BBMB 404        Biochemistry I (distance learning)        Spring 2014

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Phone: 515 294 2616

Course material: The organization of lectures is based on the text "Biochemistry", by Berg, Tymoczko, and Stryer, 7th Edition. Videotaped "live" lectures covering the material are available to you as well as the accompanying powerpoint files. All testing is based on material covered in these lectures.

We will be using the online "BioPortal" from the publisher as extra, optional learning material and "extra credit" (more about the extra credit later). Access to the BioPortal is ~ $98.99, BUT COMES WITH FULL ACCESS TO THE TEXT BOOK (which is also used in BBMB 405). It has a lot of additional learning material and is searchable. So in my opinion your best value is to purchase the BioPortal. It can be found at http://courses.bfwpub.com/yourbiochemportal/

COURSE MANAGEMENT AND POLICIES

Course Objectives: The aim of this course is to introduce you to the field of biochemistry. BBMB 404 is designed to provide the first half of a year-long offering of basic biochemistry, continuing with BBMB 405. You will learn the basic classes of biomolecules, tools of biochemical analysis, and general themes of biochemistry along with an introduction to metabolism.

Basic summary of the course: This is an online course, with materials delivered through the Blackboard learning environment. Through Blackboard you will have access to "live" (but previously recorded) lectures over the course material delivered by me, all of the Powerpoint files used in lecture, and a number of mechanisms for communication concerning the course. All of the material is in place at the start of the course, so you can move as rapidly as you wish. There are limits to how slowly you can complete the work, defined by the closing dates for the exams.

Communication during the course: For daily communication concerning course material, please email me directly with specific questions, and use the "discussion board" function of Blackboard to generate open discussion of any course-related topic. I will check messages and the discussion board regularly.

Exams: Exams will be administered in the Blackboard learning environment by the On-line Testing Center http://www.eol.iastate.edu/online-testing-center/ (for on-campus students), or through a proctor for off-campus students (the passwords for the exams will be provided to your proctor). We will have a total of four multiple-choice "midterm" exams worth 40 points each, and a comprehensive final exam also worth 40 points. Your lowest scored midterm exam will be dropped. You will be allowed two hours to complete each exam. Exams will be closed book, and you will have access to a calculator and scratch paper provided by the testing facility or your proctor. Exams will be open for completion until 11:59 pm cst on the "closing dates" listed here:
Exam 1 (covering chapters 1 through 6): closing date February 10
Exam 2 (covering chapters 7 through 10): closing date March 10
Exam 3 (covering chapters 11 through 14): closing date April 10
Exam 4 (covering chapters 14 through 18): closing date May 9
Final Exam (comprehensive): closing date May 9
Homework closing date May 8th, 5 pm.

Practice exams: There are four practice exams that cover the same material, and are of the same format as the exams. A password is not required for them, you can take them as many times as you want (the questions don't change), and the grades do not contribute to your course grade. They are provided to help you review for the exams and become accustomed to the exam format.

Homework (extra credit): Extra for the course will be available through the BioPortal associated with the textbook (see the link above for the textbook). The aspects of the BioPortal used for extra credit are the "Learning Curve" assignments, accessed through the "assignments" tab. There are 17 of these (one for each chapter 2 through 18). Successful completion will earn 1 extra credit point toward your final grade, for a total of 17 possible extra credit points.

The homework is designed to help you learn the material, thus it is best to complete it before you take the exams. However, you can complete this at whatever pace you choose but you must be finished by the closing date above.

GRADING: Grading for the course is affected by two factors: exams and "homework" (as described above).

<table>
<thead>
<tr>
<th></th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Exams (best 3 of 4 Midterm Exams)</td>
<td>120</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40</td>
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<tr>
<td>Total points possible (without extra credit)</td>
<td>160</td>
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</tbody>
</table>

LETTER GRADES: While the final grade will be scaled to the mean of the class, grades will not be any lower than the following scale: >90%=A, >80%=B, >70%=C, >60%=D. Thus, no matter what the class average is, you will get an A if you are above 90% of the possible points. From past experiences, the class average is normally around 73%, and the class average has in the past been assigned a B-.

Test scores will be used to make a grade curve based on the average. THEN the extra credit points from the homework will be added to your total score, and the resulting number will be used with the grade curve to assign your grade. Thus, the homework will be truly "extra credit" in that it will not affect the grade curve and will only benefit your grade if you choose to take advantage of it.

Exam Proctors (for off-campus students): If you are taking this class away from Iowa State University, and are unable to use the ISU online testing facility, you will need to identify a proctor. Information about this is found on the "Proctor Information" form on the Blackboard page. This needs to be completed during the first week of class.

Academic integrity: Academic integrity is paramount to everyone associated with Iowa State University. Academic dishonesty devalues the degrees earned at Iowa State, including your own. Please refer to Iowa State’s policies on Academic Dishonesty at [www.iastate.edu/~catalog/2005-07/geninfo/dishonesty.html](http://www.iastate.edu/~catalog/2005-07/geninfo/dishonesty.html). In summary, all graded work should be the result of your own effort.
instructor will comply with the policies of Iowa State University when dealing with cases of Academic Dishonesty.

**AVAILABLE RESOURCES / FINDING HELP FOR BBMB 404:**

*Questions regarding the course material:* This includes academic questions, questions about your exams, grades, homework questions, etc. Contact me by email.

*Questions regarding Blackboard administration:* If you have problems dealing with the Blackboard learning environment (this would be if you cannot login, cannot get files, cannot see the videos, etc.) please contact:
  Todd Vens (trvens@iastate.edu) or
  Rodney Fischer (videoguy@mail.iastate.edu)

*Questions regarding Iowa State registration administration:* If you have problems dealing with general Iowa State distance learning issues:
  Lori Youngberg (lyoung@mail.iastate.edu)

*Live lecture material:* The following lectures are available through Blackboard. These are me presenting the Powerpoint files covering each book chapter. These lectures were presented to a class on-campus, so some administrative details might be different from those for the Distance Learning course you are taking. However, the course content is the same. Please disregard administrative issues discussed during class, as they may not pertain to the Distance Learning course you are in.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Reading</th>
</tr>
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<tbody>
<tr>
<td><strong>Introduction to biochemistry:</strong> The chemistry in biology</td>
<td>Ch. 1</td>
</tr>
<tr>
<td><strong>Proteins:</strong> Amino acids, the building blocks</td>
<td>Ch. 2</td>
</tr>
<tr>
<td><strong>Proteins:</strong> Protein folding and structure</td>
<td>Ch. 2</td>
</tr>
<tr>
<td><strong>Working with proteins:</strong> Purification and characterization</td>
<td>Ch. 3</td>
</tr>
<tr>
<td><strong>Working with proteins:</strong> Peptide sequencing and synthesis</td>
<td>Ch. 3</td>
</tr>
<tr>
<td><strong>Working with proteins:</strong> Protein localization and structure</td>
<td>Ch. 3</td>
</tr>
<tr>
<td><strong>Genetic information:</strong> DNA structure</td>
<td>Ch. 4</td>
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<tr>
<td><strong>Genetic information:</strong> RNA, the structure of a gene</td>
<td>Ch. 4</td>
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<tr>
<td><strong>Recombinant DNA technology:</strong> Sequencing</td>
<td>Ch. 5</td>
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<tr>
<td><strong>Recombinant DNA technology:</strong> Gene cloning and transformation</td>
<td>Ch. 5</td>
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<tr>
<td><strong>Biochemical Evolution:</strong> Exploring evolution and bioinformatics</td>
<td>Ch. 6</td>
</tr>
<tr>
<td><strong>Biochemical Evolution:</strong> Exploring evolution and bioinformatics</td>
<td>Ch. 6</td>
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</tbody>
</table>

*This ends the material for Exam 1*

**Hemoglobin:** Portrait of a Protein in Action Ch. 7  
**Hemoglobin:** The coolest molecule in the world Ch. 7
Enzymes: an introduction Ch. 8
Enzymes: kinetic mechanisms Ch. 8
Enzymes: inhibitors and coenzymes Ch. 8
Catalysis: making reactions happen fast enough for you to be alive Ch. 9
Catalysis: enzymatic mechanisms Ch. 9
Enzyme regulation: allostery (Aspartate Transcarbamoylase) Ch. 10
Enzyme regulation: isozymes and covalent modifications Ch. 10

This ends the material for Exam 2

Carbohydrates: units and chains Ch. 11
Carbohydrates: plus proteins Ch. 11
Lipids/Membranes: constituents and function Ch. 12
Lipids/Membranes: buried proteins Ch. 12
Channels & Pumps: picking your ion Ch. 13
Channels & Pumps: passively and actively crossing barriers Ch. 13
Signaling: receiving the message Ch. 14
Signaling: responding to the message Ch. 14

This ends the material for exam 3

Metabolism: welcome to life Ch. 15
Metabolism: with a carbon base Ch. 15
Glycolysis: using sugar Ch. 16
Glucose: building sugar Ch. 16
Citric Acid Cycle: the center of metabolism Ch. 17
Citric Acid Cycle: continuing the oxidation of sugar, making NADH Ch. 17
Oxidative Phosphorylation: What do we do with all this NADH? Ch. 18
Oxidative Phosphorylation: How do we make all this ATP? Ch. 18

Final review