



CHEMISTRY 4401
BIOCHEMISTRY I

Section 01. MWF 8:40 – 9:30 AM, Barton Hall Room A140, Professor **Allen W. Nicholson**, Ph.D., 350 Beury Hall, 215-204-9048 (Voice), 215-204-1532 (Fax) email anichol@temple.edu, Office hours WF 3:00 – 4:00 and by appointment.

Section 02. MWF 12:40 – 1:30 AM, Barton Hall Room A140, Professor **David R. Dalton**, Ph.D., 342 Beury Hall, 215-204-7138 (Voice), 215-204-1532 (Fax) email dalton@temple.edu, Office hours MWF 11:30 – 12:30 and by appointment.

Textbook: *Lehninger Principles of Biochemistry*, 2005 4th ed., W.H. Freeman

Prerequisite: Two semesters of Organic Chemistry.

Course Information

The field of biochemistry seeks to understand the mechanisms and functional roles of chemical reactions that occur in living systems and the structures and functions of cellular biomolecules. **Chemistry 4401** addresses the structures and functions of proteins, nucleic acids (DNA, RNA), carbohydrates and lipids. The course also addresses the basis of enzymic catalysis, basic thermodynamics and kinetics in biological processes, and the structure and functions of cell membranes. Normal and abnormal functions of biomolecules and biological reactions will be related to specific human disease states. It is assumed that the student already has a background in basic chemistry, physics, mathematics (algebra and differential equations) and an introductory biology course.

There is much factual and conceptual information to be learned in this course. **Chemistry 4401** will essentially follow the material presented in the assigned textbook readings. You are strongly encouraged to attend all lectures since it is likely that material will be presented and discussed in class that is *not* in the textbook. It has been found beneficial in the past that group study profits students. Homework problems may be assigned from time-to-time and students are encouraged to work the end-of-chapter problems.

Examinations and Grading

There will be three tests and a final examination. The tests will be held during regular course time on (**tentative**) **Monday, 18 February; Monday, 24 March, and Monday, 21 April**. Each test is worth 20% of the point total for the course. Each test covers material only since the previous test. Missed tests result in a grade of “0”. Make-up tests with all new questions will be given only on the basis of a validated medical (signed letterhead) emergency. The letter must be received no later than the end of the day following the scheduled examination.

The final examination for **Section 01 (MWF 8:40-9:30)** is scheduled to be held on **Friday, 9 May from 9:00 – 11:00 AM** in Barton 140A

The final examination for **Section 02 (MWF 12:40-1:30)** is scheduled to be held on **Monday, 12 May from 11:30 AM – 1:30 PM** in Barton 140A.

The final examination is cumulative and is worth 40% of the grade. Your letter grade for the course will be based on the total points earned. Grading may be curved, depending upon the overall outcome of the classes. There will be no special assignments given for extra credit.

Other Important Course Related Information:

- (1) **Last Day to Drop the Course:** Monday, 4 February 2008.
 - (2) **Last Day to Withdraw from the Course (“W” assigned to transcript)** Monday, 31 March 2008. The "W" grade is only given in accordance with institutional procedure. The procedure to obtain a "W" grade after 31 March 2008 is governed by the Temple University Policy (#03.12.12) on Withdrawal.
 - (3) Please note that an **Incomplete (“I”) Grade** is only given in accord with Institutional procedures. The "I" grade cannot be given until the specific requirements have been met and forms filled out, signed and submitted. This course is governed by the Temple University Policy (#03.12.13) on Incompletes.
 - (4) **Academic Honesty:** The Responsibilities Section of the current Undergraduate Bulletin applies. Temple University believes strongly in academic honesty and integrity. Plagiarism and academic cheating are, therefore, prohibited. The development of independent thought and a respect for the thoughts of others is essential to intellectual growth. The prohibition against plagiarism and cheating is intended to foster this independence and respect.
 - (5) **Disability Impact Statement:** Any student who has a need for accommodation based on the impact of a disability should contact either Dr. Nicholson or Dr. Dalton privately to discuss the specific situation as soon as possible. (S)he should also contact Disability Resources and Services at 215-204-1280 in Room 100 Ritter Annex so that we can attempt to coordinate reasonable accommodations for her/his documented disabilities.
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Important: We have found that students who read the assigned material before coming to class profit from the lectures more than otherwise. We have also found that rewriting notes, working with other students (and comparing their notes to yours !) and doing problems to be profitable.

Over the years, efforts by a variety of groups and/or individuals to put a serious biochemistry textbook online have been attempted. Largely they have failed because the subject is rapidly changing and maintaining the sites has proved unprofitable. As of this writing (December 2007) there are some interesting sites that hold useful material and might provide the same information to be found in your textbook but “in other words”.

<http://en.wikibooks.org/wiki/Biochemistry>

<http://employees.csbsju.edu/hjakubowski/classes/ch331/bcintro/default.html>

<http://www.web.virginia.edu/Heidi/home.htm>

<http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=stryer.TOC&depth=2>

LECTURE SCHEDULE

| Lecture | Date | Material |
|---------|----------------------|---|
| 1 | Wed (1/17) | Chapter 1.1-1.4: Cells, Biomolecules & Thermodynamics |
| 2 | Fri (1/25) | |
| 3 | Mon (1/28) | |
| 4 | Wed (1/30) | Chapter 2.1-2.5: Water |
| 5 | Fri (2/1) | |
| 6 | Mon (2/4) | |
| 7 | Wed (2/6) | Chapter 3.1-3.5: Amino Acids, Peptides and Proteins |
| 8 | Fri (2/8) | |
| 9 | Mon (2/11) | |
| 10 | Wed (2/13) | Chapter 4.1- 4.4: Protein Structure |
| 11 | Fri (2/15) | |
| | Mon (2/18) | |
| 12 | Wed (2/20) | <u>TEST 1</u> |
| 13 | Fri (2/22) | Chapter 5.1-5.3: Protein Function |
| 14 | Mon (2/25) | |
| 15 | Wed (2/27) | |
| 16 | Fri (2/29) | Chapter 6: Enzyme Catalysis & Regulation |
| 17 | Mon (3/3) | |
| 18 | Wed (3/5) | |
| 19 | Fri (3/7) | Spring Holiday |
| | Sun (3/9)-Sun (3/16) | |
| 20 | Mon (3/17) | |
| 21 | Wed (3/19) | Chapter 6 (continued) |
| 22 | Fri (3/21) | |
| | Mon (3/24) | |
| 23 | Wed (3/26) | <u>TEST 2</u> |
| 24 | Fri (3/28) | Chapter 6 (continued) |
| 25 | Mon (3/31) | |
| 26 | Wed (4/2) | |
| 27 | Fri (4/4) | Chapter 7: Carbohydrates and Glycobiology |
| 28 | Mon (4/7) | |
| 29 | Wed (4/9) | |
| 30 | Fri (4/11) | Chapter 8: Nucleotides & Nucleic Acids |
| 31 | Mon (4/14) | |
| 32 | Wed (4/16) | |
| 33 | Fri (4/18) | <u>TEST 3</u> |
| | Mon (4/21) | |
| 34 | Wed (4/23) | |
| 35 | Fri (4/25) | Chapter 10: Lipids |
| 36 | Mon (4/28) | |
| 37 | Wed (4/30) | |
| 38 | Fri (5/2) | Chapter 11: Biological Membranes |
| 39 | Mon (5/5) | |

Last day of class.

Final Examinations on Fri 9 May and Monday 12 May for Sections 01 and 02, respectively.