Overview: Biology 303 was developed to provide Biology majors with a basic understanding of intermediary metabolism. Biology majors have the option of taking Biology 303 or Organic Chemistry 321/322. Although pre-health science students are welcome to take Biology 303 as an elective, they should not substitute Biology 303 for Organic Chemistry (check your individual degree program to make sure). Please see your advisor or me if you have any questions about whether or not you should be enrolled in Biology 303.

Biology 303 will be divided into three sections: Section I of the course will focus on reviewing the “fundamentals” of Chemistry and Biochemistry. This section will cover the basics of Chemistry and Biochemistry necessary for this course. Section II introduces the major classes of biomolecules and their molecular properties. Section III covers intermediary metabolism. This section contains a heavy emphasis on the integration of metabolic processes and is intended to help synthesize the basic biochemical concepts learned throughout the semester.

Prerequisites: Biology 105X-106X and Chemistry 105X-106X. If you do not have the appropriate prerequisites you should see me immediately. If you wish to gain special permission to take this 300 level course without the required prerequisites, please provide me with a written request (e-mail preferred) no later than the second week of class. Your request should include an explanation of why it is necessary for you to take this course out of sequence. I will respond to you by e-mail. If you have enrolled in the course without the necessary prerequisites and without my permission, your name will be withdrawn from the class list (prior to the withdrawal date) or you will receive a failing grade (after the withdrawal date).

Attendance: All students are required to attend class on the first or second meeting to save their place on the class roll (in cases where students are on the waitlist). If you have not attended class by the second class meeting, your name could be dropped from the class. Lecture and lab attendance for the remainder of the semester is encouraged.

Required Text: Lehninger Principles of Biochemistry; Nelson and Cox 4/e

Recommended Text: Metabolic Regulation, A Human Perspective; Frayn

Lecture/Discussion periods: Students should experience science as a process of inquiry that is based on methods of scientific investigation. Scientific inquiry may include some or all of the following components: observing, questioning, forming hypotheses, predicting, experimenting, analyzing data, and relating concepts and ideas to each other. Lecture and lab periods are
meant to function as a catalyst for learning, directing student interactions, activities and discussion. **Homework and Study Groups:** The objective of assigning “homework” is to help the student recognize the value of establishing a study schedule. The homework consists of problem sets and defined reading assignments outlined in the handout “Lecture Topics and Dates.” I expect all students to have read the chapters prior to the lecture period. Students will be evaluated on their ability to participate in class and laboratory discussions and their performance on exams and homework problems. I strongly recommend the formation of study groups as a means to discuss the reading material. Long-term memory increases when you review the material frequently. “If you don’t use it, you’ll loose it!” Form a study group of 3-5 students and meet at least once a week and before exams. If you are not quite sure what to do or you don’t quite know where to start, come by my office or the TA’s office and we will help. **You are strongly encouraged to work in groups of 3-5 students on the homework problems.**

**Exams & Grading:**

- Exam I: 100 points
- Exam II: 100 points
- Exam III: 100 points
- Laboratory Problem sets: 200 points
- Lecture Participation: 50 points
- Final Exam: **200 points**

**Total:** 750 points

**Exams** will cover material presented in the lectures, discussion periods or textbook. Exams I-III may have a take home component that will amount from 10-30% of the individual exam grade. You will have 2 days to complete the take home portion of the exam. Turn in one copy of your answers with the names of those that participated in the take home exam-working group (not to exceed 6 students). **I do not give make-up exams. Please mark exam dates on your calendar now.** If you have a legitimate excuse for missing an exam, I will calculate your total grade on the basis of the exams that were taken. No early or late final exams will be given. If you have any questions, please feel free to talk to me about them or send me an email.

**Class notes:** I will attempt to put my presentations on Blackboard early in the semester, and post a more complete set after the lecture if the content was changed. If you have registered for Biology 303, I will automatically add your name as a user for this class, unless you instruct me not to do so (in writing). Then, every time I update Blackboard, I will send an email notice to all users.
Section I. Fundamentals of Biological Chemistry

1. Aug. 31 Chapter 1 Class introduction & Review
2. Sept. 5 Chapter 1 Foundations of Biochem.
3. Sept. 7 Chapter 1 Foundations of Biochem
4. Sept. 12 Chapter 2 Water
5. Sept. 14 Chapter 3-4 (excerpts) Amino Acids, Protein structure

Section II. Molecular properties of Biomolecules

6. Sept. 19 Chapter 6 Enzymes
7. Sept. 21 Exam I Exam includes all chapters previously covered
8. Sept. 26 Chapter 6 More on Enzymes and their regulation
9. Sept. 28 Chapter 7 Carbohydrates
10. Oct. 3 Chapter 10 Lipids 10

Section III. Intermediary Metabolism

11. Oct. 5 Chapter 11 Biological membranes & Transport
12. Oct. 10 Chapter 12-13 Biosignaling & Bioenergetics
13. Oct. 12 Chapter 14 Glycolysis
14. Oct. 17 Chapter 14-16 Glycolysis & Citric Acid Cycle
15. Oct. 19 Exam II Exam includes all chapters previously covered
16. Oct. 24 Chapter 14-16 Glycolysis & Citric Acid Cycle
17. Oct. 26 Chapter 17 Fatty Acid Oxidation
18. Oct. 31 Chapter 18 Amino Acid Oxidation
19. Nov. 2 Chapter 18 Amino Acid Oxidation
20. Nov. 7 Chapter 19 Oxidative Phosphorylation and Photosynthesis
21. Nov. 9 Chapter 20 Carbohydrate Biosynthesis
22. Nov. 14 Exam III Exam includes all chapters previously covered
23. Nov. 16 Chapter 21 Lipid Biosynthesis
24. Nov. 21 Chapter 22 Nitrogen Metabolism
25. Nov. 23 THANKSGIVING Class Holiday
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<tr>
<th>Date</th>
<th>Chapter</th>
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<tr>
<td>Nov. 28</td>
<td>Chapter 23 &amp; Suppl. Text</td>
<td>Integration of Metabolism &amp; Review</td>
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<td>Nov. 30</td>
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<td>Chapter 23 &amp; Suppl. Text</td>
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<td>Dec. 13</td>
<td>8:00-10:00 AM</td>
<td>COMPREHENSIVE FINAL EXAM</td>
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Exact dates of the lectures may change, the order should remain the same.