

Instructor: Kevin Rice – kprice@colby.edu (Keyes 313, x5763)
Office Hours: open or by appointment

Course website: <http://wiki.colby.edu/display/BC367Rice>

Required materials:

- *Lehninger: Principles of Biochemistry*, Nelson & Cox (7th Ed), Freeman
- Specified calculator

• *Reading assignments will be posted weekly on the course website.*

• *Supplemental reading materials may also be assigned periodically.*

Course description: This is a broad introduction to the chemistry of living systems. We will focus on the biological molecules, biochemical reactions, and regulatory processes that are essential to the functioning of the cell, stressing the development of problem-solving, critical-thinking, and communication skills in both the lecture and laboratory. This course is designed for Chemistry and Biology majors and is appropriate for students intending to pursue either graduate or professional study. Topics include the structures and functions of the major classes of biological molecules (proteins, carbohydrates, nucleic acids, and lipids) and enzyme kinetics and mechanisms.

Course learning goals:

1. To learn the fundamental chemistry and biochemistry of major classes of biomolecules, including amino acids and proteins, sugars and polysaccharides, nucleotides and nucleic acids, and lipids.
2. To understand how chemical reactivity, thermodynamics, and kinetics are responsible for life.
3. To sharpen problem-solving skills of both a qualitative and quantitative nature and to solve problems that involve the integration and synthesis of new knowledge.
4. To enhance written and oral communication skills and build confidence in oral expression in a group setting.

Lecture (Tue/Thu, 9:30 - 10:45, Arey 5): Lectures in this course will be rich in content ... and hopefully in discussion. We will be covering a very wide range of biochemical topics (with an approximate schedule given below). As such, we will be moving quickly and there will be a significant responsibility for students to keep up with the material outside of lecture. Some of the material presented in lecture will go much further than is provided in the textbook while other sections will be more thoroughly covered in the text. Students will be expected to have done the reading and be prepared for each lecture. Students' engagement in the lecture will factor into their grades in BC367.

Week of:	Lecture topic:	Textbook chapters:
9/6	Living matter / aqueous chemistry	1, 2
9/11	Amino acids	3
9/18	Peptides and proteins	3-4
9/25	Protein structure	3-4
10/2	Protein dynamics	5
10/9	Enzymes and enzyme kinetics	6
10/16	Enzyme inhibition	6
10/23	Enzyme mechanisms	6
10/30	Sugars, polysaccharides, and glycobiology	7
11/6	Nucleotides and nucleic acid structure	8
11/13	Nucleic acid chemistry and function	8
11/20	DNA technology and lipid chemistry	9-10
11/27	Storage and structural lipids	10
12/4	Lipid biology and membranes	10-11

Discussion (Fri, 12:00 - 12:50, Arey 5): During discussion sessions we will delve a bit deeper into biochemistry topics. Most weeks, you will receive a problem set that you are to complete for the Friday meeting, where you will have the opportunity to present the questions to the class, typically on the chalkboard. Please neatly write or type out each problem separately on its own sheet of paper. Every week, you will be asked to turn in one or more of these problems for formal grading, so you should always be prepared for this. You may get together with other students in the class to begin working through these problems shortly after they are assigned. The principal goal of these problem sets is to stimulate discussion, not necessarily for you to obtain the “right” answers, so please do not try to check your answers with Prof. Rice before discussion section. You will be graded primarily on your effort and also on your ability to communicate effectively during discussion. You are required to attend all discussion sections. If you know you are going to be absent because of a planned event such as an interview or athletic competition, you must notify Prof. Rice and turn in your entire written problem set before discussion section. Unexcused absences will not be accommodated and the student shall be penalized at Prof. Rice’s discretion.

Assessment and grading:

- The problems collected during discussion will be evaluated for your demonstrable effort and understanding of the material. **(12% of final grade / 15% without laboratory)**
- There will be two in-class, mid-term exams: (1) **Thursday, October 5th** and (2) **Tuesday, November 14th**. Exam questions will come from all reading assignments and lecture material, but not from material discussed only during discussion sessions. More

information will precede the exams themselves, but be aware that, by design, **the exams will be very difficult!** There will be no make-up exams. In the event of an excused absence, you will be given a grade coordinate with your performance relative to the class on the subsequent exam. Exams will be written such that students will be able to complete them in 45 minutes. However, all students will be given the full 75-minute class time. As such, students for whom extended time on examinations is recommended by the Dean of Students Office needn't seek additional accommodation. Please talk to Prof. Rice with any questions or concerns about BC367 exams. **(each exam – 16% of final grade / 20% without laboratory)**

- The final exam will be given at a time and place to be assigned by the registrar. The final exam will be *comprehensive*. **(24% of final grade / 30% without laboratory)**
- Attendance and class participation will be part of your grade in the course. During class time you will be expected to have completed the assigned reading and be otherwise prepared to participate in class discussions. This is especially true for the Friday discussion sessions for which attendance is mandatory. This portion of your grade will be assigned at your Professor's discretion. **(12% of final grade / 15 % without laboratory)**
- Laboratory is an optional component of BC367, but an unquestionably useful one. More information about the laboratory can be found at the BC367 website. **(20% of final grade)**

Academic dishonesty will not be tolerated. Please refer to the Chemistry Department policies (<http://www.colby.edu/chem/about/chemistry-attendance-and-exam-policy/>), which will be followed in this course.