# CHEM 3753: Introduction to Biochemical Methods
## Fall 2016

**Instructor:** Dr. Christina Bourne  
**Email:** [cbourne@ou.edu](mailto:cbourne@ou.edu) (please use “CHEM3753” in subject)  
**Office:** SLSRC 2610  
**Action Center:** TBD  
**Office Hours:** Wednesday, 8 am – 10 am at my office  
*Also available by appointment*

**Classroom Lecture:** Wednesdays, Fridays 2:30 pm – 3:20 pm, Neilson Hall 170  
**Online Content:** canvas.ou.edu  
**Laboratory Sections:** PHSC 3xx (You must check in for the first lab session)

<table>
<thead>
<tr>
<th>Section</th>
<th>Date &amp; Time</th>
<th>TA</th>
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</thead>
</table>
| 011     | Mon., 10:30 am – 1:20 pm | Brett Roberts  
Contact: [brett.l.roberts@ou.edu](mailto:brett.l.roberts@ou.edu) |
| 012     | Mon., 1:30 pm – 4:20 pm | Brett Roberts  
Contact: [brett.l.roberts@ou.edu](mailto:brett.l.roberts@ou.edu) |
| 013     | Tues., 8:30 am – 11:20 pm | Genwei Zhang  
Contact: [genweizhang@ou.edu](mailto:genweizhang@ou.edu) |
| 014     | Tues., 1:30 pm – 4:20 pm | Katie Sharp  
Contact: [ksharp@ou.edu](mailto:ksharp@ou.edu) |
| 015     | Wed., 11:30 am – 2:20 pm | John C. White  
Contact: [John.C.White-1@ou.edu](mailto:John.C.White-1@ou.edu) |
| 016     | Thurs., 8:30 am – 11:20 pm | Genwei Zhang  
Contact: [genweizhang@ou.edu](mailto:genweizhang@ou.edu) |

**Required Materials:**
- Laboratory Notebook  
- Safety Goggles ([not](https://example.com) safety glasses, if you don’t know the difference check on-line for pictures) – you will not be permitted in the lab without them  
- A calculator for each class and lab (sharing will not be acceptable).

**Prerequisites:**  
CHEM 3653 or concurrent enrollment

**Course Description:**  
This is a one-semester survey of current and routinely used methods in biochemistry. The course will explain the theory of each technique in lecture (2 hours per week) and the execution of these through hands-on lab work (3 hours per week).

**Course Goals:**  
The course is designed to give students an intermediate level of competency in understanding and performing common biochemical experiments. This knowledge provides a foundation for future studies in biochemistry-related careers and medical fields.
Learning Outcomes:
Upon completion, the student should be able fulfill these statements about the experiments used in the lab/lecture:

- Evaluate the basis of why you would do certain experiments
- Explain what physical phenomena is being tested
- Extrapolate from experimental results back to starting material properties
- Troubleshoot why experiments would give unclear (or wrong!) results

In particular, students should know how to:

- Make up solutions to a given molarity and to calculate dilutions
- Use Excel and the Solver plug-in, line fits
- Be able to calculate pH using the Henderson-Hasselbalch equation
- How PCR reactions work
- Design of protein expression vectors and how they work
- How to quantify DNA and proteins
- How to purify proteins using chromatographic methods
- How to characterize proteins and small molecules by spectrophotometry
- How to measure and analyze the kinetic activity of selected proteins
- How to assess the mode of inhibition in enzymatic activity assays
- Michaelis-Menton kinetics

Breakdown of Course Grading Policy

A = 90 to 100% of points earned
B = 80 to 89%
C = 70 to 79%
D = 60 to 69%
F = below 60%

Check your grades carefully when they are posted! If you feel a mistake has been made you must bring it to my attention within the first week of posting – no corrections will be made beyond this point.
### Examinations and Quizzes

<table>
<thead>
<tr>
<th>Class homework</th>
<th>10 total, keep the top 8</th>
<th>= 80</th>
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</thead>
<tbody>
<tr>
<td>Mid-term Exam</td>
<td>Fri 10-14-16</td>
<td>= 120</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Tue 12-13-16 4:30–6:30</td>
<td>= 150</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>= 350</strong></td>
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</tbody>
</table>

### Lab Notebooks and Lab Quizzes

<table>
<thead>
<tr>
<th>Activity</th>
<th>Week of</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipette Calibration</td>
<td>8/22-8/25</td>
<td>= 5</td>
</tr>
<tr>
<td>Lab 1: Spectrophotometry</td>
<td>8/29-9/1</td>
<td>= 15</td>
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<tr>
<td>Lab 2: pKₐ of Fluorescein</td>
<td>9/12-9/15</td>
<td>= 15</td>
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<tr>
<td>Lab 3: Ion-Exchange Chromatography</td>
<td>9/19-9/22</td>
<td>= 15</td>
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<tr>
<td>Lab 4: Gel Filtration Chromatography</td>
<td>9/26-9/29</td>
<td>= 15</td>
</tr>
<tr>
<td>Performance Quiz #1</td>
<td>10/3-10/6</td>
<td>= 5</td>
</tr>
<tr>
<td>Lab 5: Purify genomic DNA, PCR amplification of AdhP</td>
<td>10/3-10/6</td>
<td>= 15</td>
</tr>
<tr>
<td>Lab 6: Visualize PCR product, TOPO cloning, Transformation</td>
<td>10/10-10/13</td>
<td>= 15</td>
</tr>
<tr>
<td>Performance Quiz #2</td>
<td>10/17-10/20</td>
<td>= 10</td>
</tr>
<tr>
<td>Lab 7: Minireps, Restriction Digest Analysis</td>
<td>10/17-10/20</td>
<td>= 15</td>
</tr>
<tr>
<td>Lab 8: Purification of AdhP enzyme, concentration determination</td>
<td>10/24-10/27</td>
<td>= 15</td>
</tr>
<tr>
<td>Lab 9: SDS-PAGE and Western Blotting</td>
<td>10/31-11/3</td>
<td>= 15</td>
</tr>
<tr>
<td>Lab 10: Western Blotting continued, Enzyme Activity Assay</td>
<td>11/7-11/10</td>
<td>= 15</td>
</tr>
<tr>
<td>Lab 12: Kinetics of Inhibition of AdhP</td>
<td>12/28-12/1</td>
<td>= 15</td>
</tr>
<tr>
<td>Check-out of labs</td>
<td>12/5-12/8</td>
<td>= 15</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>= 200</strong></td>
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| TA discretionary points | = 50 |

### TOTAL for Course | = 600 |

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**Examinations and Quizzes**

- In-class or online quizzes and homework assignments will be held throughout the semester at the instructor’s discretion and worth a total of 80 points.
- You should come to class prepared for *every lecture,*
- This includes bringing *your own* calculator.
- There will be no make-up quizzes.
- Consult with Canvas prior to each meeting date to stay current with class requirements
- The mid-term and final exams will be comprehensive to-date.
- Make-up exams will only be allowed only with prior approval and/or appropriate documentation per university guidelines.
Adjustments for Pregnancy/Childbirth Related Issues
Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact me as soon as possible to discuss. Generally, modifications will be made where medically necessary and similar in scope to accommodations based on temporary disability. Please see www.ou.edu/content/eoo/faqs/pregnancy-faqs.html for commonly asked questions.

Title IX Resources
For any concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or intimate partner violence, the University offers a variety of resources, including advocates on-call 24.7, counseling services, mutual no contact orders, scheduling adjustments and disciplinary sanctions against the perpetrator. Please contact the Sexual Misconduct Office 405-325-2215 (8-5) or the Sexual Assault Response Team 405-615-0013 (24.7) to learn more or to report an incident.

Academic Integrity
All students are expected to conform to college-level standards of ethics, academic integrity, and academic honesty. By enrolling in this course, you agree to be bound by the Academic Misconduct Code published in The University of Oklahoma Student Code (http://studentconduct.ou.edu/). Please see http://integrity.ou.edu for more information.

All members of the community recognize the necessity of being honest with themselves and with others. Cheating in class, plagiarizing, lying and employing other modes of deceit diminish the integrity of the educational experience. None of these should be used as a strategy to obtain a false sense of success. The need for honest relations among all members of the community is essential.

Religious Observance
It is the policy of the University to excuse the absences of students that result form religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays. Schedule conflicts such as these should be brought to the instructor’s attention at the beginning of the semester.

Reasonable Accommodation Policy
Students requiring academic accommodation should contact the Disability Resource Center for assistance at (405) 325-3852 or TDD: (405) 325-4173. For more information please see the Disability Resource Center website http://www.ou.edu/drc/home.html.

Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.