

# Biology

## Course Syllabus



### Supervising Teacher

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### Course Description:

*This course meets the graduation requirement for a laboratory science course.* Students will investigate the scientific method and the study of living organisms from molecular and cellular structures to genetics, from individual species and populations to how they interact with the biosphere, and human biology topics.

### Recommended Textbook Options:

*HARCOURT - HOLT Modern Biology Student edition 2006 Edition I-DEA TOP PICK*

*MCGRAW-HILL - GLENCOE Biology 2007 SE I-DEA TOP PICK*

*MCGRAW-HILL - GLENCOE Biology: The Dynamics Of Life 2004 SE I-DEA TOP PICK*

*PEARSON - PRENTICE HALL Biology Student Edition 2008 Edition I-DEA TOP PICK*

### Supplies or Equipment:

*A biology laboratory kit must be ordered from the curriculum catalog. It contains specialized equipment and materials that will help each student complete the laboratories for this course. A list of materials for each lab is found in the instructions of each laboratory. Laboratories can be accessed on the moodle site for this course.*

### Course Evaluation:

#### **A. Semester Examination: 12% of semester grade**

*A comprehensive semester examination will be given during exam week each semester. Semester examinations will be given by a supervising instructor at a previously agreed upon location, most often a resource center. Practice quizzes, study guides, a list of lecture topics and times and other resources to help students better prepare for the examination can be found on the moodle site for this course.*

#### **B. Home Participation and Portfolio: 60% of grade**

*Home participation is to be determined by the home teacher. The participation may include, but is not limited to, textbook activities, quizzes, unit tests, projects, oral reports, or research papers. Grades for home participation will be submitted to the contact teacher each quarter for inclusion on the student's report card. A portfolio of student work which may include copies of some of the laboratories will be presented to the contact teacher once per semester.*

#### **C. Laboratory Expectations: 28% of grade**

*Students are expected to complete a minimum of 4 labs per semester chosen from a selection of 9-10 that cover the objectives for that semester's content. All laboratories must be completed only by the student and a full experiment write-up/report must be submitted to the supervising instructor on the anchor assignment due dates.*

### End of Course Assessment:

*A comprehensive examination will be given each semester, in addition to required laboratories and the student portfolio. The exam and lab grades will be averaged as described above and will account for 40% of the final semester grade. This assessment grade will appear on the student's report card, and be entered at the end of each semester by the Biology instructor.*

## Pacing Guide

The topics and standards for this course have been divided between the two semesters.

Semester 1(Fall)	Semester 2 (Spring)
Scientific Investigation	Change Over Time and Biology
Chemistry and Biology	Classifying Diversity Found in Biology
Cellular Aspects of Biology	Human Systems and Biology
Metabolism and Biology	Ecological Aspects of Biology
Molecular Genetics and Biology	
Heredity and Biology	

In order to fulfill this pacing requirement, the recommended texts have been broken down by chapter. Covering the chapters in the order listed will insure that all topics on the final exam will be covered during the appropriate semester.

### *Harcourt/Holt: Modern Biology*

Semester 1(Fall)	Semester 2 (Spring)
Chapter 1	Chapters 11-12
Chapter 2	Chapters 19-35
Chapters 3-4	Chapters 37-43
Chapter 5	Chapters 15-18
Chapters 6-7, 9-11	
Chapter 8	

### *McGraw-Hill/Glencoe: Biology*

Semester 1(Fall)	Semester 2 (Spring)
Chapter 1	Chapters 14-16
Chapter 6	Chapters 17-30
Chapter 7	Chapters 32 - 37
Chapter 8	Chapters 2-5
Chapters 9, 10.1, 12-13	
Chapters 10.2, 10.3, 11	

### *McGraw-Hill/Glencoe: Biology: Dynamics of Life*

Semester 1(Fall)	Semester 2 (Spring)
Chapter 1	Chapters 14-16
Chapter 6	Chapters 17-32
Chapters 7-8	Chapters 34-39
Chapter 9	Chapters 2-5
Chapters 10-11, 13	
Chapter 12	

### *Pearson Prentice Hall: Biology*

Semester 1(Fall)	Semester 2 (Spring)
Chapter 1	Chapters 15-17
Chapter 2	Chapters 18-32
Chapter 7	Chapters 35-40
Chapters 8-9	Chapters 3-6
Chapters 10-12, 14	
Chapter 11	
Chapter 13	

## **Additional Information from the Instructor:**

*Upon successful completion of biology, the student will be able to:*

- *Design and conduct quality scientific investigations and be able to accurately communicate the information obtained in mathematic or written (expository) format.*
- *Demonstrate enhanced critical thinking skills.*
- *Develop and demonstrate skills related to observing, measuring, classifying, communicating and inferring.*
- *Identify and understand the inorganic and organic principles that affect biological processes.*
- *Understand the basic unit of life (the cell), and its complexity and diversity. Be able to distinguish various types of cells and cellular organelles and explain their interrelatedness and their functions.*
- *Identify the metabolic processes that occur inside a cell and be able to contrast the two primary processes of photosynthesis and respiration.*
- *Understand the basic principles of heredity and how they relate to inheritance of traits in humans.*
- *Understand the structure and function of DNA as a repository of genetic information and how mutations of the DNA affect cellular function.*
- *Understand how natural selection, mutations, genetic drift, migration and non-random mating affect the frequency of genes from generation to generation (evolution).*
- *Understand the importance of biological cycles and the interdependence that results from these cycles (i.e. the carbon cycle: autotrophs-->heterotrophs-->autotrophs).*
- *Interpret related biological information and evaluate its validity.*
- *Describe the purpose of a classification system and know and apply the characteristics that distinguish the 3 domains, the 6 Kingdoms and the major phyla within each.*
- *Understand the structure and function of human organ systems.*
- *Explain the role of abiotic and biotic factors, niche, habitat, energy flow, trophic structure, biogeochemical cycles, and succession in ecosystems; discuss contemporary problems relating to the environment.*

## **I-DEA Student Honor Code:**

With any form of valid proof of dishonesty with regard to student work or testing, the instructor may elect from a range of actions. Academic dishonesty could lead to a zero grade for the assignment or even failure for the entire course following consultation between the instructor, Secondary Supervisor, and Director.

All students must adhere to the **Honor Code:**

***“On my honor, I will maintain the highest possible standards of honesty, integrity and personal responsibility. This means I will not lie, cheat or steal, and as a member of this academic community, I am committed to creating an environment of respect and mutual trust.”***

## IDAHO CONTENT STANDARDS: BIOLOGY

### Standard 1: Nature of Science

Goals:	Objectives						
Goal 1.1: Understand Systems, Order, and Organization	B.1.1.1 Explain the scientific meaning of system, order, and organization.	B.1.1.2 Apply the concepts of order and organization to a given system.					
Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanations	B.1.2.1 Use observations and data as evidence on which to base scientific explanations.	B.1.2.2 Develop models to explain concepts or systems.	B.1.2.3 Develop scientific explanations based on knowledge, logic and analysis.				
Goal 1.3: Understand Constancy, Change, and Measurement	B.1.3.1 Measure changes that can occur in and among systems.	B.1.3.2 Analyze changes that can occur in and among systems.	B.1.3.3 Measure and calculate using the metric system.				
Goal 1.4: Understand the Theory that Evolution is a Process that Relates to the Gradual Changes in the Universe and of Equilibrium as a Physical State	B.3.1.1 Describe how natural selection explains species change over time.						
Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills	B.1.6.1 Identify questions and concepts that guide scientific investigations.	B.1.6.2 Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations.	B.1.6.3 Use appropriate technology and mathematics to make investigations.	B.1.6.4 Formulate scientific explanations and models using logic and evidence.	B.1.6.5 Analyze alternative explanations and models.	B.1.6.6 Communicate and defend a scientific argument.	B.1.6.7 Explain the differences among observations, hypotheses, and theories.
Goal 1.8: Understand Technical Communication	B.1.8.1 Analyze technical writing, graphs, charts, and diagrams.						

## Standard 2: Physical Science

<b>Goals:</b>	<b>Objectives</b>		
Goal 2.1 Understand the Structure and Function of Matter and Molecules and Their Interactions	No objectives at this grade level.		
Goal 2.2 Understand the Concepts of Motion and Forces	No objectives at this grade level.		
Goal 2.3: Understand the Total Energy in the Universe is Constant	B.2.3.1 Explain that energy can be transformed but cannot be created nor destroyed.	B.2.3.2 Classify energy as potential and/or kinetic and as energy contained in a field.	
Goal 2.4: Understand the Structure of Atoms	B.2.4.1 Describe the properties, function, and location of protons, neutrons, and electrons.	B.2.4.2 Describe the characteristics of isotopes.	B.2.4.3 State the basic electrical properties of matter.
Goal 2.5: Understand Chemical Reactions	B.2.5.1 Explain how chemical reactions may release or consume energy while the quantity of matter remains constant.		

## Standard 3: Biology

<b>Goals:</b>	<b>Objectives</b>				
Goal 3.1: Understand the Theory of Biological Evolution	B.3.1.1 Use the theory of evolution to explain how species change over time.	B.3.1.2 Explain how evolution is the consequence of interactions among the potential of a species to increase its numbers, genetic variability, a finite supply of resources, and the selection by the environment of those offspring better able to survive and reproduce.			
Goal 3.2: Understand the Relationship between Matter and Energy in Living Systems	B.3.2.1 Explain how matter tends toward more disorganized states (entropy).	B.3.2.2 Explain how organisms use the continuous input of energy and matter to maintain their chemical and physical organization.	B.3.2.3 Show how the energy for life is primarily derived from the Sun through photosynthesis.	B.3.2.4 Describe cellular respiration and the synthesis of macromolecules.	B.3.2.5 Show how matter cycles and energy flows through the different levels of organization of living systems (cells, organs, organisms, communities and their environment).
Goal 3.3: Understand the Cell is the Basis of Form and Function for All Living Things	B.3.3.1 Identify the particular structures that underlie the cellular functions.	B.3.3.2 Explain cell functions involving chemical reactions.	B.3.3.3 Explain how cells use DNA to store and use information for cell functions.	B.3.3.4 Explain how selective expression of genes can produce specialized cells from a single cell.	

#### **Standard 4: Earth and Space Systems**

<b>Goals:</b>	<b>Objectives</b>
Goal 4.1: Understand Scientific Theories of Origin and Subsequent Changes in the Universe and Earth Systems	B.4.1.1 Show how interactions among solid earth, oceans, atmosphere, and organisms have changed the earth system over time.
Goal 4.2: Understand the Geo-chemical Cycles and Energy in the Earth System	B.4.2.1 Explain the internal and external energy sources of the earth.

#### **Standard 5: Personal and Social Perspectives; Technology**

<b>Goals:</b>	<b>Objectives</b>		
Goal 5.1: Understand Common Environmental Quality Issues, Both Natural and Human Induced	B.5.1.1 Analyze environmental issues such as water and air quality, hazardous waste, forest health, and agricultural production.		
Goal 5.2: Understand the Relationship between Science and Technology	B.5.2.1 Explain how science advances technology.	B.5.2.2 Explain how technology advances science.	B.5.2.3 Explain how science and technology are pursued for different purposes.
Goal 5.3: Understand the Importance of Natural Resources and the Need to Manage and Conserve Them	B.5.3.1 Describe the difference between renewable and nonrenewable resources.		