

Biol 390-02: Molecular Techniques Laboratory Spring 2018
Tuesdays 1:00 -4:50 pm, ISC 304

Instructor and Office Hours:

Dr. Makaía Papasergi-Scott, e-mail: papasergiscott@geneseo.edu

Office Hours: By appointment.

Course Description (from the undergraduate bulletin)

An introduction to basic techniques commonly used in biotechnology. Laboratory exercises include DNA, RNA, and protein manipulations (including the use of associated apparatus), and basic bioinformatic analyses. Lectures and readings cover background information of the techniques and their applications.

End of Course Learning Objectives

At the conclusion of the course...

- students will understand the theory behind molecular biology techniques.
- students will be able to design, execute, and interpret experiments dealing with modern questions in molecular biology.
- students will be able to analyze genomic sequencing data using existing bioinformatic methods, and understand underlying algorithms.
- students will be able to properly use modern equipment in molecular biology.

Tentative Schedule:

Jan. 16th – Intro., Pipettes, EcoGene, Solutions & Dilutions

Jan. 23rd – CRISPR I, Isolation of *E. coli* DNA

Jan. 30th – CRISPR II, PCR Analysis of CRISPR Loci I

Feb. 6th – CRISPR III, PCR Analysis of CRISPR Loci II

Feb. 13th - CRISPR IV: Sequence Analysis of CRISPR PCR Products (Lab Report 1 Due)

Feb. 20th - CRISPR V: Annotation of CRISPR repeats and spacers

Feb 27th - RNA-seq I: RNA Isolation (Lab Report 2 Due)

Mar. 6th - RNA-seq II: Data Analysis

Mar. 13th – **Spring Break, No Lab**

Mar. 20th - RNA-seq III/IV: cDNA synthesis, qRT-PCR Confirmation

Mar. 27th - RNA-seq V: qRT-PCR data analysis

April 3rd - Recombinant Protein Production I: Induction (Lab Report 3 Due)

April 10th - Recombinant Protein Production II: SDS-PAGE Analysis

April 17th – **GREAT Day, No Lab**

April 24th - Recombinant Protein Production III: Western Blot Transfer

May 1st - Recombinant Protein Production IV: Western Blot Detection

(Lab Report 4 Due Date TBA)

Grading:

45% Lab Reports (4 Reports)

30% Quizzes

-may be announced or pop-quizzes, lowest quiz grade will be dropped

15% Discussion Questions/Homework

10% Participation (5% on peer review)

Grading Scheme:

The following scale (minimum averages) will be used to calculate final grades based on the percentage of 250 total points obtained. Student point totals or grading scheme may be adjusted to reflect course difficulty or section differences (instructor's discretion).

A > 94	C+ > 77
A- > 90	C > 74
B+ > 87	C- > 70
B > 84	D > 65
B- > 80	E < 65

Supplies

- *A computer running Windows or MAC OS with Microsoft Excel and R is required.
- *A calculator with scientific notation is required.
- *A sharpie marker is required (permanent ultra-fine point recommended).
- *Each laboratory should be placed in a three-ring binder along with Questions answered

Course Materials:

I will put lab protocol in Canvas prior to the lab. Please print it out, read it through and bring the hard copy to the lab. It is generally good practice to make a physical mark as you complete each step in a procedure. If you would like to talk about graphs, tables etc., ***please print them out before coming to see me*** as it is much easier for everyone to view them and it allows me to make comments right on the papers. For the lab, you should wear splash resistant glasses to all labs. (I would suggest that you get a pair of comfortable ones rather than the goggles.) You also need to purchase a "permanent sharpie" marker for marking tubes. Lab coats are optional, but we will be working with some chemicals that stain or eat clothes.

Attendance and Professional Behavior in the Lab:

Labs, including this one, are inherently participatory. Perfect attendance is expected. If there is an unavoidable conflict, please contact me several days before class if possible, so that we can work out options. Each unexcused absence will result in a one letter grade drop (e.g. from a B+ to a C+) in addition to any missed or late assignments. Your choices of behavior in lab affect your learning experience and those of other students in the lab. Please arrive on time, stay throughout the lab and limit conversation in lab to directed lab discussions. Laptops are permitted and even encouraged/required for data collection and analysis but texting, use of social media, checking e-mail, shopping, playing games and other non-lab related uses are prohibited because they reduce your lab participation and distract those around you. If you disrupt the lab or distract others around you, you may be asked to leave. Being asked to leave will be counted as an unexcused absence.

Accommodations:

SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities. Accommodations will also be made for medical conditions related to pregnancy or parenting. Students should contact Dean Buggie-Hunt in the Office of Disability Services (tbuggieh@geneseo.edu or 585-245-5112) and their faculty to discuss needed accommodations as early as possible in the semester.

Academic Policies of the Biology Department-ACADEMIC DISHONESTY:

Students are expected to be aware of and to obey the College policies concerning academic dishonesty. Any alleged cheating and/or plagiarism may be dealt with by the School as a disciplinary problem in accord with College policies as stated in the Bulletin. Be especially aware that **academic honesty** includes *putting your name on a group project that you did not contribute to and turning in lab reports where material has been copied from reports from previous semesters' classes. Group members beware-if your name is on a project you need to be sure that the work is authentic and properly referenced; you are responsible if one of the group has plagiarized material.* The faculty of the School will take all necessary steps to deter academic dishonesty, all cases of which will be reported to the Dean of the School for possible disposition as a College disciplinary matter