Please Note: The information contained in the Course Atlas is subject to change. For final schedule information, please refer to OPUS or contact the Biology Department.

**Introductory Courses**
Biology 141 and 142 are required for all upper level biology courses. These courses meet the requirements for the biology major, premed, and the life sciences laboratory GER requirements. Biology 120 meets the GER requirement for a life science laboratory course, but not the requirements for the biology major, and is recommended for students who are not science majors or premed.

**AP Credit**
Biology AP scores of 4 or 5 will earn Biology 141 credit for Freshmen entering Emory Fall 2008.

**Biology Major**
The major also requires 1 upper level course in each of three areas of biology (listed under Column A-Cell and Molecular, Column B-Organismal, and Column C-Ecology and Evolution) and 4 additional electives (16 credit hours). These courses must include two upper-level laboratory courses (starting Fall 2006).

**Additional Requirements**
The BA and BS degrees in Biology have additional required courses from other departments (or AP equivalents). The BA and BS require Chemistry 141 and 142 (or Chemistry 171 and 172). The BS also requires Chemistry 221 (or Chem 171), Chemistry 221 Lab, Math 115 and 116 (or Math 111 and 112 by permission), and Physics 141 or 151.

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**BIOLOGY 120 000 (000): Concepts in Biology w/Lab**

Beck, TTh, 10:00-11:15, MAX: 64, 1462 Clifton Road, Room 308

**NOTE:** YOU MUST ALSO REGISTER FOR A 120 LABORATORY. Dr. Jennifer Holzman is the lab director. Dates and times are as follows:

**LAB:**
- LB1, Tu, 2:30-5:30, MAX: 21, 1462 Clifton Road, Room 119
- LB2, Tu, 6:30-9:30, MAX: 22, 1462 Clifton Road, Room 119
- LG1, W, 2:30-5:30, MAX: 21, 1462 Clifton Road, Room 119
- LD1, Th, 2:30-5:30, MAX: 0, 1462 Clifton Road, Room 119

**Content:** The lecture and laboratory portions of this course will be organized around 4-5 modules that relate biology to current issues. Students in the course will help to shape the content of the course. Both the lecture and laboratory portions of the course will emphasize student-centered, collaborative, inquiry-based learning.

**Text:** None.

**Particulars:** This course is NOT applicable to a science major, including biology majors and the premedical program (but does meet the GER requirements for a life science laboratory). Science majors should NOT take
**BIOLOGY 142 (000-004): Foundations of Modern Biology II: Molecular Genetics, w/Lab**

*Escobar, (002), MWF, 10:40-11:30, MAX: 110, 1462 Clifton Road, Room 230*
*Campbell, (000), MWF, 11:45-12:35, MAX: 110, 1462 Clifton Road, Room 230*
*Fritz, (001), MWF, 12:50-1:40, MAX: 110, 1462 Clifton Road, Room 230*
*Corces, (003), TT, 11:30-12:45, MAX: 110, 1462 Clifton Road, Room 230*
*L'Hernault, (004), TT, 1:00-2:15, MAX: 110, 1462 Clifton Road, Room 230*

**NOTE: YOU MUST ALSO REGISTER FOR A 142 LABORATORY.** Dr. Jennifer Holzman is the lab director. Dates and times are as follows:

**LAB:**
- LB1, Tu, 2:30-5:30, MAX: 120, 1462 Clifton Road, Rooms 106-120
- LC1, W, 2:30-5:30, MAX: 120, 1462 Clifton Road, Rooms 106-120
- LC2, W, 6:30-9:30, MAX: 35, 1462 Clifton Road, Rooms 106-120
- LC3, W, 6:30-9:30, MAX: 35, 1462 Clifton Road, Rooms 106-120
- LD1, Th, 2:30-5:30, MAX: 120, 1462 Clifton Road, Rooms 106-120
- LE1, F, 2:30-5:30, MAX: 120, 1462 Clifton Road, Rooms 106-120

**Content:** Biology 142 will introduce evolution, population biology, molecular genetics, genomics, cell signaling, and development. The topics covered in class will address major issues in human biology and medicine. The integrated lecture and lab will emphasize the basic principles and critical thinking involved in modern biological discovery. In lab, students will design and perform experiments using several important model systems.

**Texts:**
- Freeman, Scott. *Biological Science* (Customized Emory University Edition-2008) (plus Mastering Biology Student Access Kit, and a PRS (Personal Response System) clicker rebate coupon.) (Pearson/Prentice-Hall) *(LECTURE-REQUIRED)*
- Knisely, Karin. *A Student Handbook for Writing in Biology, 2nd Edition.* (Sinauer/Freeman) *(LAB-REQUIRED)*
- Laboratory Notebook. (May be purchased in the Emory Bookstore.) *(LAB-REQUIRED)*

**Particulars:** Biology 141 and 142 are required of all biology majors, and Biology 141, along with Chemistry 141, should be taken in the fall of the Freshman year by prospective biology majors; Biology 142 and Chemistry 142 in spring of the Freshman year. If scheduling precludes taking both, it is recommended that you take Chemistry 141 before Biology 141. Biology 141 and 142 are prerequisites for all upper level biology courses and meet the biology and genetics premedical requirements. Biology 120 is recommended for non-science majors who are not premed but who wish to satisfy the Life Science Lab requirement for the GER. Some lecture and lab exams may be administered in the evening (dates and times to be determined). **Prerequisite:** Biology 141. Chemistry 141 is strongly recommended.

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**BIOLOGY 190 (000): Freshman Seminar: The Evolutionary Biology of Sex**

*Beck, TTh, 1:00-2:15, MAX: 18, 1462 Clifton Road, Room 101*

**Content:** We will explore questions about the evolutionary biology of sex through discussion of primary research...
articles. Students will be evaluated based on participation in discussion, short written synopses, class presentations, and a final paper.

**Texts:** Judson, Olivia. *Dr. Tatiana's Sex Advice to All Creation.* (Paperback-2003) (Holt and Co.)

**Particulars:** Open to Freshmen only.

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**BIOLOGY 190 (002): Freshman Seminar: Of Mics and Men: Interactions Between Microorganisms and Humans**

*Jones,* Wed, 1:00-3:30, MAX: 18, 1462 Clifton Road, Room 126

**Content:** This seminar will explore several of the relationships, both harmful and beneficial, that exist between humans and microorganisms. Topics that will be covered include evidence for ancient microbial plagues, the impact of infectious diseases on colonization of the New World, examples of natural immunity in humans produced by microbes, microorganisms and cancer, and others. Students will learn some basic microbiology in addition to exploring elements of human-microbe interactions.

**Text:** None.

**Particulars:** Open to Freshmen only. Students will be expected to give two seminar presentations to the class, participate in class discussions, and complete at least one writing assignment. Grades will be assigned based on in-class preparation, the seminar presentations, and the writing assignments.

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**BIOLOGY 190 (003): Freshman Seminar: Evolution: Conceptions & Misconceptions**

*Marsteller,* TTh, 1:00-2:15, MAX: 10, Math & Science Center W507

(Same as NBB 190 000)

**Content:** This seminar course will address conceptions and misconceptions of the theory of evolution. We will begin with a discussion of theory and evidence from a scientific perspective. Using web material (for example http://evolution.berkeley.edu/evosite/misconceps/index.shtml), readings, discussion, and PBL exercises, will will examine how the conception of evolution has changed over time. We will examine major misconceptions about evolution, including the idea of progress, randomness, chance, and necessity. Current debates about “intelligent design” will also be considered.

**Text:** Gould, Stephen J. *Ever Since Darwin: Reflections in Natural History.* (W.W. Norton)

**Particulars:** Open to Freshmen only. Grades will be based on learning issues and products from the PBL exercises, four on-line reflections, participation, a group class presentation, and a group project.

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**BIOLOGY 190 (004): Freshman Seminar: Bioethics in the Genomic Era**

*Eisen,* TTh, 11:30-12:45, MAX: 18, 1462 Clifton Road, Room 126
In this course, we will explore the science behind the social and ethical implications of many of the provocative headlines of 21st Century media, engaging questions such as: Should we and can we clone human beings? How should genomic information be used, and by whom? Who should have access to this information? What are the lines between gene therapy and cosmetic improvement? How does modern genomics define what we mean by ‘disease’? Should we design or select for ‘better’ soldiers, doctors, musicians? To develop ethical and critical thinking skills, we will frame these questions from the perspectives of scientists, the military, and pharmaceutical companies, and explore them using case studies drawn from real-life situations, as well as from readings in the primary and popular literature.

Text: Excerpts from books, popular press, primary literature.

Particulars: Open to Freshmen only. Assignments will consist of short questions and answers, participation, leading 1-2 discussions, and one major project.

BIOLOGY 206 (000): The Biology of Parasites, w/Lab
Starnes, MWF, 9:35-10:25, MAX: 48, 1462 Clifton Road, Room 308

NOTE: YOU MUST ALSO REGISTER FOR A 206 LABORATORY. Dates and times are as follows:

LAB:
LA1, M, 2:30-5:30, MAX: 24, 1462 Clifton Road, Room 124
LC1, W, 2:30-5:30, MAX: 24, 1462 Clifton Road, Room 124

Content: The lecture portion of this course will provide students with an introduction to modern and classical parasitology. Emphasis will be placed on protozoan, helminthic, and arthropod parasites of medical significance. Topics addressed will include basic principles of parasitology, ecological and societal considerations, evolutionary trends, epidemiology, life cycles, host-parasite coadaptive responses, therapeutic measures, and control programs. Relying upon microscopic evaluation, digital images, and preserved specimen dissections, the laboratory will assess a variety of parasites, along with their vectors. Ongoing group discussions of applicable case studies and assigned readings will facilitate further investigation and appreciation of pertinent host/parasite interactions.

Texts:

Particulars: Course grades will be determined by 2 lecture exams (midterm and final) and 2 laboratory exams. Lecture and lab are both taught by Dr. Starnes. Prerequisites: Biology 141 and 142.

BIOLOGY 302 (000): Biochemistry II
Kelly / Lutz (Chemistry), TTh, 1:00-2:15, MAX: 50, White Hall 206

(Same as CHEM 302)

Content: This course builds on principles developed in Biol/Chem 301 and will focus on how simple metabolic pathways expanded and were incorporated into more complex biochemical systems during the evolution of the eukaryotic genome. Aspects of molecular evolution, parasitic and symbiotic relations, and compartmentalization will be developed from a metabolic perspective. Specific examples will include the evolution and integration of the mitochondrial and chloroplast genomes into the eukaryotic cell, and the role of compartmentalization in gene
expression, energy regulation, and anabolic/catabolic regulation.


Particulars: This course is the second semester of a two-semester sequence in introductory biochemistry, which is offered jointly by the Biology and Chemistry Departments. Completion of both courses should provide students with a firm foundation in biochemistry. Prerequisites: Biology 141 and 142; Chemistry 222. Completion of Biology/Chemistry 301 is recommended.

BIOLOGY 325 (000): Primate Social Psychology

de Waal (Psychology), TTh, 11:30-12:45, MAX: 30, White Hall 112

(Same as PSYC 325)

Content: Following a general introduction to primatology, this course covers recent progress in the growing field of primate social behavior. Topics range from aggression and dominance (e.g., warfare and power politics among chimpanzees) to affiliation, sex, and peaceful coexistence (e.g., parental behavior, behavioral sex differences, conflict resolution). The evolution of the large brain and remarkable intelligence of primates has been explained as related to the complexity of their societies; survival in such societies requires sophisticated social skills and a thorough understanding of the relationship network. Course segments focus on the motivational and cognitive processes underlying coalition formation, reciprocal exchange of benefits, reconciliation following conflict, and the origin of moral systems. Parallels with human behavior will be discussed.

Text: Required reading includes two books and articles assigned at the beginning of the course.

Particulars: Prerequisites: Biology 141 and 142. This course originates in the Psychology Department.

BIOLOGY 330 (000): Chemistry, Biology, and Molecular Modeling

Snyder (Chemistry), MW, 12:50-2:05, MAX: 9, Emerson 363

(Same as Chem 330)

Content: The course is designed to put to use what you already know about chemistry and biology and to extend it in two directions. On the one hand, we will examine the world around us as reflected by the media, the web, and encounters in your own lives. Thus, we'll examine issues around 'natural and unnatural molecules', the environment, disease, and society in the context of topics such as drugs, molecules from mars, aging, AIDS, bioterrorism, and crime in the courtroom. On the other hand, we will examine these ideas by means of computer graphics, the molecular structure of small molecules and proteins, and energy.

Texts: TBA.

Particulars: Prerequisites: Biology 141 and 142, Chemistry 171 and 172 or 221. This course originates in the Chemistry Department.
**BIOLOGY 336 (000): Human Physiology**  
*Siegler, MWF, 8:30-9:20, MAX: 140, 1462 Clifton Road, Room 230*

**Content:** A study of human physiology emphasizing homeostatic mechanisms of integrated body functions. Topics include neurophysiology, endocrinology, muscle physiology, cardiology, immunology, respiration, gastroenterology, and urology.


**Particulars:** Four in-class tests. *Prerequisites:* Biology 141 and 142 or permission of instructor.

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**BIOLOGY 341 (000): Evolutionary Biology**  
*de Roode / Gerardo, MWF, 10:40-11:30, MAX: 100, White Hall 208*

**Content:** A study of the factors that cause genetic change and of the evolutionary consequences of such changes. Topics include population genetics, adaptation and natural selection, evolution of genes, proteins and genomes, sexual selection, kin selection, speciation, and diversification of taxa. Emphasis on molecular, genetic, ecological, and evolutionary factors related to variation and adaptation to environment, and constraints on adaptation.

**Texts:**
- Freeman, Scott and Jon C. Herron. *Evolutionary Analysis, 4th Edition.* (Prentice-Hall)

**Particulars:** Three tests and a comprehensive final. Discussion of current and classic literature and group presentations will be required. *Prerequisites:* Biology 141 and 142.

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**BIOLOGY 360 (000): Introduction to Neurobiology**  
*Frenzel, TTh, 1:00-2:15, MAX: 5; 1462 Clifton Road, Room 100C*

(Same as NBB 301)

**Content:** The first part of this course will focus on the electrophysiological properties of neurons, a crucial first step for understanding brain function. We will discuss the generation and propagation of action potentials, neurotransmitter release, and how ion channels and receptors determine the membrane potential and ultimately whether or not the action potential is passed to the next neuron. Also, we will examine the plasticity of this system and how the synapse is changed by learning. The second part of this course will expand upon these neuronal properties to investigate the processing of somatosensory and motor information.


**Particulars:** Exams: Three 1-1/2 hour in-class exams and a comprehensive final. There will also be a required review session for one hour each week. *Prerequisites:* Completion of Chemistry 141 and 142 and Biology 141 and 142 is required; completion or concurrent enrollment in Intro Physics is strongly recommended. *Cross listed as NBB 301.*
**BIOLOGY 364: Human Genetics**  
*Tao*, TTh, 10:00-11:15, MAX: 47, 1462 Clifton Road, Room 126

**Content:** This course will provide a fundamental understanding of human genetics in its many facets. We will study how modern technologies are making the search for genetic causes of disease much easier and faster. We will also study how the sequence of the human genome and emerging new technologies can lead to a better understanding of the cause and treatment of complex disorders. Recent decades have brought spectacular advances in identifying the causes of single-gene human diseases. However, most human phenotypes are not due to a single gene, but are caused by a complex interplay of multiple genes, different alleles in those genes, and the environment. In addition, we see how these new technologies are beginning to reveal the genetic basis that underlies our individuality. Topics include the genetics of behavior, human origins, the genetics of immunity and of cancer, stem cell research, and gene therapy.


**Particulars:** PRS (Personal Response System) RF clickers will be used in class. Exams: three in-class exams and a final. **Prerequisites:** Biology 141 and 142.

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**BIOLOGY 370 (000 & 00P): Introduction to Microbiology**  
*Jones (000)*, TTh, 10:00-11:15, MAX: 80, 1462 Clifton Road, Room 230  
*Jones (00P)*, TTh, 10:00-11:15, MAX: 20, 1462 Clifton Road, Room 230 (Permission section for Nursing students only)

**Content:** This course will present the basic elements of microbiology, including the study of viruses but emphasizing bacteriology. Topics to be covered will include the following: the tools of microbiology, microbial taxonomy and evolution, microbial physiology, microbial biochemistry, microbial genetics, and microbial pathogenesis. The implications of microbiology on medicine, environment, basic research, and biotechnology will be discussed. There is an optional 2-credit hour lab associated with the course (Biology 370L-Introduction to Microbiology Laboratory).

**Text:** Madigan, Martinko, and Parker. *Brock's Biology of Microorganisms, 12th Edition (**NEW**).* (Prentice-Hall)

**Particulars:** There will be three exams, two homework assignments, and a final project. **Prerequisites:** Biology 141 and 142. This course, taken together with Biology 370L, meets the upper level laboratory requirement for students under the Fall 2006 or later Biology major programs.

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**BIOLOGY 370L* (00C and 00D): Laboratory in Microbiology (2 Credit Hours)**  
*Campbell (00C)*, W, 2:30-5:30, MAX: 24, 1462 Clifton Road, Room 117  
*Campbell (00D)*, Th, 2:30-5:30, MAX: 24, 1462 Clifton Road, Room 117

(*Formerly Biology 375)

**NOTE:** Any students needing Biology 370L who were not able to enroll during pre-registration, please contact Dr. Kathy Campbell at kathleen.campbell@emory.edu or via LearnLink AS SOON AS POSSIBLE and let her know if you would prefer a Wednesday or Thursday lab. Thank you.

**Content:** This 2-credit hour course will introduce students to some of the basic techniques used in the study of
physiology, biochemistry, and genetics of microorganisms. Students will isolate a soil microorganism at the beginning of the term and study its properties in subsequent periods. The organisms will also be examined for the presence of plasmids and for their susceptibility to bacterial viruses.

Text: None.

Particulars: Students will be graded on the basis of their performance in the lab, on several quizzes that will be administered throughout the term, and on a major report of their analysis of the organisms they isolate that will be due at the end of the term. Prerequisites: Biology 141 and 142. Biology 370, taken previously or concurrently, is also required. This course, taken together with Biology 370, meets the upper level laboratory requirement for students under the Fall 2006 or later Biology major programs.

BIOLOGY 371 (000): Ecology of the Tropics (2 credit hours)
Wilson, L. (Fernbank Science Center), Tu, 2:30-4:40, MAX: 12, 1462 Clifton Road, Room 100C (2 Credit Hours)

(Same as ENVS 371 (000); MAX: 12)

Content: This 2-credit hour lecture course will explore the diverse biomes of the tropics. Focus will be on tropical forests and grasslands with an emphasis on ecological processes, biodiversity, human impact on the tropics, indigenous people, and ethnobotany.

Text: A variety of published papers and selected readings from books will be utilized.

Particulars: Grading is based on class participation, short written assignments, and a final exam. 2 credit hours. Prerequisites: Biology 141 and 142. Cross-listed as ENVS 371.

BIOLOGY 372 (00P): Ecology of the Tropics - Field Course
Wilson, L. (Fernbank Science Center), March 6-15, 2009, MAX: 6 (2 Credit Hours)

(Same as ENVS 372 (00P); MAX: 6)

Content: This is the field course (2 credit hours) to accompany the lecture course on tropical ecology (BIOL 371 / ENVS 371) and will take place the week of Spring Break (March 6-15, 2009). The field class is taught in the Amazon Rainforest of Peru. The upper Amazon basin is home to the greatest expression of life (biodiversity) on the entire planet.


Particulars: Permission of instructor is required. Students who completed BIOL 371 / ENVS 371 in Spring 2008 or are enrolled in the Spring 2009 semester are eligible for this course. Prerequisites: Biology 141, 142, and 371. Eligible students will need to pick up an application packet from Barbara Shannon in the Biology Department (room 2006, O. Wayne Rollins Research Center) during preregistration. Application and deposit for the field trip is due by noon, December 1st, 2008. Grading for the course is based on a field journal and a field project.
BIOLOGY 402SWR (00P): Neuroscience Live
Jaeger, TTh, 4:00-5:15, MAX: 20, 1462 Clifton Road, Room 126

Content: This advanced seminar covers current topics of neuroscience research and the intellectual and experimental challenges involved. It is a hands-on writing intensive seminar, where you learn to read and critique research papers, design experiments, and write a grant proposal. The authors of the research papers chosen are eminent Emory researchers, and you will be able to interact with them in a 'live' format, after having read their work.

Text: Kandel, Schwartz, and Jessell. Principles of Neural Science, 4th Edition. (McGraw-Hill) (NOTE: This text is recommended (but not required) and will mainly be used as a resource of background information.)

Particulars: Prerequisites: Biology 141 and 142. Pre- or corequisite: Biology 360/NBB 301. The course grade will be assigned 60% based on writing assignments and 40% based on powerpoint presentations in class. Permission of instructor is required.

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BIOLOGY 415 (000): Cancer Biology and Oncogenes
Orloff, TTh, 1:00-2:15, MAX: 60, 1462 Clifton Road, Room 308

Content: The cellular pathways regulating cell division, differentiation, and migration are examined through a focus on the mechanisms by which cancers grow and spread. Topics will include: 1) oncogenes and tumor suppressor genes, 2) mechanisms of tumor initiation, 3) regulation of cell proliferation, 4) apoptosis (programmed cell death), 5) angiogenesis (blood vessel formation), 6) metastasis, 7) pathology, and 8) cancer treatments. Lectures and discussions will emphasize the experimental basis for our current understanding of cancer biology.

Text: Primary research and review articles will be assigned throughout the course.

Particulars: This course will include lectures, invited speakers, discussions, and oral presentations by students. Through study of the primary literature, students will develop skills in identifying and analyzing the logic of the experiments. There will be quizzes, a mid-term, and a final exam. Prerequisites: Biology 141 and 142.

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BIOLOGY 440S (00P): Animal Communication
Gouzoules (Psychology), TTh, 1:00-2:15, MAX: 8, Psychology 332

(Same as PSYC 440S)

Content: From the dance of the honey bee, the “honest advertising” of frogs, and the question of why birds sing, to the symbolic abilities of primates and dolphins, recent studies of animal communication have provided considerable insight into the evolutionary origins of human language. What do animals communicate about? How do signals and displays originate? Do animals deceive one another? How do social and physical environments influence communication? Does communication provide a window on the cognitive abilities of animals? These and other questions will be explored in the seminar.

Text: Original source material, discussed in seminar format.

Particulars: Grades will be based on class participation and one paper (approximately 15 pages). There will be a large amount of reading for the course. Permission of instructor is required prior to enrollment and priority is given to students who have taken PSYC 320/BIOL 320. Prerequisites: Biology 141 and 142. This course
originates in the Psychology Department.

BIOLOGY 463S (000): Population Biology and Evolution of Disease
Levin, TTh, 4:00-6:00, with occasional sessions on Wednesdays, 5:15-6:15, MAX: 20, 1462 Clifton Road, Room 101
(Same as IBS 591)

Content: Infectious diseases as well as cancers and coronary artery diseases will be treated as population dynamic and evolutionary phenomena. Primary consideration will be given to five topics: (1) the within-host population and evolutionary dynamics of microparasite (viruses, bacteria, and protozoa) infections, the immune defenses, and the treatment of these infections with antibiotics and other chemotherapeutic agents; (2) the epidemiology of infectious diseases and their control by vaccination, prophylaxis, and chemotherapy, with a particular emphasis on influenza, HIV/AIDS, and malaria, (3) the evolution of parasite virulence (why parasites harm their hosts), (4) the somatic cell population biology and evolution of neoplasms (cancers) and their metastasis, and (5) the evolution of senescence and its implication for the extending the human life span.

Texts:
- Wilson, E.O. and W.H. Bossert. A Primer of Population Biology. (Sinauer)
- Assorted original, review, and popular articles.

Particulars: The course will include lectures, discussion, and oral reports by students. Each student will be responsible for at least one report that will be presented both orally and in writing. Grades will be based on the quality of these reports and the magnitude and enthusiasm of participation in discussions. Prerequisites: Biology 141 and 142, college level mathematics and calculus, and an intense interest in this subject.

BIOLOGY 470 (000): Special Topics in Biology: Organismal Form & Function
***NEW***
Stokes, TTh, 2:30-3:45, MAX: 40, 1462 Clifton Road, Room 308

Content: Major topics include the biology of animals and plants, physiology, evolution, and ecology.

Texts:

Particulars: There will be quizzes and a final exam. Prerequisite: Biology 141. (NOTE: This course will count for Column B for the Biology majors.)

BIOLOGY 470 (001): Special Topics in Biology: Sensory Physiology & Perception
***NEW***
Liu, TTh, 11:30-12:45, MAX: 40, 1462 Clifton Road, Room 308
Content: Ever wonder how we are able to construct our perception of the world from the sound waves, odorant molecules, and photons that envelop us? What are these mechanisms and how did they evolve? What consequences does a particular physiological and neural architecture have for how our senses can be fooled? This course will cover common themes across the major sensory modalities of mechanosensation, chemosensation, and photosensation. We will use examples from the single cell to the human to introduce the transduction mechanisms and neural pathways involved in these senses.


Particulars: Prerequisites: Biology 141 and 142, Biology 336 (Human Physiology) or Biology 360/NBB 301 (Intro to Neurobiology), or consent of instructor. The course will include lectures, invited speakers, exams, and a project. PRS Interactive Clickers are encouraged.

BIOLOGY 470 (002): Special Topics in Biology: Math Concepts in the Neurosciences
Olifer, MWF, 9:35-10:25**, MAX: 5, 1462 Clifton Road, Room 226 (**Note: time change**)

(Same as NBB 370 000)

Content: This course is intended for NBB majors and Biology majors. It is a self-contained introduction to key mathematical concepts and reasoning in the Neurosciences. Concepts from algebra, differential and difference equations, probability theory, and others will be introduced in the context of real problems of neuronal coding, neuronal network dynamics, and learning of neuronal networks.

Texts:

Particulars: Grading will be based on regular homework assignments, a midterm exam, and a final exam. Weekly discussion sections will be scheduled. Prerequisites: Biology 141 and 142; Biology 360/NBB 301 will be a useful background; and knowledge of calculus is not required but is a plus. This course will fulfill elective credit for the Biology and NBB majors.

BIOLOGY 470 (003): Special Topics in Biology: Darwin's Great Books (2 credit hours) ***NEW***
Van Houton, Th, 2:30-3:45, MAX: 20, Candler School of Theology 162

Content: The year 2009 is the 200th anniversary of Charles Darwin's birth and the 150th anniversary of the publication of his text, On the Origin of Species. But Darwin wrote other texts of great significance, both for evolutionary theory and beyond. Darwin is primarily credited for the theory of natural selection and the evolution of species from other species. That is, species are not fixed biological creatures, but dynamic organisms in a vast epic of biological time. This course examines what is generally considered his four great texts: Voyage of the Beagle (1845), On the Origin of Species (1859), The Descent of Man (1871), and Expression of Emotions in Man and Animals (1872). We will read these books and focus on the topics they raise: natural history, evolutionary theory, religious autobiography, and ethics. For example, Darwin is the first biologist to consider natural suffering and extinction as major biological forces. He was also a deeply troubled person, "acquainted with grief". This course focuses on the significance of scientific observation and descriptions of the good life that are in Darwin's work and
have been attributed since.

Text: Assigned readings.

Particulars: This 2-credit hour course will discuss Darwin's texts and related readings assigned by the instructor. Students will be evaluated based on their contributions to the discussion (much like a reading group) and on one paper turned in at the end of the term. Enrollment will be a broad group of undergraduates from various disciplines.

BIOLOGY 470S (001): Senior Seminar: How We Understand the Universe: A Study of Perception, Science, Philosophy, and Religion  ***NEW***  

Escobar, MWF, 3:00-3:50, MAX: 25, 1462 Clifton Road, Room 101

Content: This course is intended to be an introduction to concepts surrounding our human understanding of reality. In order that we may have a more complete understanding, we will look at classical myths, the scientific method, the biology of vision, modern physics, religions, and philosophers. It is hoped that by the end of the course the students will have a framework that will allow them to create a more complete and thoughtful understanding of the universe.

Texts:

Particulars: Prerequisites: Biology 141 and 142.

BIOLOGY 470S (002): Senior Seminar: Human Genome: Promise and Perils

Lucchesi, Tu, 10:00-12:30, MAX: 25, 1462 Clifton Road, Room 101

NOTE: This course is not the same as Biology 430S, Human Genome Project and Diseases, taught by Dr. Shozo Yokoyama.

Content: The complete sequencing of the human genome is offering unlimited opportunities for healthcare such as the ability to predict the onset of genetic diseases and the susceptibility to infectious agents. The other side of the coin is a fundamental infringement on the right of privacy that could have serious economic consequences.

Texts: Assigned readings of specific textbook chapters and articles in the primary literature.

Particulars: The class will be discussion-based, with little formal lecture. Grading will be based on class participation and case-study presentations. Prerequisites: Biology 141 and 142. (NOTE: This course will count for Column A for the Biology majors.)

BIOLOGY 470S (003): Senior Seminar: Sex, Drugs, Memory, & Cognition  ***NEW***

Marsteller / Anderson / Glavis-Bloom / Heuer / Mitrano, TTh, 4:00-5:15, MAX: 20, ECIT Classroom, Woodruff Library

Content: This course will focus on the evolution of human behavior and cognition. Each module will explore a different subtopic of this topic. The modules will include: reward processing, memory, human cognition, and issues
of social and reproductive behavior. The course will stress the development of these systems in humans by analyzing animal model systems and comparative anatomy. The course will be based on current research and primary literature in the field.

**Text:** Ambrose. H.W. et al., *A Handbook of Biological Investigation, 7th Edition*. (Hunter Textbooks)

**Particulars:** Prerequisites: Biology 141 and 142.

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**BIOLOGY 475 (000): Biology of the Eye**

*Edelhauser / Nickerson (Emory Eye Center/Ophthalmology), MWF, 9:35-10:25, MAX: 30, Emory Clinic B, Calhoun Auditorium*

(Same as IBS 548)

**Content:** A course designed for juniors, seniors, and graduate students who may be interested in a basic understanding of the eye. This course will review basic principles and state-of-the-art information on ocular anatomy, embryology, biochemistry, physiology, genetics, immunology, microbiology, pharmacology, and pathology. This course will provide a fascinating insight into the overall function of the eye.

**Text:** A course outline will be used with the appropriate text for each lecture.

**Particulars:** The course will have three didactic lectures with discussion per week. Course grade will be determined by two mid-term exams and one final. Graduate students will be required to write a term paper. Prerequisites: Biology 141 and 142.

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**BIOLOGY 495A* / 495BWR* (00P): Honors Research**

*Yedvobnick*

**Particulars:** Senior Biology Honors students should take Biology 495A in the Fall semester and 495BWR in the Spring semester. Those graduating in the Fall semester should take 495BWR in the Fall. (NOTE: Second semester juniors who will graduate in a Fall semester must register for the Honors Program the prior Fall semester. You cannot register for Honors in the Spring semester.) For more information, go to the webpage for the Honors Program in Biology. Permission of instructor is required for both Biology 495A and 495BWR. Contact Barbara Shannon via e-mail at barbara.shannon@biology.emory.edu or call 404-727-6294 to obtain a permission number.

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**BIOLOGY 497R (00P): Supervised Reading**

*Individual Faculty*

*(Permission of Barbara Shannon, Room 2006, Rollins Research Center, required.)*

**Particulars:** Variable credit, maximum 4 hours per semester. Readings are done in conjunction with a faculty member. Interested students should communicate with appropriate faculty and obtain their permission in advance of registration. **This course does NOT count for the Biology major and does NOT fulfill the writing requirement.** Prerequisites: Biology 141 and 142. Contact Barbara Shannon via e-mail at barbara.shannon@emory.edu or call
404-727-6294 to obtain a permission number.

BIOLOGY 499R (00P): Undergraduate Research
Individual Faculty

**Particulars:** Research participation open to sophomores, juniors, and seniors, by permission only. **Prerequisites:** Biology 141 and 142, second-semester freshman standing, and a declared major in Biology. The student must find a faculty member to supervise the research and **SUBMIT AN APPLICATION FORM TO DR. RACHELLE SPELL, DIRECTOR OF UNDERGRADUATE RESEARCH, PRIOR TO REGISTRATION.** ONCE THE APPLICATION HAS BEEN APPROVED, THE STUDENT MUST THEN REGISTER THROUGH NORMAL PROCEDURES. The application form and other detailed information regarding Biology 499 requirements can be obtained from the [Undergraduate Education page](http://www.bio.emory.edu/undergraduate) of the Biology Department website. Variable credit, maximum 4 hours per semester. A maximum of 4 credits may be used to satisfy the requirements toward a Biology major.