General Syllabus

BIOL 4233 Biochemical Genetics

Credit Hours: 3   Lecture Hours: 3   Laboratory Hours: 0

Prerequisite: BIOL 3803 Genetics

Effective Catalog: 2018~2019

I.   Course Information

A. Catalog Description
Focuses on molecular and biochemical techniques used in research, delving extensively into the process of each technique covered, discussion of applications and short comings.

II.   Student Learning Outcomes

A. Subject Matter
Upon successful completion of this course, the student will be able to:

1. Evaluate current methods used in the investigation of protein-protein interactions.
2. Appraise the benefits for both in vitro and in vivo interaction experimentation.
3. Explain basic genetic concepts, such as replication, transcription and translation, and their application in various methodologies used in research today.
4. Analyze mutations in genes of a known function, and extrapolate how that would likely affect the function of a cell, and thus the organism.
5. Evaluate the importance of molecular biology and genetic engineering in the modern society.

B. University Learning Outcomes
This course enhances student abilities in the following areas:

Analytical Skills
Critical Thinking Skills: Students will analyze appropriate experimentation to address current questions in biochemistry and genetics.

Communication Skills (written and oral)
Students will communicate proficiency by writing an extensive research paper over a protein, pathway or cellular phenomenon, as well as make coherent contributions to class discussions.

Ethical Decision Making
Students will model ethical decision-making processes through analysis and critique of scientific experiments as well as examine ethical considerations during discussions of genetic and biochemical research activities and manipulations common to the discipline.

III. **Major Course Topics**

A. Protein Identification
   1. Mass Spectrometry
   2. Antibody uses in immunoprecipitation and Westerns
B. Identification of Protein-protein interactions
   1. Yeast-2-Hybrid
   2. FLIP/FRAP/FRET
C. Gene expression analysis
   1. Microarrays
D. Gene modification
   1. CRISPR-CAS9
E. Genetic Human Diseases, as chosen by students