Course Syllabus

Department: Science and Technology

Date: 1/24/12

I. Course Prefix and Number: BIO241

   Course Name: Laboratory in Genetics

   Credit Hours and Contact Hours: 1 credit hour - 3 contact hours

   Catalog Description including pre- and co-requisites: A laboratory offering to compliment BIO 240. This course provides a variety of laboratory experiences including classical, morphological, and molecular genetics. Corequisite: BIO 240.

II. Course Outcomes and Objectives

   Student Learning Outcomes:

   Upon completion of this course, the participant will be able to:

   1. Demonstrate the use of genetics lab techniques for extraction, manipulation and analysis of DNA.

   2. Utilize lab protocols to carry out common genetics lab procedures.

   3. Design and present results of a genetics-based experiment.

   4. Prepare written reports that include an evaluation of laboratory results.

Relationship to Academic Programs and Curriculum:

This course is required for the A.S. Biotechnology program and can also fulfill elective Mathematics/Science course requirements for A.A. and A.S. degree programs.

College Learning Outcomes Addressed by the Course:

☐ writing  ☐ ethics/values
☒ oral communications  ☐ citizenship
☒ reading  ☐ global concerns
☒ mathematics  ☐ information resources
☒ critical thinking  ☒ computer literacy
III. Instructional Materials and Methods

Types of Course Materials:

- Lab book: written and organized by course coordinator
- Current materials/topics from additional handouts, articles and online resources

Methods of Instruction (e.g. Lecture, Lab, Seminar …):

- Lecture, group and online activities, hands-on laboratory experiences, and experimental design and analysis activities

IV. Assessment Measures (Summarize how the college and student learning outcomes will be assessed):

1. Lab quizzes include essay questions covering the basic concepts of the genetics lab.
2. Laboratory reports demonstrate student mastery of mathematics, computer literacy, critical thinking and individual lab techniques.
3. Presentation of the methods and results of a self-designed experiment assesses critical thinking and oral presentation skills as well as the use of information resources.
4. A cumulative lab practical exam assesses student understanding of lab concepts, techniques and equipment.

V. General Outline of Topics Covered:

- Experimental design and reagent ordering
- Laboratory solution preparation
- Chromosomal DNA preps
- Agarose gel analysis of DNA
- Plasmid preps
- Transformation experiments
- Restriction enzyme digestion and modification
- DNA cloning
- The Lac operon and blue white selection
- Beta-galactosidase assays
- Fruit fly crosses and inheritance
- Mutagenesis
- Polymerase chain reaction
- Microarray analysis