

NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
BIO 147 – BASIC LABORATORY CALCULATIONS FOR BIOTECHNOLOGY (1 CR.)

Course Description

Prepares students to work effectively in a scientific laboratory through instruction of the metric system, scientific notation, exponents, solution making, pH readings, and the creation of standard curves for data analysis. Focus will be on quantitative skills needed to perform most basic laboratory work. Skills will be practiced and reinforced through application-based problems and hands on activities. Lecture 1 hour per week.

General Course Purpose

Because entry-level technicians need to have strong quantitative skills, this course is designed to be taken previous to or to accompany BIO 250 Research Method and Skills to allow adequate time for instruction in this area. Such skills include the use of units, calculations, measurements, and conversions. Ideally, this course will be taken concurrently with BIO 250 – Biotechnology Research Methods and Skills so that students can maximize their laboratory experiences while still learning all of the required basic laboratory calculations. This course is designed for students in the A.A.S. in Biotechnology and the Biotechnology Lab Technician Career Studies Certificate.

Course Prerequisites/Corequisites

Prerequisite: Program placed. Co-enrolled in BIO 250, or biotechnology program head permission.

Course Objectives

Upon completing the course, the student will be able to:

- Use metric system appropriately while conducting experiments
- Convert numbers to scientific notation in lab calculations
- Perform calculations with exponents when making dilutions of samples
- Perform solution making calculations accurately and carry them out in the laboratory
- Understand the concept of pH and relate it to concentration and exponents
- Create and analyze a standard curve with lab samples
- Represent data graphically
- Perform basic statistical analyses on laboratory data
- Use and interpret data derived from spectrophotometry
- Calculate amounts of nucleic acids and proteins

Major Topics to be Included

- Metric system conversions
- Calculations with exponents and scientific notation
- Significant figures
- Ratios and proportions
- Concentration problems
- Solution chemistry including pH
- Dilution series and serial dilutions
- Standard curve (calculation of the concentration of an unknown sample)
- Graphical methods of describing data
- Descriptive statistics
- Calculations pertaining to nucleic acids, proteins, cells, and other biotechnology laboratory calculations