Chemistry 3360:
Biophysical Chemistry
McMurry University
Spring 2005

Professor:
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Office Hours:
MWF 9:00 – 11:00
R 2:30 – 4:30

"Meaningless! Meaningless!" says the Teacher.
"Utterly meaningless! Everything is meaningless."
[Ecclesiastes 1:2]

Prerequisites:
• chem3441 (Biochemistry I)
• math2421 (Calculus I)

Required Materials:
• Physical Chemistry – Principles and Applications in Biological Sciences. 4th ed. Tinoco, Sauer, Wang, Puglisi. (available in the campus bookstore)
• scientific calculator

Course Objectives:
Welcome to biophysical chemistry! This course is looks at the essential elements of physical chemistry as applied to biological systems. Traditional physical chemistry is a collection of principles and experimental methods for exploring chemical systems in a mathematically and physically rigorous manner. As biological systems, from small biomolecules to entire cells and tissues, are better understood at the molecular level, these physical chemistry topics are ever-increasingly important to understand. An enormous and growing amount of modern research in the biological sciences revolves around physical chemistry. Topics in this course include thermodynamics, transport properties, kinetics, quantum mechanics, molecular interactions, spectroscopy, and light scattering/diffraction, and will be approached with mathematical rigor.

Course Topics:
We will follow the chapters of the text as organized in the book. Some topics will be covered in detail, some not. Essentially, the class is divided into three subsections:

1. thermodynamics
2. kinetics
3. quantum mechanics

Assignments:
• Homework: assignments will be given for each chapter from the text. Homework will often be discussed in class as part of the lecture. You are encouraged to work on homework together in groups. Assignments will be due one class period after completing that chapter in lecture.

• Examinations: Two “take home” examinations will be given. The exams are designed to take approximately 5-6 hours, and must be done independently of one another. Any cheating will result in a score of ZERO for that examination. Exams will be scheduled in late February and in mid April. Exams will be handed out at the end of class on Wednesday and will be due at the start of class on Monday.
• **Final examination:** A comprehensive “take home” final examination will be given at the end of the course. The final must be done independently of one another. Any cheating will result in a score of ZERO for the final examination. The final will be handed out at the end of class on Monday (last day of classes) and will be due at 12:00 noon that Friday.

• **Random Questions:** In-class questions will be asked of students, selected randomly. While correct answers are not necessary, thoughtful and insightful responses will be rewarded. Each response will be judged as “correct” (10 pt), “strong” (7 pt), “weak” (3 pt), or “totally wrong” (0 pt). Your average score at the semester’s end will then count as that many percentage points.

• **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 1% 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% attendance score. 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>30%</td>
</tr>
<tr>
<td>Examinations</td>
<td>40%</td>
</tr>
<tr>
<td>Homework</td>
<td>15%</td>
</tr>
<tr>
<td>Random Questions</td>
<td>10%</td>
</tr>
<tr>
<td>Attendance</td>
<td>5%</td>
</tr>
<tr>
<td>Extra Credit (+10% max)</td>
<td></td>
</tr>
</tbody>
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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 biophysical chemistry 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.

**Blackboard:** All students must enroll in McMurry’s online “Blackboard” and then into this course. Students will find course documents and a simple log of 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 blackboard.

**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.