Advanced Placement Biology

Topic Outline
Instructor: Mrs. K. King

The following topic outline indicates the percentage of the course and exam devoted to each major subset of biology.

I.	Molecules and Cells	II.	Heredity and Evolution	III.	Organisms and Populations

I. Molecules and Cells (25%)

A. Chemistry of Life (7%)

1. Water
2. Organic molecules in organisms
3. Free energy changes
4. Enzymes

B. Cells (10%)

1. Prokaryotic and eukaryotic cells
2. Membranes
3. Subcellular organization
4. Cell cycle and its regulation

C. Cellular Energetics (8%)

1. Coupled reactions
2. Fermentation and cellular respiration
3. Photosynthesis

II. Heredity and Evolution (25%)

A. Heredity (8%)

1. Meiosis and gametogenesis
2. Eukaryotic chromosomes
3. Inheritance patterns

B. Molecular Genetics (9%)

1. RNA and DNA structure and function
2. Gene regulation
3. Mutation
4. Viral structure and replication
5. Nucleic acid technology and applications

C. Evolutionary Biology (8%)

1. Early evolution of life
2. Evidence for evolution
3. Mechanisms of evolution

III. Organisms and Populations (50%)

A. Diversity of Organisms (8%)

1. Evolutionary patterns
2. Survey of the diversity of life
3. Phylogenetic classification
4. Evolutionary relationships

B. Structure and Function of Plants and Animals (32%)

1. Reproduction, growth, and development
2. Structural, physiological, and behavioral adaptations
3. Response to the environment

C. Ecology (10%)

1. Population dynamics
2. Communities and ecosystems
3. Global issues

Advanced Placement Biology Course Outline & Syllabus

Eau Gallie High School
2004 - 2005
Instructor: Mrs. King

*Time frame is an approximation. Revisions may be made do to time fluctuations.

FIRST SEMESTER

Ch. 1- 5 (3 ½ weeks)
Introduction: Themes in the Study of Life
The Chemical Context of Life
Water and the Fitness of the Environment
Carbon and the Molecular Diversity of Life
The Structure and Function of Macromolecules
An Introduction to Metabolism
UNIT TEST #1: Ch. 1- 5.

Ch. 7 and 8 (2 weeks)
A Tour of the Cell
Membrane Structure and Function
Laboratory 1: Diffusion and Osmosis
UNIT TEST #2: Ch. 7-8 **AND** Laboratory 1.

Ch. 6, 9 and 10 (3½ weeks)
Cellular Respiration: Harvesting Chemical Energy
Photosynthesis
Laboratory 2: Enzymes
Laboratory 4: Plant Pigments and Photosynthesis
Laboratory 5: Cell Respiration
UNIT TEST #3: Ch. 6,9 and 10 **AND** Laboratories 2, 4 and 5

Ch. 11-15 (3½ weeks)
Cell Communication
The Reproduction of Cells
Meiosis and Sexual Life Cycles
Mendel and the Gene Idea
The Chromosomal Basis of Inheritance
Laboratory 3: Mitosis and Meiosis
UNIT TEST #4: Ch. 11-15 **AND** Laboratory 3

Ch. 16-21 (3 weeks)
The Molecular Basis of Inheritance
From Gene to Protein
Microbial Models: The Genetics of Viruses and Bacteria
Genome Organization and Expression in Eukaryotes
DNA Technology
The Genetic Basis of Development
Laboratory 6: Molecular Biology
UNIT TEST # 5 Ch. 16-21 **AND** Laboratory 6

MIDTERM EXAM CH 1- 21 AND ALL LABORATORY EXERCISES

SECOND SEMESTER

Ch. 22-28,31 (4 weeks)
- Descent with Modification: A Darwinian View of Life
- The Evolution of Populations
- The Origin of Species
- Tracing Phylogeny: Macroevolution, the Fossil Record, and Systematics
- Early Earth and the Origin of Life
- Prokaryotes and the Origins of Metabolic Diversity
- The Origins of Eukaryotic Diversity (545-554)
- Fungi (616-619, 629-631)

Laboratory 8: Population Genetics and Evolution
Laboratory 7: Genetics of Organisms
UNIT TEST #6 Ch. 22-28, 31, Laboratories 7 and 8

Ch. 29-30, 35-39 (4 weeks)
- Plant Diversity I: The Colonization of Land
- Plant Diversity II: The Evolution of the Seed Plant
- Plant Structure and Growth
- Transport in Plants
- Plant Nutrition
- Plant Reproduction and Development
- Control Systems in Plants

Laboratory 9: Transpiration
UNIT TEST #7: Ch. 29-30, 35-39, Laboratory 9

Ch. 32-34, 40-49 (4 weeks)
- Introduction to Animal Evolution
- Invertebrates
- Vertebrate Evolution and Diversity
- An Introduction to Animal Structure and Function
- Animal Nutrition
- Circulation and Gas Exchange
- The Body's Defenses
- Controlling the Internal Environment
- Chemical Signals in Animals
- Animal Reproduction
- Animal Development
- Nervous Systems
- Sensory and Motor Mechanisms

Laboratory 10: Physiology of the Circulatory System
UNIT TEST #8: Ch. 32-34, 40-49 and Laboratory 10

Ch. 50-55 (2 - 3 weeks)
- An Introduction to Ecology and the Biosphere
- Behavioral Biology
- Population Ecology
- Community Ecology
- Ecosystems
- Conservation Biology

Laboratory 11: Animal Behavior
Laboratory 12: Dissolved Oxygen and Primary Productivity

REVIEW

AP EXAMINATION Monday, May 9, 2005, Morning session.

FINAL EXAM/LAB: UNIT TEST #9: Ch. 50-55 and Laboratory 11 & 12 (Turn in lab manual for grade).

The Exam

The AP Biology Exam puts your knowledge and understanding of modern biology to the test -- and gives you the chance to earn college credit before you're done with high school.

About the Exam

The three hour test includes an 80-minute, 100 question multiple-choice section, a 10 minute reading period, and a 90-minute four question free-response section.

Section I: Multiple-Choice

The multiple-choice section covers a broad range of topics and types of questions. What should you expect? Everything from thought-provoking problems based on fundamental ideas to questions that ask you to recall the basic facts and major concepts of modern biology. The topic outline for AP Biology details the percentage of the course -- and the exam -- devoted to each major subset of biology.

Unlike other multiple-choice tests, random guessing can hurt your final score. While you don't lose anything for leaving a question blank, one quarter of a point is subtracted for each incorrect answer on the test. But if you have some knowledge of the question and can eliminate one or more answers, it's usually to your advantage to choose what you believe is the best answer from the remaining choices.

Section II: Free-Response

In the free-response section, you'll be asked to write persuasive and coherent essays for four broad questions. Your answers will demonstrate your reasoning and analytical skills, as well as your ability to synthesize material from several sources. Each of the four essays is given equal consideration when tallying your final score.

The free-response section usually includes one question on molecules and cells, one on genetics and evolution, and two on organisms and populations. But, since there is some overlap between these areas, some questions may cover more than one topic. Also, keep in mind that the questions may go beyond your book learning and require you to analyze and interpret data or information from your laboratory experience.

Remember to write all answers to the free-response questions in essay form. Outlines and unlabeled diagrams are not acceptable final answers.

Scoring the Exam

The multiple-choice section counts for 60 percent of your final score, and the free-response section counts for 40 percent.

While each AP Biology class generally covers the same types of information, there are differences from class to class. The test may include questions that you might not have covered in class. Don't worry -- you're not expected to know the answer to every single question to get a passing grade.

Sample Questions & Scoring Guidelines

The topic outline provides details about the content on the AP Biology Exam.

Multiple-Choice Questions

For sample multiple-choice questions, refer to the Course Description (.pdf/308K).

Free-Response Questions

2003 Free-Response Questions (.pdf/125K)
2003 Form B Free-Response Questions (.pdf/109K)
2002 Free-Response Questions (.pdf/130K)
2002 Form B Free-Response Questions (.pdf/153K)
2001 Free-Response Questions (.pdf/110K)

Scoring Guidelines

2003 Scoring Guidelines (.pdf/289K)

Lab Manual

Students are required to purchase the lab manual. You can order the AP Biology Lab Manual from the collegeboard.com store.

Labs are a crucial component of AP Biology. The AP Biology Lab Manual was revised in 1997, and again in 2001 to bring it into closer alignment with the conceptual approach of the current course and examination. The objectives of the 12 recommended laboratory exercises have been broadened to include some of the excellent variations on these lab exercises that are already being used in AP Biology courses.

Corrections to the 2001 Student Lab Manual

- **On page 15,** the label for the x-axis under Graph 1.3 should read "Sucrose Molarity within Beaker."

All other information concerning the course content and assignments can be found on

http://mrskingsbioweb.com

Student page → AP Biology