Biology II
2013-2014

Course Description:
BIOLOGY II is a second level biology course that allows the students to study advanced topics in biology. The course will attempt to address the interests of all students by providing them with a variety of topics to study. Those topics may range from molecular biology to anatomy and physiology to genetics and evolution. An integral part of the course will be a series of dissections that will detail the evolutionary relationship between different organisms from different phyla. The students will also be exposed to laboratory practices and independent research projects in preparation for continued study at the college level.

Course Content:
Some or all of the following units may be covered depending on the interest of the students.

I. Biochemistry
- Properties of water
- Polymerization
- Macromolecules
- Energetics
- Enzyme function

II. Cell structure and function
- Prokaryotic versus Eukaryotic
- Organelles
- Endosymbiotic theory
- Membrane structure
- Passive and active transport

III. Histology
- Types and characteristics
- Identification
- Function

IV. General anatomy
- Terminology
- Directions and location
- Organ systems - Structure and function

V. Specific anatomy (Some or all of the individual systems will be studied)
- Structure
- Function
- Organization
- Regulation

VI. Genetics
- History
- Mendel's principles
- Variations of Mendel's principles
- Chromosomal basis of inheritance

VII. DNA
- Structure
- Function
- Replication
- Transcription and translation

VIII. Cellular respiration
- Process
- Oxidative respiration
- Fermentation
- Comparison

IX. Photosynthesis
- Process
- Light dependent reactions
- Calvin cycle
- Structural components

X. Biotechnology
- Techniques
- Applications
- Ethical concerns

XI. Evolution
- Process
- Historical definition
- Modern synthesis
- Speciation

Required Textbooks and/or Other Reading/Research Materials
The following textbook will be used as well as additional resources.

Campbell Biology: Concepts and Connections Seventh Edition Benjamin Cummings © 2012.

Visual Anatomy and Physiology First Edition Benjamin Cummings © 2011.

Course Requirements:
The student should have successfully completed chemistry and biology. Each student is required to complete all projects, tests and assignments. Failure to do so will affect the student's overall grade. While access to the internet is not necessary, it would allow the student to do research at home and assist in completing their projects.

Grade Components/Assessments:
Grades are based on a point system that is converted into an overall percentage. The following categories will be used to assess the student's performance and provide feedback as to their individual strengths and weaknesses.

Tests and Quizzes: 35% of the grade
Laboratory activities: 30% of the grade
Projects: 20% of the grade
In-class activities: 10% of the grade
Homework: 5% of the grade

The course is focused on developing the skills necessary to succeed in biology at the collegiate level. In preparation for this success, we will concentrate on the usage of microscopes for identification, and development of dissecting skills, and the ability to take practical examinations.

Alternative Assessments:

The alternative projects that will be assigned will be dependent on the units that are studied. The following is a partial list of potential projects.

Histology – Microscopic study of the four main types of tissues. The project includes microscope drawings with appropriate labels, correlation of structure and function and laboratory practical.

Serial dissections – A series of organisms from different phyla will be dissected. The dissections will emphasize the similarities and differences between the organisms. These dissections are in preparation for the cat dissection

Cat dissection – An indepth dissection of the cat will be undertaken to correlate the study of the individual organ systems with the actual system in the cat. Identification of the individual structures and their functions will be assessed using laboratory practicals.

Disease posters and presentations – The students will research diseases related to the various systems. From this research they will develop an appropriate visual and presentation for the class.

Survey of the animal kingdom – The students will look at the development of the various systems in the animal kingdoms. The students will be responsible for microscope drawings, comparative charts and organism identification. The culminating activity will be a full-scale laboratory practical.

Cell model project – Working in pairs, the students will create a model of a plant and animal cell. The models will include appropriate organelles and a booklet that describes their function and structure.

Laboratory activities – Various activities that correlate to the unit being studied will be used as assessment of the understanding of the students.

Each marking period is worth 20% of a student's overall grade. The midterm and final exam are each worth 10% of a student's overall average:

Quarter 1	20%
Quarter 2	20%
Midterm	**10%**
Quarter 3	20%
Quarter 4	20%
Final	**10%**

Required Summer Reading/Assignments:

No Summer assignment.