Course Syllabus  
Chemistry 452L  
Comprehensive Biochemistry Laboratory

**Course Description:** Purification and characterization of biomolecules.

**Number of Credit Hours:** 1 semester hour - 3 hours lab per week

**Course Prerequisites and Corequisites:** Prerequisites: CHE 330L or 331L and CHE 452 or concurrent enrollment. Required lab fee.

**Program Learning Outcomes:**
1. The student will integrate knowledge with critical thinking to solve problems.
2. The student will perform qualitative/quantitative chemical analyses/syntheses using modern instrumentation.
3. The student will articulate scientific information through oral communication.
4. The student will articulate scientific information through written communication.

**General Education Core Curriculum Objectives:** There are no specific general education core curriculum objectives in this course. This course is not a general education core curriculum course.

**Course Objective:** To gain competency in basic laboratory techniques of biochemistry that are needed for the purification and characterization of biological molecules.

**Student Learning Outcomes:** Upon successful completion of this course, the student will be able to demonstrate basic biochemical techniques. The student will have laboratory experience in

- Basic analytical techniques for biochemical applications (pipetting, mass, solution/buffer preparation)
- Theory and application of biochemical techniques with emphasizing on critical thinking and problem solving in a laboratory setting (PLO 2, 3)
- Written and oral communication of literature and laboratory results. (PLO 4, 5)

**Outline of Topics (approximate course time):**
Introduction/Safety (1 lab period)  
Pipetting (1 lab period)  
Data Analysis (1 lab period)  
Solution and Buffer Preparation (1 lab period)  
Protein Purification (1-2 lab periods)  
Electrophoresis (1-2 lab period)  
Enzyme Kinetics (1-2 lab period)  
PCR (1-2 lab period)  
DNA Purification (1-2 lab period)
Class Syllabus
Fall 2019
CHE 452-021

Comprehensive Biochemistry I Laboratory

Professor: Dr. ‘Tayo Odunuga
Department: Chemistry and Biochemistry
Email: odunugaoo@sfasu.edu
Phone: (936) 468-6468
Office: 122 Math Building
Office Hours: Monday to Friday: 11 a.m. – 12 noon

Class meeting time and place: R, 2:00 – 2:50 p.m., 3:00 – 5:50 p.m. Room 301 Chem. Bldg.

Recommended Text and other materials:
(2) A hardbound laboratory notebook – the instructor will provide specifications.
(3) Materials for writing and graphing.
(4) A scientific calculator.
(5) An active email address.
(6) Students will search for research articles and materials.

Course timetable

<table>
<thead>
<tr>
<th>Date</th>
<th>Tentative laboratory activities</th>
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</thead>
<tbody>
<tr>
<td>August 29</td>
<td>Safety issues, lab tour, students sign safety form, keeping good laboratory, dress code, goggles est.</td>
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<tr>
<td>September 5</td>
<td>Lab #1: Basic laboratory skills</td>
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<tr>
<td>September 12</td>
<td>Lab #2: Simple color tests for amino acids and proteins. (Quiz 1)</td>
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<tr>
<td>September 19</td>
<td>Lab #3: Colorimetric and spectroscopic quantification of solutions of biomolecules: DNA (UV and agarose gel) and protein (Bradford, Lowry and UV) (Quiz 2)</td>
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<tr>
<td>September 26</td>
<td>Lab #3 cont’d (Quiz 3)</td>
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<tr>
<td>October 3</td>
<td>Discussion and preparation for labs 4 (protein) and 5 (DNA) (Quiz 4)</td>
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<tr>
<td>October 10</td>
<td>Mid-term Exam</td>
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<tr>
<td>October 17</td>
<td>Lab #4: Partial purification and characterization of catalase from plants (pairs of students to choose preferred plants that are rich in catalase). (Quiz 5) Students to start writing scientific report</td>
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<tr>
<td>October 24</td>
<td>Lab #4 cont’d (Quiz 6)</td>
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<tr>
<td>October 31</td>
<td>Lab #4 completed (Quiz 7)</td>
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<tr>
<td>November 7</td>
<td>Lab #5: Isolation of total genomic DNA from bacteria (E. coli) and PCR amplification of dnaK gene (Quiz 8)</td>
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<tr>
<td>November 14</td>
<td>Lab #5 cont’d (Quiz 9)</td>
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<tr>
<td>November 21</td>
<td>Lab #5 completed (Quiz 10)</td>
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<tr>
<td>December 5</td>
<td>Final Exam</td>
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### Method of Evaluation

<table>
<thead>
<tr>
<th>Test quantity</th>
<th>Points</th>
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<tbody>
<tr>
<td>Laboratory notebook</td>
<td>100</td>
</tr>
<tr>
<td>Quizzes (10 x 5)</td>
<td>50</td>
</tr>
<tr>
<td>Mid-term exam</td>
<td>50</td>
</tr>
<tr>
<td>Final exam</td>
<td>50</td>
</tr>
<tr>
<td>Scientific report</td>
<td>40</td>
</tr>
<tr>
<td>Professionalism</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>300</strong></td>
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**Grading scale** -  
A ≥ 270; B ≥ 240; C ≥ 210; D ≥ 180; F < 180

**Laboratory Notebook**: Laboratory notebook must be signed by Dr. Odunuga at the end of every lab. **Unsigned notebooks will not be graded.** Laboratory notebooks can be turned in either immediately after the lab or before noon the next day. It will be graded and returned to the student the following Monday or Tuesday.

**General laboratory notebook outline**
1. Title
2. Date
3. Name(s) of Partner(s) if applicable
4. Short but relevant introduction with references if necessary
5. List of reagents and brief description of preparation
6. Procedure: flowchart, bullets, diagrams
7. Expected results
8. Actual results (data) presented in appropriate format
9. Discussion and Conclusion
10. Continuity – what to do next

**Criteria for grading laboratory notebook**
1. Organization – see above
2. Legibility
3. Neatness
4. Amount of content
5. Reproducibility

**Quizzes**: There will be a weekly quiz during the lecture portion of the class. Each quiz is worth 5 points.

**Midterm and Final Exams**: A written midterm will be given. It will be worth 50 points. It will cover the first half of the semester. The final exam will be given during the last lab week and will be worth 50 points. It will cover the material for the second half of the semester.
Written Report: One scientific report will be required on Lab #4. The report should include the following sections: Introduction, Materials & Methods, Results, Discussion and Conclusion. A minimum of 6 references, excluding URLs and textbook citing and should be in the Journal of Biological Chemistry format. The report is worth 40 points, and has a five-page minimum typed in Times New Roman 12 font and with margins of one inch margin all round.

Professionalism: This includes keeping deadlines, promptness to lab, good lab behavior, following instructions etc.

Make-up Policy: For a proven unexcused absence, the professor reserves the right to decide appropriate actions to be taken.

Attendance Policy: Two or more unexcused absences will result in an ‘F’ for the course. Absences may be assigned to anyone that disrupts class/lab, sleeps in class/lab, or consistently comes in late or leaves early without authorization.

Academic Honesty Policy: Cheating in any form will result in an ‘F’ in the course and further action by the University. Plagiarism in any form is not tolerated and will be punished severely.

Academic Disabilities Policy: If you have a certified disability, registered with the Office of Disability Services at 468-3004 and need accommodations for this course, it is your responsibility to notify me by the third class day.

Classroom Behavior Policy:

- Unexcused absences may be assigned to anyone that disrupts class, sleeps in class, or consistently comes in late or leaves early without authorization. This is college; everyone is expected to behave professionally.

- Cell phone must be turned off during class/lab. After one cell phone interruption, any subsequent cell phones interruption will be assigned an unexcused absence.

- Text messaging is a disruption. Anyone text messaging during class will have an unexcused absence assigned to them. Read Attendance Policy Section for how this can affect grades.

The syllabus is subject to changes at the discretion of the instructor.

Dr. Tayo Odunuga
August 23, 2019