# Biochemistry Lab

BIOL3134/CHEM3134  
Robertson B112  
Section LA M: 2:10-5:00P or Section LB W: 2:10-5:00P

Dr. Edward Nam (LA & LB) – name@stthom.edu

**Handouts**: All handouts will be posted on Blackboard. You are responsible for reading the handouts **before** lab. You must also print and bring the handout to the lab.

<table>
<thead>
<tr>
<th>DATE</th>
<th>LAB EXERCISE (Lab Quizzes)</th>
<th>PRE-LAB ASSIGNMENT</th>
<th>POST-LAB ASSIGNMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>22-24 AUG</td>
<td><strong>Pre-lab</strong> Introduction (Syllabus &amp; Safety); lab notebook; pre-assessment</td>
<td>Read syllabus &amp; Lab notebook handout</td>
<td></td>
</tr>
<tr>
<td>29-31 AUG</td>
<td><strong>LAB 1</strong> Pipetting, Buffers, β-lactamase intro</td>
<td>Read Handout (Q1) Lab notebook</td>
<td>Before-class exercises</td>
</tr>
<tr>
<td>12-14 SEPT</td>
<td><strong>LAB 2</strong> β-lactamase purification + SDS-PAGE</td>
<td>Read Handout (Q2) Lab notebook Before-class exercises</td>
<td>SDS-PAGE presentation (group) due next lab</td>
</tr>
<tr>
<td>19-21 SEPT</td>
<td><strong>Lab 3</strong> SDS-PAGE presentation, Protein quantification, PyMol</td>
<td>Read Handout (Q3) Lab notebook</td>
<td>Before-class exercises Bring laptop to class</td>
</tr>
<tr>
<td>26-28 SEPT</td>
<td><strong>LAB 4</strong> β-lactamase enzymatic assay + catalytic mechanisms</td>
<td>Read Handout (Q4) Lab notebook Before-class exercises Bring laptop to lab</td>
<td>Lab 4 Post assignment (individual)</td>
</tr>
<tr>
<td>3-5 OCT</td>
<td><strong>LAB 5</strong> Enzyme kinetics analysis + develop hypotheses</td>
<td>Read Handout (Q5) Lab notebook Before-class exercises Bring laptop to lab</td>
<td>Hypothesis presentation (group)</td>
</tr>
<tr>
<td>17-19 OCT</td>
<td><strong>LAB 6</strong> Presentation of hypotheses (mock lab meeting)</td>
<td>Reagent list due at end of period</td>
<td>Kinetics HW (individual) due 10/24</td>
</tr>
<tr>
<td>24-26 OCT</td>
<td><strong>LAB 7</strong> Independent Experiments</td>
<td>Protocol due 10/23 or 10/25 Lab notebook</td>
<td></td>
</tr>
<tr>
<td>31 OCT 2 NOV</td>
<td><strong>LAB 8</strong> Independent Experiments</td>
<td>Protocol due 10/30 or 11/1 Lab notebook</td>
<td></td>
</tr>
<tr>
<td>7-9 NOV</td>
<td>Lab 10 Data analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-16 NOV</td>
<td><strong>Final Presentations</strong> (mock lab meeting)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description and goals of this course**: This course focuses on laboratory techniques and scientific methodology. Skills such as critical thinking, reading and writing, learned in BIOL 1151, will be reinforced in this course.
Outcome 1: Students will develop their understanding of the scientific method by designing experiments to test hypotheses, analyzing interpreting data, and communicating their results.

Outcome 2: Students will become familiar with laboratory techniques relevant to biochemistry and molecular biology.

Outcome 3: Students will deepen their understanding of biochemistry through practicing data analysis and interpretation.

Outcome 4: Students will engage in an authentic research experience by keeping a lab notebook, presenting their data in lab meetings, and participating in scientific discussions with their peers.

Attendance and Assignments:

YOU MUST ATTEND EACH LABORATORY. If you have an emergency that requires you to miss a laboratory, you must notify your instructor immediately. You should email him/her, BEFORE CLASS BEGINS and discuss the possibility of attending another lab section (if the other instructor agrees). You will be working in groups in the laboratory and this will be difficult for your group and the groups in the other lab sections. If the instructor does not hear from you before class, you relinquish the right to make up the laboratory. The instructor will deduct 25 points from your overall total points for every lab that is missed.

You must turn in assignments on time. Reports, homework and laboratory assignments are due at the beginning of each class period. All work handed in after the beginning of class will be levied a 20% penalty. Each additional day that the work is late will add an additional 20% penalty.

Read the assigned lab material and prepare for your quizzes. You will have a quiz at the beginning of every lab.

Scholastic Ethics:

Each student is expected to do his/her own work. Should you turn in work that is paraphrased from a colleague, or plagiarized from any source, you will be given a zero (0) for that portion of the course. The professor reserves the right to report the student to the Academic Dishonesty Committee, and he/she may be withdrawn from the course. When you work within your lab groups, you are still expected to do your own work and not represent the work of others as your own. Please note: allowing others to copy from your work also constitutes cheating. University policies on academic dishonesty are detailed on pp. 73-75 of the Undergraduate Catalog and in the Student Handbook, available online at http://www.stthom.edu/.

Activities and Grading:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes (5 total, 15 pts each)</td>
<td>75</td>
</tr>
<tr>
<td>Lab notebook (7 total, 15 pts each)</td>
<td>105</td>
</tr>
<tr>
<td>Before-class exercises (5 total, 10 pts each)</td>
<td>50</td>
</tr>
<tr>
<td>Lab 4 post assignment (individual)</td>
<td>10</td>
</tr>
<tr>
<td>Kinetics HW (individual)</td>
<td>25</td>
</tr>
<tr>
<td>SDS-PAGE presentation (group)</td>
<td>40</td>
</tr>
<tr>
<td>Final presentation (group)</td>
<td>100</td>
</tr>
<tr>
<td>Peer Evaluation</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>415</td>
</tr>
</tbody>
</table>

To calculate your grade at any time, add up the total number of points you have received and divide by the total number of possible points at that time, then multiply the result by 100 for a percentage.

<table>
<thead>
<tr>
<th>F</th>
<th>D</th>
<th>D+</th>
<th>C-</th>
<th>C</th>
<th>C+</th>
<th>B-</th>
<th>B</th>
<th>B+</th>
<th>A-</th>
<th>A</th>
</tr>
</thead>
</table>

Please note the following policy from the UST Handbook: 6.2.15d. “Course grades are communicated to students by the Registrar’s Office. Faculty members may not post course grades, even with a coded listing, or by any other means, whether orally or in writing, communicate them to the students.”
**Cell phones, beepers, pagers, and other electronic noisemakers:**
These devices are extremely disruptive during a class period. Please DO NOT USE THEM DURING CLASS. If you must bring them, make sure to turn them off before class begins. If you are texting, blogging, tweeting or facebooking, or your device rings during class time, the instructor reserves the right to remove you and/or your device from the classroom, and retain it for 3 days.

Attached are a series of appendices that will provide you with valuable information on lab safety (pages 4-6), writing mini-reports (pages 7-11) and posters (pages 11-15), peer evaluation (page 16), and proper citing of scientific references (pages 17-18).

**Personal protection equipment**
You must wear approved safety goggles at all times in the lab.
You will be provided with disposable non-latex gloves.
You must wear a lab coat at all times as well.
You must wear closed-toe shoes. I will send you home and you will lose the maximum points for that lab. Keep shoes in your car if you need.

---

**BIOLOGY DEPARTMENT SAFETY RULES AND INFORMATION**

In case of emergency, notify your instructor and campus security (713-525-3888)
If directed, call 911.

Other contacts to be used only in case of emergency:
Lab Coordinator – Debra Rollo (713) 831-7811
Building Safety Captain – Rosemarie Rosell (713) 525-3166

General Information:

- Completely read the assigned lab exercise or experiment **BEFORE** entering the lab.
- Teaching assistants are employees of the University and must be treated with the same level of respect as any other staff or faculty member.
- The consumption of food or drink in lab is **PROHIBITED**. All food items must remain OUTSIDE of the lab during class time. **NO EXCEPTIONS**. This includes chewing gum.
- Putting on makeup or contacts is not allowed in lab. Please do this before coming to class.
- Closed-toed shoes must be worn at all times. **Open-toed shoes are not permitted. You will be asked to leave the lab if you arrive in sandals, flip flops, or shoes that do not adequately cover your feet.** Wear lab-suitable clothing.
- If you are allergic or sensitive to any material used in lab, notify the instructor immediately. The Biology Dept. provides nitrile gloves for laboratory use.
- Never work in the laboratory alone, except with instructor permission. Access to the laboratory is limited at the discretion of the instructor and lab coordinator, especially during non-classroom times.
- No materials, reagents or instruments are to be removed from the lab, except by the instructor.

Lab Safety:
• All accidents, even the most minor, should be reported to the instructor, TA, or lab coordinator IMMEDIATELY.
• In case of fire, there is an evacuation route at both ends of the lab - take the route that takes you away from flames (see attached floor plan). There is also a fire extinguisher in the lab. Only use if the fire has small risk of spreading and if usage does not put you in danger. Please leave the lab in a prompt but calm manner if a fire occurs, while alerting those around you that there is a fire in the building. Fire alarms are located near the entrances to Anderson Hall.
• There are shower and eye wash stations in all labs (see attached floor plan). If you 'think' you need to use a wash station, especially when your eyes are involved, then you do.
• There is a first aid kit for minor injuries located in the lab.
• Be careful not to touch hot glass - glass cools slowly. Use hot pads provided by instructor.
• Never leave a flame or hot plate unattended.
• Gloves should be worn when working with preserved specimens, bacteria, buffers, or caustic liquids. Remove gloves BEFORE LEAVING.
• NEVER use your mouth to pipette solutions.
• Keep hands away from face and mouth while in lab.
• Wash your hands after lab, especially if you have been working with bacteria or chemicals.
• Horseplay and practical jokes can be dangerous and are not permitted.
• Keep all extra books and materials such as jackets stored away from your bench top.
• Dumb questions are not nearly as dangerous as dumb mistakes - please ask!!!!

Waste Disposal:
• You MUST clean your lab bench before leaving the laboratory for the safety of the students in the following labs. This includes washing your glassware, wiping down your lab bench, and properly disposing of any waste generated.
• Disposable sharp objects such as scalpels, needles, or razor blades must be disposed of in a proper sharps container which will be provided to you if necessary.
• Broken or chipped glassware should be disposed of in the broken glassware disposal boxes. If in doubt, ask a professor or TA what you should do BEFORE you use it.
• Do not dispose of anything down the sink unless you have permission to do so by the instructor. Most chemicals CANNOT go down the sink and must be disposed of in a chemical or biohazard waste container.
• Biohazardous waste must be disposed of in a biohazard bag. DO NOT throw away biohazardous materials in the trashcan.
• Chemical spills should be cleaned according to the nature of the liquid. Notify the instructor of spills, especially if they involve acids, bases or caustic solutions.
• MSDS (material safety data sheets) are provided in an addendum to this safety information. Please reference the MSDS for chemicals you are working with in the lab so that you are aware of any potential hazards.

Please acquaint yourself with the following waste disposal and chemical hazard signs:
Sharps container for proper sharps disposal.

Glass disposal box for broken glassware.

Universal biohazard symbol that indicates biohazardous waste. Do not discard non-hazardous waste in these containers.

NFPA Ratings that you may see on lab chemicals and solutions.