ALLEGANY COUNTY PUBLIC SCHOOLS
HIGH SCHOOL COURSE SYLLABUS
2012-2013

Course Title: 430 Honors Biology **Teacher:** Mrs. Stark **Planning Time:** 1:06-1:51

School Phone: 301-777-2570 **E-mail Address:** anne.stark**@acps.k12.md.us**

Course Description:

Honors Biology (9-10) is a Pre AP laboratory science course that satisfies the Maryland high school graduation requirement. The curriculum includes scientific process skills and content as specified in the Maryland Biology Core Learning Goals. This course provides an in-depth introduction to the structure and function of biological molecules, structure and function of cells and organisms, inheritance of traits, mechanisms of evolutionary change, and interdependence of organisms in the biosphere. Honors Biology requires laboratory investigations and synthesis of content knowledge demonstrated by an integration of reading and writing in research and laboratory reports. Honors Biology is a prerequisite for AP Biology (435) and highly recommended for students wishing to enroll in College Biology I (439). Students who enroll in Honors Biology in 9th or 10th grade are expected to enroll in College Biology or Advanced Placement science courses in Grades 11 and 12. All students must pass the Maryland Biology High School Assessment (HSA) or achieve a combined score of 1602 on the four HSA tests. This course is recommended for students who are considering continuing their education at a four year college or university especially in a biological science or health field.

Text/Materials of Instruction - Required:

- Textbook: Biology, Holt
- calculator (for addition, division, multiplication, and subtraction), pencil and pen, binder, looseleaf paper
- cover for textbook

Grading/Evaluation:

County Grading Scale– Marking Period

Percentage	Grade
100% – 90%	A
89% – 80%	B
79% – 70%	C
69% – 60%	D
59% – 50%	F

Teacher's Grading Structure – Marking Period

Assignment Categories	Percentage of Grade
Daily Work (incl. homework) *No more than 25%*	25%
Quizzes/Tests	45%
Projects/Papers	10%
Class Participation	N/A%
Lab Worksheets/Reports	20%
Other:	%
Other:	%

Additional Expectations:

1. Students are expected to be in assigned seats, prepared for class, on time.
2. Students are not to operate any classroom equipment or items not belonging to themselves unless instructed to do so.
3. Students will follow all school rules.
4. Profanity, abusive language, and derogatory comments will not be tolerated.
5. Students may turn in late work for each unit until the date of the unit test. All late will receive a deduction in points.
7. Cell phones must be turned off and put away during class.

Honors Biology – Course Overview

First Quarter

I. The Science of Life - Introduction
- A. Characteristics of Living Things
- B. Science Methods used in Life Science
- C. Importance of Data Verification
- D. The Tools of Biology
- E. Science and Ethics

II. Chemistry
- A. Atomic Structure
- B. Bonding (Ionic, Covalent, Hydrogen)
- C. Properties of Water
- D. Acids and Bases

III. Biochemistry
- A. Carbohydrates
- B. Lipids
- C. Proteins/Enzymes
- D. Nucleic Acids
- E. Minerals
- F. Vitamins
- G. Cells exist in a narrow range of conditions (Temperature, pH)

BIOLOGICAL MOLECULES BENCHMARK

END OF FIRST QUARTER

Second Quarter

IV. Cell Biology
- A. History (…including the Cell Theory)
- B. Cell Structure and Function
- C. Diversity (Specialization) of Cells
- D. Roles of Systems (Excretory, Circulatory, Skeletal/Muscular, Endocrine, Nervous/Sensory, Respiratory, Digestive, Reproductive, Lymphatic, Integumentary)
- E. Dissection – Lab Practical

V. Cell Transport
- A. Cell Membrane Structure
- B. Passive Transport (Diffusion, Osmosis)
- C. Active Transport (Endocytosis, Exocytosis)
- D. Maintaining Homeostasis

VI. Energy Transfer in Cells
- A. Photosynthesis
- B. Cellular Respiration

VII. Cell Reproduction
- A. Chromosomes (Karyotypes)
- B. The Cell Cycle
- C. Mitosis

CELLS AND ORGANISMS BENCHMARK

END OF FIRST SEMESTER

Third Quarter

VII. DNA and Protein Synthesis
- A. Structure of DNA, RNA, and Protein
- B. Replication, Transcription, and Translation
- C. Gene Mutation

VIII. Genetics
- A. History (including Mendel's Three Principles)
- B. Meiosis (link to Sexual Reproduction)
- C. Fertilization
- D. Analyzing Genetic Crosses
  1. Monohybrid
  2. Dihybrid
  3. Co/incomplete dominance
  4. Sex-linkage
- E. Human Genetics
  1. Pedigrees
  2. Analyzing Karyotypes
  3. Chromosomal Mutations

IX. Genetic Engineering
- A. Gel Electrophoresis
- B. Recombinant DNA
- C. Cloning
- D. Gene Splicing
- E. Benefits and Consequences of Genetic Engineering

INHERITANCE OF TRAITS BENCHMARK

END OF THIRD QUARTER

Fourth Quarter

X. Evolution
- A. History (including Darwin's Theory of Natural Selection)
- B. Artificial and Natural Selection
- C. Adaptation, Variation
- D. Cladistics
- E. Evolutionary Relationships (Anatomical Similarities/Embryological & Biochemical Comparisons – DNA & Amino Acid Sequences & Analyzing Results from Gel Electrophoresis

XI. Classification
- A. History of Taxonomy
- B. Linnaeus and Binomial Nomenclature
- C. Modern Classification (Three Domains and Six Kingdoms)
- D. Dichotomous Keys

XII. Ecology
- A. Abiotic/Biotic Factors
- B. Biotic Relationships (Predator-Prey, Parasite-Host, Mutualism, Commensalism, Competition)
- C. Transfer of energy (Producers, Consumers, Trophic Levels)
- D. Succession
- E. Biogeochemical Cycles (Water, Nitrogen, and Carbon) – Photosynthesis & Cellular Respiration (ATP)
- F. Factors Influencing Populations (Urbanization/Population Increase, Pollution, Natural Disasters, Disease, Food Depletion, Destruction of Habitat)

EVOLUTION AND INTERDEPENDENCE OF ORGANISM BENCHMARK

END OF SECOND SEMESTER