BIOCHEMISTRY I – CRN: 62699
Department of Physical and Environmental Sciences
Fall 2015

A. COURSE INFORMATION
Course number/section: 4401.002
Class meeting time: MWF – 12:00-12:50
Class location: EN-101
Course Website: Biochemistry I at the University Catalogue

B. INSTRUCTOR INFORMATION
Instructor: Dr. Cesar A. Marquez
Office location: CS-206
Office hours: TR – 11:00-13:00
Telephone: (361) 825 5701
e-mail: cesar.marquez@tamucc.edu
Appointments: By email

C. COURSE DESCRIPTION
CHEM 4401 is the first half of a two-semester course that covers the structure and function of the major biomolecules (amino acids, lipids, carbohydrates, proteins, lipids, nucleic acids and polysaccharides) as well as the major metabolic pathways involved in their synthesis and degradation. This course has a laboratory component that covers basic biochemical techniques, the use of various biochemistry databases, and the analysis and preparation of biochemical data.

D. PREREQUISITES AND COREQUISITES
Prerequisites
General Chemistry I & II (CHEM 1411 & 1412) and the Student Laboratory Safety Training (SMTE-0091) are required for continued participation in this course.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
Required Textbook(s)
Lehninger Principles of Biochemistry, 6th Edition (2013), Nelson and Cox. Older editions are also acceptable but end-of-chapter questions and some material will be out of date.

Recommended Texts

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT
Upon successful completion of this course, students will be able to:
• Identify important biochemical functional groups, the types of bonds (hydrogen, ionic, hydrophobic, etc.) they typically form, and the impact these bonds have on biochemical structure, activity and function.
• Recognize and describe the chemical and physical properties of water, its relationship to ionization constants, the pH of a solution, and its role in the structure and function of proteins, nucleic acids, carbohydrates and lipids.
• Identify the major classes of small biochemical compounds (amino acids, carbohydrates, nucleotides, lipids), compare and contrast their chemical characteristics and biological roles.
• Describe the primary features of protein structure and function, including ligand binding, enzyme catalysis and the regulation of enzyme activity.
• Recognize the primary features of polysaccharide structure and function, and describe their major biological roles.
• Recognize the primary features of nucleic acid (DNA, RNA) structure, compare and contrast their functions and major biological roles.
• Describe the construction and function of biological membranes.
• Identify and describe the basic mechanisms of biological signal transduction.
• Perform basic biochemistry procedures, including: buffer preparation, spectrophotometry, chromatography, enzyme preparation, kinetic analysis and standard bioinformatics techniques.
• Analyze experimental protocols, perform standard biochemical calculations, critique data, and prepare results for oral or written presentation.

G. INSTRUCTIONAL METHODS AND ACTIVITIES
The course implement high-impact practices (HIPs) such as ‘weekend challenges’ and ‘real life’ applications of course material, to encourage the students’ engagement with their studies both in and out of the classroom. Although the lecture’s style necessarily adapts to class size, it is in general based upon a constructivist approach where the acquisition of knowledge is conceived as a student-centered and dynamic process, rather than objective and static.

H. MAJOR COURSE REQUIREMENTS AND GRADING
The course includes lectures and laboratories. They will be graded separately, and the final course grade (100pts) will consider the following distribution:

Lecture (75%): There will be three semester examinations in addition to a comprehensive final examination. Exams will take place during regular class time.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Score</th>
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<tbody>
<tr>
<td>Exam 01</td>
<td>100</td>
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<td>Exam 02</td>
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<td>Exam 03</td>
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<td>Final Exam</td>
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Attendance is mandatory and therefore it will not be considered when grading.

Laboratory (25%): After completed all lab assignments and exam, you will be assigned a lab grade by your lab instructor. You will receive more information about the Biochemistry I Laboratory Course (CHEM-4401.10x) in the lab syllabus.
Laboratory Score: \[
\left( \text{laboratory reports} + \text{worksheets} + \text{exam points} \right) \div 190 \times 25
\]

I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
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<tbody>
<tr>
<td>Aug 27</td>
<td>Introduction/Foundations</td>
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<tr>
<td>Aug 29</td>
<td>Cells &amp; Organelles</td>
<td>1.1</td>
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<td>Sep 3</td>
<td>Cells &amp; Organelles</td>
<td>1.1</td>
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<tr>
<td>Sep 5</td>
<td>Cells &amp; Organelles</td>
<td>1.1</td>
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<tr>
<td>Sep 8</td>
<td>Biomolecules/Reactions</td>
<td>1.2-3</td>
</tr>
<tr>
<td>Sep 10</td>
<td>Biomolecules/Reactions</td>
<td>1.2-3</td>
</tr>
<tr>
<td>Sep 12</td>
<td>Biomolecules/Water</td>
<td>2.1</td>
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<tr>
<td>Sep 15</td>
<td>Biomolecules/Water</td>
<td>2.1</td>
</tr>
<tr>
<td>Sep 17</td>
<td>Water</td>
<td>2.2</td>
</tr>
<tr>
<td>Sep 19</td>
<td>Water</td>
<td>2.3-5</td>
</tr>
<tr>
<td>Sep 22</td>
<td>Water</td>
<td>2.3-5</td>
</tr>
<tr>
<td>Sep 24</td>
<td>Exam 1</td>
<td></td>
</tr>
<tr>
<td>Sep 26</td>
<td>Amino Acids</td>
<td>3.1</td>
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<tr>
<td>Sep 29</td>
<td>Amino Acids</td>
<td>3.1</td>
</tr>
<tr>
<td>Sep 29</td>
<td>Protein Structure</td>
<td>3.2, 3.4</td>
</tr>
<tr>
<td>Oct 1</td>
<td>Protein Structure</td>
<td>4.1-4</td>
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<tr>
<td>Oct 3</td>
<td>Protein Function: Ligand Binding</td>
<td>5.1-2</td>
</tr>
<tr>
<td>Oct 6</td>
<td>Protein Function: Ligand Binding</td>
<td>5.2-3</td>
</tr>
<tr>
<td>Oct 8</td>
<td>Protein Function: Ligand Binding</td>
<td>5.2-3</td>
</tr>
<tr>
<td>Oct 10</td>
<td>Enzymes: General function</td>
<td>6.1-2</td>
</tr>
<tr>
<td>Oct 15</td>
<td>Enzymes: Kinetics</td>
<td>6.3</td>
</tr>
<tr>
<td>Oct 17</td>
<td>Enzymes: Mechanisms</td>
<td>6.4</td>
</tr>
<tr>
<td>Oct 20</td>
<td>Enzymes: Regulation</td>
<td>6.5</td>
</tr>
<tr>
<td>Oct 22</td>
<td>Exam 2</td>
<td></td>
</tr>
<tr>
<td>Oct 24</td>
<td>Carbohydrates</td>
<td>7.1-2</td>
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<tr>
<td>Oct 27</td>
<td>Carbohydrates</td>
<td>7.1-2</td>
</tr>
<tr>
<td>Oct 29</td>
<td>Carbohydrates</td>
<td>7.3-4</td>
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The schedule below is a preliminary outline of the course. It is your responsibility to keep up with changes to this schedule. The reading and problems assignments that will be assigned in class should be completed before the next class meeting. Failure to stay current on reading and problem assignments will greatly affect your ability to keep up during lecture and, therefore, will have an indirect affect on your grade in this course.

Changes in this course schedule may be necessary and will be announced to the class by the instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

### J. COURSE POLICIES

**Attendance/Tardiness**

The student is expected to be on time and attend every class. If absent, it is the responsibility of the student to obtain missed information from a classmate. Missed information includes not only lecture notes, but also any possible information regarding syllabus changes. The student is expected to arrive on time prepared to take notes, i.e., with pen, paper, and colored markers/pencils.

**Late Work and Make-up Exams**

There is no make-up exam for this class. Students with a university approved scheduled absence (athletics, military duty, etc.) MUST contact the instructor well in advance of the scheduled absence. Exams may be taken early in those specific cases. Students who do not arrange to take the exam ahead of time will not be eligible for this special consideration. A written excuse from the university department involved or the Office of the Dean of Students is required.

**Extra Credit**

There is no extra credit in this course.

**Cell Phone Use**

Cell phones and laptops are allowed during lectures. Before you enter the lecture hall turn OFF the volume of your cellular phone or laptop! Beepers must also be turned off or put on silent mode. Electronic interruptions absolutely will NOT be tolerated.

**Food in Class**
Food is allowed in this course.

**Missed Exam**
Students who do not arrange to take the exam ahead of time will not be eligible for this special consideration. A written excuse from the university department involved or the Office of the Dean of Students is required.

**Participation**
Students are expected to participate during the classes, this way contributing to the learning process of the group. The classes are designed as an active environment where every new concept is applied to real synthetic examples. The students are expected to participate as a team, applying critical thinking to the resolution of the different practical challenges proposed.

**K. COLLEGE AND UNIVERSITY POLICIES**

**Academic Integrity (University)**
University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

**Classroom/Professional Behavior**
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

**Statement of Civility**
Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

**Deadline for Dropping a Course with a Grade of W (University)**
The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.
Grade Appeals (College of Science and Engineering)
As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

Disability Services
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

[http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

Statement of Academic Continuity
In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. OTHER INFORMATION

Academic Advising
The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.
M. GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.