Syllabus for CHEM 410 (Fall 2015)

Class:  Biochemistry I
Room:  SCIT 302
Time:  Lecture: TR 2:30 - 3:45 pm
       Lab: Thurs 4:00-6:45 pm

Instructor:  Md Abul Kalam
Office:  SCIT 318B
Office Hrs:  MW 03:00 -5:00pm
Email:  md.kalam@tamut.edu
Office Phone:  (903)-223-3175

COURSE DESCRIPTION

Biochemistry I is the first course of a two-semester sequence in biochemistry. This course covers the structure and function of amino acids, proteins, carbohydrates, lipids, nucleotides and nucleic acids. This course also introduces biological membranes, membrane transport, enzyme kinetics and regulation. Prerequisites: CHEM 1311, CHEM 1312, and CHEM 2425 passed with grade C or better.

COURSE DELIVERY METHODS

- Face-to-face lecture
- Class discussion
- Web-enhanced/based multimedia
- Laboratory Work

TEXTBOOKS/RESOURCES

Required:  Biochemistry by Garrett &Grisham (5/E)
Recommended:  1. Experiments in Biochemistry- A Hands-on Approach by Farrell & Taylor (2/E)
               2. OWL access to Biochemistry by Garrett &Grisham (5/E)

STUDENT LEARNING OUTCOMES (SLO)

A student graduating with the chemistry minor is expected to demonstrate that (s)he is able to:

1. Explain atomic & molecular structures, bonding, stoichiometry, and periodic properties of representative elements
2. Apply the concepts and fundamental principles of thermodynamics, chemical equilibria, and chemical kinetics.
3. Write and explain organic reactions, stereochemistry, and processes in biological and environmental systems
4. Use essential instruments/equipment to perform selected chemistry experiments in the laboratory
STUDENT LEARNING OBJECTIVES

At the end of this course, a student should be able to

A. Describe the structures and functions of water, carbohydrates, lipids, amino acids, and proteins
B. Explain the enzyme Kinetics and recognize the roles of Thermodynamics in Biological Systems
C. Describe nucleic acids and their functions in the storage and transfer of biological information
AND
D. Demonstrate essential lab-techniques used in biochemistry

Lecture sessions are designed to fulfill SLO 3 and lab sessions are designed to fulfill SLO 4

COURSE OUTLINE

The following topics will be covered:

Chapter 1: The Facts of Life: Chemistry is the Logic of Biological Phenomena
Chapter 2: Water: The Medium of Life
Chapter 3: Thermodynamics of Biological Systems
Chapter 4: Amino Acids and the Peptide Bond
Chapter 5: Proteins: Their Primary Structure and Biological Functions
Chapter 6: Proteins: Secondary, Tertiary, and Quaternary Structure
Chapter 7: Carbohydrates and the Glycoconjugates of Cell Surfaces
Chapter 8: Lipids
Chapter 9: Membranes and Membrane Transport
Chapter 10: Nucleotides and Nucleic Acids
Chapter 11: Structure of Nucleic Acids
Chapter 12: Recombinant DNA
Chapter 13: Enzyme Kinetics and Specificity
Chapter 14: Mechanism of Enzyme Action
Chapter 15: Enzyme Regulation
## Course Calendar

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture on</th>
<th>Homework Due</th>
<th>Pre-Lab Report Due</th>
<th>Experiment</th>
<th>Post-Lab Report Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/25/2015</td>
<td>Chapter 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08/27/2015</td>
<td>Chapter 1</td>
<td></td>
<td></td>
<td>Safety Video</td>
<td></td>
</tr>
<tr>
<td>09/01/2015</td>
<td>Chapter 2</td>
<td>HW 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09/03/2015</td>
<td>Chapter 3</td>
<td>HW 2</td>
<td>Expt. 1</td>
<td>Expt. 1</td>
<td></td>
</tr>
<tr>
<td>09/08/2015</td>
<td>Chapter 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09/10/2015</td>
<td>Chapter 4</td>
<td>HW 3</td>
<td>Expt. 2</td>
<td>Expt. 2-Part I</td>
<td>Expt. 1</td>
</tr>
<tr>
<td>09/15/2015</td>
<td>Chapter 5</td>
<td>HW 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09/17/2015</td>
<td>Chapter 5</td>
<td></td>
<td>Expt. 2- Part II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>09/22/2015</td>
<td>Exam I: Ch 1-5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09/24/2015</td>
<td>Chapter 6</td>
<td>HW 5</td>
<td>Expt. 3</td>
<td>Expt. 3-Part I</td>
<td>Expt. 2</td>
</tr>
<tr>
<td>09/29/2015</td>
<td>Chapter 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/01/2015</td>
<td>Chapter 7</td>
<td>HW 6</td>
<td>Expt. 3-Part II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/06/2015</td>
<td>Chapter 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/08/2015</td>
<td>Chapter 8</td>
<td>HW 7</td>
<td>Expt. 4</td>
<td>Expt. 4-Part I</td>
<td>Expt. 3</td>
</tr>
<tr>
<td>10/13/2015</td>
<td>Chapter 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/15/2015</td>
<td>Chapter 9</td>
<td>HW 8</td>
<td>Expt. 4-Part II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/20/2015</td>
<td>Chapter 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/22/2015</td>
<td>Exam II: Ch 6-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/27/2015</td>
<td>Chapter 10</td>
<td>HW 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/29/2015</td>
<td>Chapter 11</td>
<td>Expt. 5</td>
<td>Expt. 5-Part I</td>
<td>Expt. 4</td>
<td></td>
</tr>
<tr>
<td>11/03/2015</td>
<td>Chapter 12</td>
<td>HW 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/05/2015</td>
<td>Chapter 12</td>
<td>Expt. 5-Part II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/10/2015</td>
<td>Chapter 13</td>
<td>Expt. 6</td>
<td>Expt. 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/12/2015</td>
<td>Chapter 13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/17/2015</td>
<td>Exam III: Ch 10-13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/19/2015</td>
<td>Chapter 14</td>
<td>Expt. 7/Make-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/24/2015</td>
<td>Chapter 14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/01/2015</td>
<td>Chapter 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/03/2015</td>
<td>Chapter 15</td>
<td>Lab Final/Cleaning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/05/2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**N.B.: This course calendar is subject to change. Changes will be announced via blackboard**
List of Experiments

Expt. 1: Use of pipettors  
Expt. 2: Preparation of Buffers  
Expt. 3: Beer's Law and Standard Curves  
Expt. 4: Protein Concentration of LDH Fractions  
Expt. 5: Gel Filtration Chromatography  
Expt. 6: Ion-Exchange Chromatography  
Expt. 7: Enzyme Kinetics

Homework Assignments

There will be a total 10 problem sets. **NO LATE HOMEWORK WILL BE ACCEPTED.**

Laboratory

Laboratory attendance is required. **NO MAKE-UP LABORATORIES WILL BE GIVEN.** You may drop one laboratory report during the semester. Any additional missed laboratories will count as a **zero**. The laboratory component is worth 25% of the final grade. **Students require getting minimum passing grade (60%) in lab section to pass the course.**

**METHODS OF EVALUATION**

- Examinations
- Assignments
- Lab Reports
- Participation in Lab work

Examinations

There will **three in-course** examinations and **a final** examination. **NO MAKE-UP EXAMS WILL BE GIVEN (with some exceptions).** The final is mandatory and comprehensive. It will be used for the assessment of PLO 1, 2, & 3. Each in-course exam is worth 15% and the final will be worth 20% of the final grade.

- **Exam I:** (15%) Tuesday, September 22, 2015  
- **Exam II:** (15%) Thursday, October 22, 2015  
- **Exam III:** (15%) Tuesday, November 17, 2015  
- **Final Exam:** (20%) Saturday, December 05 (1:30 pm)  
- **Laboratory:** (25%) Ten graded lab sessions  
- **Homework/Class activities:** (10%) Ten graded problem sets  
- **Total Points:** 100%
GRADING SCALE

A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F = 0-59%

N.B.: A student may request for an ‘incomplete’ grade, ONLY if (s)he completes all the course requirements except final exam due to extra-ordinary circumstance(s). If you are in such situations, you are advised to contact me as soon as possible.

STUDENT PARTICIPATION

a. **Participation Policy**: Students are always encouraged to participate in class discussion in lecture sessions and form group to solve assigned problems. Students will participate in team work by conducting lab experiments and discussing the findings in groups.

b. **Course Etiquette**: Use of cell phones (for any purpose) is prohibited. Please turn the cell phone off or keep it in airport mode. Observing safety rules is a MUST for all present in the class.

c. **Discussion Board Standards**: Students are encouraged to use discussion board (on blackboard) for discussions on topics relevant to the course.

LAB POLICIES

**Expectations:**

- Read the purpose and experimental details of the experiment before coming to the lab
- Follow all safety procedures:
  - Shorts and open-toed shoes are NOT allowed in lab. If you come to class without appropriate clothing, you will be asked to leave. NO EXCEPTIONS!

**Attendance:**

Attendance is mandatory. Be on time and plan to spend the entire period in lab. Points may be deducted late arrival or leave early.

**Assignments:**

- **Pre-Lab**: Due at the beginning of the lab (i.e. submit the pre-lab of an experiment before starting the experiment)
- **Data Sheet**: Due at the end of the class on the same day of the experiment
- **Lab Report**: Due at the beginning of the class for the next experiment
Lab Grading:

- Each experiment is worth **50 points**
- These point distribution is as follows
  - Pre-lab report (10)
  - Class Participation (20)
  - Post-lab report (20)
  - Points will be deducted for not turning in lab reports

- Assignments must be completed and turned in on time
  - Assignments must be legible
  - 10% of the grade will be deducted for assignments not turned in at the beginning of lab. An additional 10% will be deducted for each day that the assignment is late

Writing Guidelines

Pre-Lab Report:

- **Purpose:** State the goal of the experiment (in your own words)
- **Reagents:** Write a list of all of the chemicals used in the experiment along with relevant data (grams, volume, molarity etc.)
- **Apparatus:** List all of the equipment that you will use.
- **Procedure:** Outline the steps in the experiment in your own words.

Post-Lab Report:

- **Purpose:** Same as pre-lab report
- **Reagents:** Same as pre-lab report
- **Apparatus:** Same as pre-lab report
- **Procedure:** Same as pre-lab report
- **Observations:** Note the observations that you made during the experiment.
- **Data:** What are your findings? (percent yield etc.)
- **Conclusions:** What do you think of the results? Are they what you expected? Why?

**DISABILITY ACCOMMODATIONS**

Students with disabilities may request reasonable accommodations through the A&M-Texarkana Disability Services Office by calling 903-223-3062.

**PREGNANCY RELATED CONDITIONS**

PLEASE NOTIFY YOUR INSTRUCTOR ABOUT YOUR CONDITION ON THE VERY FIRST DAY IN THE BEGINNING OF THE COURSE.
ACADEMIC INTEGRITY

Academic honesty is expected of students enrolled in this course. Cheating on examinations, unauthorized collaboration, falsification of research data, plagiarism, and undocumented use of materials from any source constitute academic dishonesty and may be grounds for a grade of ‘F’ in the course and/or disciplinary actions. For additional information, see the university catalog.

A&M-TEXARKANA EMAIL ADDRESS

Upon application to Texas A&M University-Texarkana an individual will be assigned an A&M-Texarkana email account. This email account will be used to deliver official university correspondence. Each individual is responsible for information sent and received via the university email account and is expected to check the official A&M-Texarkana email account on a frequent and consistent basis. Faculty and students are required to utilize the university email account when communicating about coursework.

DROP POLICY

To drop this course after the census date (see semester calendar), a student must complete the Drop/Withdrawal Request Form, located on the University website (http://tamut.edu/Registrar/droppingwithdrawing-from-classes.html) or obtained in the Registrar’s Office. The student must submit the signed and completed form to the instructor of each course indicated on the form to be dropped for his/her signature. The signature is not an “approval” to drop, but rather confirmation that the student has discussed the drop/withdrawal with the faculty member. The form must be submitted to the Registrar’s office for processing in person, email Registrar@tamut.edu, mail (7101 University Ave., Texarkana, TX 75503) or fax (903-223-3140). Drop/withdraw forms missing any of the required information will not be accepted by the Registrar’s Office for processing. It is the student’s responsibility to ensure that the form is completed properly before submission. If a student stops participating in class (attending and submitting assignments) but does not complete and submit the drop/withdrawal form, a final grade based on work completed as outlined in the syllabus will be assigned.

CLASS PARTICIPATION

Students are responsible for beginning their participation on the FIRST CLASS DAY by logging on and completing assignments according to the COURSE CALENDAR. Failure to submit online assignments between the first day of classes and the University census date (according to the University schedule) will result in an ADMINISTRATIVE DROP from the course.

STUDENT TECHNICAL ASSISTANCE

- Solutions to common problems and FAQ’s for your web-enhanced and web courses are found at this link: http://www.tamut.edu/Training/Student%20Training/index.html
- If you cannot find your resolution there, you can send in a support request detailing your specific problem here: http://www.tamut.edu/techde/support.htm
Blackboard Helpdesk contacts (office hours are: Monday - Friday, 8:00a to 5:00p)
Julia Allen (main contact) 903-223-3154 julia.allen@tamut.edu
Nikki Thomson (alternate) 903-223-3083 nikki.thomson@tamut.edu
Jayson Ferguson (alternate) 903-223-3105 jayson.ferguson@tamut.edu

TECHNICAL REQUIREMENTS

Minimum Windows PC Requirements:

- Pentium IV 1.5GHz+ (preferred: Core Duo)
- 1 GB RAM minimum (preferred: 2 GB)
- 128MB Video Card minimum - Sound Card is required for some courses
- 56K modem minimum (Cable or DSL required for some courses)
- Windows 2000, XP, Vista or 7
- Web browser (Internet Explorer 7.0+; Firefox 3.0+)
- Microsoft Word, minimum Office 97
  Some courses will need plug-ins such as Flash player 10+, QuickTime player 7.0+, Adobe Reader 9.0+, Java Runtime Environment (Java 1.6.0_15), Windows Media Player 10+, RealPlayer, and Macromedia/Adobe Shockwave.

Some online courses may also require a CD ROM (8x minimum, higher recommended)

Blackboard has certified the following browsers for computers running Windows Operating Systems:

- Internet Explorer 8 or 9 (IE is not supported on Windows XP)
- Mozilla Firefox 3.6+
- Google Chrome

Minimum Apple Macintosh Requirements:

- Intel Core 2.0GHz+
- 1 GB RAM (preferred: 2 GB)
- 128MB Video Card minimum - Sound Card is required for some courses
- 56K modem minimum (Cable or DSL required for some courses)
- Web browser (Firefox 3.0+ ; Safari 3.0+)
- Microsoft Word, minimum Office 97

Some courses will need plug-ins such as Flash player 10+, QuickTime player 7.0+, Adobe Reader 9.0+, Java Runtime Environment, RealPlayer, and Macromedia/Adobe Shockwave.

Some online courses may also require a CD ROM (8x minimum, higher recommended)
Blackboard has certified the following browsers for computers running Macintosh Operating Systems:

- Mac OS 10.2 (Jaguar): (Safari 1 is compatible)
- Mac OS 10.3 (Panther): Safari 1.2 (Firefox 1.5 is compatible)
- Mac OS 10.4 (Tiger): Safari 2 and Firefox 1.5
- Mac OS 10.5 (Leopard): (Firefox 2.0 is compatible)

**I-OS and Android Devices**

These devices are currently supported using the Blackboard Mobile App, available for free from your App Store or scan the code below:

To access Texas A&M University - Texarkana, there is an individual license fee of $1.99 per year or $5.99 lifetime. This fee gives you access to the university from all your (same platform) devices; it is not necessary to pay the fee for each device you own.