

**BIOL 301 Cell Biology Laboratory, Fall 2021**  
**Wednesday 1:30- 4:20 pm (ISC 304)**

**Instructor:**

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**Virtual Office Hours:**

M (12- 1:30 pm)

<https://geneseo.zoom.us/j/98291704864?pwd=TmINMDRTUHIORk9SRGxKai93SEJ1dz09>

Meeting ID: 982 9170 4864 Passcode: 342590

F (12:30- 2 pm)

<https://geneseo.zoom.us/j/96471276528?pwd=Uk5LNXpTRW4wZ242Qm5iU2ptemU2UT09>

Meeting ID: 964 7127 6528 Passcode: 147256 OR e-mail for appointments

**Learning Outcomes:**

- 1) **To reinforce important concepts in cell biology.** By the end of this course, you will have better understanding on lectures involving cell signaling, protein structure, enzyme kinetics and biochemical reactions in mitochondria.
- 2) **To learn and practice skills in data collection, analysis, and interpretation, designing scientific experiments, and communicating experimental results with others.** By the end of this course, you will have acquired and improved your ability to i) collect, organize and interpret data, ii) to integrate the results of a scientific experiment with what is known about the topic, iii) to design novel experiments, iv) to test hypotheses, and v) to present experimental results through writing and oral presentation.
- 3) **To be able to master common techniques used in cell biology.** You will understand and develop skills in working with chemicals i.e. making solutions and dilutions, microbial culture, protein quantification, SDS-PAGE, cell fractionation/organelle isolation, and enzyme assay.

**Course Materials and Supplies:**

- *Mask*

Due to the COVID pandemic, in addition to keeping a proper social distance, we need to protect ourselves and minimize the risk of spreading illness by wearing *masks*.

- *Sharpie fine point permanent marker* for marking tubes
- *Splash resistant glasses or Goggle* for protection
- *Notebook/ loose-leaf notepaper* for taking notes, recording your data and calculation.

**You should hand-write data into your notebook/ loose-leaf notepaper rather than only enter it into the computer.** There were more than once when groups lost all or part of their data because of a computer problem.

- *Lab protocols* will be posted in Canvas every week. Please PRINT it out, READ it through, PLACE it in the 3- ring binder and BRING to the lab. *Failing to do so will affect your lab performance grade* because reading and following protocols directly from electronic devices while carrying out experiments is one major cause of experimental error in the lab. Besides, it is a good practice to make a physical mark as you complete each step in a multi-step procedure.
- *Lab coats* are optional, but we will work with some chemicals that stain or are corrosive.

### Attendance and Professional Behavior in the Lab:

Perfect attendance is expected for this course. *However, you are discouraged to attend the lab if you are sick.* If there is an unavoidable conflict, please contact me ASAP 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 behavior in lab affects your learning experience and those of other students. Please *arrive on time, turn off your cell phone, stay throughout the lab and limit conversation in lab to directed lab discussions.* *Laptops* are permitted and even encouraged for data collection and analysis but texting, use of social media, checking e-mail, and other non-lab related uses are prohibited because they reduce your lab participation and distract people around you. If you disrupt the lab or distract others, you may be asked to leave.

### Grading:

#### Group Data analysis and Questions (D & Q) (35%)

- Making solutions and calculation
- Cell Signaling
- Protein structure
- Enzyme kinetics
- Mitochondrial isolation and characterization

#### Group Abstracts (ABs), Laboratory Reports (LRs) and Experimental Outline (EO) (25%)

- 5 pts for the Abstract of Quorum Sensing
- 20 points for the protein structure lab report
- 25 pts for WGAP investigative lab:
  - 10 pts Experimental outline
  - 10 pts Abstract & Figures/Tables
  - 5 pts Oral presentation

#### Individual Quiz after each lab module (30%)

- The quizzes include but not limit to fill-in, calculation, and Excel graphing where some experimental data will be given to you for preparing graphs as you did for the D&Q.

#### Peer Evaluation (5%)

#### Lab Performance (5%)

#### *Note:*

- All submission need to be **hard copies**. There will be a 2-point penalty per day for late assignments.
- Also, see Supplemental Materials in Canvas "*Hints for figures*", "*Hints for Assignment and Report*" and "*Simple Rules for Concise Scientific Writing*" for more information.

### 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 dishonesty includes *cheating in exams, putting group member's name on a group project that he/she did not contribute to* and *turning in lab reports where material has been copied from*

reports from previous semesters' classes. **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 your 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. To learn about plagiarism and how to avoid it, self-enroll in the Canvas Plagiarism Tutorial ([geneseo.edu/library/library-workshops](http://geneseo.edu/library/library-workshops)) for more information.

#### Accommodations:

SUNY Geneseo is dedicated to providing an equitable and inclusive educational experience for all students. The Office of Accessibility (Erwin Hall 22, (585) 245-5112, [access@geneseo.edu](mailto:access@geneseo.edu)) will coordinate reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities, as well as medical conditions related to pregnancy or parenting. Students with letters of accommodation should submit a letter to each faculty member at the beginning of the semester and discuss specific arrangements.

#### Tentative Schedule:

| Week | Date  | LAB EXERCISE  | Materials Due at 1:30 pm   |
|------|-------|---|--|
| 1    | 9/1   | Introduction, Pipetting, Making Solutions and Dilutions                         | In class group assignment  |
|      |       | <b>Module I: Cell Signaling</b>   |  |
| 2    | 9/8   | I. Bioluminescence and Quorum Sensing   |  |
| 3    | 9/15  | II. Quorum Sensing controls the bioluminescence of <i>Vibrio harveyi</i>        | D&Q: Quorum Sensing I  |
|      |       | <b>Module II: Protein Structure</b>   |  |
| 4    | 9/22  | I. Protein Quantification and Sample Prep. for SDS-PAGE                         | D&Q: Quorum Sensing II<br>Abstract: Quorum Sensing<br>Quiz 1: Quorum Sensing |
| 5    | 9/29  | II. SDS-PAGE and Gel Staining   | D&Q: Protein Structure I   |
| 6    | 10/6  | Discussion on Results of the Protein Structure & Lab Report Write-up            | D&Q: Protein Structure II<br>Quiz 2: Protein Structure                       |
|      |       | <b>Module III: : Enzyme Kinetics</b>  |  |
| 7    | 10/13 | I. Wheat Germ Acid Phosphatase Assay  | Lab Report: Protein Structure  |
| 8    | 10/20 | II. Preliminary study for Phosphatase Investigative Lab<br>Experimental Outline | D&Q: Enzyme Kinetics<br>Outline due at 4:50 pm                               |
| 9    | 10/27 | III. Phosphatase Investigative Lab  |  |
| 10   | 11/3  | Discussion on Phosphatase Results   | Quiz 3: Enzyme Kinetics  |
| 11   | 11/10 | Oral presentation of Phosphatase Investigative Lab                              | Abstract: Enzyme Kinetics  |
|      |       | <b>Module IV: Cell Fractionation and Organelle Isolation</b>                    |  |
| 12   | 11/17 | I. Mitochondrial Isolation and Characterization I                               |  |
| 13   | 11/24 | <b>Thanksgiving: NO LAB</b>   |  |
| 14   | 12/1  | II. Mitochondrial Isolation and Characterization II                             | D&Q: Mitochondria I  |
| 15   | 12/8  | Discussion on Mitochondria  | D&Q: Mitochondria II<br>Quiz 4: Mitochondria                                 |

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