Learning Outcomes:

1) 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 collect, organize and interpret data, to integrate the results of a scientific experiment with what is known about the topic, to design novel experiments, to test hypotheses, and to present experimental results through writing and oral presentation.

2) To be able to master common techniques used in cell biology. You will develop skills in working with chemicals i.e. making solutions and dilutions, protein assay, SDS-PAGE, organelle isolation, and enzyme assay.

3) To reinforce important concepts in cell biology. By the end of this course, you will have better understanding on lecture concepts involving: protein structure, enzyme kinetics and biochemical reactions in mitochondria.

Course Materials and Supplies:

- **Mask**
  In addition to a proper keeping social distance, we need to protect ourselves and minimize the risk of spreading illness by wearing masks all the time.
- **Sharpie fine point permanent marker** for marking tubes
- **A pair of comfortable 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 participation grade.** 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.
- To minimize the risk of spreading COVID-19, you are asked to wipe down your own workspace in the lab with college-provided disinfectant wipes.

Attendance and Professional Behavior in the Lab:

Perfect attendance is expected for this course. However, you are strongly discouraged to attend the F2F lab meetings if you are feeling unwell physically and there is no penalty for this type of non-attendance. 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
- Protein structure
- Enzyme kinetics
- Mitochondrial isolation and characterization

**Group Laboratory Reports (LRs) and Experimental Outline (EO) (30%)**
- 30 points for the protein structure lab report
- 10 pts for the experimental outline of WGAP investigative lab
- 20 pts for the lab report of WGAP investigative lab

**Individual Quiz after each lab module (25%)**
- 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 “Hints for Assignment and Report” for information concerning the appropriate formats.
- 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.

**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 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 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.

**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) 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.

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**Tentative Schedule:**
F2F weeks are highlighted in yellow.
<table>
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<tr>
<th><strong>Cohort A</strong></th>
<th><strong>LAB EXERCISE</strong></th>
<th><strong>Materials Due at 1:30 pm</strong></th>
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<tbody>
<tr>
<td><strong>Week</strong></td>
<td><strong>Date</strong></td>
<td><strong>Module I: Protein Structure</strong></td>
</tr>
<tr>
<td>1.</td>
<td>9/2</td>
<td>Protein Quantification and Preparation for SDS-PAGE</td>
</tr>
<tr>
<td>2.</td>
<td>9/9</td>
<td>Calculation on Making Solution, How to use pipettes Watch Video: Making Polyacrylamide Gel, SDS-PAGE</td>
</tr>
<tr>
<td>3.</td>
<td>9/16</td>
<td>SDS-PAGE and Gel Staining</td>
</tr>
<tr>
<td>4.</td>
<td>9/23</td>
<td>Data Analysis and Lab Report Write-up (Zoom or F2F)</td>
</tr>
<tr>
<td>5.</td>
<td>9/30</td>
<td>Rejuvenation Day- No lab</td>
</tr>
</tbody>
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**Cohort B** | **LAB EXERCISE** | **Materials Due at 1:30 pm** |
<table>
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<td>9/16</td>
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</tr>
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<td>Data Analysis and Lab Report Write-up (Zoom or F2F)</td>
</tr>
<tr>
<td>5.</td>
<td>9/30</td>
<td>Fall Break- No lab</td>
</tr>
</tbody>
</table>

**Materials Due at 1:30 pm**