

# **Biology 201A – Spring 2009**

## **General Information on Course Requirements and Grading**

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### **Introduction:**

**Biology 201A, "Principles of Cell and Molecular Biology,"** is one course of a two-semester sequence for biology majors, Biology 201A and 201B. Note: this course is not a GE course; it is a required course for all biology majors.

In 201A, we introduce principles that apply to all living organisms. The underlying theme is the unity of life while Biology 201B covers the diversity of life. Some of the biological disciplines that are touched on include biochemistry, cell biology, classical genetics, and molecular biology. Consequently, Biology 201A provides a foundation for much of your upper division coursework in biology, particularly Genetics and Evolution (Biol. 352) and Biochemistry, Cell, and Molecular Biology I, II, and III (Chemistry 365, Biology 366, and Biology 467).

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### **Prerequisites:**

Although Biology 201A is introductory in nature, we have a lot of ground to cover. Therefore, as a minimum background you should have **all of the following:**

1. A **college-level chemistry course** such as **Chem. 200** is required as a prerequisite. **You should not take Biology 201A course without Chem. 200 or its equivalent. You face possible course failure for lacking prerequisites.**
  2. A **working knowledge of algebra** (graphing, interpreting graphs, simple equations, logs, exponents, etc.).
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### **Biology 201A Course Information:**

All information for this course will be posted on Blackboard. The Biology 201A Blackboard site contains course information including the lecture schedule, lecture notes if they are available, and a bulletin board for course announcements. Students can obtain a free E-Mail account if they do not already have one; check in the Student Computing Center in the Love Library.

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### **Course Organization:**

Biology 201A is a team-taught course as are many courses for Biology majors. There are two lecturers who cover topics in their particular fields of expertise, and graduate teaching assistants who handle the laboratory sections. The lecture portion of the course is divided into 4 unequal segments:

**Cell Structure and Function**  
**Energy Metabolism**

**Classical Genetics**  
**Molecular Biology**

**The lab exercises** have been designed to reinforce concepts presented in lecture, and to introduce you to some of the procedures and instruments used in biological research. We

have tried to schedule the various lab topics so that they come after the relevant material has been covered in lecture.

## Instructors

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**Office Hours: Tues/Thurs 9:30am-10:30am**

**If you must contact the instructor, make sure to put “Bio201a” at the beginning of the subject line in order to properly pass email spam filters.**

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### **Textbook Required:**

**Campbell and Reece, *Biology* 8<sup>th</sup> Edition; Pearson/Benjamin Cummings, 2008**

Publisher Website : [www.campbellbiology.com](http://www.campbellbiology.com)

Assigned reading from the text accompanies each lecture and is indicated on the lecture outline. You are responsible for all text material assigned with emphasis on material that relates directly to the lectures. You need not bring the text to lecture or to lab meetings. There is a Lecture Notebook and/or CD that may be packaged with the textbook; this contains figures from the text and space for lecture notes. Some of you may have acquired the 7<sup>th</sup> edition of Campbell. The information in the two editions is essentially the same, but the course will rely on the information contained within the 8<sup>th</sup> edition of the textbook.

**Lab Manual: *Biology 201 Principles of Cell and Molecular Biology: Lab Exercises* published by Burgess (ISBN# 0-8087-4495-X); available at Aztec Bookstore**

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### **Learning Objectives:**

In this course you will learn the fundamentals of Cell and Molecular Biology - principles that apply to all living organisms.

By the end of the course, students will be able to:

- Describe the importance of water to biological systems
- Understand the basic principles of organic (carbon-based) chemistry as it relates to life
- Describe and understand the structure and function of large biological molecules
- Describe and understand the basic structures and properties of cells
- Understand and explain membrane structure and function
- Describe and understand the principles and processes of cellular metabolism and respiration
- Understand the process of photosynthesis
- Compare and contrast the similarities and differences between mitosis and meiosis
- Describe the principles of Mendelian genetics
- Describe and understand the principles and major features of the chromosomal and molecular basis of inheritance
- Understand the flow of genetic information from DNA to RNA to Protein and will be able to describe those processes at the molecular level
- Understand and describe the basic properties of gene regulation and cell communication

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### Grading:

Your final grade will be calculated using the following weighting:

**Lecture component = 75%**

**Laboratory component = 25%**

We use a point system and your grade will be based on a percentage basis. The point values of the lecture exams are shown on the lecture outline. Consult the lecture schedule for exam dates. The **Final Exam** is comprehensive, and segment coverage for this exam breaks down as follows:

<b>Exam I material</b>	<b>100 points</b>
<b>Exam II material</b>	<b>100points</b>
<b>Exam III material</b>	<b>100 points</b>
<b>Final exam</b>	<b>100 points from last section of course; 100 points comprehensive (Scantron)</b>

- During the lecture course, there may be opportunities to earn extra credit – these opportunities will be explained in lecture. Attendance during lectures may be necessary to earn extra credit points.
- A series of self-study quizzes for each chapter will be provided on Blackboard. You should take advantage of these quizzes as they will help you to understand the material in this course.

Grades are earned on a straight percentage basis as shown below:

<b>Scale:</b>	<b>B+:</b> 88-89.9%	<b>C+:</b> 78-79.9%	<b>D+:</b> 68-69.9%	<b>F:</b> <59.9%
<b>A:</b> 93-100%	<b>B:</b> 83-87.9%	<b>C:</b> 73-77.9%	<b>D:</b> 63-67.9%	
<b>A-:</b> 90-92.9%	<b>B-:</b> 80-82.9%	<b>C-:</b> 70-72.9%	<b>D-:</b> 60-62.9%	

The lecture exams will be objective (mostly multiple choice) with possibly some short-answer essays (a sentence or two up to a couple of paragraphs). These exams will assess your knowledge of both lecture and reading assignments. **Questions will be drawn from both the lecture and reading assignments.** If you have a **legitimate excuse**, be sure to notify the appropriate lecturer **by the day after the exam** and be prepared to provide **written confirmation** (letter from your doctor etc.). Job-related excuses are not acceptable; you are responsible for arranging your work schedule around your classes.

Lab performance is evaluated by several criteria with the indicated weights:

<b>Quizzes</b>	<b>25%</b>
<b>Write ups</b>	<b>75%</b>

The quizzes are given at the beginning of the lab period and test whether you have carefully read the lab exercise(s) before coming to lab. Unprepared students tend to make mistakes in lab and become a liability for their lab partners. Write-ups refer to the material you hand in from the previous week's exercise (graphs, answers to questions, etc.). Neatness counts here!

### **Plagiarism:**

In many cases you will share data with other students, but **the lab write-up you turn in must be your own work.** Turning in a copy of someone else's work is **plagiarism** and is considered a serious academic offense. **Two students who turn in the same lab report will each receive no points for the write-up. Any Blackboard bonus quizzes assigned during lecture must be your own work.** Multiple offences of cheating, including plagiarism, will result in the student being reported to the judicial office. The genetics paper is a formal write-up of the "Segregation Analysis" experiment, and must be

typewritten in a format spelled out in the lab syllabus and by your lab instructor at the appropriate time. The lab final exam is no longer given.

### Important Note:

Attendance at lab meetings is mandatory! Role is taken at each meeting, and **missing more than one lab without a legitimate excuse is grounds for failing.**

### Another Important Note:

**You must pass both the Lecture Component and the Laboratory Component to pass the course.** A superior performance in lab will not make up for a failing performance on lecture exams. A superior performance in lecture will not make up for a failing performance in lab. A score of <50% in lecture is an automatic "F".

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### Final Note:

Biology 201A covers a lot of material. In order to pass the course, you should **keep up with the material on a daily basis.** Attend lectures, take detailed notes of your reading and the lecture (this involves more than copying down what the lecturer writes on the board!) either annotate or recopy your notes while the lecture is still fresh in your mind, and use the text to fill in gaps and correct ambiguities. Try to answer questions at the end of the text chapters or use the "Interactive Study" guide on CD ROM which comes with your text. Take advantage of the online resources provided by the textbook publisher. These are all proven mechanisms for obtaining command of the subject matter, but it requires time.

Each lecturer and lab TA has specific office hours and a desire to help students understand the material and the assignments. If you need assistance for any reason (for example to clarify a confusing concept or explain what the instructor expects, etc.) **take advantage of office hours.** If the posted times do not fit your schedule, arrange with the instructor a time of mutual convenience, but don't expect your instructor or TA to drop whatever she/he is doing at the moment you drop by to help you. You can also contact your instructors by E-Mail, and this will often prove an efficient and quick way to obtain answers to simple questions.

Finally, be sure you understand the material as we go. Memorizing facts without understanding the conceptual framework is like trying to memorize 100 telephone numbers. Use the text and/or the instructor's office hours to sort out difficulties in understanding the material when these problems arise, not the day before the exam! Most students find that **the exams are hard!** They will test your understanding of concepts as well as the facts that support them. We will ask you to use your knowledge, not just spit it back. One method many students find successful is to study in small groups, but also leave time to study on your own. You should plan on devoting 10-12 hours per week study time (outside of class time).

# Biology 201A Course Schedule – Spring 2009

Dr. Kathleen McGuire and Dr. Ralph Feuer

Class Meeting	Day	Month	Date	Topic	Reading	Instructor
1	Thurs	Jan	22	<b>Introduction: Review of Chemistry I</b>	Ch. 2-4	Feuer
2	Tues	Jan	27	<b>Review of Chemistry II</b>	Ch. 2-4	Feuer
3	Thurs	Jan	29	<b>Amino Acids and Proteins</b>	Ch. 5	Feuer
4	Tues	Feb	3	<b>Carbohydrates and Lipids</b>	Ch. 5	Feuer
5	Thurs	Feb	5	<b>Cell Structure</b>	CH. 6	Feuer
6	Tues	Feb	10	<b>Energy, Enzymes and Metabolism</b>	Ch. 8	Feuer
7	Thurs	Feb	12	<b>EXAM I</b>		
8	Tues	Feb	17	<b>Membrane Structure and Transport</b>	Ch. 7	Feuer
9	Thurs	Feb	19	<b>Respiration: Glycolysis and Krebs Cycle</b>	Ch. 9	Feuer
10	Tues	Feb	24	<b>Cell Respiration Mitochondrial Transport</b>	Ch. 9	Feuer
11	Thurs	Feb	26	<b>Photosynthesis: Light and Dark Reactions</b>	Ch. 10	Feuer
12	Tues	March	3	<b>Cell Signaling</b>	Ch. 11	Feuer
13	Thurs	March	5	<b>Mitosis</b>	Ch. 12	Feuer
14	Tues	March	10	<b>Completion/Review</b>		Feuer
15	Thurs	March	12	<b>EXAM II</b>		
16	Tues	March	17	<b>Meiosis</b>	Ch. 13	McGuire
17	Thurs	March	19	<b>Genetics: Mendel and the Gene Idea I</b>	Ch. 14	McGuire
18	Tues	March	24	<b>Genetics: Mendel and the Gene Idea II</b>	Ch. 14	McGuire
19	Thurs	March	26	<b>Chromosomal Inheritance</b>	Ch. 15	McGuire
	Tues	March	31	<b>Holiday - Cesar Chavez Day</b>		
	Thurs	April	2	<b>Spring Break</b>		
20	Tues	April	7	<b>Molecular Basis of Inheritance</b>	Ch. 16	McGuire
21	Thurs	April	9	<b>From Gene to Protein I</b>	Ch. 17	McGuire
22	Tues	April	14	<b>From Gene to Protein II</b>	Ch. 17	McGuire
23	Thurs	April	16	<b>EXAM III</b>		
24	Tues	April	21	<b>Prokaryotic Gene Expression</b>	Ch. 18	McGuire
25	Thurs	April	23	<b>Eukaryotic Genome and its Expression</b>	Ch. 18	McGuire
26	Tues	April	28	<b>Genomes and Their Evolution</b>	Ch. 21	McGuire
27	Thurs	April	30	<b>Genomes and Their Evolution</b>	Ch. 21	McGuire
28	Tues	May	5	<b>Biotechnology I</b>	Ch. 20	McGuire
29	Thurs	May	7	<b>Biotechnology II</b>	Ch. 20	McGuire
30	Tues	May	12	<b>Completion/Review</b>		McGuire
	Thurs	May	21	<b>Final Exam 8:00-10:00</b>		