Illinois Institute of Technology  
Biological and Chemical Sciences Department  
Biology Division  
Biology 403: Biochemistry Lectures, fall 2012

- **Class sessions:**
  held in Stuart Building Room 204, Mondays 1:50-3:05pm and Wednesdays 1:50-4:05pm. In most weeks I will give the class a ten-minute break midway through the long (Wednesday) session.

- **Textbook:** Laurence A. Moran, Robert A. Horton, Gray Scrimgeour, and Marc Perry, *Principles of Biochemistry*, 5th Edition, hardcover, New York: Prentice Hall, 5th Ed., 2011. ISBN-10: 0321707338; ISBN-13: 978-0321707338. You're welcome to consult other introductory textbooks on biochemistry; last year we used the text by McKee & McKee, but after some reconsideration we have returned to this Moran, Horton et al. text. The book we use in the two-semester biochemistry sequence by Garrett & Grisham is excellent, and you may want to consider investing in it. Some of you may have already purchased either the previous edition of this text (for which the authors' names were somewhat permuted: Horton was first author on the previous three editions), or the McKee & McKee text. I will not force you to replace these older books with the current one, but if I make reference to chapter headings or homework problems, it will be your responsibility to find a copy of the 5th edition of Moran so that you get those relationships straight.

- **iClickers:** All students in biology 403 section 1 (the live section) will need to purchase an iClicker, which is a wireless transmitter roughly the size of a TV remote. These are available at the IIT bookstore for about $42, and you may sell yours back to the bookstore at the end of the semester for roughly half-price if it’s still functional. You will need to bring your iClicker to class every Monday and Wednesday. We will use these in two ways during the semester: see below. Students in the Internet section (section 2) do not need to purchase an iClicker. Around the middle of the semester, you will be given a single substitute assignment to compensate for the fact that you're not doing the iClicker quizzes.

Andrew J Howard, instructor; howard@iit.edu,  
312-567-5881, cell phone 773-368-5067; Fax : 312-567-3576

Office Hours: Life Sciences Room 174, Monday 10am - 12:30pm,  
and Wednesday 10am - 11:05am and 4:30 - 6:00, or by appointment. This schedule may change as the spring progresses; check this space for possible modifications.

**Grading plans:**

The percentage of your grade contributed by various sources will be as follows.
<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm</td>
<td>12 September</td>
<td>15%</td>
</tr>
<tr>
<td>Midterm</td>
<td>10 October</td>
<td>15%</td>
</tr>
<tr>
<td>Midterm</td>
<td>5 November</td>
<td>15%</td>
</tr>
<tr>
<td>Final</td>
<td>7 December, 2-4pm*</td>
<td>24%</td>
</tr>
<tr>
<td>Homework</td>
<td>roughly weekly</td>
<td>13%</td>
</tr>
<tr>
<td>iClicker Quizzes</td>
<td>roughly weekly</td>
<td>6%</td>
</tr>
<tr>
<td>Peer-reviewed Literature Assignments</td>
<td>Weekly</td>
<td>6%</td>
</tr>
<tr>
<td>Class Participation</td>
<td>passim.</td>
<td>6%</td>
</tr>
</tbody>
</table>

* The Registrar determines the schedule for Final Exams. This date and time have been assigned to MW classes that begin at 1:50.
We may fine-tune the details of the grading system as the semester develops: watch this space for details.

**Electronic communication:**

I expect to be able to reach you by electronic mail and through Blackboard throughout the semester. You should use your official IIT e-mail address. If you choose to use another address for most of your e-mail, you have two choices: either check your IIT address in addition to your non-IIT address, or arrange to forward your IIT mail to your non-IIT mail system. Instructions for doing so are available on the IIT website.

**Class participation:**

The class participation grade will be determined based on your participation in several activities:

1. Comments contributed in class;
2. E-mail exchanges with me;
3. Telephone conversations with me;
4. Contributions to the "Content" forum of the class discussion board. This is the best of all.

Recognize that this last kind of participation will be positively scored even if it involves disagreements with my assertions; but the participation needs to be related to the content of the course, not the structure of the course offering. Thus your contributions won't be positively scored if they are limited to questions like "which chapters are going to be covered on the exam?" That's a legitimate question, and I'll endeavor to answer it, but it won't help your class-participation grade. Regular participation, rather than a flurry of last-minute contributions, will help you and your fellow students more, and will therefore earn you more points. In fact, there will be two separate discussion boards: one for discussions of content, and one for discussions of logistics. Only contributions on the content board will count. Questions of the kind mentioned above (schedules, syllabi, etc.) really belong on the "Logistics" forum rather than the "Content" forum.
Midterms:

The dates for the midterms are listed above. Each will include definitions, short-answer questions, and more substantial questions that require one to three paragraphs each to answer. 75 minutes will be available for the exam; the two exams that fall on Wednesdays will be administered from 1:50 to 3:05, and there will be a 10-minute break followed by a 50-minute lecture following the midterm. The third midterm falls on a Monday, so it will simply occupy the 1:50-3:05 slot. You will not be permitted to use your textbook or class notes, but for each midterm I will supply a help-sheet to help you remember factual information like the gas constant and the relationship among free energy, entropy, and enthalpy. I will also provide some relevant mathematical constants, like e, ln(2), log_{10}2, and ln(10), and physical constants like c, h, and the gas constant. There are, in fact, help-sheets already posted for the midterms and for the final exam; the ultimate versions of these help-sheets will be posted shortly before the exam itself. You will be handed a copy of the help-sheet at the exam, so don't bring your personal copy with you. When you're finished with each exam, take your help-sheet with you to help you study for the next exam.

Final Examination:

I recognize that the date of the Final Exam is late in the semester, and some of you may be eager to leave Chicago earlier than that date. I am willing to consider giving the exam to certain students on an earlier date in hardship cases only, e.g. if your airfare back to your home will cost half as much if you leave on Thursday. There will be a help-sheet for the final as for the midterms. The final will be closed-book and closed-notes. The final will be comprehensive, i.e. it will cover all the material in the course; but it will be especially geared toward the material from the final seven lectures, since we will not have had a midterm on that material. As a rough estimate I would say 40% of the material will be taken from those final chapters; 30% will be from earlier chapters; and 30% will require synthesis of what you learned in earlier segments with the new material.

Homework:

Submit your homework assignments through the "assignments" section of the Blackboard system itself. Do not use the Digital Dropbox, email, or paper submissions. These assignments will be due at 2359 CDT (before 4 November) or CST (after 4 November) on the date stated on Blackboard. I will accept late homework assignments, but your grade will be lowered relative to the score you'd get if you turn it in on time. Generally an assignment will receive full credit if it is turned in within 24 hours of the posted due date; it will receive 80% credit if it's turned in one to seven days late; it will receive 60% credit if it's turned in 7.001 to 14 days late; and so on. Once I have posted the answer key for a homework assignment, you will not be able to submit your contribution. I encourage you to do the homework assignments for three reasons:

- They count for a portion of your grade.
- They enable you to stay on top of the material.
- They provide content for your submissions to the class discussion board.
Your answers to most non-calculational homework questions should require about a paragraph. For study purposes, I'd encourage you to try the problems in the textbook for which the answers are found in the back, and the problems given in the textbook website for the previous edition of our textbook. I'm working on access to the website for the current edition; I don't know if I will be successful in obtaining it. If you've gotten them right, you probably understand the material.

Students sometimes want to resubmit assignments, either because they realize that their original submission contained errors or because they have submitted an assignment into the wrong slot. Blackboard doesn't permit you to resubmit on your own, so if you want to resubmit an assignment, simply email me and I will delete your original submission so you can submit your revised version.

**Literature Assignments:**

You will need to turn in a brief report roughly once per week summarizing a paper from the peer-reviewed literature. The specifics of these assignments are outlined on the Assignments page on Blackboard. It is your responsibility to find the assigned journal articles, but many of them will be posted in PDF form on the Blackboard site under "Course Documents" → "Journal Articles". There may be others available electronically from Galvin Library, and others may be available from Crerar, UIC, or Argonne. If you want help finding an article, request help from a reference librarian at Galvin: that's why they're there. Getting an obscure article from an external source can take a day or two in some cases, so plan ahead.

**Schedule:**

This is the plan for what topics we'll cover. This information is provided in greater detail in the course schedule. Note that some of the chapters, or sections of chapters, in Moran *et al* are not on the list at all; that's deliberate. This is a 950-page book, and there's no way to move through the entire book in one semester without oversimplifying things to the point of incoherence. So we'll pick and choose. The schedule listed below is pretty aggressive; we may fall slightly behind and have to truncate the schedule a bit, but we'll let you know that in advance. The lecture numbers listed here do not include the short lectures that I will deliver after the midterms on 12 September and 10 October.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Lectures</th>
<th>Dates</th>
<th>Chapters in Text</th>
<th>Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods, building blocks, enzymes, cofactors</td>
<td>Lectures 1-6</td>
<td>20 Aug- 10 Sep</td>
<td>1-6.3</td>
<td>12 Sep</td>
</tr>
<tr>
<td>Carbohydrates, Glycolysis, TCA cycle</td>
<td>Lectures 7-12</td>
<td>12 Sep- 3 Oct</td>
<td>6.4-9</td>
<td>10 Oct</td>
</tr>
<tr>
<td>Nitrogen Metabolism, Integration, Molecular Biology</td>
<td>Lectures 19-24</td>
<td>7 Nov- 28 Nov</td>
<td>14-18</td>
<td>7 Dec, 2-4pm</td>
</tr>
</tbody>
</table>
Taking the Exams:

Those of you taking the exams at IIT should be aware that we will go to substantial lengths to minimize the likelihood of cheating. Any student who is found to be cheating will be given a summary zero on the exam on which he or she is found to be cheating; a second infraction will result in an automatic E for the course. The teaching assistants will be present to proctor the exams, and will keep an eye out for low-tech and high-tech forms of cheating. No hats or other headgear, apart from those required by your religious practices, will be allowed at exams. You will not be allowed to bring any electronic devices, notes, or books to the exams; the calculational problems will be numerically straightforward, so that you can do them with a pencil and paper. I reserve the right to impound calculators, cell phones, MP3 players, PDAs, laptops, and other electronic devices brought into exams. Any numbers that you might ordinarily have to obtain from a calculator will be provided on the help-sheet. I reserve the right to provide some mathematical and physical constants that you will not need; don't assume that if a constant is on the help-sheet, you're going to have a use for it. If you haven't done long division in six years, you might want to practice a bit before the first midterm. My exams tend to be reasonably easy, but long, so planning and prioritization are important.

Grading scale:

I am often asked whether I grade on a curve. The answer is yes, but I curve your performance relative to ten years of students who have studied this material before you, rather than just relative to your current cohort. In general I tend to assign the top 27% of the class as A's, the next 40% as B's, the next 20% as C's, and the final 13% as D's and E's; but if your performance as a group is poorer than the average over previous years, the percentages in the A and B ranges will go down, and if you're doing better than previous years, the percentages in the A and B ranges will go up. I never assign letter grades to individual assignments or exams, although I may provide rough estimates of the A/B and B/C cutoffs for individual midterms; so don't ask for exact cutoffs, since they don't exist.

How we'll use the iClickers:

We'll use the iClickers in two ways. From time to time I plan to ask multiple-choice questions for which you should punch in your answers on your iClicker. These questions will not be graded; instead, they'll be used as votes, and we'll look at the vote totals before I provide an actual answer. Sometimes I'll ask you to produce the answer on your own; other times, I'll ask you to work in small teams. Roughly once per week, we'll have an actual in-class quiz, consisting of a few multiple-choice questions that you will answer by iClicker. These quizzes will count in your final grade. If you miss one of these quizzes, you'll get a zero on it, unless you have notified me in advance that you have a legitimate excuse for missing the class. I'm the one who decides whether your excuse is legitimate.