PRINCIPLES OF BIOLOGY- BI 111

Instructor- Various *Spring, 2013*
Office Location and Office Hours provided by each instructor.

COURSE DESCRIPTION

BI 111, Principles of Biology, is the first course in the department's sequence of courses for biology and other science majors and minors. This course covers the chemical basis of life, cell structure and function, metabolism, and genetics, including the theme of evolution throughout these topics. There are three one-hour lecture periods and one two-hour laboratory period per week. Special fee: $50.00. Four credit hours are earned for successful completion of the course.

TEXT

Campbell Biology, 9th ed., by Reece *et al*.

CLASS ATTENDANCE AND MAKE-UPS

Each instructor establishes their own attendance policy within university guidelines.

EXAMS AND EVALUATION

Each instructor establishes their own evaluation policy, but all instructors count lecture as 2/3 of the course grade and laboratory as 1/3. All instructors administer three-four major exams throughout the semester.

LECTURE TOPICS

Chapter 1. Introduction: Themes in the Study of Life

290-3-3-.15(1)(a)1.(xi)
Knowledge of fundamental process of modeling and investigating in the biological sciences.
This chapter covers the "scientific method," *i.e.* making observations, forming and testing hypotheses, flexibility of the scientific method, theories in science, and a case study in scientific inquiry. Assessed on lecture examination.

290-3-3-.15(1)(a)1.(xiii) and 290-3-3-.16(1)(c)9.
Knowledge of historical development and perspectives in biology including contributions of significant figures and underrepresented groups, and the evolution of theories in biology.
This chapter includes "Charles Darwin and the Theory of Natural Selection." Assessed on lecture examination.

290-3-3-.15(1)(a)1.(iv)
Knowledge of scientific theory and principles of the origin and development of life. This chapter covers the "scientific method," *i.e.* making observations, forming and testing hypotheses,

flexibility of the scientific method, theories in science, and a case study in scientific inquiry. Assessed on lecture examination.

Chapter 2. The Chemical Context of Life

290-3-3-.15(1)(a)1.(i)
Knowledge of life processes in living systems including organization of matter and energy. This chapter covers the organization of matter and energy. Assessed on lecture examination.

Chapter 3. Water and the Fitness of the Environment

290-3-3-.15(1)(a)1.(xii)
Knowledge of applications of biology in environmental quality and in personal and community health. This chapter includes "Acidification: A Threat to Water Quality" and "The Threat of Ocean Acidification to Coral Reef Ecosystems." Assessed on lecture examination.

290-3-3-.16(1)(c)2.
Knowledge of biochemical interactions of organisms with their environments. This chapter includes "The Threat of Ocean Acidification to Coral Reef Ecosystems." Assessed on lecture examination.

290-3-3-.16(1)(c)6.
Knowledge of issues related to living systems such as genetic modification, uses of biotechnology, cloning, and pollution from farming. This chapter includes "Acidification: A Threat to Water Quality" and "The Threat of Ocean Acidification to Coral Reef Ecosystems." Assessed on lecture examinations.

Chapter 4. Carbon and the Molecular Diversity of Life

Chapter 5. The Structure and Function of Large Biological Molecules

290-3-3-.15(1)(b)2.(i)
Knowledge of biology, including molecular biology, bioenergetics, and ecology. This chapter covers the structure and function of the molecules involved in molecular biology. Assessed on lecture examination.

Chapter 6. A Tour of the Cell

290-3-3-.15(1)(a)1.(xiii) and 290-3-3-.16(1)(c)9.
Knowledge of historical development and perspectives in biology including contributions of significant figures and underrepresented groups, and the evolution of theories in biology. This chapter includes "The Evolutionary Origins of Mitochondria and Chloroplasts" (endosymbiont theory). Assessed on lecture examination.

290-3-3-.15(1)(b)2.(i)
Knowledge of biology, including molecular biology, bioenergetics, and ecology. This chapter

covers how mitochondria and chloroplasts change energy from one form to another. Assessed on lecture examination.

290-3-3-.16(1)(c)1.
Knowledge of bioenergetics including major biochemical pathways. This chapter includes "Mitochondria and chloroplasts change energy from one form to another." Assessed on lecture examination.

290-3-3-.15(1)(d)2.(i)
Knowledge of biology, including organization of life, bioenergetics, biomechanics, and cycles of matter. This chapter covers organization at the cellular level as well as how mitochondria and chloroplasts change energy from one form to another.. Assessed on lecture examination.

Chapter 7. Membrane Structure and Function

Chapter 8. An Introduction to Metabolism

290-3-3-.15(1)(a)1.(i)
Knowledge of life processes in living systems including organization of matter and energy. This chapter covers some of the life processes in living systems. Assessed on lecture examination.

Chapter 9. Cellular Respiration and Fermentation

290-3-3-.15(1)(b)2.(i)
Knowledge of biology, including molecular biology, bioenergetics, and ecology. This entire chapter concerns bioenergetics and the major biochemical pathways of cellular respiration and fermentation. Assessed on lecture examination.

290-3-3-.15(1)(d)2.(i)
Knowledge of biology, including organization of life, bioenergetics, biomechanics, and cycles of matter. This entire chapter concerns bioenergetics and the major biochemical pathways of cellular respiration and fermentation. Assessed on lecture examination.

290-3-3-.15(1)(a)1.(i)
Knowledge of life processes in living systems including organization of matter and energy. This chapter covers some of the life processes in living systems. Assessed on lecture examination.

290-3-3-.16(1)(c)1.
Knowledge of bioenergetics including major biochemical pathways. This entire chapter concerns bioenergetics and the major biochemical pathways of cellular respiration and fermentation. Assessed on lecture examination.

Chapter 10. Photosynthesis

290-3-3-.15(1)(b)2.(i)
Knowledge of biology, including molecular biology, bioenergetics, and ecology. This entire chapter concerns bioenergetics and the major biochemical pathways of photosynthesis. Assessed on lecture examination.

290-3-3-.15(1)(d)2.(i)
Knowledge of biology, including organization of life, bioenergetics, biomechanics, and cycles of matter. This entire chapter concerns bioenergetics and the major biochemical pathways of photosynthesis. Assessed on lecture examination.

290-3-3-.15(1)(a)1.(i)
Knowledge of life processes in living systems including organization of matter and energy. This chapter covers some of the life processes in living systems. Assessed on lecture examination.

290-3-3-.15(1)(a)1.(xv)
Knowledge of applications of biology and biotechnology in society, business, industry, and health. This chapter includes "Alternative Fuels from Plants and Algae." Assessed on lecture examination.

290-3-3-.16(1)(c)1.
Knowledge of bioenergetics including major biochemical pathways. This entire chapter concerns bioenergetics and the major biochemical pathways photosynthesis. Assessed on lecture examination.

290-3-3-.16(1)(c)6.
Knowledge of issues related to living systems such as genetic modification, uses of biotechnology, cloning, and pollution from farming. This chapter includes "Alternative Fuels from Plants and Algae." Assessed on lecture examination.

290-3-3-.16(1)(c)2.
Knowledge of biochemical interactions of organisms with their environments. This chapter includes "Alternative mechanisms of carbon fixation have evolved in hot, arid climates [C_4 plants and CAM plants]." Assessed on lecture examination.

Chapter 12. The Cell Cycle

290-3-3-.15(1)(a)1.(i)
Knowledge of life processes in living systems including organization of matter and energy. This chapter covers some of the life processes in living systems. Assessed on lecture examination.

Chapter 13. Meiosis and Sexual Life Cycles

290-3-3-.15(1)(a)1.(i)
Knowledge of life processes in living systems including organization of matter and energy. This chapter covers some of the life processes in living systems. Assessed on lecture examination.

Chapter 14. Mendel and the Gene Idea

290-3-3-.15(1)(a)1.(vii)
Knowledge of general concepts of genetics and heredity. This entire chapter is concerned with concepts of genetics and heredity. Assessed on lecture examination.

290-3-3-.16(1)(c)3.
Molecular genetics and heredity and mechanisms of genetic modification. This entire chapter is concerned with heredity. Assessed on lecture examination.

290-3-3-.16(1)(c)2.
Biochemical interactions of organisms with their environments. This chapter includes "Nature and Nurture: The Environmental Impact on the Phenotype." Assessed on lecture examination.

Chapter 15. The Chromosomal Basis of Inheritance

290-3-3-.15(1)(a)1.(vii)
Knowledge of general concepts of genetics and heredity. This entire chapter is concerned with concepts of genetics and heredity. Assessed on lecture examination.

290-3-3-.16(1)(c)3.
Molecular genetics and heredity and mechanisms of genetic modification. Material in this chapter expands on that covered in Chapter 14 with regard to heredity/inheritance, including sex-linked genes and linkage. Also includes material on mechanisms of genetic modification ("Alterations of chromosome number or structure cause some genetic disorders"). Assessed on lecture examination.

Chapter 16. The Molecular Basis of Inheritance

290-3-3-.15(1)(b)2.(i)
Knowledge of biology, including molecular biology, bioenergetics, and ecology. This chapter covers the structure and function of DNA. Assessed on lecture examination.

290-3-3-.15(1)(a)1.(vii)
Knowledge of general concepts of genetics and heredity. This entire chapter is concerned with concepts of genetics and heredity. Assessed on lecture examination.

290-3-3-.15(1)(a)1.(xiii)
Knowledge of historical development and perspectives in biology including contributions of significant figures and underrepresented groups, and the evolution of theories in biology. This chapter includes two "Scientific Inquiry" sections ("The Search for the Genetic Material" and "Building a Structural Model of DNA") that trace the development of the theory of molecular genetics, including the work of many scientists in various laboratories around the world. Assessed on lecture examination.

290-3-3-.15(1)(a)1.(i)
Knowledge of life processes in living systems including organization of matter and energy. This chapter covers some of the life processes in living systems. Assessed on lecture examination.

290-3-3-.16(1)(c)3. Molecular genetics and heredity and mechanisms of genetic modification. The entire chapter is concerned with molecular genetics. Assessed on lecture examination.

290-3-3-.16(1)(c)9. Historical development perspectives in biology including contributions of significant figures and underrepresented groups, and the evolution of theories in biology. Includes two "Scientific Inquiry" sections ("The Search for the Genetic Material" and "Building a Structural Model of DNA") that trace the development of the theory of molecular genetics, including the work of many scientists in various laboratories around the world. Assessed on lecture examination.

Chapter 17. From Gene to Protein

290-3-3-.15(1)(a)1.(vii)
Knowledge of general concepts of genetics and heredity. This entire chapter is concerned with concepts of genetics and heredity. Assessed on lecture examination.

290-3-3-.15(1)(a)1.(xii)
Knowledge of applications of biology in environmental quality and in personal and community health. This chapter includes a section on "Mutagens" that discusses how environmental agents can affect the genes (and in turn the biochemistry) of organisms. Assessed on lecture examination.

290-3-3-.15(1)(b)2.(i)
Knowledge of biology, including molecular biology, bioenergetics, and ecology. This chapter covers the molecular basis of protein synthesis. Assessed on lecture examination.

290-3-3-.15(1)(a)1.(i)
Knowledge of life processes in living systems including organization of matter and energy. This chapter covers some of the life processes in living systems. Assessed on lecture examination.

290-3-3-.16(1)(c)3.
Molecular genetics and heredity and mechanisms of genetic modification. The entire chapter is concerned with molecular genetics. Also included is material on genetic modification ("Mutations of one or a few nucleotides can affect protein structure and function"). Assessed on lecture examination.

290-3-3-.16(1)(c)2.
Biochemical interactions of organisms with their environments. This chapter includes a section on "Mutagens" that discusses how environmental agents can affect the genes (and in turn the biochemistry) of organisms. Assessed on lecture examination.

Chapter 20. Biotechnology

290-3-3-.15(1)(a)1.(xii)
Knowledge of applications of biology in environmental quality and in personal and community health. This chapter includes a section on the practical applications of DNA technology: medical applications (diagnosis and treatment of diseases, human gene therapy), environmental cleanup, and agricultural applications. Assessed on lecture examination.

290-3-3-.15(1)(a)1.(xv)
Knowledge of applications of biology and biotechnology in society, business, industry, and health. This chapter includes a section on the practical applications of DNA technology: medical applications (diagnosis and treatment of diseases, human gene therapy, pharmaceutical products), environmental cleanup, and agricultural applications. Assessed on lecture examination.

290-3-3-.16(1)(c)6.
Issues related to living systems such as genetic modification, uses of biotechnology, cloning, and pollution from farming. The entire chapter is concerned with biotechnology and includes much material on cloning ("DNA cloning yields multiple copies of a gene or other DNA segment" and "Cloning organisms may lead to production of stem cells for research and other applications"). Assessed on lecture examination.

BI 111, PRINCIPLES OF BIOLOGY LABORATORY
Syllabus for Spring Semester 2013

Instructor- Various
Office Location and Office Hours provided by each instructor

COURSE DESCRIPTION

BI 111, Principles of Biology, is the first course in the department's sequence of courses for biology and other science majors and minors. This course covers the chemical basis of life, cell structure and function, metabolism, and genetics, including the theme of evolution throughout these topics. There are three one-hour lecture periods and one two-hour laboratory period per week. Four credit hours are earned for successful completion of the course.

290-3-3-.16(1)(c)8. Knowledge of how to design, conduct, and report research in biology. Assessed on laboratory assignments.

LABORATORY MANUAL

Biology 111 and 112 Laboratories, University of North Alabama, Biology Department, Perry, Morton, and Perry.

CLASS ATTENDANCE AND MAKE-UPS

Each instructor establishes their own attendance policy within university guidelines.

EXAMS AND EVALUATION

Each instructor establishes their own evaluation policy, but all instructors count lecture as 2/3 of the course grade and laboratory as 1/3. All instructors administer a series of periodic quizzes and/or lab reports throughout the semester.

Laboratory Schedule:

Scientific Method
Measurements
Microscopy
Macromolecules
Enzymes
Cell Structure and Function
Diffusion and Osmosis
Photosynthesis
Respiration
Mitosis and Cytokinesis
Meiosis

Heredity