

## Chemistry 471 (3 C.H.): Biological Chemistry Laboratory – Fall 2016

<b>Lecture:</b>	Tuesday 12 pm – 12:50 pm	LaT 300
<b>Laboratory:</b>	Tuesday & Thursday 1:00 pm – 3:50 pm	LaT 445
<b>Professor:</b>	Dr. James Horn, Associate Professor <a href="mailto:jrhorn@niu.edu">jrhorn@niu.edu</a> , Ph: 815-753-8654	LaT 432

**Teaching Assistants:** Brian Hartnett ([bhartnett@niu.edu](mailto:bhartnett@niu.edu))  
Dakota Grote ([dgrote1@niu.edu](mailto:dgrote1@niu.edu))  
Kaitlynn Davenport ([ksullivan4@niu.edu](mailto:ksullivan4@niu.edu))

**Website:** NIU Blackboard (<https://webcourses.niu.edu/>)

**Required Text:** Modern Experimental Biochemistry, 3<sup>rd</sup> ed., R.F. Boyer Addison – Wesley, 2000  
*Recommended Text* Lenhinger “Biochemistry 6th edition.

<b>Office Hours:</b>	Dr. Horn	By Appointment	LaT 432
	Brian Hartnett	T/TH: 11AM-12PM	LaT 438
	Dakota Grote	T/TH: 4PM-5PM	LaT 438
	Kaitlynn Davenport	W: 10AM-11AM	LaT 437A

### Learning Outcomes

- Improve the ability to think critically, logically, and creatively;
- Develop proficiency in basic biochemical laboratory skills and the use of biochemical techniques, tools, and equipment;
- Develop proficiency in the application of the scientific method to design biochemical experiments to better understand biochemical phenomena;
- Improve the ability to communicate scientific topics through written reports and oral presentations

### Student Assessment

The course grade breakdown is as follows:

Exams (2)	(100 pts each)	30% of final grade
Lab reports	(100 pts each)	30% of final grade
Weekly reading quizzes	(10 pts each)	10% of final grade
FPP Presentation	(100 points)	10% of final grade
FPP Final Paper	(100 points)	20% of final grade

The grading scale will be based on the total weighted points from 9 reports (6 regular labs, 1 final lab, 2 worksheets), 10 quizzes and two one-hour long exams. The total percent of points earned, **based on the weighted scale**, will be used to determine the final grade as follows:

≥93=A, 90-92=A-, 87-89=B+, 83-86=B, 80-82=B-, 77-79=C+, 70-76=C, 60-69=D, ≤59= F.

### Accessibility Statement

Northern Illinois University is committed to providing an accessible educational environment in collaboration with the Disability Resource Center (DRC). Any student requiring an academic accommodation due to a disability should let his or her faculty member know as soon as possible. Students who need academic accommodations based on the impact of a disability will be encouraged to contact the DRC if they have not done so already. The DRC is located on the 4th floor of the Health Services Building, and can be reached at 815-753-1303 (V) or [drc@niu.edu](mailto:drc@niu.edu).

## Course Procedures and Policies

### Grading & Attendance

1. The course will consist of one hour of lecture and two three-hour laboratory periods per week.
2. Punctuality is important with all laboratories and lectures. Students must be on time to each laboratory or classroom unless otherwise discussed with the professor or teaching assistant. If the student is late to lecture by more than 5 minutes, they will receive a zero for the lab report. If the student is late to lecture by more than 10 minutes, they will be unable to take the quiz and they will receive a zero for their lab report.
3. Attendance at *all* lecture and laboratory periods **is mandatory!** Students absent from a lecture period or laboratory will receive a grade of zero for that quiz and laboratory. No make up labs will be offered. Absences may be excused for medical reasons at the discretion of the professor in consultation with the teaching assistants. Timely notification to the teaching assistant as well as to the professor is imperative; **an official, original, doctor's note indicating the class time to be missed is required.** *Note: University Health Services will (usually) only excuse an absence for the time that you are at Health Services and not excuse you from any classes missed as result of an illness.*

From the NIU catalog

*"The university does not use a "cut" system. Each instructor decides whether to excuse class absences and determines how to permit make-up work. [...]"*

*Students are expected to comply with each individual instructor's established attendance policy. It is recommended that students avoid registering for classes in which they would amass significant absences. In the case of an absence due to required attendance at a university-sponsored event such as a department trip, performing arts activity, ROTC function, or athletic competition, reasonable attempts shall be made by faculty members to allow the student to make up missed work. Students are responsible for completing the work assigned and/or due on the days they are absent for university-sponsored events. Both the sponsoring unit and the student should inform the faculty member as soon as possible in the semester in order for arrangements to be made for completing missed assignments, examinations or other required course work. The student is required to provide each instructor with an official notification in advance of the absence (e.g., a letter from the chair of the sponsoring department, the head of the sponsoring unit, or the coach)."*

4. If a student does not attend a lecture period, that student will not be allowed to attend the laboratory periods that week. They will receive a grade of zero as discussed above.
5. At the beginning of each lecture period, students will be given a written quiz on the reading assignment for that week. There will be no make-up quizzes.
6. Students with a recorded **grade of zero on two or more** laboratory reports, or if they do not turn in their final fluorescent protein report, will receive a grade of **F** for the course.

## Laboratory Reports

*See Boyer Pages 8 – 10*

1. Laboratory reports and worksheets are due at the beginning of the first lecture hour following the scheduled completion of the experiment. If experiments last more than one week, multiple reports will be due, one on each lecture period during the course of the experiment, covering the portion of the experiment performed the preceding week. **Late reports will not be accepted, and will have a grade of zero recorded.**
2. **Experimental data is to be kept in a laboratory notebook.** The original data recorded are to be turned in with the lab report as carbon copies or photocopies of pages.
3. Written formal laboratory reports should conform to the general format described in the course text on pages 8 – 10 (as well as the example provided on blackboard). The final report will resemble the format of a primary research article, as found in the ACS Journal *Biochemistry*. A general rubric will be provided with guidelines for expectations and grading. Note, not all sections are required each week. The syllabus outlines the required sections.
4. **Lab reports are to be typed, single spaced, Times New Roman font, with proper ACS citations when needed.**
5. **All lab reports will be submitted through blackboard safe assign. This must be accomplished before coming to lecture the day the lab report is due.** Safe assigned is used to check for plagiarism from the internet as well as from other students. A percentage of similarity between other papers will be given to the students. Care must be taken to ensure proper citation is followed. You will be required to turn in a paper copy as well, since lab reports will be graded on paper.
6. Plagiarism, or any other form of academic dishonesty, will not be tolerated. Lab reports are expected to be wholly original works created in their entirety by the individual who turns them in for credit. This also includes tables, graphs, and other images! Any violation of this will be handled in accordance with the NIU Student Code of Conduct. The student must complete the academic dishonesty tutorial within the first week of the course in order to have grades given for the course. **Students must complete the academic dishonesty tutorial with a passing grade and a certificate of completion before grades will be return to the student.**

From the academic catalog:

*“Good academic work must be based on honesty. The attempt of any student to present as his or her own work that which he or she has not produced is regarded by the faculty and administration as a serious offense. Students are considered to have cheated if they copy the work of another during an examination or turn in a paper or an assignment written, in whole or in part, by someone else. Students are responsible for plagiarism, intentional or not, if they copy material from books, magazines, or other sources without identifying and acknowledging those sources or if they paraphrase ideas from such sources without acknowledging them. Students responsible for, or assisting others in, either cheating or plagiarism on an assignment, quiz, or examination may receive a grade of F for the course involved and may be suspended or dismissed from the university.”*

## Fluorescent Protein Projects (FPP)

To gain true inquiry-based research experience, the last third of the class is devoted to project-based lab sessions. During this time, new techniques will be introduced to you and you will be in the driver seat to design, execute, and analyze lab experiments. The final paper will be a formal report with no page limitation discussing your experiences in the lab. You will also be required to have a 10-15 minute presentation of your findings, as well as proposing future investigations. More details will be available later in the semester.

## Exams

You will take two exams during the semester that will cover the topics in the labs that occurred prior to the exam. They will not be cumulative. They will be one hour long.

## Safety and Conduct

1. Students are expected to follow all safety procedures. This includes correct usage of department-issued safety goggles at all times, unless specifically instructed otherwise, as well as any and all other personal protective equipment directed by the instructor.
2. **Goggles are required at all times!** Failure to comply will result in the following penalties: The first will be a warning, the second will be a 5 point deduction from the student's lab report, and the third will be removal from the lab, resulting in a zero on the lab report for that week.
3. Clothing should be able to protect you from spills or chemicals including strong acids and bases. Illinois law requires that, while working in a laboratory setting, anything **below the waist to be covered. Shorts, short skirts, sandals, and open-toed shoes are not acceptable lab clothing.** If a student comes to lab not properly dressed and prepared for lab, they shall be removed from lab until they can return properly covered.
4. **Lab coats will be mandatory for all laboratories. Coats will be available for purchase through the stock room, or you may provide your own. These are required by the second week of classes (8/30) or you will not be allowed to participate, this will result in a 0 for the week.** They must be long-sleeved and at least mid thigh length. Cotton-based coats are preferable over synthetic fibers for safety reasons.

Students are expected to conduct themselves in a safe, professional manner at all times. If at any point a student appears to be disruptive and unsafe, they may be removed from the laboratory at the teaching assistant's discretion without the ability to make up the lab.

## TENTATIVE LECTURE SCHEDULE

<u>Week</u>	<u>Day</u>	<u>Date</u>	<u>Lab</u>	<u>Due*</u>	<u>Reading*</u>
<b>1</b>	T	8/23	<b>#1)</b> Check in, Pipettors, Specs	None	B: 3-41, L: 132-134
	Th	8/25	pH meters, Buffers		
<b>2</b>	T	8/30	<b>#2)</b> Miniprep/DNA melt/PCR	Buffer WS	L: 415-421, 431-436
	Th	9/1			
<b>3</b>	T	9/6	<b>#3)</b> Agarose/Restriction Digest	<b>#2:</b> I	L: 415-421, 431-436
	Th	9/8			
<b>4</b>	T	9/13	<b>#4)</b> Bradford Assay/UV-Vis	<b>#3:</b> RD	B: 29-48
	Th	9/15			
<b>5</b>	T	9/20	Test 1 review	<b>#4:</b> ARD	
	Th	9/22	<b>EXAM 1</b>		
<b>6</b>	T	9/27	<b>#5)</b> Bacterial Expression Week 1	None	B: Ch 3, L: 3.3
	Th	9/29			
<b>7</b>	T	10/4	<b>#6)</b> Bacterial Expression Week 2	<b>#5:</b> I	B: Ch 4, L: 3.3
	Th	10/6			
<b>8</b>	T	10/11	<b>#7)</b> Enzyme Kinetics	<b>#6:</b> ARD	B: Exp 5 279-301, L: Ch 6
	Th	10/13			
<b>9</b>	T	10/18	Test 2 review	<b>#7:</b> MRD	
	Th	10/20	<b>EXAM 2</b>		
<b>10</b>	T	10/25	Molecular Viewing	None	L: Ch 4
	Th	10/27	FPP intro day		
<b>11</b>	T	11/1	FPP Week 1	Molecular Viewing WS	
	Th	11/3			
<b>12</b>	T	11/8	FPP Week 2		
	Th	11/10			
<b>13</b>	T	11/15	FPP Week 3		
	Th	11/17			
<b>14</b>	T	11/22	FPP Week 4	Rough draft/outline (optional)	
	Th	11/24	NO CLASS		
<b>15</b>	T	11/29	Check out/Presentations		
	Th	12/1	Presentations	Full FPP Report (AIMRD)	

\*Legend

A: Abstract

I: Introduction

M: Methods

R: Results

D: Discussion

WS: Worksheet

FPP: Fluorescent Protein Project L: Lenhinger

B: Boyer