AP BIOLOGY II TENTATIVE SYLLABUS

Mrs. Swogger

2011-2012

*This syllabus is set as a tentative schedule which I hope to closely follow for the course in the 2011-2012 school year. This will provide you with an understanding of the pace and depth of information that you will cover. This course is a college level course and requires a high level of maturity, discipline, and devotion. You must develop successful time management skills in order to be successful. These skills will be of great value to you not only in this course, but in all college courses. I wish you a successful school year.

AP BIOLOGY COURSE SYLLABUS
2011 – 2012

I. MOLECULES AND CELLS	CHAPTERS / TOPICS	READINGS	TESTS	LABS	COMPLETION DATE
A. Chemistry of Life	1- Themes in Life All major themes related to AP Biology will be introduced in this chapter. Those themes include: • Science as a Process • Evolution • Energy Transfer • Continuity and Change • Relationship of Structure and Function • Regulation • Interdependence in Nature • Science, Technology, and Society 2 – Chemical context • Chemical Elements and Compounds • Atoms and Molecules 3 – Water • Effects of Water's Polarity • Dissociation of Water Molecules 4 – Carbon • Importance of Carbon • Functional Groups	pp. 1 - 19 pp. 22 – 34 pp. 37 – 46 pp. 48 – 55	1 (Chapters 1-4)		Friday 9 / 9 / 11 (Introduction to Course and then Content)

	5 – Macromolecules • Organic molecules in Organisms • Carbohydrates, Lipids, Proteins, Nucleic Acids 6 – Metabolism • Metabolism, Energy, and Life • Free energy changes • Enzymes	pp. 58 – 79 pp. 83 – 97	1 (Chapters 5 & 6)	#2 Enzyme Catalysis	Monday 10 / 03 / 11
B. Cells	7 – Tour of Cell • Microscopes • Prokaryotic and Eukaryotic • Organelles • Cell Surface Junctions 8 – Membrane Structure and Function • Traffic Across Membrane 12 – Cell Cycle • Mitosis • Regulation of Cell Cycle	pp. 102 – 127 pp. 130 – 144 pp. 206 – 221	2 (Chapters 7&8, and Chapter 12)	#1 Diffusion and Osmosis #3a Mitosis	Thursday 10 / 20 / 11
C. Cellular Energetics	9 – Cellular Respiration • Coupled Reactions • Glycolysis, Kreb's Cycle, ETC • Fermentation 10 – Photosynthesis • Pathways • Focus on Energy Transfer and Interdependence in Nature 11 – Cell Communication	pp. 147 – 166 pp. 168 – 185 pp. 188 - 203	1 (Chapters 9 & 10)	#5 Cell Respiration #4 Photosynthesis	Friday 11 / 11/ 11

	• Signal Reception and Signal-Transduction Pathways		* Quiz on Chapter 11		
TOTALS	**12**	**198**	**5**	**5**	**11 November 2011**

Approximately
10 Weeks Spent on Unit I Content
_____ = 27.5 % of time spent in AP Biology is devoted to Unit I material.
36.4 Weeks in School Year

II. HEREDITY AND EVOLUTION	CHAPTERS	READINGS	TESTS	LABS	COMPLETION DATE
A. Heredity	13 – Meiosis and Gametogenesis • Heredity • Sexual Life Cycles • Origins of Genetic Variation • Inheritance Patterns 14 – Mendelian Genetics • Eukaryotic chromosomes and genes 15 – Inheritance • Relating Mendelism to Chromosomes • Sex Chromosomes • Errors and Exceptions in	pp. 226 – 237 pp. 239 – 258 pp. 261 – 276	1 (Chapters 13, 14, 15) Genetically – inherited conditions (research paper)	#3b Meiosis (fungal spores and crossover)	Friday 12 / 02 / 11

	Chromosomal Inheritance				
B. Molecular Genetics	16 – DNA / RNA • Structure and Function 17 – Genes to Proteins • Steps of Protein Synthesis 18 – Bacterial / Viral genetics	pp. 278 – 291 pp. 294 – 316 pp. 319 – 341	1 (Chapters 16, 17, 18)	#7 Genetics of Organisms (*Drosophila*) #6 Molecular Biology (transformation)	Thursday 01 / 05 / 12
	19 – Control of Eukaryotic Genomes • Control of Gene Expression • Molecular biology of Cancer 20 – DNA technology • Cloning • Stem Cell Research 21 – Development and genetics • From a single-cell to multicellular organism • Differential Gene Expression • Mechanisms of Pattern Formation.	pp. 344 – 361 pp. 364 – 385 pp. 388 – 406	* Quiz on 19, 20, 21	• Students research Stem cell research and attend a Genetic Conference presented by Dr. Sam Rhine	Thursday 01 / 12/ 12
C. Evolutionary Biology	22 – Evolutionary theory 23 – Evolution of Population • Population Genetics	pp. 414 – 426 pp. 428 – 442	2 (Chapters 22 & 23 and Chapters 24 & 25)	# 8 Population Genetics and Evolution (Hardy-Weinberg)	Friday 02 / 10 / 12

	• Causes of Microevolution • Mechanism of Adaptive Radiation 24 – Natural selection • Modes of Speciation 25 – Phylogeny • Fossil Record and Geological Time	pp. 445 – 462 pp. 464 – 485			
TOTALS	13	235	4	4	10 February 2012

Approximately
10.5 days spent on Unit II
_____ = 28.8 % of time spent in AP Biology is devoted to Unit II material. (29%)
36.4 Weeks in School Year

III. ORGANISMS AND POPULATIONS	CHAPTERS / TOPICS	READINGS	TESTS	LABS / REARCH	COMPLETION DATE
A. Diversity of Organisms	*(Winter Requirements)* 26 – Early earth and the Origin of Life* 27 – Prokaryotic diversity* 28 – Eukaryotic diversity* • Phylogeny and Diversity	pp. 490 – 500 pp. 502 – 517 pp. 520 – 543	No Exam will be given on Chapters 26-34, however students will be responsible for completing assessment questions to test their level of comprehension.	Protozoan identification *(if time permits)*	Friday 2 / 17 / 12 (independent work)
	29 – Plant Diversity* • Early Plants • Colonization of Land • Phylogeny and Diversity	pp. 546 – 559		Comparison of plant types Molds and mushrooms *(if time permits)*	Friday 2 / 17 / 12 (independent work)

	30 – Evolution of Seed plants* • Gymnosperms • Angiosperms • Phylogeny and Diversity 31 – Fungi* • Diversity • Phylogenetic Relationships	pp. 561 – 572 pp. 574 – 587			
	32 – Animal evolution • Phylogeny and Diversity 33 – Invertebrates* 34 – Vertebrates* Diversity and Evolution	pp. 589 – 596 pp. 599 – 626 pp. 630 – 665		Video: Evolution of whales	Friday 2 / 17 / 12 (independent work)
B. Structure and Function of Plants	*(Summer Requirements)* 35 – Structure / Growth* 36 – Transport*	pp. 670 – 692 pp. 695 – 711	1 (Chapters 35-39)	#9 Transpiration	Friday 09/02/11 • Students complete outlines of the entire unit before the start of school.
	37 – Nutrition* 38 – Reproduction and Development* 39 – Control systems* • Daily and Seasonal Controls and Adaptations • Responses to the Environment	pp. 714 – 726 pp. 730 – 748 pp. 751 – 773			Friday 09/02/11 • Students complete outlines of the entire unit before the start of school.

III. ORGANISMS AND POPULATIONS	CHAPTERS / TOPICS	READINGS	TESTS	LABS	COMPLETION DATE
Structure and Function of Animals	40 – Animal Structure and Function • Levels of Organization • Bioenergetics • Structural, Physiological, and Behavioral Adaptations 41 – Digestive System and Animal Nutrition 42 – Circulatory / Respiratory Systems • Response to Environment 43 – Immune System 44 – Controlling the internal Environment • Regulation of Body Temperature • Excretory 45 – Chemical Signals • Endocrine 46 – Animal Reproductive 47 – Animal Developmental 48 – Nervous System 49 – Sensory / Motor	pp. 778 – 790 pp. 792 – 808 pp. 811 – 837 pp. 840 – 861 pp. 865 – 890 pp. 893 – 910 pp. 913 – 933 pp. 936 – 957 pp. 960 – 989 pp. 992 – 1020	5 (Chapters 40 & 41, Chapter 42 & 43, Chapter 44 & 45, Chapters 46 $ 47, Chapters 48 & 49)	#10 Physiology of the Circulatory System (*Daphnia*) #11 Animal Behavior (pill bug)	Friday 4 / 13 / 12
C. Ecology	50 – Biomes / Biosphere 51 – Behavior 52 – Population ecology 53 – Community	pp. 1026 – 1050 pp. 1053 – 1079 pp. 1082 – 1104 pp. 1107 – 1128	2 (Chapters 50, 51, and 52 / Chapters 53, 54, and 55)	#12 Dissolved Oxygen and Aquatic Primary Productivity	Friday 05 / 04 / 12

	ecology 54 – Ecosystems 55 – Conservation Biology • Global Issues	pp. 1131 – 1151 pp. 1154 – 1172			
TOTALS	30	620	8	4	04 May 2012

* Topics not to be covered in great detail during class time

DISSECTION OF FETAL PIGS AND DOGFISH SHARKS WILL FOLLOW THE ECOLOGY UNIT. THE DISSECTIONS WILL FOCUS ON ANIMAL FORM AND FUNCTION. DISSECTION AND ADDITIONAL LABS WILL CONTINUE UNTIL JUNE 2012.

APPROXIMATELY

16 Weeks Spent on Unit III during class time + 3 additional weeks on summer requirement work

_____ = 45 % of class time in AP Biology is devoted to Unit III material. With summer work, students will spend well over 50% of their time studying Unit III Material.

36.4 Weeks in School Year

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Prerequisites:
- An 80% B average or better in both Biology I and Chemistry I
- Successful completion of the summer requirements
- Recommendations by the Biology I and Chemistry I instructors

Overview:
AP Biology includes topics which are regularly covered in an introductory biology course; however, the AP course differs significantly from the usual first high school course in biology with respect to the type of textbook used, the range and depth of topics covered, the kind of laboratory work done by the students, and the time and effort required by the students.

Major Themes of AP Biology:

Science as a Process – life is an ongoing series of scientific discoveries.

Evolution – a unifying biological theme which accounts for the diversity of life on Earth.

Energy Transfer – energy is the capacity to do work.

Continuity and Change – life continues as a function of cell division and DNA replication. Change occurs as a result of genetic recombination and mutation.

Relationship of Structure and Function – various molecular structures provide for specific functions. The same is true for tissues, organs, and organ systems.

Regulation – occurs as a result of membrane structure, gene action, enzyme and hormonal control.

Interdependence in Nature – found in respiration/photosynthesis and organism/environment relationships.

Science, Technology, and Society – scientific research and biotechnology are being used to help solve the problems of society.

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AP Biology Objectives:
- ❖ Students will develop skills necessary to be successful in college, such as, organization, time management, and independent learning.
- ❖ Students will develop an understanding of AP Biology by studying and analyzing the content and concepts critical to the field.
- ❖ Students will analyze what they read, thereby improving critical thinking skills.
- ❖ Students will actively practice and improve writing ability.
- ❖ Students will improve on public speaking by presenting their work to their peers.

- ❖ Students will increase their active working vocabulary.
- ❖ Students will increase their ability to interpret, understand, and analyze problems; applying the scientific method to solve them.
- ❖ Students will increase their knowledge of AP Biology, and will demonstrate this by applying their knowledge to various assessment situations – including projects, tests, "students as teachers" and laboratory activities.
- ❖ Students will meet the standards set for them by Riverview School District and the State of Pennsylvania.

Class Periods:
AP Biology will meet for a total of seven periods per week (five times per week with double periods on two of those days)

Classroom Experience:
The class will involve a lot of lecture with time taken to show examples of problems or interactives on the various topics. The class will also involve "student as teachers" presentations. It is imperative that students develop the skill of filtering through text material to extrapolate the essential material. It is also valuable to gain public speaking skills. These presentations will be presented in collaborative groups and will require the students to master the content well enough to present the topics to their peers. Students will also need to answer periodic questions that I will interject to ensure that they, and the rest of the class, understand the concepts.

Laboratory Experience:
There will be at least 12 labs that we will complete over the course of the school year. One of the four essay questions on the AP exam will pertain to one of the 12 labs, so it is critical that you understand and complete all labs. You will be required to keep a laboratory notebook and binder that will include your data, thought processes, and results of each lab. During laboratory experiments you will work in groups of two, unless otherwise specified. The length of each lab varies. Most labs will be conducted within a double period; however some labs will require additional days for data collection. The Drosophila lab will require approximately one month of periodic work. Below is a list of the 12 mandatory labs, including objectives and time frame for completion:

Lab Title	Wet or Dry Lab	Objectives	Approximate time needed to complete lab
Diffusion and Osmosis	Wet Lab	Investigate diffusion and osmosis in a model membrane, and investigate the effect of solute concentration on water potential.	4 class periods
Enzyme Catalysis	Wet Lab	Observe and measure the effects of an enzyme catalyzed reaction	2 class periods
Mitosis and Meiosis	Wet and Dry Lab	Observe the various stages of mitosis in an onion root tip and calculate the	3 class periods

		relative duration of each phase. Also, simulate the various stages of meiosis.	
Plant Pigments and Photosynthesis	Wet Lab	Separate plant pigments using chromatography and measure the rate of photosynthesis in isolated chloroplasts.	2 class periods
Cell Respiration	Wet Lab	Measure oxygen consumption during germination, and measure the rate of respiration in germinating and non-germinating seeds at two temperatures.	2 class periods
Molecular Biology	Wet Lab	Transform bacterial cells and separate DNA using gel electrophoresis	2-4 class periods
Genetics of Organisms	Wet Lab	Collect and manipulate Drosophila and analyze the results from a monohybrid, dihybrid, or sex-linked cross	Several class periods over a four week period
Population Genetics and Evolution	Dry Lab	Learn about the Hardy-Weinberg equilibrium and study the relationship between evolution and changes in allele frequency in a population	2 class periods
Transpiration	Wet Lab	Apply the concept of water potential to the movement of water within a plant, and measure transpiration under various conditions	3 class periods
Physiology of the Circulatory system	Dry Lab	Measure blood pressure and pulse rate under different conditions	3 class periods
Animal Behavior	Wet and Dry Lab	Observe animal behavior under various conditions	2 class periods
Dissolved Oxygen and Aquatic Primary Productivity	Wet Lab	Analyze dissolved oxygen concentration in water samples at varying temperatures	2 class periods

Methods of grading:

Grades are based on the cumulative points earned from the following:

- Tests/quizzes
- Laboratory performance and written reports
- Research and creative projects
- Textbook and journal readings
- "Students as teachers" – Peer teaching presentations
- Chapter outlines and vocabulary

Course Grading:
100% - 90% = A
89% - 80% = B
79% - 70% = C
69% - 60% = D
59% - below = F

Materials:
For this class you will need to keep a class notebook and binder, which you need to bring to class everyday. You will also need to bring a pen or pencil. You will also be responsible for checking out a textbook. The text used for the course is Campbell, Neil A., Jane B. Reece, and Lawrence G. Mitchell. *Biology, Fifth Edition*. Menlo Park, California, 1999. If the textbook is lost or destroyed, it will be your responsibility to pay for the text. As mentioned earlier, you will be responsible to keep a laboratory notebook and binder, which you will need to bring with you on announced lab days. The laboratory manual is Biology: Lab Manual by The College Board, Advanced Placement Program, 2001. All other materials will either be provided or assigned at a later date.

Homework:
Homework must be turned in at the beginning of class. Everyday that homework is turned in late, unexcused, you will lose 10% per day from the total points of the assignment. In essence, the assignment will drop a letter grade every day that it is late. If you need additional time to complete an assignment please come to see me before the assignment becomes late. In addition, all assignments should be typed unless otherwise noted.

Makeup Work:
Makeup work is the responsibility of the student! You must come to me **before or after class the day following your absence**. If you do not get the work and complete it within the timeframe that I give you, it will be considered late or as no credit.

Class Rules:
(These are for both you as a student and me as the teacher)

1. I will be on time.
2. I will be prepared
3. I will be courteous and show respect to every person in the classroom, including myself.

Discourtesy (mishandling lad equipment, walking out, stealing, talking back, fighting, etc) will not be tolerated, and if the problem persists it could be grounds for dismissal from the class. Cheating will also not be tolerated. Students caught cheating the first time will take a no-score (zero) on the assignment/quiz/test. A second time will result in a failing grade for the course.

Any questions or concerns regarding this class are welcomed. Please come see me anytime after school between 2:20 p.m. - 3:00 p.m.