

**Instructor:** Craig L. Moyer  
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**Web page:** <http://fire.biol.wvu.edu/cmoyer/cmoyer.courses.html>  
**Office Hours:** MWF, 10-11am, and by Appt., BI 406  
**Lecture:** MWF, 11:30 to 12:50pm, PH 228  
**Labs:** T, 8-10:50am or Noon-2:50pm or R, 2-4:50pm, BI 261

**Required Texts:**

1. Alberts et al., Essential cell biology, 3<sup>rd</sup> 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 &amp; READING ASSIGNMENT</u>   | <u>LABS</u>            |
|-------------------|-------------------|---|------------------------|
| Jan 9 (W)         | 2                 | Introduction to cell biology;<br>An Evolutionary Perspective<br>Chap. 1 (Review Chap. 2)                          | No lab, P/U lab manual |
| Jan 14            | 3                 | Protein Structure & Function;<br>Endomembrane System<br>Chap. 4, 15   | Protein Structure      |
| <b>Jan 18 (F)</b> |                   | <b>Quiz#1 (10 min)</b>  |                        |
| Jan 23 (W)        | 2                 | Wonders of the Cytoskeleton;<br>Construction of the "Bags of Biochemistry"<br>Chap. 17, 11 (Review Chap. 12 & 20) | Enzyme Activity I      |
| Jan 28            | 3                 | Cellular Reproduction & Cell Cycle;<br>Chap. 18   | Enzyme Activity II     |
| <b>Feb 1 (F)</b>  |                   | <b>Quiz#2 (10 min)</b>  |                        |
| <b>Feb 4 (M)</b>  |                   | <b>Midterm Exam I</b> (through chapter 17, part of 18)  |                        |
| Feb 6 (W)         | 2                 | Reduction & Division;<br>Genes and Their Heritable Traits<br>Chap. 19   | Diffusion and Osmosis  |
| Feb 11            | 3                 | Cracking the Genetic Code & The Double Helix;<br>DNA Replication<br>Chap. 5, 6                                    | Bacterial Genetics I   |
| <b>Feb 15 (F)</b> |                   | <b>Quiz#3 (10 min)</b>  |                        |
| Feb 20 (W)        | 2                 | The Central Dogma; DNA to Proteins;<br>Transcription and Translation<br>Chap. 7                                   | Bacterial Genetics II  |

|                   |   |   |                       |
|-------------------|---|---|-----------------------|
| Feb 25            | 2 | The Eukaryotic Genome and Its Expression<br>Chap. 8 (Review Chap. 9)                                  | DNA Sequence Analysis |
| <b>Feb 25 (M)</b> |   | <b>Quiz#4 (10 min)</b>  |                       |
| <b>Mar 1 (F)</b>  |   | <b>Midterm Exam II</b> (through chapters 8 & 9)   |                       |
| Mar 4 (M)         | 3 | Cellular respiration: Cellular Pathways that Harvest Energy<br>Chap. 13, 14 (Review Chap. 3)          | Photosynthesis        |
| Mar 11            | 3 | Photosynthesis: Transforming Sunlight into<br>into Cellular Energy and Organic Carbon<br>Chap. 13, 14 | <b>Final Lab Exam</b> |
| <b>Mar 18 (M)</b> |   | <b>FINAL COMPREHENSIVE EXAM:<br/>3:30 – 5:30pm</b>  |                       |

### Course Description:

BIOL 205 demonstrates the interdependence of many scientific disciplines. The physical and chemical mechanisms that make life possible will be emphasized in both lecture and lab meetings. 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 that has successfully colonized a variety of habitats on earth will also be addressed through topics demonstrating the emergent properties of 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 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. 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. 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 (10 points each) | 40 points         | Tentative Grading Scale:  |
| Midterm Exam I           | 100 points        | 100 to $\geq 92\%$ = A $< 92$ to $\geq 90\%$ = A-                               |
| Midterm Exam II          | 100 points        | $< 90$ to $\geq 88\%$ = B+ $< 88$ to $\geq 82\%$ = B $< 82$ to $\geq 80\%$ = B- |
| Final Comprehensive Exam | 135 points        | $< 80$ to $\geq 78\%$ = C+ $< 78$ to $\geq 72\%$ = C $< 72$ to $\geq 70\%$ = C- |
| <u>Laboratory</u>        | <u>125 points</u> | Below 70% = D   |
| Total points possible:   | 500 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 an actual 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.
- (4) Academic dishonesty is taken very seriously, if you are caught cheating or plagiarizing, you will automatically fail this course. It isn't worth it. If you are getting stressed over this course, come see me, the earlier the better! I will be happy to go over the material with you one-on-one.