the human body as it relates to health maintenance and health problems encountered in everyday living. The Adventist philosophy of health, especially as expressed by Ellen White, is an integral part of the course. Does not apply toward a biology major or minor. Three lectures and one laboratory period per week. Cross-listed as HLSC 140.

### **BIOL 150 Microbiology Spring Semester; 4**

*Prerequisites: CHEM 105. CHEM 110 strongly recommended.* A study of the structure, function, organization, classification, distribution, activities, and medical significance of viruses, monera, protista, fungi, and animal parasites. Three lectures and one laboratory per week, with additional lab time required for some labs.

### **BIOL 161; 162 College Biology Fall (161) & Spring (162) Semester; 4; 4**

**BIOL 161:** This course identifies and elaborates basic themes in the study of biology, reviews important chemical concepts including the biochemical and structural basis of cell function with a focus on the relation between structure and function of cells as well as higher order assembly. Considers basic concepts regarding heredity; introduces mechanisms of evolution. Topics include cell structure and function; consideration of macromolecules, including proteins, lipids, carbohydrates, and nucleic acids; enzyme structure and activity; hormone control; protein synthesis; photosynthesis; energy and metabolism; structure and function of nucleic acids and chromosomes; Mendelian and molecular genetics, including regulation of gene expression; and basic principles of evolution. Four lectures and one laboratory per week.

**BIOL 162:** *Prerequisite: BIOL 161 with a minimum grade of "C".* This course is a

survey of animal systematics and animal biology including nutrition, gas exchange, transport systems, excretion, reproduction and embryonic development, nervous and chemical regulation, muscle physiology, animal behavior, structure and function of plants, ecosystems, and populations and community ecology. Four lectures and one laboratory per week.

**BIOL 265 Animal Diversity Spring Semester; 4**

*Prerequisite: Permission of the instructor.* A systematic study of the phyla and major classes of animals, including taxonomy, life histories, general structure, and representative genera with emphasis on the invertebrate phyla and on forms affecting people. Three lectures and one laboratory per week.

**BIOL 266 Plant Diversity Fall Semester; 4**

Major plant and fungal groups including taxonomy, life cycles, general structure, and representative genera. Three lectures and one laboratory per week.

**BIOL 294 Topics in Biology Offered as needed; 1-4**

Designed for students who wish a course not listed in the regular offerings. A current topic in biology will be explored.

**BIOL 295 Independent Study in Biology Offered as needed; 1-3**

Study on an independent basis in collaboration with the instructor on a topic in biology at the lower division level.

**BIOL 305 Genetics Fall Semester; 4**

*Prerequisites: BIOL 162 with a minimum grade of "C".* A thorough survey of the field of genetics covering biochemistry, organization, replication, transcription, translation, regulation, mutation, recombination, repair of the macromolecules forming the genetic apparatus; Mendelian inheritance, cytogenetics, gene mapping, and population genetics. Three lectures and one laboratory per week.

**BIOL 311 A Scientific Study of Creation Offered through External Degree Only; 2**

A study of the evidences supporting a creation origin of the earth. The approach is scientific rather than biblical.

**BIOL 315 Histology Fall Semester, odd years; 4**

*Prerequisites: BIOL 162 with a minimum grade of "C".* A detailed study of the gross and fine structure of the cells and tissues that comprise the organs and organ systems of the vertebrate body. Lecture will deal with the structure-function relationships seen in the tissues of the body; lab will emphasize the microscopic identification of normal vertebrate tissues. Three lectures and one laboratory per week.

**BIOL 330 Animal Physiology Spring Semester; 4**

*Prerequisites: BIOL 162 with a minimum grade of "C" or BIOL 111; 112 with a minimum grade of "B". PHYS 272 recommended.* A study of the major functional systems of animals and their physiological interactions with the environment. Emphasis is on a comparative physiology approach. Three lectures and one laboratory per week.

**BIOL 381 Natural History of the Chesapeake Bay Offered as needed; 4**

This course focuses below the fall line of coastal regions of the Chesapeake Bay. It considers the major non-biotic factors of the bay including geology, salinity gradients, tides and circulation, as well as major habitats of the bay, including

plant and animal species typical of each habitat. It also considers the economic and political issues that help determine present and future uses of the Chesapeake Bay watershed and its biota. Three lectures per week and seven (8-hour) Sunday laboratory field trips.

**BIOL 405 Cell and Molecular Biology Spring Semester; 4**

*Prerequisites: BIOL 162 with a minimum grade of "C"; and BIOL 305.* An in-depth analysis of the structure and function of prokaryotic and eukaryotic cells both as organisms and as subunits constituting multicellular organisms. The lecture will examine the physiology of the nucleus and cytoplasmic organelles, cell growth and division, and cellular regulatory mechanism. The laboratory will introduce students to a variety of microscopic, cytological, protozoological, and cell culture techniques useful in experimental cell biology. Three lectures and one laboratory period per week.

**BIOL 410 Developmental Biology Fall Semester; even years; 4**

*Prerequisite: BIOL 162; BIOL 305 and BIOL 405 recommended.* An examination of the processes of embryonic development at the molecular, cellular, and organismic levels. The lecture will cover experimental studies of the biological mechanisms controlling developmental processes, while the laboratory will stress descriptive studies of embryonic structural development. Three lectures and one laboratory per week.

**BIOL 415 Immunology Spring Semester; 3**

*Prerequisite: BIOL 162 with a minimum grade of "C"; BIOL 305 and BIOL 405 recommended.* An introduction to the immune system, with emphasis on mammalian models. Lecture includes discussions on generation of humoral and cell-mediated immune responses, antigen and antibody structure and function, transplantation and tolerance, and immunopathologies. Three lectures per week.

**BIOL 416 Immunology Lab Spring Semester; 1**

*Co-requisite: BIOL 415.* An introduction to the techniques used in clinical immunology. One three-hour session per week.

**BIOL 420 General Ecology Fall Semester, odd years; 4**

*Prerequisite: BIOL 162, BIOL 265, BIOL 266; BIOL 305 and MATH 110 strongly recommended.* The study of the relationships of plants and animals, both as individuals and assemblages, to their biological and physical environments. It will consider such topics as: features of the physical environment, biological communities, ecosystems and the flow of energy, life history strategies, population structure and growth, species interactions, biodiversity, biogeography, extinction and conservation, and the role of humans in the ecosphere. Three class lectures per week; one three-hour laboratory or equivalent per week, with weekly trips.

**BIOL 425 Life Origins and Speciation Spring Semester; 2**

A comparative study of life origins and speciation from the viewpoint of contemporary creationists and evolutionists, an examination of the geological and biological evidence and consequences of the Noachian flood, and an overview of mechanisms and processes of variation and speciation. Two lecture-discussion periods per week.

**BIOL 491; 492 Senior Seminar Fall & Spring Semesters; 1; 1**

*Prerequisite: BIOL 491—senior class standing and a minimum of 26 credits in biology.* A discussion of the philosophy of science, scientific method, exchange and interpretation of data, reference resources, etc., as well as an introduction to the critical evaluation of periodical literature in the biological. One class meeting per week.

**BIOL 494 Topics in Biology Offered as needed; 1-4**

*Prerequisite: Approval of the chair.* Designed for a group of students who wish a course not listed in the regular offerings. Examples: biogeography, avian biology, human reproductive physiology. Not more than four hours of credit may be earned in any one term.

**BIOL 495 Independent Study in Biology Offered as needed; 1-4**

Study on an independent basis in collaboration with the instructor on a topic in biology at the upper division level.

The following courses are offered during the summer at the Walla Walla University marine station. Each course is not necessarily offered every summer. All upper division courses offered at the Rosario Beach Marine Biological Field Station require either BIOL 162 (WAU) or BIOL 143 (WWU) as a prerequisite.

The following

courses are classified as marine courses: BIOL 417, 458, 460, 462, 463, 468, and 475.

**BIOL 141, 142, 143 General Biology 2.7, 2.7, 2.7**

(Equivalent to BIOL 161,162) Study of the basic principles of biology. Topics such as anatomy, physiology, cytology, genetics, taxonomy, ecology, and embryology are considered with reference to both plants and animals.

**BIOL 403 Ornithology 3.3**

Study of native birds of North America, with emphasis on physiology, identification, migration, and life histories. Research project and field trips required. Binoculars required.

**BIOL 405 Natural History of Vertebrates 3.3**

Study of vertebrates with emphasis on natural history, ecology, physiology, and taxonomy. (Course fees apply.)

**BIOL 410 Limnology 3.3**

An introduction to the history, structure, physical characteristics, and biota of lakes, rivers, and streams and to the physical, biological, and geochemical processes occurring there.

**BIOL 417 Behavior of Marine Organisms 3.3**

A study of inter- and intraspecific behaviors of marine animals and their behavioral responses to the physical environment. The course involves laboratory experience, field observations, and research project. Prerequisite: a course in animal behavior, organismal biology and/or psychology.

**BIOL 426 Systematic Botany 3.3**

Study of the principles of plant classification, together with a systematic survey of vascular plants, with emphasis on natural history and ecology.

**BIOL 430 Molecular Biology Techniques 3.3**

Introduction to the theory and practice of modern molecular techniques. The laboratory will include techniques such as the purification and analysis of DNA, RNA, and protein, recombination DNA procedures, mutagenesis, hybridization methods, PCR, and DNA sequencing technology. Two laboratories per week. Prerequisites: BIOL 305 Genetics, CHEM 221 Organic Chemistry, CPTR 105 Introduction to Computers, MATH 126 Precalculus, MATH 110 Probability and Statistics. Offered even years only.

**BIOL 440 Human Anatomy 3.3**

Comprehensive study of human anatomy covering all systems of the head, neck, trunk, and extremities. A solid morphological basis for a synthesis of anatomy, physiology, and clinical sciences. Dissection and identification of anatomical structures using cadavers, charts, and models.

**BIOL 450 Paleobiology 3.3**

Study of the biology, diversity, and history of ancient life and of the principles and methods employed in interpreting life of the past. Special consideration will be given to the fossil record of western North America. (College Place campus – 4 quarter hours; Rosario Beach Marine Laboratory – 5 quarter hours).

**BIOL 458 Marine Biology 3.3**

An integrated approach to understanding the marine environment primarily from an ecological perspective. Included are principles of basic oceanography, plankton biology, deep-sea biology, and shallow-water marine communities. Research project and field trips required.

**BIOL 460 Marine Ecology 3.3**

Study of interspecific, intraspecific, and community relationships demonstrated by marine organisms.

**BIOL 462 Ichthyology 3.3**

Systematic study of the fishes found in Puget Sound, with a survey of the fishes of other waters.

**BIOL 463 Marine Phycology 3.3**

A systematic survey of marine algae, covering the principles of their classification, natural history, ecology, physiology, and practical use.

**BIOL 468 Comparative Physiology 3.3**

*Prerequisite: BIOL 330 (WAU) or BIOL 392 (WWU).* Comparative study of the physiology and life processes of animals with emphasis on invertebrates.

**BIOL 475 Marine Invertebrates 3.3**

A study of the biology of selected groups of marine invertebrates.