

**BIOLOGY 120 – CONCEPTS IN BIOLOGY**  
**COURSE SYLLABUS, DR. AMANDA PENDLETON**  
**FALL 2011**

**Faculty Information:** Pierce 105, (770) 784 – 4506, arpendl@emory.edu

**Office hours:** M, Th: 2:30 – 4:00 pm; or feel free to make an appointment with me for another time

**Course Meeting Times:**

Lecture – T, Th	10:00 – 11:15	Pierce Hall Room 102
Lab – W	2:00 – 5:00	Pierce Hall Room 119

**Required Texts:**

- (1) Text: *Essentials of Biology*, S.S. Mader & M. Windelspecht, 3<sup>rd</sup> edition, McGraw Hill publishing company, 2012.
- (2) Lab Manual: The custom laboratory manual for this course will be available in the laboratory. Your student account will be charged.

**Course description:** Bio120 is an introductory biology course meant for students who are not majoring in biology. The course content is designed to help students understand the following core concepts:

- Common structures found in almost all living things
- Common ways that almost all living things use to interact with their environments
- The function of hereditary information and how hereditary information is passed to future generations
- Cellular and environmental factors that contribute to evolution
- Infectious organism life cycles and human immune responses to these organisms

This course will then give students practice connecting these core concepts to the following issues that are critical to biology and society:

- The definition of life and the possible origin of life on this planet
- Energy and nutrition
- Brain function and behavior
- Disease conditions, such as drug addiction and cancer, as well as current treatments for cancer
- Importance of and issues involved in maintaining healthy ecosystems.
- Impact, prevention and treatment of infectious disease

Students will be given experience, in both lecture and laboratory portions, asking questions, solving problems, and inquiring about the world around them using the tools and techniques of biology. Through these experiences, I hope that students will learn to incorporate a biology perspective into their approaches to their own disciplines and future careers. Additionally, I hope that this course will give students the background and tools for dealing with personal issues related to biology that will arise in their futures. Finally, I hope that this course will help prepare students to participate in society as informed and responsible citizens.

**BIOLOGY 120; CLASS SCHEDULE; FALL 2011**

Date	Topic	Assigned Reading	Due
<b>Module 1: The physical basis of 'life'</b>			
Th Aug 25	Science as a way of knowing; Evolution	pp. 8-9, 11-14	
T Aug 30	Building blocks for life	Ch. 3	BCQ 1
W Aug 31	Lab: Cells		
Th Sep 1	Cell Theory	Ch. 4	BCQ 2
T Sep 6	What is life? How did life begin?	Assigned articles	Response 1
W Sep 7	Lab: Bacteriology and the scientific method		
<b>Module 2: Energy-flow on Earth, in our bodies, &amp; in cells</b>			
Th Sep 8	Energy, Photosynthesis, Cellular respiration	pp. 78-86, 94-96, 109	BCQ 3 <i>Independent project: Topic outline</i>
T Sep 13	Case study: 'Energy' Drinks??		BCQ 4
W Sep 14	Lab: Digestion & nutrition and Ch. 25		
<b>Module 3: Brain &amp; behavior</b>			
Th Sep 15	Membrane transport	pp. 86 – 89	BCQ 5
T Sep 20	<b>Exam I (Modules 1 &amp; 2)</b>		Journal 1
W Sep 21	Lab: Osmosis		
Th Sep 22	Neurons, the brain & behavior	pp. 517 – 527	BCQ 6
T Sep 27	Case study: drug addiction		
W Sep 28	<b>Lab Exam I (Scientific Method, Cells, Digestion &amp; Nutrition, Osmosis)</b>		
Th Sep 29	Case study: brain & monogamy		
<b>Module 4: Cancer</b>			
T Oct 4	Central dogma & mutation	pp. 175 – 187	BCQ 7
W Oct 5	Lab: cellular reproduction		
Th Oct 6	Cell cycle and cancer basics	Ch. 8 & pp. 207 – 211	BCQ 8
T Oct 11	Fall break – no class		
W Oct 12	Lab: Power of genetics – molecular biology, DNA technology, forensics		
Th Oct 13	Case study: treating cancer		Response 2
T Oct 18	Meiosis and inheritance	Chs. 9 & 10	BCQ 9
W Oct 19	Lab: Human genetics & genetic counseling		
Th Oct 20	Case study: Inherited cancers		<i>Independent project: Polished draft</i>
T Oct 25	Future of genetics	pp. 188 – 190, 192 – 193	
W Oct 26	<b>Lab Exam II (Cellular reproduction, Power of genetics, Human genetics)</b>		

**BIOLOGY 120; CLASS SCHEDULE, CON'T; FALL 2011**

Date	Topic	Assigned Reading	Due
<b>Module 5: Evolution &amp; Environment</b>			
Th	Oct 27	Evolutionary theory and evidences	Ch. 14: pp. 236-240, 242-246 <b>BCQ 10</b> Ch. 15: pp. 256, 259-261 Ch. 16: pp. 266-267, 272-279, 282-283
T	Nov 1	Evolutionary theory and evidences	same as above
W	Nov 2	<i>Lab: Reproduction Systems &amp; Development</i>	
Th	Nov 3	<b>Exam II (Modules 3 &amp; 4)</b>	<b>Journal 2</b>
T	Nov 8	Co-evolution and population dynamics	Ch. 30: pp. 585-592, 595-600 <b>BCQ 11</b> Ch. 31: pp. 605-606, 609-614
W	Nov 9	<i>Lab: Ecology</i>	
Th	Nov 10	Case study: Carbon cycle	pp. 621 – 622 (Fig. 31.26) <b>BCQ 12</b> <b>Independent project:</b> <b>Peer feedback</b>
T	Nov 15	Environment and humans	Ch. 32 <b>BCQ 13</b>
<b>Module 6: Infectious Disease</b>			
W	Nov 16	<i>Lab: Cardiovascular &amp; renal systems</i>	
Th	Nov 17	Basics of infectious organisms	pp. 288 – 298 <b>BCQ 14</b>
T	Nov 22	The body fights back: immune responses	Ch. 26 <b>BCQ 15</b> <b>Independent project:</b> <b>Final form</b>
W	Nov 23	<i>Thanksgiving – no lab</i>	
Th	Nov 24	<i>Thanksgiving – no class</i>	
T	Nov 29	Epidemiology, prevention & treatment	
W	<b>Nov 30</b>	<b>Lab Exam III (Reproduction, Ecology, Cardiovascular &amp; renal systems)</b>	
Th	Dec 1	Case study: Rwandan refugee camp	
T	Dec 6	Big themes revisited	<b>Journal 3</b>
<b>FINAL EXAMINATION: Friday, December 9; 2:00 pm – 5:00 pm</b> <b>(Modules 5 &amp; 6; comprehensive questions)</b>			

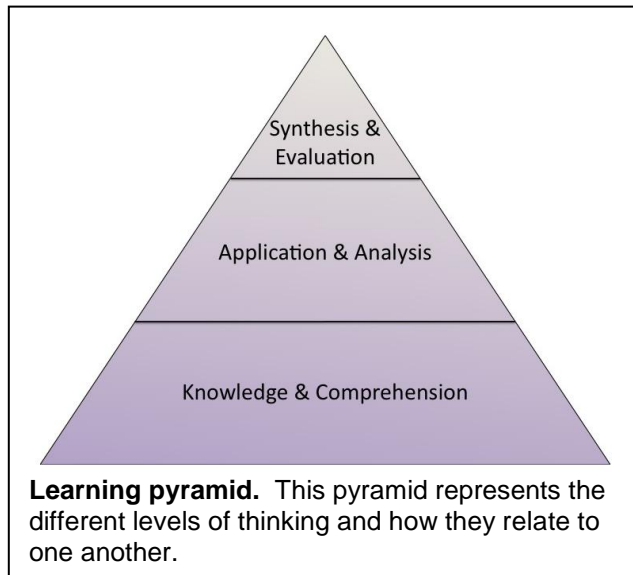
***The instructor reserves the right to make changes to this schedule as necessary.***

## EXPECTATIONS, EVALUATION AND TIPS FOR SUCCESS IN BIOLOGY 120

Welcome to Biology 120! The information in this handout and accompanying materials is designed to help you navigate this course. Please do not hesitate to ask for clarification at any time.

**Tips for Success:** Biology 120 is an intensive course that requires time and commitment. To perform well in this course, you must manage your time appropriately and have a proper study plan, beginning from the first day of class. The best overall approach is to work consistently, in small doses. The following are some additional tips that will help you succeed:

- **Be prepared for class every day.** The readings should be done before class. The best overall reading approach is to read before class (or at least browse) assignments at first for an overview, jotting down questions or areas of confusion. I have assigned several 'Before-class Quizzes' to help you focus on the most important knowledge you should bring with you into class each day. Finally, read a second time after class (the same day as class is best), using a different color of highlighter and paying careful attention to topics discussed during class. This second reading is critical because it will help you to connect class discussions to the textbook readings.
- **Take good notes.** During class, we will discuss the most significant concepts from your readings. At times, I will present examples that may not be given in your textbook. You are responsible for all of the information discussed in class. Good note-taking will help you to remember which concepts are most important and why. Additionally, the act of note-taking is a learning exercise that helps you actively engage in the topic and better remember class discussions. Feel free to also print out class powerpoints before class and annotate the figures during class if you find this helpful.
- **Ask questions.** Biology 120 is a collaborative course. Therefore, if you don't understand something discussed in class, ask questions in class, ask questions of your peers, form productive study groups, or arrange to meet with me. I welcome your questions, and if you're struggling, it's important to get help early. Additionally, by asking questions, you take charge of your own learning.
- **Build a foundation of knowledge, but aim high in your thinking** (adapted from [www.cas.lsu.edu](http://www.cas.lsu.edu)). While studying, keep in mind that you will need to do more than simply learn facts; you will need to think. We will use a learning pyramid as a guide for our thinking this semester:
  - **Level 1 = Knowledge & Comprehension:** Memorizing and understanding information, restating in your own words, paraphrasing, or summarizing.
  - **Level 2 = Application & Analysis:** Identifying parts, patterns, and connections in new information and comparing, contrasting, or arranging these parts and patterns in a logical order or in categories. Using information to solve new problems; transferring abstract or theoretical ideas to a practical, new situation.
  - **Level 3 = Synthesis & Evaluation:** Evaluating the relative effectiveness, value, or worth of a set of different solutions, ideas, or results. Predicting



consequences. Taking a position on an issue and defending that position. Combining information to form a unique product that requires creativity and originality.

Notice how each level of the pyramid builds on the foundation that precedes it. We must learn the lower levels before we can effectively perform at higher levels. In general, students who earn lower grades have not gone past the 'Knowledge & Comprehension' level. Students who earn higher grades generally know the course material well enough to perform higher level thinking tasks.

- **Review, review, review and practice.** Any biology course these days has a lot of information. So, mastering the course material at the 'Knowledge & Comprehension' level first is key. To do this, I suggest that you study the appropriate diagrams in your text and lecture handouts; practice writing out and linking concepts by memory; prepare your own tables and diagrams as a study aid; create lists of questions that help you remember the material, and then practice answering those questions by memory. You should do at least one or two of these activities (in addition to your reading) each day. To move up to the higher learning levels, complete all worksheets, problems, and case studies given during class. Use the online textbook resources for additional study help.

**Evaluation Criteria:** Your performance in the course is evaluated through quizzes, examinations, writing assignments, and class participation.

- **Before-class Quizzes (BCQs):** Students will complete a simple, short quiz that accompanies each textbook reading assignment. These quizzes will be available on the course Blackboard website before class. Each quiz will be graded as "full credit" / "no credit" and will be worth 1 point. To receive "full credit" on a BCQ, a student must score at least a 75%. BCQs direct students to important information to understand before arriving to class. Exams assume a higher mastery of course material and will be much more difficult than BCQs.
- **Independent project:** Students (in coordination with the instructor) will choose a biology-related topic. Students will then research this topic and present their findings in an informational pamphlet meant for the general public. A rubric with more details is available on the course Blackboard site.
- **Lecture examinations:** The lecture exams will be a combination of multiple choice, short answer and short essay questions, including application problems. Exams will focus on material covered in the classroom and assigned problems, responses, and case studies. The final examination will cover the last portion of the course (Modules 5 & 6) and will also include comprehensive information.
- **Laboratory examinations:** Laboratory exams will be in a practical exam format and can include all material covered during lab, as well as all material found in the custom laboratory manual for this course or on the Blackboard site. Reading each exercise thoroughly before each lab will help you learn the most during your laboratory period.
- **Biology journal:** Students will keep a biology journal according to the rubric on the course Blackboard site. The purpose of this journal is to help students see the ways in which they encounter biology in their everyday lives. Journals will be collected three times throughout the semester (see the syllabus schedule) and will be worth a total of 30 points (10 points each time a journal is collected).
- **Reading responses:** Special readings will be distributed twice during the semester along with instructions and a series of questions. We will then discuss student responses as a class. Response grades will be determined by both written responses and participation in class discussion. Responses will be worth a total of 30 points.

- **Extra Credit:** We have the special opportunity this semester to have on campus Dr. Shirley Malcom from the American Association for the Advancement of Science. Dr. Malcom will give a Lyceum Lecture on September 22 at 7 pm in Williams Hall. You will be awarded extra credit for attending this lecture and writing a response.

#### Evaluation Points:

##### Lecture:

Lecture exams (2)	200 points
Before class quizzes	15 points
Reading responses	30 points
Journal entries	30 points
Independent pamphlet project	70 points
Laboratory exams (3)	150 points
Final exam	<u>175 points</u>
<b>Total</b>	<b>670 points</b>

##### Final grade determination:

*(Plus and minus grades are given)*

90 - 100%	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
<60	F

#### Class Policies:

1. **Attendance:** See the attached sheet for the attendance policy. Unexcused absences in lecture, lab, examinations or a failure to follow the procedures outlined in that handout will result in a reduction in your grade. It is your responsibility to communicate with the instructor as much in advance as possible about medical or family emergencies or send a message through another student.
2. **Exams:** Students should place all book bags, purses, and other belongings at the front of the room while sitting for any type of exam or graded assignment. Cell phones should be turned off and should be placed in bags or on a bench at the front of the room. (Desktops should be clear except for the materials needed and authorized for testing). Students should feel free to ask for clarification about any question during the exams
3. **Late work:** My due dates are fixed, unless you provide documentation of a serious life event.
4. **Missed exams:** In general, missed exams may not be made up (see the attached sheet for the absence policy) except for serious reasons (such as death or illness) with proper documentation.
5. **Electronic devices:** Please turn off all cell phones and other electronic devices prior to entering the classroom. Photography and using calculators on phones is also prohibited. If you would like to take notes on your personal laptop in class you must seek special permission from the instructor. Use of laptops for surfing the web, Facebook, Skype, or other networking/chat during class is **completely unacceptable**.
6. **Academic dishonesty:** Honesty and ethical behaviors are imperatives in any career. Therefore, academic dishonesty will not be tolerated. See [http://oxford.emory.edu/audiences/faculty\\_and\\_staff/resource\\_policies/faculty\\_handbook/honor\\_code.dot](http://oxford.emory.edu/audiences/faculty_and_staff/resource_policies/faculty_handbook/honor_code.dot) for descriptions of what constitutes academic dishonesty. Regulations of the Honor Code apply to all work in this course, including lecture and lab examinations and all assignments. Please pledge all of your work with your signature to indicate that you have followed the rules of the Honor Code. Anyone caught violating this policy will be reported to the Honor Council, as detailed in the Honor Code. If you have any questions about what constitutes your own work, definitely ask!