CURRICULUM GUIDE

NAME OF COURSE: BIOLOGY

COURSE NUMBER: SCI 501 **WRITTEN / REVISED:** SEPTEMBER, 2011

LEVEL OF COURSE: AP **NUMBER OF CREDITS:** SIX (6)

PREREQUISITES: TEACHER RECOMMENDATION **GRADE LEVEL OFFERED TO :**10-12

COURSE DESCRIPTION:

The Advanced Placement Biology course is designed to be the equivalent of a college introductory biology course taken by biology majors during their first year. This college level course follows the syllabus prescribed by the College Entrance Examination Board. Topics cover biological chemistry, cell structure and function, energy transformations, genetics, molecular genetics, evolution, ecology, physiology, microbiology, DNA technology, plants, animals and a survey of Whittaker's five kingdoms. Students enrolled in this course are prepared for and expected to take the AP examination. The course provides students with an opportunity to develop a conceptual framework for modern biology emphasizing applications of biological knowledge and critical thinking to environmental and social concerns.

Evolutionary themes are discussed within every unit. Evolution of the earth and organic molecules, events leading to the development of the theory of evolution, Systematics, classification, and the origin of different life forms are discussed throughout the course.

Every unit includes activities designed to integrate each topic into the eight major themes of the AP Biology Course Description.

The course meets 6 -42 minute periods a week. This includes a double lab period (90 minutes). Labs take up about 30% of instructional time.

COURSE OBJECTIVES:

When this course has been completed successfully, students should be able to develop a conceptual framework for modern biology emphasizing the integration of the general topics of biology through the eight major themes as specified in the Course Description (Science as Process; Evolution, Energy Transfer; Continuity and Change; Relationship of structure to function; Regulation; Interdependence in nature; and Science, Technology and Society).

1. Understand that science is a process which involves a discovery process using inductive reasoning or a process of hypothesis testing.(Science as a Process)
2. Explain that biological change of organisms that occur over time is driven by a process of natural selection and that Evolution accounts for the diversity of life on Earth. (Evolution)
3. Identify that all living organisms are active (living) because of their abilities to link energy reactions to the biochemical reactions that take place within their cells.(Energy Transfer)

4. Explain that all species tend to maintain themselves from generation to generation using the same genetic code. However, there are genetic mechanisms that lead to change over time or evolution. (Continuity and Change)
5. Describe and explain that the structural levels from molecules to organisms ensure successful functioning in all living organisms and living systems. (Relationship of structure and function)
6. Understand that everything from cells to organisms to ecosystems is in a state of dynamic balance that must be controlled by positive or negative feedback mechanisms. (Regulation)
7. Identify that living organisms rarely exist alone in nature. (Interdependence in nature)
8. Understand that scientific research often leads to technological advances that can have positive and/or negative impacts upon society as a whole. (Science, Technology and Society)

NJ CORE CURRICULUM CONTENT STANDARDS ADDRESSED:

5.1 - Science Practices

5.2 – Physical Science (A, B)

5.3 - Life Science

5.4 – Earth Systems Science (G)

SPECIFIC BEHAVIORAL OBJECTIVES/PROFICIENCIES AND TIME LINES:

Unit 1: Chemistry of Life Time: 15 days

Goal: Students will obtain a thorough understanding of the chemistry of life.

Objectives:

1. To develop a working understanding of the structure and behavior of atoms by creating models of specific atoms showing their valence level. Science as a Process

2. To analyze the types of chemical bonds, and be able to recognize the properties of these specific bonds in holding the various chemical compounds together.

3. To relate the extraordinary properties of water and their relationship to living organisms by deciding how to support their decisions on why organisms benefit from these properties in the environment. Science as a Process, (Evolution) (Interdependence in nature)

4. Develop a working understanding of the variety of compounds that can be developed from the element carbon, by creating a variety of compounds and their isomers in model form. Science as a Process

5. Design a classification pattern of carbon compounds based on their functional groups. Science as a Process

6. Outline the four major classes of biological macromolecules, analyze the roles of each in a living organism, and derive an understanding of their chemical make up by comparing and contrasting their sub-compound make up. Science as a Process,(Energy Transfer)

7. Demonstrate how the concentration and activity of carbohydrates, lipids, proteins and nucleic acids are regulated by hormones in a negative or positive feedback mechanism. (Regulation)

8. Determining the evolutionary significance of conserved domains in polypeptides among various organisms by using bioinfomatics. (Evolution) (Relationship of structure and function)(Science, Technology and Society)

9. Students will discuss the properties of matter in relation to its use in nuclear energy generation. (Energy Transfer), (Science, Technology and Society)

Audio-visuals:

1. Computer generated animations (Mona Group-MGEAR, textbook Internet websites)

Assignments:

1. Chapter outlines (Textbook chapters 2, 3, 4, 5)
2. Textbook self-quizzes (Textbook chapters 2, 3, 4, 5)
3. Textbook study guide review (Textbook study guide chapters 2, 3, 4, 5)

Recommended Lab Experiences Science as a Process

1. Protein Modeling Lab (using Toobers) and Bioinformatics (NCBI database)-(2 period lab -90 min.) wet lab(Evolution) (Science, Technology and Society)

Students will use a foam Toober to construct a polypeptide based on a given amino acid sequence. Students will be provided with the properties of amino acids and folding rules. The students will search the NCBI database for the polypeptide using BLASTN, BLASTP and determine if the folding pattern matches their polypeptide model. Students will then determine if the sequence represents any conserved domains, describe the properties of these domains and the evolutionary relationships between organisms which contain similar polypeptides.

2. Constructing 3-D representation of biological molecules using molecular model sets.-(1 period -42 min.) wet lab

Students will use molecular model sets to construct models of functional groups, glucose, sucrose, lipid, and amino acid (alanine).

3. Mc Mush Lab-Biological molecule identification lab-(2 period lab -90 min.) wet lab

Students will identify the macromolecules found in a Fast Food Kids Meal (Hamburger, French fries, and milk). They will use iodine, Benedicts and Biuret solution. Students will also determine the percentage of fat in the meal. Students will also discuss how digestion of these compounds is regulated by hormones in the human body.(Regulation)

Evaluation:

1. Homework(s)-consists of the assignments listed above
2. Lab notebook/lab report
4. Unit test-chapters 2, 3, 4, 5

Unit 2: The Cell **Time: 40 days**

Goal: The student will describe and explain the metabolic processes which occur in the cell as well as the structure and function of organelles.

Objectives:

1. Relate the relationship of current cell knowledge to the methods of microscope development. Science as a Process(Science, Technology and Society)

2. Criticize the development of the cell theory. Science as a Process(Science, Technology and Society)

3. Compare and contrast the prokaryotic and eukaryotic cells. Science as a Process,(Evolution) (Interdependence in nature)

4. Relate the form and function of the nucleus to its component and the cell in general. (Relationship of structure and function)

5. Compare and contrast plant and animal cellular organelles. Discuss the process of endosymbiosis and it's evolutionary significance Science as a Process,(Evolution) (Interdependence in nature)

6. Evaluate the reasons why the chloroplasts and mitochondria are the only cellular organelles able to transform matter into energy Science as a Process,(Evolution),(Energy Transfer)

7. Analyze the form and function of the cellular cytoskeleton Science as a Process,(Evolution) (Relationship of structure and function)

8. Evaluate the form and function of the various intercellular junctions used by plant and animal cells to form functional tissue. (Relationship of structure and function)

9. Describe the form of the plasma membrane and relate it to its semi permeability. . (Relationship of structure and function)

10. Compare and contrast hypo osmotic, hyperosomtic, and isosmotic solutions. Science as a Process

11. Develop a working knowledge of the cause and effect of active and passive transport in a cell. Science as a Process

12. Distinguish between prokaryotic and eukaryotic cellular reproduction.

13. Analyze the form and function of a eukaryotic chromosome. (Relationship of structure and function)

14. Rearrange the complete cell cycle of an animal cell from a series of disorganized pictures and descriptions. Science as a Process

15. Criticize the first and second laws of thermodynamics, by explaining how organisms carry out endergonic reactions. Science as a Process,(Energy Transfer)

16. Analyze the form and function of ATP. Science as a Process,(Energy Transfer) (Relationship of structure and function)

17. Recognize the structure of enzymes. Be able to evaluate their function as related to pH, temperature, and substrate availability Science as a Process,(Energy Transfer) (Relationship of structure and function) (Regulation)

18. Clarify the importance of coenzymes to their relationship to enzyme reactions.(Energy Transfer) (Relationship of structure and function) (Regulation)

19. Rearrange the process of glycolysis into its original form from a series of altered steps. Science as a Process,(Evolution),(Energy Transfer)

20. Integrate the Krebs Cycle and the ETS to glycolysis and explain the net result of aerobic respiration. Identify the evolutionary significance of organisms which conduct glycolysis. Science as a Process,(Energy Transfer)

21. Compare and contrast the process of fermentation in animals and Science as a Process,(Energy Transfer)

22. Relate how the light spectrum and the photosynthetic pigments combine in order for the plant to carry on photosynthesis. Science as a Process,(Energy Transfer)

23. Compare and contrast the light reaction and the Calvin cycle in C3, C4, and CAM plants. Discuss the evolutionary significance of plant adaptation to the environment. Discuss the regulation of energy containing molecules in C3, C4, and CAM plants Science as a Process,(Evolution),(Energy Transfer) (Regulation)

Audiovisual:

1. United Streaming video-enzymatic reactions
2. The Mona Group-Mgear CD

Assignments:

1. Chapter Outline-(Textbook chapters 6, 7, 8, 9, 10, 11, 12)
2. Self-quizzes-(Textbook chapters 6, 7, 8, 9, 10, 11, 12)
3. Textbook study guide review (chapters 6, 7, 8, 9, 10, 11, 12)
4. Cell Cycle Review- http://nobelprize.org/educational_games/medicine/2001/cellcycle.html

Recommended Lab Experiences:

1. AP Lab 1, Diffusion/Osmosis lab- 3 periods (2 period lab + 1-42 min. period) wet lab
2. AP Lab 2, Enzyme Catalysis-(2 period lab + 1-42 min. period) wet lab)Regulation)
3. AP Lab 5, Cellular Respiration (2 period lab -90 min.) wet lab) (Regulation)
4. AP Lab 4, Plant Pigments and Photosynthesis (2 period lab + 1-42 min. period) wet lab

Evaluation:

1. Homework(s)-consists of the assignments listed above
2. Lab notebook/lab report
4. 2 unit tests- chapters 6,7,8 and Chapters 9, 10,11, 12

Unit 3: The Gene Time: 40 days

Goal: The student will recognize the relationship between the genetic code and diversity of life.

Objectives:

1. Analyze the development of the scientific research involved in the search for DNA. Science

as a Process (Science, Technology and Society)

2. Analyze and synthesize the process of DNA replication Science as a Process

3. Evaluate the development and implications of Beadle and Tatum's hypothesis "One Gene one Protein. Science as a Process,(Continuity and Change)

4. Analyze and synthesize the processes of transcription and RNA formation Science as a Process

5. Derive a working knowledge of translation (protein synthesis) and be able to construct a viable protein from a given DNA code. Science as a Process

6. Classify the cause and value of genetic mutations and their effect on proteins. Discuss the evolutionary significance of mutations Science as a Process,(Evolution) ,(Continuity and Change), (Relationship of structure and function)

7. Describe the process of meiosis and it's relationship to oogenesis and spermatogenesis. (Regulation)

7. Recognize the form and function of bacteria and viruses. (Relationship of structure and function)

8. Develop a working knowledge of viral reproduction. Be able to distinguish between the lytic and lysogenic cycles of a virus Science as a Process(Interdependence in nature)

9. Define and discuss the methods involved in the transfer and recombination of bacterial genes. Describe the evolutionary significance of conjugation, transformation and recombination in bacteria. (Evolution) (Interdependence in nature)

10. Analyze and discuss the processes of regulation and gene expression in prokaryotic and eukaryotic cells. Science as a Process,(Evolution) (Regulation)

11. Evaluate the form and function of a eukaryotic chromosome. (Relationship of structure and function)

12. Develop a working knowledge of Mendel's Law of Independent Assortment. (Interdependence in nature)

13. Develop a working knowledge of Mendel's Law of Segregation.

14. Analyze the laws of independent assortment and segregation using the rules of probability. ((Science, Technology and Society)

15. Differentiate among the following: multiple alleles, pleiotrophy, epistasis and polygenetic inheritance. Be able to recognize the type of inheritance exhibited from assorted genetic problems. Describe how inheritance patterns can alter a population and lead to evolutionary change. Science as a Process,(Evolution),(Continuity and Change) (Interdependence in nature)

16. Analyze the cause and effects of human genetic problems by constructing and interpreting a karyotype. (Science, Technology and Society)

Audio-visuals:

1. Human Genome (50:09)-United Streaming

2. Biologix: Manipulating DNA (29:07)-United Streaming

3. Biologix: Introduction to Classical Genetics and Monohybrid Crosses (29:06)-United Streaming

4. Biologix: The Hardy-Weinberg Principle (29:07)-United Streaming

Assignments:

1. Chapter outline (textbook chapters 13, 14, 15, 16, 17, 18, 19, 27)
2. Textbook self-quizzes (textbook chapters 13, 14, 15, 16, 17, 18, 19, 27)
3. Textbook study guide review (chapters 13, 14, 15, 16, 17, 18, 19, 27)

Recommended Lab Experiences:

1. AP Lab 7: Genetics of Organisms (2 period lab + 1-42 min. period) wet lab(Evolution)
2. AP Lab 6: Molecular Biology-electrophoresis and transformation (2 period lab + 1-42 min. period) wet lab
3. Form and function of Bacteria (2 period lab (90 min.) wet lab(Evolution)
4. Students will use prepared slides and the compound microscope to identify coccus, bacillus, and spirillum bacteria. Students will also look at slides of bacterial organisms which cause disease (Bacterial meningitis, Tetanus, Diptheria, Bacterial Pnuemonia, Strep throat, food poisoning (E. coli).

Evaluation:

1. Homework(s)-consists of the assignments listed above
2. Lab notebook/lab report
3. Unit tests-chapters 13, 14, 15 ; chapters 16, 17; chapters 18, 19, 27

Unit #5: Plants Form and Function Time: 20 days

Goal: The student will recognize the relationship between plant form and function.

Objectives:

1. Discuss the general characteristics of the plant kingdom.

2. Evaluate the differences that separate the nonvascular plants from the vascular plants. Discuss how these characteristics have led to evolutionary success of vascular plants. Science as a Process(Evolution) (Relationship of structure and function)

3. Justify the reasons for dividing the vascular plants into their selected Divisions. Science as a Process

4. Compare and contrast the angiosperms and gymnosperm and discuss their evolutionary significance. Science as a Process,(Evolution)

5. Compare and contrast the major Divisions of Fungi and discuss their evolutionary significance. Science as a Process,(Evolution)

6. Analyze the major tissues of the seed plants and develop a working knowledge of their relationship to each other and their evolutionary success. Science as a Process,(Evolution)

7. Predict the out come of plant growth based on the data given from experiments using plant hormones. Science as a Process,(Regulation)

8. Evaluate the processes of water and food movement in plants. Science as a Process,(Regulation)

9. Evaluate the progress of plant responses based on the type of tropism being exhibited.

Science as a Process,(Regulation)

10. Compare and contrast photoperiodism and Circadian rhythms. Science as a Process

11. Discuss the pros and cons for the use of genetically modified organisms in agriculture. (Science, Technology and Society)

12. Identify and evaluate the use of biotechnology in agriculture and medicine. (Science, Technology and Society)

Audiovisuals:

1. Fast Plant Instructional video

2. Biologix: Asexual Reproduction and Alternation of Generations (29:07)

Assignments:

1. Outlines (textbook chapters 29, 30, 31, 35, 36 37, 38, 39)

2. Textbook self-quizzes (textbook chapters 29, 30, 31, 35, 36 37, 38, 39)

3. Chapter study guide review questions (chapters 29, 30, 31, 35, 36 37, 38, 39)

4. In-class case study analysis and discussion about the use of genetically modified organisms.

Recommended Lab Experiences:

1. AP Lab 9, Transpiration, (2 period lab-90 min.) wet lab (Regulation)
2. Fast Plant Lab (2 period lab -90 min. + 5 minute observations everyday for 3 weeks) wet lab (Regulation)

   Students will plant Wisconsin Fast Plants and observe their growth/tropism; effect of acid precipitation and salt; response to plant hormones.

Evaluation:

1. Homework(s)-consists of the assignments listed above

2. Lab notebook/Report

3. 2 Unit tests (chapters 29, 30, 31, 38) and (chapters 35, 36, 37)

Unit 6: Evolutionary History and Biological Diversity Time: 10 days

Goal: The students will recognize the relationship between the evolutionary history and biological diversity of life on earth.

Objectives:

1. Examine the historical background behind Darwin's theory; voyage of the *Beagle.* (Science, Technology and Society)

2. Provide evidence of evolution. Science as a Process,(Evolution),(Continuity and Change)

3. Examine population genetics, Hardy-Weinberg law of genetic equilibrium and solve population problems. Science as a Process,(Evolution),(Continuity and Change)

4. Examine natural selection, microevolution, and types of selection and preservation of

variation. (Evolution),(Continuity and Change) (Relationship of structure and function) (Interdependence in nature)

5. Formulate a discussion based on the analysis of the history and modern developments in the science of Taxonomy. (Evolution),(Continuity and Change)

Audio-visuals:

1. The Day the Universe Changed: Darwin's revolution
2. Elements of Biology: Evolution

Assignments:

1. Chapter outline (textbook chapters 22, 23, 24, 25)
2. Textbook self quizzes (textbook chapters 22, 23, 24, 25)
3. Textbook study guide review (chapters 22, 23, 24, 25)
4. In-class a discussion based on the analysis of the history and modern developments in the science of Taxonomy.

Recommended Lab Experiences:

1. AP Lab 8: Population Genetics and Evolution. (2 period lab + 1-42 min. period) wet lab(Evolution) (Continuity and Change)

Evaluation:

1. Homework(s)-consists of the assignments listed above
2. Lab notebook/Report
3. Unit Test (chapters 22, 23, 24, 25)

Unit #7: Animals Form and Function Time: 25 days

Goal: Students will recognize the relationship between animal form and function.

Objectives:

1. Analyze the phylogeny of the animal kingdom and their evolutionary relationships. Science as a Process,(Evolution),(Continuity and Change)

2. Evaluate the characteristics of the animal phyla from Porifera to Arthropoda and describe their evolutionary relationship. Science as a Process,(Evolution)

3. Derive an understanding of the characteristics of the phylum Chordata and its evolutionary relationship to other organisms.,(Evolution)

4. Compare and contrast the characteristics of the seven classes of vertebrates and its evolutionary relationship to other organisms.,(Evolution)

5. Analyze the form and function of animal tissue. Science as Process, Relationship of structure and function)

6. Analyze the form and function of the organs of the mammalian digestive system. Identify how the system is regulated. Science as Process,(Energy Transfer) (Relationship of structure and function) (Regulation)

7. Develop a working knowledge of the human circulatory system and its regulation.. Science as Process,(Energy Transfer) (Relationship of structure and function) (Regulation)

8. Evaluate the form and function of the human respiratory system and its regulation. Science as Process,(Energy Transfer) (Relationship of structure and function) (Regulation)

9. Differentiate between the non-specific and specific defense mechanisms of the human immune system. Describe how the immune system is regulated. Science as a Process Relationship of structure and function) (Regulation)

10. Develop a working knowledge of the human kidney and its regulation. Science as a Process Relationship of structure and function) (Regulation)

11. Develop a working knowledge of the human endocrine system, its affect in the body and its regulation. Science as a Process (Relationship of structure and function) (Regulation)

12. Analyze the form and function of the human reproductive system and its regulation. Science as a Process, (Energy Transfer) (Regulation)

13. Develop a working knowledge of vertebrate embryonic development and the hormones involved in regulating development. Science as a Process,(Energy Transfer) (Relationship of structure and function) (Regulation)

14. Students will discuss the use of stems cells in research. (Science, Technology and Society)

15. Analyze the phyla of Protista: compare and contrast the protozoa and algae. Science as a Process

16. Compare and contrast the digestive, circulatory, respiratory, and nervous system of various organisms with respect to evolution and adaptation to the environment. Science as a Process, (Evolution) ,(Energy Transfer) (Relationship of structure and function) (Interdependence in nature)

Audio-visual:

1. Biologix: Hormonal Controls and Conception (29:08)-United Streaming
2. Biologix: Embryonic Development and Differentiation (29:07)-United Streaming
3. Sense For Technology, A (54:00)-United Streaming
4. Body Story: The Flu (24:40)-United Streaming
5. Biologix: The Central Nervous System and Brain (29:07)-United Streaming
6. Biologix: Fetal Development and Birth (29:08)-United Streaming

Assignments:

1. Textbook outlines-(chapters 40, 42, 43, 44, 45, 46, 47, 48, 49)
2. Textbook self-quizzes-(chapters 40, 42, 43, 44, 45, 46, 47, 48, 49)
3. Textbook study guide review -(chapters 40, 42, 43, 44, 45, 46, 47, 48, 49)
4. In-class discussion about stem cell research.

Recommended Lab Experiences:

1. Histology Lab (4 periods, 180 mins.) wet lab(Relationship of structure and function)

Students will study the characteristics of human and plant tissues using the microscope. The tissue studied include: epithelial, connective, nervous, muscle, monocot and dicot stems and roots,

2. A P Lab 10, Physiology (2 period lab + 1-42 min. period) wet lab. (Energy Transfer) (Regulation)

3. Fetal Pig dissection (4 periods, 180 mins.) wet lab(Relationship of structure and function)

Students will dissect the fetal pig. They will focus on all external and internal structures. Students who do not wish to dissect will have the option of performing a virtual fetal pig dissection.

4. Eye and Brain dissection (2 period lab-90 min.) wet lab(Relationship of structure and function)

Students will dissect a cow eye and sheep brain. The students who do not wish to dissect will perform a virtual dissection online.
www.exploratorium.org/learning_studio/cow_**eye**/index.html and
www.exploratorium.edu/memory/**braindissection**/

5. Comparison of Protozoa and Algae, (2 period lab-90 min.) wet lab(Relationship of structure and function)

Student will use live culture/prepared slides and the compound microscope. Student will identify structure, function, and describe the organism's habitat.

Evaluation:

1. Homework(s)-consists of the assignments listed above
2. Lab notebook/Report
3. Quizzes/Tests

Unit #8: Ecology Time: 15 days

Goal: Students will recognize the factors which influence and determine the nature of the environment.

Objectives:

1. Define Ecology and demonstrate the relationships between the biotic and abiotic factors. (Interdependence in nature)

2. Compare the terrestrial biomes by discussing their characteristics and their relationships to each other. Science as a Process (Interdependence in nature)

3. Evaluate the various aquatic biomes as to their dependence on light, pH, temperature, and community structure. Science as a Process,(Energy Transfer) (Interdependence in nature)

4. Develop an understanding of population dynamics. Determine the factors that regulate population growth, and be able to describe the phase of growth a given population is in. Science as a Process(Evolution) ,(Energy Transfer),(Continuity and Change) (Interdependence in nature)

5. Analyze the process of biological succession. (Regulation) (Interdependence in nature))

6. Define the hierarchy of an ecosystem as related to its biotic organization and abiotic factors. (Interdependence in nature)

7. Analyze the relationships of the nutrient cycles in relation to living organisms in an ecosystem. Science as a Process,(Energy Transfer) (Regulation) (Interdependence in

nature)

8. Apply the forms of animal behavior to various situations. Science as a Process(Interdependence in nature)

9. Students will identify the factors which influence human population growth and discuss how population growth affects ecosystems as well as the biosphere as a whole. (Science, Technology and Society)

Audio-visuals:

1. Biologix: Patterns of Population Growth and Management (29:00)-United Streaming
2. Elements of Biology: Matter and Energy: Organization in Living Systems (56:00)-United Streaming
3. Elements of Biology: Ecosystems: Organisms and Their Environment (56:00)-United Streaming
4. Elements of Biology: Biomes: The Adaptations of Organisms (56:00)-United Streaming
5. Tempest from the Deep (52:40)-United Streaming

Assignments:

1. Textbook outlines (textbook chapters 50-55)
2. Textbook self quizzes (textbook chapters 50-55)
3. Chapter study guide Review Questions (chapters 50-55)
4. In-class discussion based on a case study about human population growth.

Recommended Lab Experiences:

1. A P Lab 11, Behavior Habitat Selection (2 period lab-90 min.) wet lab

2. A P Lab 12, Dissolved Oxygen and Aquatic Primary Production. (2 period lab + 1-42 min. period) wet lab.(Energy Transfer)

Evaluation:

1. Homework(s)-consists of the assignments listed above
2. Lab notebook/Report
3. Unit test (chapter 50-55)

MATERIALS / RESOURCES:

1. Biology by Campbell and Reece, 7th edition, 2004
2. Preparing for the Biology AP Exam with Campbell and Reece, 2004
3. AP Lab Manual for Students, 2001
4. Study Guide by Martha Taylor, 5th edition, 1999
5. Multiple Choice Questions in Preparation for the AP Biology Examination by Barbara Berthelsen, 4th edition, 2001

In addition to the textbook, lab manual, and review books, articles from science sections of the New York Times, Science (journal) and Nature (journal) are used. The use of these

resources helps to connect the content of the course to current social issues associated with biology.

Students are provided with past AP Biology exams and review materials which are distributed after the 2nd marking period. These review materials are addressed at after school review sessions.

To help student become organized and keep up with the fast pace of this course, the following are provided:

- Course Schedule (online and hard copy)
- Monthly Calendars of activities, labs, and assignments.
- Reading and lecture guidelines
- Online group site (through yahoo groups) in which student can post questions to the whole class. This encourages interaction between peers and many students benefit from the questions asked by fellow students. In addition, I will post questions for discussion online which reinforces the connections between the eight themes and the current topics.
- Website with review games and lecture notes (using PowerPoint)

There is also a Science Research Club at the high school which focuses primarily on research in Molecular Biology conducted in coordination with Rutgers University, Waksman Student Scholar Program. Students have the opportunity to conduct primary research and two students in the past year have become published in the National Centers for Biotechnology Information (NCBI) database.

Since this is a very specific area of biology, the students will be provided with the opportunity to conduct their own research project in this club. Students conducting their own research develop their ideas and test them if the materials are available through the high school, community college, or Rutgers University.

A. STUDENT PROGRESS:

The evaluation of student progress will be made on the following criteria:

1. Unit Test/Quizzes	35-45%
2. Laboratory Reports/Notebook	30-40%
3. Homework	10%
4. Independent Work	10%

B. EVALUATION OF TEACHER EFFECTIVENESS

Evaluation of the teacher will be through several mechanisms. They will include:

1. Teacher self evaluation, utilizing video tape, audio tape, or peer evaluation.
2. Evaluation by students utilizing either a teacher constructed or standardized evaluation form.
3. Each unit may be evaluated by the students in a brief written format.

C. PERIODIC EVALUATION OF OBJECTIVES AND GUIDE:

1. Next evaluation due June 2012

D. SPECIAL COURSE POLICIES

As explained in the initial meeting of class.

E. DATE MID-TERM / FINAL REVISED

1. Mid-term – January 2011
2. Final – June 2011

The curriculum and instruction are aligned to the State's Core Curriculum Content Standards and address the elimination of discrimination by narrowing the achievement gap, by providing equity in educational programs and by providing opportunities for students to interact positively with others regardless of race, creed, color, national origin, ancestry, age, marital status, affectionate or sexual orientation, gender, religion, disability or socioeconomic status.