

Instructor: Craig L. Moyer
Email: cmoyer@hydro.biol.wvu.edu
Web page: <http://fire.biol.wvu.edu/cmoyer/cmoyer.courses.html>
Office Hours: MWF, 3-4pm; and by Appt., BI 406
Lecture: MWRF, 11:00 to 11:50am, AW 304
Labs: T, 9-11:50am or 3-5:50pm or F, Noon-2:50pm, BI 261

Required Texts:

1. Alberts et al., Essential cell biology, 2th Edition
2. Biology 205 Laboratory Manual (available at Bookstore)

Prerequisites: Biol 204, Chem 121 or 125; pre/coreq Chem 122 or 126

Course Goals: As an integral component in the curriculum for biology majors, this course will emphasize the chemical and physical principles underlying biological processes and thereby focus on how cells deal with information and energy in order to survive. You will become familiar with the following topics:

- The structure and function of biological molecules
- The cellular basis of life and its hierarchical organization
- Storage, transfer, and expression of genetic information
- Genome and proteome organization
- Energy acquisition and cellular metabolism
- Evolutionary history of life

Tentative Class Schedule: (Will be updated accordingly)

<u>WEEK OF</u>	<u># Lectures</u>	<u>LECTURE & READING ASSIGNMENT</u>	<u>LABS</u>
Jan 7 (W)	3	Introduction to cell biology; An Evolutionary Perspective Chap. 1 (Review Chap. 2)	No lab, P/U lab manual
Jan 12	4	Protein Structure & Function; Endomembrane System Chap. 4, 15	Protein Structure
Jan 16 (F)		Quiz#1 (10 min)	
Jan 21 (W)	3	Wonders of the Cytoskeleton; Construction of the "Bags of Biochemistry" Chap. 17, 11 (Review Chap. 12)	Enzyme Activity I
Jan 26	3	Cellular Reproduction & Cell Cycle; Chap. 18	Enzyme Activity II
Jan 30 (F)		Midterm Exam I (through chapter 18)	
Feb 2	4	Reduction & Division; Genes and Their Heritable Traits Chap. 19, 20	Diffusion and Osmosis
Feb 9	4	Cracking the Genetic Code & The Double Helix; DNA Replication Chap. 5, 6	Bacterial Genetics I
Feb 13 (F)		Quiz#2 (10 min)	
Feb 18 (W)	3	The Central Dogma; DNA to Proteins; Transcription and Translation Chap. 7	Bacterial Genetics II

Feb 23	3	The Eukaryotic Genome and Its Expression Chap. 8	DNA Sequence Analysis
Feb 27 (F)		Midterm Exam II (through chapters 8 & 9)	
Mar 2	4	Cellular respiration: Cellular Pathways that Harvest Energy Chap. 13, 14	Photosynthesis
Mar 9	4	Photosynthesis: Transforming Sunlight into into Cellular Energy and Organic Carbon Chap. 13, 14	Final Lab Exam
Mar 17 (T)		FINAL COMPREHENSIVE EXAM: 8:00am – 10:00am	

Course Description:

BIO 205 demonstrates the interdependence of many scientific disciplines, notably chemistry and physics. The physical and chemical mechanisms which make life possible will be emphasized in both the lecture and the laboratory meetings, and related to our understanding of the origin and evolution of life on earth. We will investigate the levels of organization in living things: beginning with important molecules and how they interact in biological systems, including simple cellular organization, and progressing to more complex specializations for particular lifestyles (e.g., photosynthesis). The diversity of life which has successfully colonized a variety of habitats on earth will be addressed through topics which demonstrate unity in biological processes: the storage, inheritance and expression of genetic information, organized energy transformations, and the metabolic machinery necessary for the maintenance of structure and function in an array of cells.

Course Evaluation and Grading:

Lecture exams will contain a mixture of multiple choice, short answer, and essay questions, designed to evaluate your knowledge, understanding, and application of course material. You will be expected to be able to integrate concepts, especially towards that latter parts of the course.

The use of scientific modeling is an important part of several laboratory investigations. Laboratory exercises are designed as a means of demonstrating cellular processes and providing opportunities to gain experience in laboratory technique and scientific method. Lab reports are required following most of the exercises, and focus on the construction of graphs and tables for effective communication and analysis of the results. The lab grade contributes ~25% of your total grade. Undergraduate and graduate student teaching assistants will be available in the lab. They are resources important to your success in this course: please respect the work they do for you, and don't hesitate to ask them for assistance with lecture and lab material. This class proceeds at an accelerated pace and your success depends upon the discipline you muster in keeping up with the large amount of material that we are required to cover.

Quizzes (20 points each)	40 points	Tentative Grading Scale:
Midterm Exam I	90 points	100 to $\geq 92\%$ = A < 92 to $\geq 90\%$ = A-
Midterm Exam II	90 points	< 90 to $\geq 88\%$ = B+ < 88 to $\geq 82\%$ = B < 82 to $\geq 80\%$ = B-
Final Comprehensive Exam	120 points	< 80 to $\geq 78\%$ = C+ < 78 to $\geq 72\%$ = C < 72 to $\geq 70\%$ = C-
<u>Laboratory</u>	<u>110 points</u>	Below 70% = D
Total points possible:	450 points	Below 60% = F

Notes:

- (1) I grade with an accuracy to the nearest the 0.5%. I reserve the right to round up and will not round down. You may improve your grade by writing a 2-page summary (double spaced) based on one of the supplementary readings provided for each of the two series we will cover. Deadlines for summaries will be posted on the web page and they are final.
- (2) You are currently enrolled in this course and only you can change this. If you fail to complete all of the assignments, or stop coming to class and do not officially withdraw, you will receive a failing grade. This policy is in place due to the high demand for this class and to facilitate responsible and timely decisions regarding enrollment.
- (3) It is the student's responsibility to turn in assignments and take exams at the scheduled times. In the event this is completely impossible, contact me ahead of time. Documentation of family emergency or illness from a health professional confirming that you were unable to take the exam during the scheduled time will be expected before special arrangements will be made. Make-up exams may not be in the same format as typical exams.