

Course Syllabus

Department: Science and Technology

Date: 2/11/13

I. Course Prefix and Number: BIO 286

Course Name: Cell/Tissue Culture Techniques

Credit Hours and Contact Hours: 1 credit hour and 1.5 contact hours (3 hours/ ½ semester)

Catalog Description including pre- and co-requisites: A laboratory module introducing students to the basic techniques used in culturing tissues and cells. An emphasis will be placed on mammalian systems. Topics covered include sterile and aseptic technique, media preparation, cell count and viability cryopreservation, subculturing, and research applications using cell cultures. (3 hours each). Prerequisite: BIO 121

Relationship to Academic Programs and Curriculum including SUNY Gen Ed designation if applicable:

This course is a required course for the A.S. Biotechnology degree. This course may also be taken as an elective for students outside of biotechnology program.

II. Course Student Learning Outcomes:

1. Demonstrate an understanding of the concepts of mammalian cell culture.
2. Utilize lab protocols to carry out common mammalian cell culture techniques.
3. Design and present results of a cell-culture-based experiment.
4. Maintain detailed records of lab work.

College Learning Outcomes Addressed by the Course: *(check each College Learning Outcome addressed by the Student Learning Outcomes)*

- | | |
|---|--|
| <input type="checkbox"/> writing | <input type="checkbox"/> computer literacy |
| <input type="checkbox"/> oral communications | <input type="checkbox"/> ethics/values |
| <input checked="" type="checkbox"/> reading | <input type="checkbox"/> citizenship |
| <input checked="" type="checkbox"/> mathematics | <input type="checkbox"/> global concerns |

critical thinking

information resources

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

List identified College Learning Outcomes(s)	Specific assessment measure(s)
Reading	Students will read background information and follow laboratory protocols to culture and maintain mammalian cell lines. Lab exams and a laboratory practical assess student understanding of theory, techniques and equipment.
Mathematics	Students will apply mathematics principles in order to generate accurate cells counts and prepare laboratory reagents. Lab exams, an experimental design project and a laboratory practical assess student mastery of these principles.
Critical Thinking	Students will maintain accurate records and critically analyze the results of their individually designed cell culture experiment.
Information Resources	Students will access and utilize scientific resources in order to design and carry out their own cell culture experiment. A laboratory report and proper documentation will assess the background and design of the experiment.

IV. Instructional Materials and Methods

Types of Course Materials:

- Lab book: written and organized by course coordinator
- Textbook: selected by course coordinator

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

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

V. General Outline of Topics Covered:

Cell culture equipment and safety
Sterile and aseptic technique
Biology of the culture cell
Contamination
Culture vessels
Cell culture media
Cell differentiation
Primary cultures
Feeding cells
Subculturing cells
Cell counting
Cryopreservation
Cytotoxicity assays
Tissue culture applications