For by him all things were created: things in heaven and on earth, visible and invisible... [Colossians 1:16]

Prerequisites:  
- chem3420 (Organic Chemistry II)  
- proficiency with first semester calculus

Required Materials:  
- Fundamental Laboratory Approaches for Biochemistry and Biotechnology, Alexander J Ninfa & David P Ballou. (available at the campus bookstore)  
- Laboratory Notebook – Meade notebook with bound pages. (available at the campus bookstore)

Course Objectives:  
This course is the first part of the two semester biochemistry sequence. After successful completion of both lecture and lab, the student will have mastered introductory knowledge of biochemistry, especially pertaining to the structures and functions of proteins, enzymes, DNA, and lipids, and will have obtained practice in biochemical/biotechnological laboratory techniques.

Course Topics:  
The following chapters will be covered. Student is expected to have read the material before lecture.

Chapter 01  The Foundations of Biochemistry  
Chapter 02  Water  
Chapter 03  Amino Acids, Peptides, and Proteins  
Chapter 04  The Three Dimensional Structure of Proteins  
Chapter 05  Protein Function  
Chapter 06  Enzymes  
Chapter 07  Carbohydrates and Glycobiology  
Chapter 08  Nucleotides and Nucleic Acids  
Chapter 09  DNA-based Information Technologies  
Chapter 10  Lipids  
Chapter 11  Biological Membranes and Transport  
Chapter 12  Biosignaling

Assignments:  
- Tests: A test (approx 30 minutes) will be given for each chapter and will cover all topics from both lecture and the chapter in the text book unless explicitly stated otherwise in class. The lowest score test will be dropped from the grade total for each student individually; a missed test will count as the lowest score (a zero). No late tests will be given.  
- Quizzes will be given over special topics, such as amino acid names and
structures. Quizzes will be announced in class as the topics arise throughout the semester. Each quiz will count half as much as a test.

- **Final examination**: A comprehensive final examination will be given at the end of the course.
- **Extra Credit**: Seminars are often given each semester by upper classmen as part of their coursework and/or honors or research projects, and by visiting scientists to our campus. Any chemistry or biochemistry related seminars will be announced in class. Extra credit of 2% points will be given for attendance at each seminar.

**Attendance:**

Attendance at all lectures and laboratories is **mandatory**. Attendance will be taken each class period; absences will be excused only if the student is away on an official university function and has obtained authorization from the Vice President of Academic Affairs (see student handbook). It is the student’s responsibility to notify the professor about each excused absence; otherwise, the student will be marked to have an unexcused absence for that day. It is the student’s responsibility to obtain any missed lecture material.

Attendance will count toward the course grade. All students will begin with a **5% participation grade**. Up to three unexcused absences are allowed and will have no effect on this grade; excused absences will also have no effect. However, the student will lose 1 percentage point (1%) from this grade for each unexcused absence beyond three, until 0% is reached. Students with ten or more unexcused absences will be administratively dropped from the course.

**Grading:**

Course grades will be computed according to the following percentages:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Tests and Quizzes</td>
<td>50%</td>
</tr>
<tr>
<td>Laboratory</td>
<td>25%</td>
</tr>
<tr>
<td>Participation Grade</td>
<td>5%</td>
</tr>
</tbody>
</table>

Letter grades will be assigned as follows:

- 100 – 93% A
- 90 – 92.99% A-
- 87 – 89.99% B+
- 83 – 86.00% B
- 80 – 82.99% B-
- 77 – 79.99% C+
- 73 – 76.00% C
- 70 – 72.99% C-
- 67 – 69.99% D+
- 63 – 66.00% D
- 60 – 62.99% D-
- 0 – 59.99% F

**note:** Raw percentages in an upper level course such as biochemistry can be depressed due to the difficult nature of the material. Letter grades will be assigned on a mapped scale which will neither be more stringent than the standard “straight scale” nor will ever lower a student’s score. Final determinations will be made based on performance, in both lecture and laboratory, of individual students and of the class as a whole.

**Moodle:**

All students must enroll in McMurry’s online “Moodle” and then into this course (chem3441). Students will find course documents, reading assignments, and extra credit listed on moodle. A class agenda summarizing where the class is at in the course as far as chapters and topics will be posted. Also, any class announcements
will be made using e-mail via moodle.
   note: you must enroll yourself in chem3441 after you sign into moodle.
   Moodle is located at http://cs1.mcm.edu/moodle
   Your initial login is your standard login.
   Your initial password is your student ID number.

Laboratory: Laboratory exercises are designed to give the student experience in those areas and
techniques most commonly used in the field of biochemistry. They also provide
opportunity to develop writing skills by way of written laboratory reports.
Experiments will be from both the lab book and from individual handouts which will
be made available online on moodle. The exact sequence and duration of each
experiment is likely to change and evolve; as such, the lab agenda will be developed
and announced as the course progresses through the semester.

Students are expected to maintain a proper lab notebook. The notebook will be
checked periodically for adherence to proper format, and a grade recorded.

At the end of each experiment, the student is required to submit some form of analysis
and/or report – the type of submission depending on the experiment. Submission
types are:
   1. Answers to questions
   2. Summary lab report
   3. Formal lab report
Descriptions of these submission types will be provided in class.

Classroom and Academic Conduct:

   • As explained in the student handbook, students are expected to conduct
     themselves in a manner compatible with McMurry University’s function as an
     educational, church-affiliated institution. Any and all instances of dishonest or
disruptive behavior, including cheating and plagiarism, will result in a zero for
that assignment, will be reported to the Dean of Student Affairs, and could lead
to official action against the student.

   • Cell phones are not permitted in class. Special exceptions can be granted by the
     professor on a person by person basis.

   • Computers and PDAs are permitted for note taking only! All other uses, such as
     web surfing, e-mailing, or instant messaging, are prohibited.

   • Respectful behavior is expected at all times; subsequent rules include:
     1. no hats are to be worn in the classroom
     2. no loud or disruptive behavior
     3. no rude or insulting comments will be tolerated

   If a student violates these rules, he will be asked to leave for the rest of the class
period, and will be marked as “unexcused absent” for the day.

Disability Accommodation:

McMurry University abides by Section 504 of the Rehabilitation Act of 1973 and the
Americans with Disabilities Act. If you have a disability, whether physical, learning,
emotional, or otherwise, you must register with the Disability Services Office (Old
Main 102). The disability office will then instruct your professors and instructors as
to what accommodations are appropriate for your situation.
“What will it take to pass this course?”:

1. Spend time on biochemistry every day… make it part of your routine and schedule.
2. Read the text before it is discussed in class.
3. Attend class and participate in discussions.
4. Strive to learn and understand the concepts, not just memorize them.
5. Don’t fall behind. The subject materials build upon themselves – each chapter often depending on the previous ones.
6. Review topics from past courses as needed – especially general chemistry, organic chemistry, and biology.
7. Ask questions and utilize resources, i.e. the professor and other students.