

# Warren County School District

## PLANNED INSTRUCTION

### COURSE DESCRIPTION

**Course Title:** Advanced Biology – Honors

**Course Number:** 00317

**Course Prerequisites:** Academic Biology (College Prep)

**Course Description: (Include “no final exam” or “final exam required”)**

Advanced Biology is an honors course offered to students who have successfully completed Biology-CP. It is highly recommended to students who desire to attend college and/or pursue a career in a biological related field. The main approach to the course is at the molecular level with an emphasis on ecology, systematics, and surveys the viruses and major phyla of living things. The course involves varied types of instruction including in depth lab analysis with the use of technological devices. Prerequisite: Successful completion of Biology-CP

**Suggested Grade Level:** 10-12

**Length of Course:**          One Semester   X   Two Semesters          Other  
(Describe)

**Units of Credit:**         1         (Insert **NONE** if appropriate.)

**PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certification(s)**  
(Insert certificate title and CSPG#)         Biology        

**Certification verified by WCSD Human Resources Department:**

  X   Yes          No

**Board Approved Textbooks, Software, Materials:**

Title:

Publisher:

ISBN #:

**Copyright Date:**

**Date of WCSD Board Approval:**

**BOARD APPROVAL:**

**Date Written:**         September 2009        

**Date Approved:**   

**Implementation Year:**

**Suggested Supplemental Materials: (List or insert None)**

None

**Course Standards**

**PA Academic Standards: (List by Number and Description)**

**3.1.12 Unifying Themes**

- A. Apply concepts of models as a method to predict and understand science and technology.
- B. Assess and apply patterns in science and technology.
- C. Analyze scale as a way of relating concepts and ideas to one another by some measure.
- D. Evaluate change in nature, physical systems and man made systems.

**3.2.12 Inquiry and Design**

- A. Evaluate the nature of scientific and technological knowledge.
- B. Evaluate experimental information for appropriateness and adherence to relevant science processes.
- C. Apply the elements of scientific inquiry to solve multi-step problems..
- D. Analyze and use the technological design process to solve problems.

**3.3.12 Biological Sciences**

- A. Explain the relationship between structure and function at all levels of organization.
- B. Analyze the chemical and structural basis of living organisms.
- C. Analyze the theory of evolution.

**3.7.12 Technological Devices**

- A. Apply advanced tools, materials and techniques to answer complex questions.
- B. Evaluate appropriate instruments and apparatus to accurately measure materials and processes.

**3.8.12 Science Technology and Human Endeavors**

- A. Evaluate the consequences and impacts of scientific and technological solutions.

**4.6.12 Ecosystems and their Interactions**

- A. Analyze the interdependence of an ecosystem.
- B. Analyze the impact of cycles on the ecosystem.
- C. Analyze how human action and natural changes affect the balance within an ecosystem.

**4.7.12 Threatened, Endangered and extinct Species**

- A. Analyze biological diversity as it relates to the stability of an ecosystem.
- B. Examine the effects of extinction, both natural and human caused, on the environment.
- C. Analyze the effects of threatened, endangered, or extinct species on human and natural systems.

**WCSD Academic Standards: (List or None)**

None

**Industry or Other Standards: (List, Identify Source or None)**

None

**WCSD EXPECTATIONS**

WCSD K-12 Expectations for instruction in writing, reading, mathematics and, technology have been developed and revised annually. The teacher will integrate all WCSD Expectations into this planned instruction.

**SPECIAL EDUCATION AND GIFTED REQUIREMENTS**

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (IEP) or Gifted Individual Education Plan (GIEP).

## **SPECIFIC EDUCATIONAL OBJECTIVES/CORRESPONDING STANDARDS AND ELIGIBLE CONTENT WHERE APPLICABLE**

(List Objectives, PA Standards #'s, Other Standards (see samples at end))

### **ASSESSMENTS**

**PSSA Assessment Anchors Addressed:** This course is written to the 12<sup>th</sup> grade standards. No assessment anchors have been written for this level.

**Suggested Formative Assessments:** The teacher will develop and use standards-based assessments throughout the course.

- Pre-Assessments of prior knowledge (e.g. entrance cards or KWL chart)
- Labs/lab reports
- Bell ringers/Problems of the Day(PODs)
- Discussions
- Teacher observation/Questioning
- Graphic organizers (e.g. Venn diagrams, word mapping, webbing, KWL chart, etc.)
- Summarizing
- Retelling
- Notetaking
- Problem-based learning modules
- Authentic assessment
- Oral presentations
- Outlining
- Journaling
- Student presentations/projects
- Open-ended response
- Quizzes/tests
- Activities
- Classroom Performance System (CPS)
- White boards

### **Suggested Summative Assessments:**

- Essays
- Open-Ended Responses
- Projects
- Quizzes/tests
- Student presentations
- Portfolios
- Lab Practical
- Lab Report

### **District Approved Assessment Instruments**

- PSSA Tests-Grades 4, 8 and 11 only

### **Differentiated Instructional Assessment Strategies**

**Portfolio Assessment:**        \_\_\_\_\_ Yes      X   No

**District-wide Final Examination Required:**        \_\_\_\_\_ Yes      X   No

**Course Challenge Assessment (Describe):**

### **REQUIRED COURSE SEQUENCE AND TIMELINE**

(Content must be tied to objectives)

Content Sequence	Dates
I. Taxonomy	<b>1 week</b>
A. Systematics and phylogeny	
B. Kingdoms and domains	
II. Viruses	<b>2 weeks</b>
A. Structure of viruses	
B. Viral life cycles	
C. Emerging viruses	
III. Prokaryotes	<b>2 weeks</b>
A. Structure of prokaryotes	
B. Classification of prokaryotes	
C. Reproductive strategies and gene transfer	
D. Helpful and harmful bacteria	
IV. Immune System	<b>2 weeks</b>
A. Koch's postulates	
B. Nonspecific defenses	
C. Specific defenses	
D. Disorders of the immune system	
V. Protists	<b>3 weeks</b>
A. Evolution of eukaryotes	
B. Classification of protists	
C. Major structural features of protists	
D. Life cycles of protists	
VI. Fungi	<b>3 weeks</b>
A. Classification of fungi	
B. Structural features of the major groups of fungi	
C. Life cycles of fungi	
D. Helpful and harmful fungi	
VII. Plants	<b>9 weeks</b>
A. Plant evolution and adaptation to life on land	
B. Structure features of the major groups of plants	
C. Alternation of generations life cycle	
D. Reproduction and development	
E. Nutrient uptake and transport	

- F. Nutrient deficiencies
- G. Control systems
- VIII. Animals **6 weeks**
  - A. Invertebrates
    - 1. Classification of invertebrates
    - 2. Structural features of the major groups of invertebrates
    - 3. Life cycles of the major groups of invertebrates
  - B. Vertebrates
    - 1. Classification of vertebrates
    - 2. Structural features of the major groups of vertebrates
    - 3. Life cycles of the major groups of vertebrates
- IX. Ecology **8 weeks**
  - A. Populations
    - 1. Population growth
    - 2. Population density
    - 3. Life histories
    - 4. Human populations
  - B. Communities
    - 1. Structural features of communities
    - 2. Energy flow in the ecosystem
    - 3. Nutrient cycles
  - C. Animal behavior
    - 1. Types of learning
    - 2. Biological rhythms
    - 3. Social behavior

### **Objectives:**

1. Explain how living things are classified.
2. Explain how the major groups of living things have evolved.
3. Describe the basic structure of a virus.
4. Explain how viruses cause disease.
5. Describe the structural features of the major groups of bacteria, protists, fungi, plants and animals.
6. Describe the life cycles of the major groups of bacteria, protists, fungi, plants, and animals.
7. Explain how bacteria benefit the ecosystem.
8. Explain how bacteria cause disease.
9. Identify several protists that cause disease.
10. Explain the role of fungi in the ecosystem.
11. Explain how fungi cause disease in plants and animals.
12. Explain how the human immune system functions.
13. Describe how plants have adapted to life on land.
14. Explain the alternation of generations life cycle.
15. Explain how plants take up and transport nutrients.
16. Describe how primary and secondary growth occurs.
17. Explain how plant hormones regulate growth responses.
18. Describe how populations change.
19. Explain the structural features of communities, such as competition, predation, and symbioses lead to diverse adaptations in organisms.
20. Explain ecosystem dynamics such as energy flow and nutrient cycling.
21. Differentiate between different types of learning in animal populations.
22. Explain how social behavior benefits animal populations.

**WRITING TEAM:** Robin Swanson, Danni Hedman

**WCSD STUDENT DATA SYSTEM INFORMATION**

1. Is there a required final examination?                        X   Yes    No
2. Does this course issue a mark/grade for the report card?  
                                   X   Yes                             No
3. Does this course issue a Pass/Fail mark?                             Yes                        X   No
4. Is the course mark/grade part of the GPA calculation?  
                                   X   Yes                             No
5. Is the course eligible for Honor Roll calculation?                        X   Yes                             No
6. What is the academic weight of the course?  
                                        No weight/Non credit                             Standard weight  
                                   X   Enhanced weight (Describe) As per current school board policy