San Ramon Valley HS **ADVANCED PLACEMENT BIOLOGY**
COURSE OUTLINE

This course outline follows the course recommended by the Advanced Placement Biology Committee. Text readings are given for Campbell & Reese Biology. Benjamin/Cummings Publ. Co., Inc.
It is also highly recommended that you get a copy of Cliffs Advanced Placement Biology Preparation Guide by Phillip E. Pack. This book can be ordered from local book stores or the Internet.

I.	Molecules and Cells			
	A.	Basic Biological Chemistry		
		1.	Atoms, molecules, bonding, pH and water	Ch. 2, 3 & 4
		2.	Carbohydrates, lipids, proteins, and nucleic acids	Ch. 5
		3.	Chemical reactions, free-energy changes, and equilibrium	Ch. 6
		4.	Enzymes: and enzyme regulation	Ch. 6
	B.	Cells		
		1.	Prokaryotic and eukaryotic cells	Ch. 7
		2.	Structure and function of cell membranes	Ch. 8
		3.	Structure and function of organelles and subcellular components	Ch. 7
		4.	Plant and animal cells	
		5.	Cell cycle: mitosis and cytokinesis	Ch. 12
	C.	Energy transformations		
		1.	ATP, energy transfer, coupled reactions and chemiosmosis	Ch. 6 (pp. 88-91)9 & 10
		2.	Glycolysis, fermentation and aerobic respiration	Ch. 9
		3.	C_3 and C_4 photosynthesis	Ch. 10
II.	Heredity and Evolution			
	A.	Heredity		
		1.	Meiosis and gametogenesis	Ch. 13
		2.	Mendel's Laws and probability	Ch. 14
		3.	Inheritance patterns: chromosomes, genes, alleles and interactions	Ch. 14 & 15
		4.	Human genetic defects	Ch. 14 & 15
	B.	Molecular Genetics		
		1.	DNA and RNA: Structure and function	Ch. 16 & 17

	2.	Eukaryotic chromosomal structure	Ch. 19 (pp.344-346)
	3.	Transcription and translation	Ch. 17
	4.	Regulation of gene expression	Ch. 18 & 19
	5.	Mutations	Ch. 16 & 19
	6.	DNA and RNA viruses	Ch. 18
	7.	Biotechnology	Ch. 20
C.		Evolutionary biology	
	1.	Origin of life	Ch. 26
	2.	Evidence for evolution	Ch. 22
	3.	Mechanisms of Evolution	
		a. Natural selection	Ch. 22 & 23
		b. Population Genetics	Ch. 23
		c. Speciation: isolating mechanisms, allopatry, sympatry and adaptive radiation	Ch. 24
		d. Patterns of evolution, gradualism and punctuated equilibrium	Ch. 24
III.		Organisms and Populations	
A.		Principles of taxonomy and systematics; the five kingdom system; evolutionary relationships	Ch. 25 & 26
B.		Survey of Monera, Protista and Fungi	Ch. 27, 28 & 31
C.		Plants	
	1.	Diversity; Classification, phylogeny, adaptations to land, alternations of generations in moss, fern, pine and flowering plants	Ch. 29 & 30
	2.	Structure and physiology of vascular plants	Ch. 35 & 36
	3.	Seed formation, germination and growth in seed plants	Ch. 38
	4.	Hormonal regulation of plant growth	Ch. 39
	5.	Plant response to stimuli: tropisms and photoperiodicity	Ch. 39
D.		Animals	
	1.	Diversity; Classification, phylogeny, survey of acoelomate, pseudocoelomate, protostome and deuterostome phyla	Ch. 32 & 34

	2.	Structure and function of tissues, organs and systems, homeostasis and immune response	Ch. 40, 42, 43, 44, 11, 45, 48 & 49
	3.	Gametogenesis, fertilization, embryology and development	Ch. 46 & 47
	4.	Behavior	Ch. 51
E.	Ecology		
	1.	Population dynamics, biotic potential, and limiting factors	Ch. 52
	2.	Ecosystems and communities	Ch. 53 & 54
	3.	Biogeochemical cycles	Ch. 54
	4.	Global Issues	Ch. 54 & 55

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