

BSCI 105: Principles of Biology I
Fall 2013

Lecturer: **Dr. Reid Compton:** For **All** Lecture-Associated Issues
BPS 2222
301/405-6916
E-mail: compton@umd.edu
Office hours: Mondays, 4:00–5:00 PM
Thursdays 9:30–10:30 AM
And by Appointment

Laboratory Coordinator: For **ALL** Lab-Associated Issues
Dr. Michael Keller
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Teaching Assistants (TAs)

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Drew Hart	drewhart@umd.edu	Sections 5120 & 5165

Course Website: I have a secure web space on the university ELMS system. Important course announcements, copies of lecture presentations, links to animations, online quizzes, review materials, previous exams, and current-semester exam keys will be posted over the course of the semester for your use.

<http://www.elms.umd.edu>

Textbook:

Required: *Campbell Biology*, 9th Edition
Reece, Urry, Cain, Wasserman, Minorsky, and Jackson
Pearson–Benjamin Cummings, 2010

Mastering Biology Student Access Kit

Clickers: We will use audience response “Clickers” in this class for you to assess your understanding and progress on an ongoing basis. Points will be earned by “clicking in” during each lecture. You can purchase a clicker from the University bookstore or use a web-enabled device (notebook or smartphone). Please consult the following web site for specific information: (<http://www.clickers.umd.edu/Students/BuyingAClicker.html>http://www.clickers.umd.edu/store/index_purchase_RF-LCD.html) for specific information.

Once you have a clicker or a ResponseWare license, be sure to register the unique identifying number and associate it with your name through ELMS (<https://myelms.umd.edu/courses/1020311>). This is the **Only Way** that earned points can be properly attributed to you. Your failure to properly register your device

Laboratory Manual:

Required: *Introduction to Experimental Biology*; Customized Edition

The lab coordinator changes the manual each year in some subtle and not-so subtle ways. Please make sure that you are using a manual for the Fall 2013–Spring 2014 academic year.

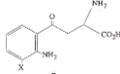
Labs will begin the week of week of 9/9/2013).

Lecture Topic

Text Readings

Introduction to the Cell and Its Building Blocks

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| 1 | Course Introduction & Miscellaneous Information | Chapter 1 |
| 2 | Introduction to Basic Cell Structure: High-Speed Tour of the Cell | Chapter 6 |
| 3 | Chemistry Is the Basis of All Life: ☹️ | Chapter 2 |
| 4 | Water in the Context of Biology and Life Science: 💧 | Chapter 3 |
| 5 | Carbon Is the Backbone of Organic Molecular Diversity: C–C | Chapter 4 |
| 6 | Biological Macromolecules: Carbohydrates, Lipids, Nucleic Acids & Proteins | Chapter 5 |



Cellular Biochemistry and Energy Conversion

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| 7 | Thermodynamics and Chemical Reactions: The Role of Free Energy | Chapter 8 |
| 8 | Most Cellular Reactions Require a Catalyst: Enzyme Structure and Function | Chapter 8 |
| 9 | Biomembrane Structure and Function: How Cells Control Their Environment | Chapter 7 |
| 10 | Membrane Transport I: Passive and Active Transport of Small Molecules | Chapter 7 |
| 11 | Membrane Transport II: Bulk Transport; Endocytosis & Exocytosis | Chapter 7 |
| 12 | Introduction to Cellular Metabolism: Oxidation–Reduction Reactions and the Importance of ATP | Chapter 9 |
| 13 | Cellular Metabolism of Carbohydrates I: Glycolysis and Fermentation | Chapter 9 |
| 14 | Cellular Metabolism of Carbohydrates II: Aerobic Respiration and Oxidative Phosphorylation | Chapter 9 |
| 15 | Photosynthesis I: Introduction and Light-Dependent Reactions: ⚡ | Chapter 10 |
| 16 | Photosynthesis II: Light-Independent Reactions and Alternative Pathways | Chapter 10 |

The Central Dogma of Molecular Biology

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| 17 | The Molecular Basis of Inheritance  | Chapter 16 |
| 18 | DNA Replication: Like Begets Like | Chapter 16 |
| 19 | Transcription of DNA into RNA: <i>Transcription of DNA into RNA</i> | Chapter 17 |
| 20 | Translation of RNA into Protein and Cellular Protein Targeting: <i>Traducción del ARN en proteínas</i> | Chapter 17 |
| 21 | Regulation of Gene Expression in Prokaryotes | Chapter 18 |
| 22 | Regulation of Gene Expression in Eukaryotes | Chapter 18 |
| 23 | Biotechnology: Manipulating DNA and Proteins for Commercial & Societal Gains | Chapter 20 |

Intra- and Extracellular Signaling Pathways

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|----|---|------------------|
| 24 | Cell Communication: Signaling and Transduction | Chapter 11 |
| 25 | Structural and Functional Aspects of the Cell Division Cycle | Chapter 12 |
| 26 | Cancer Results from Aberrant Expression of Cell Cycle Control Genes | Chapters 12 & 18 |
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Important Dates

Spring Break: March 17–21, 2013

Exam 1: Monday September 30, 2013 (80 pts.)

Exam 2: Wednesday October 30, 2013 (100 pts.)

Exam 3: Friday December 6, 2013 (120 pts.)

Final Exam: Saturday December 21, 2013: 8:00–10:00 AM (150 pts.)

The Final Exam Will Be Given in the Regular Lecture Room: BRB 1101

NOTE: The Final Exam will be COMPREHENSIVE

BSCI 105 Policies and Grading Scheme

Course Context: Biology is a wild and thoroughly exciting field of study involving every aspect of life, including how living things interact with and impact the environment. A thorough study of biology involves exploring living organisms from many levels, including individual molecules, complex macromolecular assemblies, individual and group behavior, and the interplay between organisms and between the environment and organism. BSCI 105, Principles of Biology I, is not designed to cover everything about biology, even at the most superficial of levels. Instead, BSCI 105 is designed to provide an introduction to the structure and behavior of cells and molecules within cells during the lifetime of an organism.

Modern biology is an experimental science. Scientists ask questions about the natural world and design experiments involving various model systems to generate data that can be analyzed to answer the questions. This semester, we will explore biology from an experimental perspective in an effort to open the door into how science and scientists work to discover what we know about how cells evolved, how they function, and how they reproduce.

BSCI 105 is part of a three-semester course sequence intended to prepare **Biological Sciences Majors** for more advanced course work. The topics covered in BSCI 105 are biological chemistry, cell biology, energetics and metabolism, and molecular genetics. BSCI 105 is a rigorous science course that is fast paced and demanding. It requires facility with basic arithmetic, algebra, and other mathematical skills. Students in BSCI 105 should have an interest in sophisticated biological concepts and evidence. We will cover a substantial amount of material during the semester, but success in the course does not demand memorization so much as working to develop an understanding of basic biological concepts that will be repeated several times in different contexts.

Some academic degree programs outside of Biological Sciences accept or require BSCI 105 as a part of their degree requirements. Students in those majors should expect the material in BSCI 105 to be directed at students studying Biological Sciences as a major. Students who wish only to satisfy a CORE/General Education science lab course may not find BSCI 105 appropriate. Other non-major science lab courses are available.

Exams, Assignments, and Grades:

- There will be three (3) **Lecture Exams** during the semester.
 - The lecture exams will be worth **80, 100, and 120** points, respectively.
 - Lecture exam questions will be based primarily on material presented in class.
 - Exams are meant to assess student understanding and comprehension of material presented in the course. Some questions will involve simple recall of information (knowledge), but many will focus on higher-levels of comprehension, including application, analysis, and synthesis of data and concepts. Top grades will be earned by students who can go beyond superficial, short-term recall of information and demonstrate true learning.
 - Lecture exam dates have been scheduled so as to avoid conflict with University-recognized religious holidays and semester breaks. They have also been scheduled on different days of the week to spread the difficulty of accommodating exam study with lab assignments and other classes.
 - Any student who has a legitimate conflict with the date of a scheduled exam must inform Dr. Compton before the end of the schedule-adjustment period (**September 16, 2013**).
- The **Final Exam** will be worth **150** points.
 - The final exam will be comprehensive.
 - The final exam is scheduled for 8:00 AM–10:00 AM on **Friday December 21, 2013**.
 - The structure of the final exam will mirror that of the first three exams.
 - **The Final Exam is scheduled by the University. NO EXCUSES** for changing the date of the final exam will be considered. According to current university policy, only students who have three or more final exams scheduled on that date will be allowed to take an exam on a different day.
- There will be approximately weekly **Mastering Biology** online quizzes valued for a total of **40** possible points.
 - Every student should purchase the Mastering Biology access code and register for the site. Information for how to do this is posted on ELMS. The necessary program access code can be purchased separately from your textbook or bundled with the textbook at the University Book Center.
 - Each of the 12–14 online quizzes will contain 10 brief multiple-choice questions. Each quiz will be scored for this course at a maximum of 4 possible points at the end of the semester. Get all 10 questions correct, you will gain 4 points for the course. Get 5 of the 10 correct; earn 2 points, etc.
 - The scores from your highest 10 quizzes will be used to calculate the number out of a maximal **40 points**.
 - Each quiz will be available for 7–10 days with the due date being 7:00 PM on a Friday. Once the time limit has been reached, online access to the quiz will close, and it will not be made available again.
 - If you don't complete a quiz for any reason (you forget to do it, your computer freezes, you time out, etc.), then it will not count in your 10 needed to earn all the points.
- There will be (nearly) daily **Clicker Questions** that give students the opportunity to “click in” to assess their knowledge and remain engaged with the material.
 - There will be a total of 30 possible clicker points assigned as follows:

If you “click in” for this % of the total clicker questions....	then, you will earn this many of the possible 30 points.
80–100	30
70–79	25
60–69	20
50–59	15
40–49	10
25–39	5
below 25	0

- Clicker questions are designed to reinforce or complement lecture material. They may assess your conceptual understanding or be simple knowledge recall.
- Clicker points will be awarded for clicking in not whether you got the answer correct.
- Please have your clicker ready to go at the beginning of class.
- Clicking in for a student who is not present will be considered a violation of the University Code of Academic Integrity.
- Clicker points cannot be made up.
- Not being present or not having a functional clicker means no points awarded.
- The laboratory assignments will be worth **280 total points**.

Summary:

	<u>Possible Pts.</u>
3 Lecture Exams	300 points
1 Comprehensive Final Exam @ 150 Points	150 points
10 Mastering Biology Quizzes @ 4 Points Each	40 points
Clicker Questions	30 points
Lab Assignments	280 points
Total:	800 points

Grades: Lecture: 65.0% (520 points) + Laboratory: 35.0% (280 points) = 800 total points
Grades will be assigned on the following scale:

A+ = 97.000%–100% (776–800)	C+ = 77.000–79.999% (616–639)
A = 92.000–96.999% (736–775)	C = 72.000–76.999% (576–615)
A– = 90.000–91.999% (720–735)	C– = 70.000–71.999% (560–575)
B+ = 87.000–89.999% (696–719)	D+ = 67.000–69.999% (536–559)
B = 82.000–86.999% (656–695)	D = 62.000–66.999% (496–535)
B– = 80.000–81.999% (640–655)	D– = 60.000–61.999% (480–495)
F = <60.000% (0–479)	

NOTE: Every student begins the class with 0 points. You earn points throughout the course of the semester by your performance on various quizzes, clicker questions, lab assignments, and exams. You have either earned the points or you haven't. I fully expect that these numbers will stand throughout the course; however, I reserve the right to make adjustments that will benefit the group. No changes in this scheme will even be contemplated until after the final exam when all the grades are in.

Grades are assigned on the basis of performance in the class and not on effort expended. Working hard is a minimal expectation. Three lecture exams, a comprehensive final exam, daily clicker questions, weekly Mastering Biology quizzes, and a dozen or so laboratory assignments provide enough data for me to assign a fair grade. No additional assignments will be asked for or accepted. When the semester is over, the semester is over.

Out-Of-Class Course Help: There are several optional out-of-class activities you can participate in to increase your understanding of the material. **NOTE:** These are offered solely for interested students. There is no pressure for any student to participate. You can do one, both, or neither depending on your schedule and level of interest.

Guided Study Sessions (GSS): A Guided Study Session (GSS) is available for all students who want to improve their understanding of the material in this course. GSS sessions will be led by a fellow student who has already mastered the course material and has been trained to facilitate group study sessions where students meet to compare class notes, review and discuss important concepts, develop appropriate strategies for studying, and prepare for exams. Attendance is free and voluntary (no grades, credit, etc.). Students may attend as many times as they choose.

Ms. Danielle Nussbaum will lead sessions for this class on Tue. & Thurs. from 4:00–5:00 PM in CHM 0127.

Ms. To-Lam Nguyen will lead sessions for this class on Tue. & Thurs. from 6:00–7:00 PM in 1108 Oakland Hall.

In addition, the schedule will be online at www.counseling.umd.edu/LAS/html/gss.html#schedule.

Optional BSCI 105 Discussion: In addition to the mandatory lecture and laboratory periods required for BSCI 105, we are offering students the opportunity to enroll in an optional, 1-credit supplemental discussion section (BSCI 279). Unlike the lecture and laboratory, the grade in this optional discussion will be based entirely on attendance, classroom participation, and completion of in-class assignments.

The purpose of this discussion is to provide you with additional opportunities to actively engage with the lecture material, with the hope that it will improve your understanding of core BSCI 105 concepts. While the discussion is not a step-by-step review of the classroom lectures, it reflects and compliments the main topics and concepts covered. In the three semesters this program has been available, participating students have shown significant improvements in the exam and final semester grades over those who have chosen not to participate. While there is no guarantee that the discussion will help your grade, please understand that most students who enroll score better on all exams than those who do not. (Statistics are available if you wish to speak to the discussion coordinators.)

Each discussion will be facilitated by two peer instructors. Most of the time, you will be working with a group of 3–4 fellow students—either solving problems or doing an activity appropriate to the topic. Some days we may work together as a class. On most days, there is time at the end of period for a quick review and a chance for you to ask questions about things you don't understand. This course is here to help you! All registered students will receive an e-mail about how to register for this.

Regrade Policy: Exam regrade requests in this course may be submitted during the initial grading process. They are not a renegotiation of the original score. Before even contemplating submitting your exam for a regrade, you should carefully review the exam key posted on the course Canvas site. If you feel that a question was graded incorrectly, then you should attach a **NEATLY written or typed** note to the exam justifying your request and give the exam to Dr. Compton. Alternatively, you can bring the exam to class and or office hours to talk with Dr. Compton and explain your concern. Regrade requests must be submitted within **ONE WEEK** of the exam being returned to your lab section. Exams submitted after the deadline will not be considered. Dr. Compton may review the entire exam and either endorse or not endorse the change. Following the review, points may be added or subtracted, or there may be no change in the grade.

Appointments: Communication is essential: We must hear your comments, criticisms, questions, etc. Your Teaching Assistant will also have time to discuss both lecture and laboratory material with you. Feel free to send e-mails (only signed messages, please; anonymous messages will be ignored) or take the opportunity to visit during office hours to make your concerns known. I want to meet you and learn from you.

Evaluations: Please complete the online course evaluation at the end of the semester. The CourseEval system is open from: Tuesday, December 3 through Sunday December 15, 2013.

<https://www.courseevalum.umd.edu>

Honor Code: The University of Maryland Honor Code states that all students of the University community have been equally entrusted by their peers to conduct themselves honestly on all academic assignments. The BSCI 105 course staff takes this seriously. We will deal with you honorably and expect the same from you.

The students of this college understand that having collective and individual responsibility for the ethical welfare of their peers exemplifies a commitment to the community. Students who submit materials that are the products of their own minds demonstrate respect for themselves and the community in which they study. On your writing assignments, all outside resources or information should be clearly acknowledged. If there is any doubt or question regarding the use and documentation of outside sources for academic assignments, your teaching assistant should be consulted. For all assignments, assume that the only people you may consult with are the instructor or teaching assistant (and not fellow students) as appropriate, unless told otherwise. For exams, any suspicion of cheating will be treated seriously. The student will be separated from the group if there is any suspicion. If there is serious concern, the exam will be taken, the student will receive a 0 for the exam, and the matter will be immediately forwarded to the Honor

Council for consideration. Any violations of the Honor Code will be handled by the Honor Council. The standard penalty for violating the Honor Code is a grade of XF (Failure Due to Academic Dishonesty). Such a designation on your transcript severely limits opportunities for future graduate and professional school admission.

All students will be asked to sign the following statement on each examination: *"I pledge on my honor that I have not given or received any unauthorized assistance on this examination."* There is no penalty for not signing the honor pledge.

For more information, please review the university policies on academic integrity at the following address: <http://www.president.umd.edu/policies/docs/III-100A.pdf>

Academic Dishonesty: Any of the following acts, when committed by a student, shall constitute academic dishonesty:

- **Cheating:** Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
- **Fabrication:** Intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
- **Facilitating Academic Dishonesty:** Intentionally or knowingly helping or attempting to help another to violate any provision of this Code.
- **Plagiarism:** Intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise.

Use of Wireless Devices: Wireless phones ringing in class have become a common annoyance. Thus, all wireless phones and other devices that make noise **MUST** be silenced during lectures, labs, and exams. Also, camera phones and text messaging have the potential to be used inappropriately by students. Students observed using such a device during an exam or quiz will have their papers confiscated and will be forwarded to the Office of Student Conduct for review.

Students with Disabilities: The course staff is committed to providing appropriate accommodation for students with recognized disabilities. If you have been evaluated by Disability Support Services (DSS) and qualify for specific service, please inform Dr. Compton at the beginning of the semester. If you think that you may qualify for some accommodation but have not yet been evaluated, then please contact DSS (<http://www.counseling.umd.edu/DSS/>; 301/314-7682) immediately to arrange for a consultation. Students who have not been evaluated by DSS will **NOT** be eligible for any alternative arrangements.

Inclement Weather Policy: It is not unknown for weather to affect class schedules in the last weeks of the fall semester. If the university is open, class will be held. Classes will be canceled only in the event of an official university closing. Once an announcement has been made, information will be available on the university home page (<http://www.umd.edu>) and by calling the designated university snow phone line (301-405-SNOW). I will also put up an announcement on the course ELMS website as soon as possible.