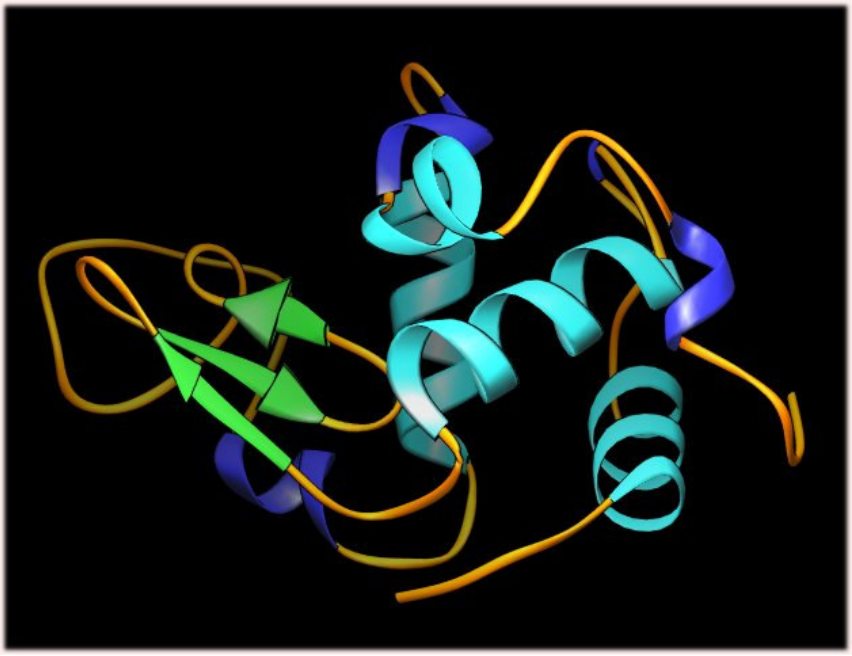
The University of Texas at Tyler
CHEM 4135: Biochemistry Laboratory



T or W 1:00-5:00PM, Room RBS 4007
Fall 2009

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"If we knew what it was we were doing, it would not be called research, would it?!"
- Albert Einstein

THE UNIVERSITY OF TEXAS AT TYLER
SYLLABUS FOR CHEM 4135
BIOCHEMISTRY LABORATORY
Instructor – Dr. Shaun D. Black
Fall 2009

I. INTRODUCTION

This course will guide you through the major topics of modern experimental Biochemistry, which include measurement techniques, buffers, spectrophotometry, sub-cellular fractionation, differential centrifugation, enzyme purification, column chromatography, electrophoresis, immunoblotting, enzyme kinetics, protein crystallization, protein NMR, and molecular modeling. At the completion of the course, students should have a good understanding of the theory and practice of modern Biochemical research techniques.

Because Biochemistry is, by its nature, an integrative subject, a background in chemistry, organic chemistry, algebra, physics, and biology are very important for success. Students who discern some deficiency with regard to background in any of these areas should commit extra study time to improve understanding, especially in the early weeks of the semester.

II. COURSE OBJECTIVES / STUDENT LEARNING OUTCOMES

A. To provide the student with a thorough understanding of the fundamentals of modern Biochemical research techniques.

B. To develop mechanistic, quantitative, and conceptual problem-solving skills.

C. To promote creative thought by the student.

D. To encourage independent work and learning.

E. To encourage multitasking and organizational skills fundamental to good research.

III. INSTUCTIONAL MATERIALS

A. Text: Handouts of the experiments will be available in the laboratory room.

B. A ~1.5” looseleaf 3-ring notebook and lined paper.

C. Scientific calculator capable of basic operations, logarithms, inverse, & scientific notation.

D. A 12-inch ruler with metric scale.

E. Safety items: Closed-toed shoes, safety glasses or goggles, and lab coat or apron.

F. Other materials assigned by the instructor.

IV. COURSE REQUIREMENTS

A. The class will meet September 1st or 2nd through December 7th or 8th at 1:00 – 5:00PM on T or R

B. Students begin to earn the grade they will ultimately receive in the course at the first meeting. Scores on laboratory write-ups will primarily determine the course grade; a midterm examination and final examination will determine the remainder of the grade. However, class participation, initiative, and attendance may also be considered in the final course grade. Students must keep up with material as the semester progresses.

C. Students should bring their laboratory notebook, pencil/pen, calculator, and all other necessary materials to each class meeting. If you are unable to attend a class meeting, all discussed material and all assignments are your responsibility. Regular classroom attendance is expected.

D. Students will be required to spend some time outside normal laboratory hours to check or monitor experimental progress.

E. Students should take adequate notes during pre-lab talks.

F. Any student with an exam or laboratory grade of D or F should consult with the instructor to ascertain the basis for their low performance. Prompt action is most prudent.

G. If an exam or laboratory is missed, a score of 0 will be used during final grade computation. No make-up examinations will be given, except in the case of official university absences. No examination will be given after its scheduled date. If a student must miss class for a religious observance, please inform the instructor at the beginning of the course.

H. Preparation for the final examination will begin with the fist class meeting. The comprehensive final examination will be given on Tuesday December 15, 2009 from 2:00 – 4:00PM (Section 001) or Wednesday December 16, 2009 from 2:00 – 4:00 PM (Section 002).

I. Students will find CHEM 4334 (Biochemistry I Lecture) a useful companion to this course.

J. Mental discipline and repetition are important in the learning process. Students should discipline themselves to perform at their optimal level in this course.

K. The last day to withdraw from this course (automatic grade of "W") is October 30, 2009. Before withdrawing from this course, students should consult with the instructor; the instructor must sign all withdrawal forms. Failure to drop officially results in an "F" grade.

V. LAB WRITE-UPS and EXAMINATIONS

A. Four multi-part laboratory exercises will be carried on during the course of the semester; reports on each of these will be required at various times, generally a week after the completion of the laboratory. **Late assignments will not be accepted and will receive a grade of 0.**

B. One midterm examination and a final examination will be given. All examinations are comprehensive, but the material covered since the previous examination will receive the greatest emphasis. Examinations will cover material from the lab write-ups, lectures, and any other assigned material. A student who does not show their student identification to the instructor when requested during an examination period will not receive a grade for the examination.

C. Students are to take only pencils, pens, eraser, and calculator to their desks for examinations. Only non-programmable calculators will be allowed during examinations. For students who do not have a non-programmable scientific calculator, one will be provided. Under no circumstance should a student have paper, textbook, notebooks, or other materials at their desk during an examination, unless the instructor approves the materials. Scratch paper will be provided. Students will have an opportunity during an examination to clarify test questions that may be unclear.

D. The best strategy for examinations is: "Test yourself before the test". Study previous examinations, draw structures, work problems, consult with your study group, or make your own examination to achieve this.

E. Cheating of any kind will not be tolerated. University regulations are quite explicit about academic dishonesty, and these regulations will be enforced. During examinations, an honor code will apply such that students are to work alone and neither give nor accept help to/from others. Students are expected to help enforce the code. Students are encouraged to obtain a copy of *A Student Guide to Conduct and Discipline at UT Tyler*, available in the Office of Student Affairs.

VI. UNIVERSITY POLICIES

A. **Disability Services:** If you have a disability, including a learning disability, for which you request disability support services or accommodation(s), please contact Ida MacDonald in the Disability Support Services Office (282 University Center) or telephone 903-566-7079 (TDD 903-565-5579) so that the appropriate arrangements may be made. In accordance with Federal Law, a student who requests disability support or accommodation(s) must

provide documentation of his/her disability to the Disability Support Services counselor. In order to assure approved services the first week of class, diagnostic, prognostic, and prescriptive information should be received 30 days prior to the beginning of the semester services are requested. Additional information may be obtained from the following UT Tyler website: http://www.uttyler.edu/disabilityservices .

B. **Student Rights and Responsibilities:** To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/StudentRightsandResponsibilities.html .

C. **Grade Replacement / Forgiveness:** If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class. Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates will receive grade forgiveness (grade replacement) for only three course repeats; graduates, for two course repeats during their career at UT Tyler.

D. **State-mandated Course Drop Policy:** Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the 12th day of class (See Schedule of Classes for the specific date). Exceptions to the 6-drop rule include, but are not limited to, the following: totally withdrawing from the university; being administratively dropped from a course; dropping a course for a personal emergency; dropping a course for documented change of work schedule; or dropping a course for active duty service with the U.S. armed forces or Texas National Guard. Petitions for exemptions must be submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions.

E. **Social Security and FERPA Statement:** It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

VII. SEMESTER GRADE COMPUTATION

A. Laboratory Exercises: Your score out of 100 on each.

B. Midterm examination: Your score out of 100.

C. Final examination: Your score out of 100.

D. Laboratory sub-sections (13) are weighted by 6% each (78% total).

E. Midterm is weighted by 10% and the final examination is weighted by 12%.

F. Incentive points may be added, based on initiative, improvement, lab participation, professional attitude, and class attendance.

G. Percent to grade ratio:

90-100%	A
80-89.9%	B
70-79.9%	C
60-69.9%	D
50-59.9%	F

Chemistry 4135: Biochemistry Laboratory

Instructor: **Dr. Shaun D. Black (RBS 3029)**
Office hours: **T,R 11:00 AM – 12:00 Noon, W 9:00 AM – 12:00 Noon**
Laboratories: **T or W 1:00 – 5:00 PM (RBS 4007)**

1.	T,W 9/1,2/09	Experiment 1: Significant Figures, Quantitative Pipeting
2.	T,W 9/8,9/09	Experiment 2: 2a. pH/pKa Measurement & Unknowns (Census Day)
3.	T,W 9/15,16/09	2b. Theory and Preparation of Buffers
4.	T,W 9/22,23/09	Experiment 3: 3a. LDH Purification: Centrifugation & Fractionation
5.	T,W 9/29,30/09	3b. Ion Exchange Chromatography and Spectrophotometry
6.	T,W 10/6,7/09	3c. Affinity Chromatography
7.	T,W 10/13,14/09	3d. Gel Filtration Chromatography (*Midterm Examination*)
8.	T,W 10/20,21/09	3e. LDH Enzyme Kinetics
9.	T,W 10/27,28/09	3f. SDS-PAGE Electrophoresis & Unknowns
10.	T,W 11/3,4/09	3g. Western Blotting of LDH
11.	T,W 11/10,11/09	Experiment 4: Protein Biophysics: 4a. Lysozyme Crystallization
12.	T,W 11/17,18/09	4b. Protein model building
13.	T,W 11/24,25/09	*No Laboratories (Thanksgiving Vacation)*
14.	T,W 12/1,2/09	4c. Protein NMR Spectroscopy
15.	T,W 12/8,9/09	Make-ups

Final Examination: Tuesday December 15, 2009 from 2:00 – 4:00PM (Section 001) or Wednesday December 16, 2009 from 2:00 – 4:00 PM (Section 002) (comprehensive over entire course)

Lab Sub-sections (13) are worth 6% each, the Midterm Examination is worth 10% of your grade, and the Final Examination will count 15% toward your final grade. Grading will be as follows: A = 100-90%, B = 89.9-80%, C = 79.9-70%, D = 69.9-60%, F = below 60%.