

**CHEM 3438W – Introductory Biochemistry**  
**Sam Houston State University**  
Fall 2016  
Dr. Donovan C. Haines

**Course Information**

Section 02:        TuTh 11:00 am – 12:50 am  
Meet in CFS 121

**Instructor Information**

Dr. Donovan C. Haines  
Office: CFS 317F        Phone: 936-294-1530        Email: [haines@shsu.edu](mailto:haines@shsu.edu)  
Office hours (tentative – listen in class for any changes):  
TuTh 10:00am-10:45am; Tu 3:30pm-4:00pm; Other hours by appt.

**Required Materials**

Lecture Text: Berg, Tymoczko, Stryer: Biochemistry, 8<sup>th</sup> Edition; Freeman. ISBN 9781464126109.  
Lab Text: SHSU CHEM 3438W Lab Manual (“Protocols and Procedures Manual”)

**SHSU Catalog Descriptions and Prerequisites**

**CHEM 3438W - Introductory Biochemistry.** Prerequisite: A minimum grade of C in CHEM 1311/1111 or 1411, 1312/1112 or 1412, 2323/2123, 2325/2125. The chemistry and functions of carbohydrates, lipids, proteins, enzymes, nucleic acids and vitamins; enzyme kinetics; the processes of and mechanisms of digestion and absorption; and biological buffers are studied. Four-hour laboratory. Writing Enhanced.

**Course Objectives**

- Understand the nature of amino acids and proteins, and how their structures support their functions
- Understand and be able to perform and analyze enzyme kinetic experiments
- Become familiar with the fundamental lab techniques used in the field of biochemistry
- Understand the detailed organic chemistry of how enzymes catalyze chemical reactions
- Become familiar with the role of genetics and bioinformatics in modern biochemistry, and be able to find, read, interpret, and apply bioinformatics data
- Understand the basic features of drug development and drug metabolism

## **Writing Enhancement**

This is a writing enhanced course, and as such a significant portion of the course is designed to help you improve your writing. The majority of your lab grade (which is 25% of the course grade) is awarded for your formal lab reports, of which there are four. A portion of the points are also awarded for your written laboratory notebook and discussions you will write there after each experiment. You will receive written comments on your writing so that you may improve for the subsequent reports and notebook discussions. You will also have lecture assignments requiring you to write posts in the discussion board in Blackboard. Very detailed requirements for formal reports and the notebook will be provided in writing in lab and discussed the first day of lab. Most of the lecture assignments are also written assignments and there are some essay questions on the exams.

## **Blackboard:**

We will use Blackboard heavily for this course. You will find PowerPoint files and printable lecture note handouts there, check grades, and take some quizzes in Blackboard. In addition, some writing assignments will be uploaded or pasted directly into Blackboard. You must check both Blackboard and your email periodically (at least once or twice per week) for announcements.

## **Kaltura:**

Dr. Haines will be using Kaltura in Blackboard to post recorded lectures and videos for some assignments outside of lecture. He uses Adobe Captivate and Screencast-O-Matic to record the videos, which are programs that record everything on the screen and the audio on a microphone that Dr. Haines uses in class. Typically lectures are available (from within Blackboard) within an hour or two after lecture. Students have found this extremely useful and I will require you to check it out early in the semester. Like any technology, however, from time to time there is a malfunction so ***it is possible that not all lectures may be available***. You will only be required to access videos a few times this semester, if you have problems accessing it from off campus you can always use the on campus computer labs (in LSC for example). As Dr. Haines tests related tools, he may post additional audiovisual learning aids as well.

## **Note on Exam Material:**

Exams cover material in the relevant chapters of the text as well as what we go through in class. Often there is extensive overlap between the two, but make sure you are studying your textbook in addition to the lectures. Always work the problems at the end of the chapters (these problems may be collected as formative assignments – be sure to listen to announcements in class regarding this.)

**Schedule** (This schedule is subject to change.)

|              | <u>Date</u>   | <u>Chapter</u>  | <u>Subject</u>                                | <u>Lab</u>  |
|--------------|---------------|-----------------|---|---|
| Thurs        | 26-Aug        | 1               | Introduction/Review                           |   |
| Tue          | 30-Aug        | 1               | Biochemistry (Overview and Rev.)              |   |
| Thurs        | 1-Sep         | 1               | Biochemistry (Overview and Review)            |   |
| Tue          | 6-Sep         | 2               | Protein Structure                             | Check-in, Pipette cal., Intro to Series                                     |
| Thurs        | 8-Sep         | 2               | Protein Structure                             |   |
| Tue          | 13-Sep        | 2/3             | Protein Structure/ Exploring Proteins         | 1Riboflavin (Buffers and Dyes)  |
| Thurs        | 15-Sep        | 3               | Exploring Proteins                            |   |
| <b>Tue</b>   | <b>20-Sep</b> | <b>EXAM 1</b>   | <b>EXAM 1 (Chp 1-2 &amp; Review)</b>          | Enzyme Series Day 1: Lactase Extraction/Bradford                            |
| Thurs        | 22-Sep        | 3               | Exploring Proteins                            |   |
| Tue          | 27-Sep        | 7               | Hemoglobin                                    | Enzyme Series Day 2: Gel Filtration   |
| Thurs        | 29-Sep        | 7/8             | Hemoglobin/ Enzymes, Intro and Kinetics       |   |
| Tue          | 4-Oct         | 8               | Hemoglobin/ Enzymes, Intro and Kinetics       | Enzyme Series Day 3: SDS-PAGE & Kinetics (Derivation Videos and Experiment) |
| Thurs        | 6-Oct         | 8/9             | Enzymes, Intro and Kinetics/ Enzyme Catalysis |   |
| <b>Tue</b>   | <b>11-Oct</b> | <b>EXAM 2</b>   | <b>EXAM 2 (Chp 3,7,8)</b>                     | Enzyme Series Day 5: Kinetic Data Analysis (Video Tutorial)                 |
| Thurs        | 13-Oct        | 9               | Enzyme Catalysis                              |   |
| Tue          | 18-Oct        | 9/10            | Enzyme Catalysis/Regulation                   | Synthetic Biology Day 1: Intro, Transformation/Plates                       |
| Thurs        | 20-Oct        | 10              | Enzyme Regulation                             |   |
| Tue          | 25-Oct        | 10              | Enzyme Regulation                             | SynBio Day 2: Digestion, Ligation, Transformation                           |
| Thurs        | 27-Oct        | 10              | Enzyme Regulation                             |   |
| <b>Tue</b>   | <b>1-Nov</b>  | <b>EXAM 3</b>   | <b>EXAM 3 (Chp 9,10)</b>                      | SynBio Day 3: DNA Purification & Protein Fluor.                             |
| Thurs        | 3-Nov         | 4/5             | Video Lecture: Genetics /Genes and Genomes    |   |
| Tue          | 8-Nov         | 5               | Genes and Genomes                             | SynBio Day 4: Agarose Gel Electrophoresis, Wrap-up and Final Exam Review    |
| Thurs        | 10-Nov        | 6               | Bioinformatics                                |   |
| Tue          | 15-Nov        | 6               | Bioinformatics                                | Lab Final   |
| Thurs        | 17-Nov        | 6               | Bioinformatics                                |   |
| <b>Tue</b>   | <b>22-Nov</b> | <b>Exam 4</b>   | <b>Exam 4 (Chp 4-6)</b>                       |   |
| Thurs        | 24-Nov        | <i>No Class</i> | <i>No class - Thanksgiving Break</i>          |   |
| Tue          | 29-Nov        | 34              | Drug Development and Drug Metabolism          |   |
| Thurs        | 1-Dec         | 35              | Special Topic #2                              |   |
| <b>Thurs</b> | <b>8-Dec</b>  |                 | <b>COMPREHENSIVE FINAL EXAM, noon-2pm</b>     |   |

Note: The topics covered after Exam 4 are not on a regular exam. They are on the comprehensive final (and will be addressed in quizzes and assignments).

## Grading

|                       |     |
|-----------------------|-----|
| Exams (4)             | 30% |
| Formative Assignments | 10% |
| Summative Assignments | 15% |
| Lab                   | 25% |
| Final Exam            | 20% |

TOTAL: 100%

### Grading Scale:

Your total points for the semester will be rounded to the nearest whole point and your grade will be determined as follows:

|              |   |
|--------------|---|
| 90 and above | A |
| 80 to 89     | B |
| 70 to 79     | C |
| 60 to 69     | D |
| Below 60     | F |

Exams. Exams will be taken during normal class time. All exams are inherently comprehensive, but focus on the material covered since the previous exam. If you miss an exam for any reason your final exam score will be counted in place of the missing exam score. Exams are mixed format with some multiple choice questions and some essay questions.

Assignments. Various writing assignments on topics related to class will be assigned throughout the semester. We will be doing a series of small writing assignments that will be later incorporated into a major paper for the semester. The major paper at the end will be count double (it will be entered into the gradebook as two writing assignments with the same score). Some assignments are Formative Assignments, which are assignments designed primarily to help you learn not necessarily to measure what you have learned. These assignments tend to have high average scores. Other assignments are Summative Assignments designed to measure if your mastery of the material is coming along; these assignments tend to have lower averages (in-class pop-quizzes are a good example of a summative assignment). In each category of assignment, I will drop one lowest score for every five assignments (so if there are ten summative assignments by the end of the semester, I will drop your lowest two scores for example).

Lab. A separate dedicated lab syllabus describing the schedule and grading and handouts regarding lab formal report content will be distributed in your lab course.

Final Exam. The final exam is comprehensive and takes place in our lecture room at noon to 2pm on Thursday, December 8<sup>th</sup>.

## **University Wide Policies**

Additional details can be found at <http://www.shsu.edu/syllabus/>.

### **ACADEMIC DISHONESTY:**

All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials. For a complete listing of the university policy, see:

[Dean of Student's Office: http://www.shsu.edu/~slo\\_www/](http://www.shsu.edu/~slo_www/)

### **STUDENT ABSENCES ON RELIGIOUS HOLY DAYS POLICY:**

Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Section 51.911 (a) (2) defines a religious holy day as: "a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20...." A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed. For a complete listing of the university policy, see:

</dept/academic-affairs/documents/aps/students/861001.pdf>

## **STUDENTS WITH DISABILITIES POLICY:**

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail [disability@shsu.edu](mailto:disability@shsu.edu)). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see:

<http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf>

## **VISITORS IN THE CLASSROOM:**

Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.