

FUNDAMENTALS OF BIOTECHNIQUES

Course ID: SCB252
Course Title: Fundamentals of Biotechniques
Department: Natural Sciences
Discipline: SCB-Biology
Course Credits: 3 credits 3 hours (lecture and laboratory combined)
Course Coordinator: Dr. Thomas M. Onorato (thomas.onorato@gmail.com)

Textbooks: Asking Questions in Biology, Chris Barnard, Francis Gilbert & Peter Mcgregor, 4th Edition, 2011, ISBN# 9780273734680
Journal of Visualized Experiments: Basic Methods in Cellular and Molecular Biology and General Laboratory Techniques

Course Description: Students will participate in authentic undergraduate research experiences to learn techniques commonly performed in a biological laboratory, such as micropipetting, isolation and quantification of nucleic acids and proteins, Polymerase Chain Reaction (PCR), immunodetection and gel electrophoresis. Students will also learn about data analysis, responsible conduct of research, communicating science and reflect on the impact of biotechniques on society.

Prerequisite: ENG101, MAT115, SCC201, SCB201

Grading:	10 assignments	40%
	Lab notebook	10%
	Biotechnology reflection	10%
	Oral presentation	10%
	Data analysis	10%
	Final Exam	20%

PERFORMANCE OBJECTIVES

1. Demonstrate research integrity and responsible conduct of research.
2. Interpret scientific literature.
3. Effectively report scientific concepts through oral and written communication.
4. Analyze existing datasets and student-generated experimental data.
5. Utilize mathematical and chemistry concepts in performing laboratory work.
6. Describe the theoretical aspects and perform the practical aspects of techniques utilized in a biological laboratory to study macromolecules, such as nucleic acids and proteins.
7. Illustrate the impact of biotechniques on society.

ARTIFACT ASSESSMENT

This class will be depositing student work for this semester. Students will be depositing an assignment for the Global Learning competency and Oral Communication ability.

For a tutorial on how to deposit student work, go to:

<http://eportfolio.lagcc.cuny.edu/support/tutorials.htm> and find the section called, "Assessment for Students." Click on the adobe flash button for "Depositing Assessment Artifact in Digitization Instructions for Students." You will see a brief video on how to deposit.

COURSE OUTLINE	
Week	Topic
1	Lab safety, research integrity, responsible conduct of research. (Lecture only)
2	Introduction to scientific literature and analyzing data. Assignment 1 due. (Lecture only)
3	Micropipetting, making solutions. Assignment 2 due. (Combined lecture and laboratory)
4	Nucleic Acid Module: isolation. Assignment 3 due. (Combined lecture and laboratory)
5	Nucleic Acid Module: quantification. Assignment 4 due. (Combined lecture and laboratory)
6	Nucleic Acid Module: PCR, restriction enzyme digestion. Assignment 5 due. (Combined lecture and laboratory)
7	Nucleic Acid Module: agarose gel electrophoresis, data analysis. Assignment 6 due. (Combined lecture and laboratory)
8	Protein Module: sample preparation. Assignment 7 due. (Combined lecture and laboratory)
9	Protein Module: protein assay. Assignment 8 due. (Combined lecture and laboratory)
10	Protein Module: Immunodetection of proteins. Assignment 9 due. (Combined lecture and laboratory)
11	Protein Module: Polyacrylamide gel electrophoresis, data analysis. Assignment 10 due. (Combined lecture and laboratory)
12	Biotechniques and society. Lab notebooks due, biotechnology reflection due. (Lecture only)
13	Final exam, oral presentations.