Course Syllabus
Chemistry 452-001
Comprehensive Biochemistry I

Course Description: Structure, function, and chemical aspects of proteins, nucleic acids, and carbohydrates; enzyme kinetics; mechanism/regulation of enzymes; introduction to metabolism; carbohydrate metabolism.

Number of Credit Hours: 3 semester hours - 3 hours lecture

Course Prerequisites and Corequisites: Prerequisite: CHE 330 or CHE 331.

Program Learning Outcomes:
1. The student will demonstrate knowledge of fundamental content in the basic areas of chemistry: Analytical, Biochemistry, Inorganic, Organic, and Physical.
2. The student will integrate knowledge with critical thinking to solve problems.
5. The student will articulate scientific information through written communication.

General Education Core Curriculum Objectives: There are no specific general education core curriculum objectives in this course. This course is not a general education core curriculum course.

Course Objective: To gain competency in the major areas of biochemistry which include protein structure/function, protein techniques, nucleic acid structure/function, nucleic acid techniques, enzymes, enzyme kinetics, enzyme mechanisms, membranes, carbohydrate, metabolism.

Student Learning Outcomes: The student is expected to demonstrate and apply the following concepts to biochemistry.

- Recognize vocabulary used in biochemistry especially in relation to proteins, DNA, enzymes, other biological molecules, and metabolism. (PLO 1)
- Applying vocabulary and basic concepts to solving more advance problems in biochemistry. (PLO 1, 2)
- Applying mathematical knowledge in the field of biochemistry which includes buffers, kinetics, energy as well as theoretical background of centrifugation and electrophoresis. (PLO 1, 2)
- Be able to integrate knowledge of other scientific disciplines with the field of biochemistry and be able to communicate this knowledge. (PLO 5)

Outline of Topics (approximate course time):
Introduction (5-15%)
Biomolecules (5-15%)
Amino Acids, Peptides, and Proteins (5-15%)
Protein Architecture and Biological Function (5-15%)
Enzyme Reactions (5-15%)
Kinetics (5-15%)
Coenzymes (5-15%)
Enzymes Regulation/Mechanism (5-15%)
Abzymes and Ribozymes (5-15%)
Carbohydrates (5-15%)
Lipids (5-15%)
DNA and RNA (5-15%)
Cellular Metabolism (5-15%)
Metabolism of Carbohydrates (5-15%)
Citric Cycle (5-15%)
Phosphogluconate Pathway (5-15%)
ATP (5-15%)

Class Syllabus
Fall 2012
CHE 452-001
Comprehensive Biochemistry I

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Office: 122 Math Building
Office Hours: M-F, 11 a.m. to 1 p.m.
Class meeting time and place: TR, 8 – 9:15 a.m. Room 126 Math Bldg

Recommended Text and other materials:
(2) A non-programmable scientific calculator.
(3) An active email address.
(4) Enroll in Sampling Learning Online Homework at https://www.saplinglearning.com/

<table>
<thead>
<tr>
<th>Class #</th>
<th>Date</th>
<th>Tentative Topic</th>
<th>Pages in textbook</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug 28</td>
<td>Introducing syllabus and review of chapter 1 of textbook</td>
<td>1 - 29</td>
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<tr>
<td>2</td>
<td>Aug 30</td>
<td>Acid-base chemistry: water, ions, buffers and the cytoplasm, pH &amp; Henderson</td>
<td>30 - 50</td>
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<td></td>
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<td>Hasselbach equation.</td>
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<tr>
<td>3</td>
<td>Sep 4</td>
<td>Acid-base chemistry: water, ions, buffers and the cytoplasm, pH &amp; Henderson</td>
<td>30 - 50</td>
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<tr>
<td></td>
<td></td>
<td>Hasselbach equation.</td>
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<td>4</td>
<td>Sep 6</td>
<td>Thermodynamics of Biological Systems</td>
<td>51 - 76</td>
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<td>5</td>
<td>Sep 11</td>
<td>Amino acids and the peptide bond</td>
<td>77 - 100</td>
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<td>6</td>
<td>Sep 13</td>
<td>Proteins: Primary structure and biological functions</td>
<td>101 – 140</td>
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<td>7</td>
<td>Sep 18</td>
<td>Proteins: Secondary, tertiary and quaternary structure</td>
<td>141 - 190</td>
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<td>8</td>
<td>Sep 20</td>
<td>Exam 1</td>
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<td>9</td>
<td>Sep 25</td>
<td>Enzymes: Kinetics and specificity</td>
<td>407 - 444</td>
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<td>10</td>
<td>Sep 27</td>
<td>Mechanisms of Enzyme action</td>
<td>447 - 479</td>
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<td>11</td>
<td>Oct 2</td>
<td>Enzyme Regulation</td>
<td>481 - 512</td>
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<tr>
<td>12</td>
<td>Oct 4</td>
<td>Carbohydrates</td>
<td>193 - 232</td>
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<tr>
<td>13</td>
<td>Oct 9</td>
<td>Carbohydrates cont’d</td>
<td>193 - 232</td>
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<tr>
<td>14</td>
<td>Oct 11</td>
<td>Nucleotides and Nucleic acids</td>
<td>309 - 335</td>
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<td>15</td>
<td>Oct 16</td>
<td>Structure of Nucleic acids</td>
<td>336 - 377</td>
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Method of Evaluation: The point total for this course is 500 (400 points from exams and 100 points from online assignment). Grades are based on the total number of points earned out of 500.

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[A \geq 450; B \geq 400; C \geq 350, D \geq 300, F < 300]
\]

There will be a total of four (4) exams given on the dates indicated in the table above. Each exam will be worth 100 points. All exams, including the final (Exam IV), will be based on topics taught since the last exam only. A person coming in late cannot start the exam if someone has already left the exam. The exams may consist of any type of format. Students have two days from the day any graded item is returned to notify professor of grading error or ask questions about the grade of the item. After two days no points will be returned. In addition, at his own discretion, the professor may re-grade the entire item.

Make-up Policy: For a PROVEN, EXCUSED absence, a missed exam may be given at the professor's discretion.

Attendance Policy: Attendance in class is mandatory. Roll call will be taken in every lecture. Four (4) or more absences will result in an ‘F’ for the course.

Academic Honesty Policy: Cheating in any form will result in an ‘F’ in the course and further action by the University.

Academic Disabilities Policy: If you have a certified disability and need accommodations for this course, it is your responsibility to notify my by the third class day. If you have questions concerning the academic disabilities, contact the Office of Disability Services at 468-3004.

Acceptable Student Behavior: Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.
Note: If you are taking this class in preparation for becoming a teacher, please see Dr. John Moore.

Note: This syllabus is subject to change.