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BCH 110.01: Introductory Biology for Biochemists

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Intro Biology for Biochemists
BCH 110
Spring 2015
Health Sciences 207, MWF, 11:10 AM-12:00 PM

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Text: Campbell & Farrell, Biochemistry, 6th ed. (ISBN: 978-0-495-39041-1)

Clicker: i>Clicker (any model; let me know if you are using i>Clicker GO)

Biology is the study of life: it is a diverse science that spans molecules, cells, physiology, development, behavior, evolution, and ecology as well as medicine, conservation, flora, and fauna. Chemistry is the study of the structures and functions of atoms and molecules. As implied by the name, biochemistry is the study of the structure and function of biologically relevant molecules within the appropriate biological context, be it a molecule, a cell, or an ecosystem. This introductory course will explore these biomolecules and their roles in life processes. It will provide a solid foundation for Cellular and Molecular Biology (BIOB 260), Genetics and Evolution (BIOB 272), Biochemistry Seminar (BCH 294), and many other advanced science courses. The **expected course outcomes** are to understand the chemistry of life; to begin to think critically and solve scientific problems; and to appreciate the role molecular processes play in biology. This course will emphasize biochemical principles, scientific concepts, and information syntheses while fostering an appreciation of the structure and function of molecules in cells as well as the chemical reactions that together constitute life.

Students are expected to diligently study the material and are strongly encouraged to read the text and supplementary materials prior to the corresponding lectures. Questions will be assigned for each chapter, but they will not be collected or graded. Students are encouraged to participate in classroom discussions and to ask questions at any time, certainly as they pertain to particular details of the lecture or readings, but also to explore relevance and connections to their own interests with respect to life and science.

The **required course prerequisite** is CHMY 141N or equivalent and the **required course co-requisites** are CHMY 143N and BCH 111.

Grading: There are a total of 500 points to earn:

- Two midterm exams, 100 points each
- One final exam, cumulative, 100 points
- Five writing assignments, 10 points each
- Five quizzes, 10 points each
- Participation points, 100 points total

A 90% or higher will earn an A– or A, an 80% or higher will earn at least a B–, a 70% or higher will earn at least a C–, a 60% or higher will earn at least a D–, and lower than 60% is at risk of earning an F.

Pluses (+) and minuses (–) will be used (A, A–, B+, B, B–, C+, C, C–, D+, D, and D–).

A CR grade is equivalent to a D– or better and a NCR grade is equivalent to an F.

Extra credit will be available for students that volunteer to judge at the Montana State Science Fair on Monday, March 16 (<http://www.mtsciencefair.org/>).

Make-ups for missed exams are strongly discouraged, but requests with a compelling and verifiable excuse will be considered on a case-by-case basis. There are no make-ups for missed clicker questions.

Exams and quizzes will cover material from lecture and assigned reading. Midterm exams are during class (11:10 AM) on Wednesday, March 4 and Wednesday, April 15. The final exam will be at 10:10 AM on Thursday, May 14. All exams are closed book: no outside materials are allowed; electronic devices (including cell phones, translators, calculators, MP3 players, and others) are not allowed during exams without the explicit permission of the instructor.

If you would like to have an **exam re-graded**, you need to submit your comments in writing within two weeks of the return of the graded exam and your exam will be completely re-graded.

Clickers will be used for participation points. Students are required to purchase an i>Clicker remote and will be graded on i>Clicker use: 2 clicker points for responding to 75% of questions in one class, plus 1 clicker point for each answer and 1 additional clicker point for each correct answer. Clicker points will be scaled to 100 participation points depending on how many clicker points are offered (which is expected to be about 475, in which case ~5 clicker points will be equal to 1 participation point). The i>Clicker remote must be registered on Moodle in order to receive participation points. Enter your i>Clicker remote ID (found on the back of your i>Clicker) in Remote Registration under the I>CLICKER block in Moodle. Students will need to contact the instructor by the end of the first month of class if they cannot determine their remote ID or if there is another reason that their i>Clicker is not registered. i>Clickers will be used every day in class and students are responsible for bringing their remote daily (and perhaps extra batteries).

Writing assignments will be due about every other Friday; the top five scores from six assignments will be used. The assignments are to write a one-page essay; they be completed on a word processor and submitted as a legible hard copy. Each written assignment will be worth 10 points and will be graded for both content (8 points) and writing style (2 points). Late written assignments will be penalized one point per day and must be handed directly to the instructor.

PDF files of lectures and supplementary material will be available to **download** from Moodle: <http://umonline.umt.edu>. These notes are best used as a *template* for taking notes in class. They are not a substitute for attending class or reading the assignments.

An official UM email address must be used for **email correspondence** with the instructor, according to University policy. Grades cannot be discussed by email, according to FERPA.

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). Please contact DSS in Lommasson 154 if you think you may have a disability adversely affecting your academic performance. The course instructor will work with you and DSS to provide an appropriate **accommodation**.

Dropping the course or changing grading status will strictly follow the University policies and procedures, which are described in the catalog. Students should note that they cannot change to an audit after the 15th day of instruction. In addition, dropping the course or changing the grading status (to CR/NCR) are not automatically approved after the 45th day of the semester; these may be requested by petition, but the petition must be accompanied by documentation of extenuating circumstances. Requests to drop the course or change the grading status to benefit a student's grade point average will not be approved.

Academic misconduct will be reported and handled as described in The University of Montana Student Conduct Code. *All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code.* The Student Conduct Code defines plagiarism as "representing another person's words, ideas, data, or materials as one's own." Students are encouraged to work together in completing written assignments to solve problems, to share information or resources, and to test each other's understanding: these are all acceptable forms of collaboration. However, the written work that each student turns in must be her or his own. Only in this way can individual understanding of concepts or information be judged. Students can work together up to the point of writing. At that stage, each student must work independently. In addition, once a student has written an out-of-class assignment, it must not be shown to another student in the course. Assignments from two or more students that have significant overlap as judged by the instructor will be regarded as a violation of the expectation that students turn in independent assignments. Also, direct copying of sentences from any published source, including the Internet, without proper citation is considered plagiarism: write the information in your own words; the instructor will check literary and online resources. These violations will be handled according to the Student Conduct Code.

Day/Date	Topic	Reading
M Jan 26	Introduction	
W Jan 28	Science as a way of knowing	How Science Works <i>and</i> Science Denial
F Jan 30	Chemical foundations	Ch. 1
M Feb 2	Origins of life	Meaning of Life <i>and</i> Twice as Natural
W Feb 4	Cells	Ch. 1
F Feb 6	Energy, enthalpy and entropy	Ch. 1
M Feb 9	Evolution	The Challenge of Antibiotic Resistance
W Feb 11	Hydrogen bonds	Ch. 2
F Feb 13	pH, acids and bases	Ch. 2
W Feb 18	Amino acids	Ch. 3
F Feb 20	(continued)	
M Feb 23	Peptides	Ch. 3
W Feb 25	Protein structure	Ch. 4
F Feb 27	Hemoglobin and myoglobin	Ch. 4
M Mar 2	(continued)	
W Mar 4	Midterm exam I	
F Mar 6	Protein folding	Ch. 4
M Mar 9	Enzymes	Ch. 6 and 7
W Mar 11	Lipids (<i>Dan Drecktrah</i>)	Ch. 8
F Mar 13	Biological membranes (<i>Dan Drecktrah</i>)	Ch. 8
<i>M Mar 16</i>	<i>Montana State Science Fair</i>	
W Mar 18	Monosaccharides	Ch. 16
F Mar 20	(continued)	
M Mar 23	Disaccharides and polysaccharides	Ch. 16
W Mar 25	Metabolism overview	Ch. 15
<i>F Mar 27</i>	<i>No class</i>	
M Apr 6	Respiration overview	Ch. 17, 19, and 20
W Apr 8	Photosynthesis overview	Ch. 22
F Apr 10	DNA structure	Ch. 9
M Apr 13	RNA structure	Ch. 9
W Apr 15	Midterm exam II	
F Apr 17	Replication	Ch. 10
M Apr 20	(continued)	
W Apr 22	Transcription	Ch. 11
F Apr 24	(continued)	
M Apr 27	Transcriptional regulation	Ch. 11
W Apr 29	(continued)	
F May 1	Genetic code and translation	Ch. 12
M May 4	(continued)	
W May 6	Cell cycle, mitosis, and meiosis	
F May 8	(continued)	
R May 14	Final exam (10:10 AM)	