BIOL 101 Introduction to Biological Research Techniques I

Upon successful completion of this course, students will be able to:

1. Develop a research plan including hypothesis, controls and procedures.
2. Conduct a primary literature review relating to their research project.
3. Use lab and/or field techniques appropriate to the procedure.
4. Collect and process field samples as well as environmental data relevant to their research plan.
5. Appropriately document protocols & data collection.

BIOL 102 Introduction to Biological Research Techniques II

Upon successful completion of this course, students will be able to:

1. Write their research findings formatted as a scientific manuscript, including abstract, introduction, materials and methods, results and discussion.
2. Focus on analyzing their already-collected data using appropriate techniques.
3. Share their research as a poster and/or oral presentation to the public at a workshop, conference or symposium.
4. Review the scientific literature and, using critical thinking skills, formulate a discussion based upon their analysis and results for their research project.

BIOL 103 Biology and Society

Upon successful completion of this course, students will be able to:

   Explain the basic principles and concepts behind scientific method, cell structure, biological energy transformation, the structure of DNA, cell reproduction, patterns of inheritance, evolution, and ecology.

BIOL 104 Natural History of Alaska

Upon successful completion of this course students will be able to:

1. Explain the process of scientific observation and investigation and the role it plays in our knowledge and appreciation of the environment.
2. Explain how meteorological, geological and biological forces have shaped Alaska’s ecosystems and topography.
3. Explain the relationship between geologic and biological history using a selection of Alaskan organisms.
4. Use taxonomic keys, written descriptions and range maps to identify organisms.
BIOL 105: Fundamentals of Biology I

Upon successful completion of this course, students will be able to:

1. Explain the basic chemistry of life.
2. Describe the basic structure and function of cells.
3. Summarize the transmission and evolution of heritable information.
4. List the major components of the scientific method.
5. Write the components of a scientific paper in the proper format.

BIOL 106: Fundamentals of Biology II

Upon successful completion of this course, students will be able to:

1. Explain hypotheses for the origin of life on earth.
2. Describe the major groups of animals, plants, fungi, and protists.
3. Describe the concept of homeostasis and several examples of its function.
4. Summarize the basics of reproduction and development in plants and animals.
5. Describe the basics of the immune system in animals.
6. Summarize the levels of ecological organization important to life on earth.

BIOL 111 Human Anatomy and Physiology I

With respect to development of foundational knowledge in terminology, chemistry, cells, and tissues, and with respect to focused study of integumentary, skeletal, muscular and nervous systems, and upon successful completion of this course, students will be able to:

1. Develop a vocabulary of appropriate terminology to effectively communicate information related to anatomy and physiology.
2. Recognize the anatomical structures and explain the physiological functions of body systems.
3. Recognize and explain the principle of homeostasis and the use of feedback loops to control physiological systems in the human body.
4. Use anatomical knowledge to predict physiological consequences, and use knowledge of function to predict the features of anatomical structures.
5. Recognize and explain the interrelationships within and between anatomical and physiological systems of the human body.
6. Synthesize ideas to make a connection between knowledge of anatomy and physiology and real-world situations, including healthy lifestyle decisions and homeostatic imbalances.
7. Demonstrate laboratory procedures used to examine anatomical structures and evaluate physiological functions of each organ system.
8. Interpret graphs of anatomical and physiological data.
9. Demonstrate information literacy skills to access, evaluate, and use resources to stay current in the fields of anatomy and physiology.
10. Approach and examine issues related to anatomy and physiology from an evidence-based perspective.
11. Communicate clearly and in a way that reflects knowledge and understanding of the human body and demonstrates the ability to adapt information to different audiences and applications.
BIOL 112 Human Anatomy and Physiology II

With respect to focused study of endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary, and reproductive systems, and upon successful completion of this course, students will be able to:

1. Develop a vocabulary of appropriate terminology to effectively communicate information related to anatomy and physiology.
2. Recognize the anatomical structures and explain the physiological functions of body systems.
3. Recognize and explain the principle of homeostasis and the use of feedback loops to control physiological systems in the human body.
4. Use anatomical knowledge to predict physiological consequences, and use knowledge of function to predict the features of anatomical structures.
5. Recognize and explain the interrelationships within and between anatomical and physiological systems of the human body.
6. Synthesize ideas to make a connection between knowledge of anatomy and physiology and real-world situations, including healthy lifestyle decisions and homeostatic imbalances.
7. Demonstrate laboratory procedures used to examine anatomical structures and evaluate physiological functions of each organ system.
8. Interpret graphs of anatomical and physiological data.
9. Demonstrate information literacy skills to access, evaluate, and use resources to stay current in the fields of anatomy and physiology.
10. Approach and examine issues related to anatomy and physiology from an evidence-based perspective.
11. Communicate clearly and in a way that reflects knowledge and understanding of the human body and demonstrates the ability to adapt information to different audiences and applications.

BIOL 175 Current Topics of Marine Research (Submitted by Jan Straley 3/16)

Upon successful completion of this course, students will be able to:

1. Read and analyze research papers and discuss research methods
2. Compare and contrast research projects discussing similarities and differences
3. Demonstrate knowledge or presented research by writing a synthesis paper on speakers analyzed

BIOL 215 Introduction to Marine Biology

Upon successful completion of this course, students will be able to:

1. Describe how physical aspects of the marine environment shape the general biology of marine organisms.
2. Summarize the basic phyletic taxonomic diversity of marine organisms.
3. Identify the basic habitat types found in the ocean and their general physical and biological characteristics.
4. Explain the degree of ecological connectivity among basic ocean habitats.
5. List the major human threats to marine habitats and stability.
BIOL 239 Introduction to Plant Biology

Upon successful completion of this course, students will be able to:

1. Describe basic plant physiology and processes such as photosynthesis, cell respiration, growth and development.
2. Summarize major trends in the evolutionary history of plants.
3. List the major tissue systems of plants and how they develop.
4. Define common plant morphology terminology used in identification of taxa.
5. List the discriminating characteristics of the major botanical taxa.
6. Summarize the many ecological niches and diverse strategies employed by plants to thrive across the globe.

BIOL 240 Introductory Microbiology

Upon successful completion of this course, students will be able to:

1. Explain fundamental principles of microbial anatomy, physiology and genetics and how these principles determine a microbe’s function, habitat and ability to cause disease in humans or developing resistance to antimicrobials.
2. Describe tactics microbes use to establish disease in humans.
3. Summarize defenses of the human immune system and how those defenses work together to keep microbes at bay.
4. Demonstrate common microbiological techniques to culture and identify bacteria in a manner consistent with all safety guidelines.
5. Describe the unit learning objectives that cover the main principles and techniques illustrated in this course.
6. Extrapolate the academic knowledge gained in this course to the global struggle with microbes.
7. Describe how the foundation of microbial diseases is used in applied research, patient care and other fields of interest.

BIOL 250 Tropical Marine and Coastal Ecology

Upon successful completion of this course, students will be able to:

1. Explain the biodiversity, habitat connectedness, and natural and anthropogenic impacts of tropical marine and coastal ecosystems, and how these ecosystems are managed and conserved.
2. Explain the purpose, methods, results, and conclusions of studies presented in the scientific literature.
3. Demonstrate the ability to communicate one’s personal perspectives and views on written and spoken material while considering other, alternative points of view.
4. Write the components of a scientific paper in the proper format.
5. Demonstrate the ability to verbally discuss scientific concepts, ideas, and opinions.
6. Demonstrate mastery of marine biology field techniques and skills.
BIOL 271 Ecology

Upon successful completion of this course, students will be able to:

1. Summarize the physical, chemical, and biological features that determine the distributions and abundances of organisms.
2. Describe ecological interactions at the individual organism, population, community, and ecosystem levels.
3. Be able to design, conduct, and complete an ecology research project to demonstrate their quantitative, written, and oral communication skills.