FALL 2016
BIOLOGY COURSE DIRECTORY

For your advising appointment you will need:
✓ Course Directory
✓ Degree Advice Report
✓ Major/Specialization Guidelines
✓ Transcript

REGISTRATION NOTES:

- For permission required courses: If contact information is not listed on the Student Link, email Stacy Straaberg Finfrock at stacysf@bu.edu.
- Full time students may take up to 18 credits per semester. Seniors are automatically awarded a fee waiver so that they may take up to 20 credits per semester without additional fees. Non-seniors may request this fee waiver.
- PDP, ROTC, and CAS FY/SY courses do not count towards graduation credits.
- The following courses do not count toward the Biology or BMB major or minor:
  - CAS BI 105 Introductory Biology for Health Sciences
  - CAS BI 211 Human Physiology

COURSES:

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Courses fulfilling breadth requirements:

- Cell & Molecular
- CAS BI 203 Cell Biology
- CAS BI 213 Intensive Cell Biology
- Neurobiology & Physiology
- CAS BI 315 Systems Physiology
- CAS BI 325 Principles of Neuroscience
- Ecology, Behavior & Evolution
- CAS BI 225 Behavioral Biology
- CAB BI 306 Biology of Global Change
- CAS BI 309 Evolution
- CAS BI 407 Animal Behavior

Upper Level Lab Courses Offered Fall 2016:

- CAS BI 306 Biology of Global Change
- CAS BI 311 General Microbiology
- CAS BI 315 Systems Physiology
- CAS BI 407 Animal Behavior
- CAS BI 421 Biochemistry I
- CAS BI 445 Cell & Molecular Neurophysiology
- CAS BI 513 Genetics Laboratory
**CAS BB 191: UNDERGRADUATE RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY I**

*Prereq: freshman standing, GPA in biochemistry and molecular biology (BMB) courses of at least 3.0, consent of instructor (laboratory advisor), and approval of application by the BMB Research and Honors Committee.*

[2 cr] Not for BMB major credit. Laboratory research under the supervision of a faculty member.

**CAS BB 291: UNDERGRADUATE RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY II**

*Prereq: sophomore standing, GPA in biochemistry and molecular biology (BMB) courses of at least 3.0, consent of instructor (laboratory advisor), and approval of application by the BMB Research and Honors Committee.*

[2 cr] Not for BMB major credit. Laboratory research under the supervision of a faculty member.

**CAS BB 391: UNDERGRADUATE RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY III**

*Prereq: junior standing, GPA in biochemistry and molecular biology (BMB) courses of at least 3.0, consent of instructor (laboratory advisor), and approval of application by the BMB Research and Honors Committee.*

[2 or 4 cr] Two credit option is not for BMB major credit. Laboratory research under the supervision of a faculty member. A maximum of 4 credits earned in undergraduate research courses may be counted toward the BMB major.

**CAS BB 491: UNDERGRADUATE RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY IV**

*Prereq: senior standing, GPA in biochemistry and molecular biology (BMB) courses of at least 3.0, consent of instructor (laboratory advisor), and approval of application by the BMB Research and Honors Committee.*

Laboratory research under the supervision of a faculty member. A maximum of 4 credits earned in undergraduate research courses may be counted toward the BMB major.

**CAS BB 401: HONORS RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY**

*Prereq: senior standing, GPA in biochemistry and molecular biology (BMB) courses of at least 3.5, consent of instructor (laboratory advisor), and approval of application by the BMB Research and Honors Committee.*

Coreq: CAS BB 497

Independent laboratory research under the supervision of a faculty member. Minimum of 12 hours per week in the lab, not including preparation and evaluation. Course grade is determined by laboratory performance, oral presentation, written thesis, and defense of the thesis before a committee of three BMB faculty members. Successful completion of both CAS BB 401 and BB 402 may lead to a degree with honors in the major, although only 4 of the credits may count toward the BMB major. Students must also present a research talk at the BMB symposium at the end of the Spring semester of the academic year. No more than 12 credits of undergraduate research may be counted toward the 128 credits required for graduation from CAS.

**CAS BB 497: HONORS RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY SEMINAR II**

*Prereq: For students currently enrolled in the Honors BMB Program.*

[1 cr] A one-credit research seminar for students enrolled in Honors Research in BMB (CAS BB 402) or in BA/MA in Biotechnology research (CAS BB 592). Students present at the BMB Symposium. A minimum grade of B+ in this seminar and in CAS BB 401 and CAS BB 402 is required to graduate with Honors in BMB.

**CAS BB 591: GRADUATE RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY**

*Prereq: admission to the combined BA/MA Biotechnology Program.*

Coreq: CAS BB 497 is encouraged.

BMB laboratory research conducted under supervision of a faculty member. Externships are acceptable if approved and overseen by a BMB faculty member or the BMB Director. Minimum of 15 hours per week in the lab, culminating in submission to the BMB Director of a written progress report and research outline for CAS BB 592.

**NOTE:** Minimum of three hours per week per credit of lab or field work, not including preparation and evaluation. No more than 12 credits of undergraduate research may be counted toward the 128 credits required for graduation.
### CAS BI 105: INTRODUCTORY BIOLOGY FOR HEALTH SCIENCES

**Prereq:** None

Principles of biology; emphasis on cellular structure, genetics, microbiology, development, biochemistry, metabolism, and immunology. This course is appropriate for non-majors and students in the health and paramedical sciences (Sargent College). Students may not receive credit for CAS BI 105 if CAS BI 108 has already been passed. Three hour lecture and a two hour lab. Carries natural science divisional credit (with lab) in CAS.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>A1 Co Mon, Wed, Fri</th>
<th>9:00am - 10:00am</th>
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<tbody>
<tr>
<td>Lab C1</td>
<td>Tue 9:30am - 11:30am</td>
<td>D2 Wed 1:30pm - 3:30am</td>
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<td>Lab C2</td>
<td>Tue 12:00pm - 2:00pm</td>
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<td>Lab C3</td>
<td>Tue 3:00pm - 5:00pm</td>
<td>E2 Thu 12:30pm - 2:30pm</td>
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<td>Lab D1</td>
<td>Wed 10:30am - 12:30pm</td>
<td>E3 Thu 3:00pm - 5:00pm</td>
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**Note:** Not for Biology or BMB credit.

### CAS BI 203: CELL BIOLOGY

**Prereq:** CAS BI 108 and CAS CH 102 or equivalent

Principles of cellular organization and function. Topics include biological molecules, flow of genetic information, membranes and subcellular organelles, and cell regulation.

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<tr>
<td>Discussion</td>
<td>B2 Mon 3:00pm - 4:00pm D3 Wed 3:00pm - 4:00pm</td>
<td>B3 Mon 3:00pm - 4:00pm D4 Wed 2:00pm - 3:00pm</td>
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<td>B4 Mon 2:00pm - 3:00pm D5 Wed 3:00pm - 4:00pm</td>
<td>B5 Mon 2:00pm - 3:00pm D6 Wed 12:00pm - 1:00pm</td>
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<td></td>
<td>C1 Tue 4:00am - 5:00am D7 Wed 12:00pm - 1:00pm</td>
<td>C2 Wed 12:00pm - 1:00pm E2 Thu 1:00pm - 2:00pm</td>
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<td>D1 Wed 2:00pm - 3:00pm E3 Thu 2:00pm - 3:00pm</td>
<td>D2 Wed 2:00pm - 3:00pm</td>
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**Notes:** Must also be enrolled concurrently in CAS CH 203 or equivalent. Class meets with BI 281 and A1 also meets with BI 218.

* These time slots are reserved for exams.

### CAS BI 213: INTENSIVE CELL BIOLOGY

**Prereq:** CAS BI 108 and CAS CH 102 or equivalent

Molecular basics of cell biology including genomics, subcellular organelles, cell signaling, stem cells, and cancer.

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<td>Lab B1</td>
<td>Mon, Wed 12:00pm - 2:00pm B3 Wed 5:00pm - 6:00pm</td>
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<tr>
<td>Lab B2</td>
<td>Wed 12:00pm - 1:00pm B4 Thu 5:00pm - 6:00pm</td>
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**Notes:** Must also be enrolled in CAS CH 203 or equivalent. This course meets with CAS BI 218.

### CAS BI 410: DEVELOPMENTAL BIOLOGY

**Prereq:** CAS BI 203 and CAS CH 206 or equivalent or consent of the instructor

Contemporary aspects of embryonic development are covered, drawing from current literature. There is an emphasis on the use of experimental approaches to address topics such as polarity in the egg, body axis specification, embryonic patterning, and organogenesis.

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<tr>
<th>Lecture</th>
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<td>Discussion</td>
<td>B2 Mon 3:00pm - 4:00pm</td>
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<td>B4 Mon 3:00pm - 4:00pm D2 Wed 3:00pm - 4:00pm</td>
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<td>D1 Wed 1:00pm - 2:00pm E2 Thu 1:00pm - 2:00pm</td>
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<td>D2 Wed 1:00pm - 2:00pm E3 Thu 1:00pm - 2:00pm</td>
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**Notes:** Must also be enrolled concurrently in CAS CH 203 or equivalent. Class meets with BI 281 and A1 also meets with BI 218.

* These time slots are reserved for exams.
CAS BI 421: BIOCHEMISTRY I

Prereq: CAS CH 204 or CAS CH 212 or CAS CH 214 or equivalent

Introductory biochemistry. The following topics are covered: protein structure and folding, enzyme mechanisms, kinetics, and allostery; nucleic acid structure; lipids and membrane structure; bioenergetics; vitamins and coenzymes; introduction to intermediary metabolism.

Lecture
A1 Tolan Mon 8:00am-10:00am
Wed, Fri 9:00am - 10:00am
A2 Perlstein Tue, Thu 2:00pm - 3:30pm
Mon 5:00pm - 7:00pm *

Lab
BA Mon 8:00am - 12:00pm B4 Thu 8:00am - 12:00pm
BB Mon 1:00pm - 5:00pm B5 Thu 1:00pm - 5:00pm
BC Mon 6:00pm - 10:00pm B6 Thu 6:00pm - 10:00pm
B1 Wed 8:00am - 12:00pm B7 Fri 8:00am - 12:00pm
B2 Wed 1:00pm - 5:00pm B8 Fri 1:00pm - 5:00pm
B3 Wed 6:00pm - 10:00pm B9 Fri 6:00pm - 10:00pm

Discussion
C1 Mon 1:00pm - 2:00pm C3 Thu 10:00am - 11:00am
C2 Mon 2:00pm - 3:00pm C4 Thu 1:00pm - 2:00pm

Note - Graduate students will have extra assignments and discussion sections. This class meets with CH 421, BI 621, CH 621, BI 527, and MET CH 421.

*This time slot is reserved for exams.

CAS BI 527: BIOCHEMISTRY LAB I

Prereq: (CAS CH 204 and CAS CH 212 and CAS CH 214) or CAS CH 282

Emphasizes the purification and characterization of proteins and DNA. Development and use of modern instrumentation and techniques.

Lecture
A1 Tolan Mon 1:00pm - 2:00pm
A2 Tolan Mon 2:00pm - 3:00pm
A3 Tolan Thu 10:00am - 11:00am
A4 Tolan Thu 1:00pm - 2:00pm

Lab
BA Mon 8:00am - 12:00pm B4 Thu 8:00am - 12:00pm
BB Mon 1:00pm - 5:00pm B5 Thu 1:00pm - 5:00pm
BC Mon 6:00pm - 10:00pm B6 Thu 6:00pm - 10:00pm
B1 Wed 8:00am - 12:00pm B7 Fri 8:00am - 12:00pm
B2 Wed 1:00pm - 5:00pm B8 Fri 1:00pm - 5:00pm
B3 Wed 6:00pm - 10:00pm B9 Fri 6:00pm - 10:00pm

Notes: Meets with CAS CH 527, CAS BI/CH 421, GRS BI/CH 621 and MET CH 421.

CAS BI 513: GENETICS LAB

Prereq: CAS BI 203 and CAS BI 206 and senior standing and consent of instructor

Genetic techniques such as mutant selection and screening, complementation, mapping, recombinant DNA, and chemical genetic screening are taught using the genetic model systems Escherichia coli, Saccharomyces cerevisiae, and Arabidopsis thaliana. Short-term and long-term projects in which students formulate and test hypotheses.

Lab
A1 Celenza Tue,Thu 11:00am - 2:00pm

CAS BI 551: BIOLOGY OF STEM CELLS

Prereq: CAS BI 203 or CAS BI 206 or consent of instructor

Views on stem cell research range from assumptions of a potential cure for most diseases to fears that it will depreciate the value of human life. This course equips students with the science that underlies this discussion, including the biological properties of stem cells and the experimental hurdles to its utilization in regenerative medicine.

Lecture
A1 Frydman Tue,Thu 11:00am - 12:30pm

Discussion
B1 Thu 10:00am - 11:00pm
CELL & MOLECULAR

**CAS BI 552: MOLECULAR BIOLOGY I**  
*Prereq: (CAS BI 203 or CAS BI 213) and CAS BI 206 or CAS BI 216*  
Synthesis, structure, and function of biologically important macromolecules (DNA, RNA, and proteins). Regulation and control of the synthesis of RNA and proteins. Introduction to molecular biology of eukaryotes. Discussion of molecular biological techniques, including genetics and recombinant DNA techniques.  
*Lecture*
A1 Loechler  Tue, Thu  3:30pm - 5:00pm  
*Discussion*
B1 Tue  5:00pm - 6:00pm  
B2 Wed  10:00am - 11:00am  
B3 Wed  2:00pm - 3:00pm  
B4 Thu  5:00pm - 6:00pm  
B5 Wed  3:00pm - 4:00pm

**CAS BI 560: SYSTEMS BIOLOGY**  
*Prereq: CAS BI 552 or consent of the instructor*  
Examines critical components of systems biology, including design principles of biological systems (e.g., feedback, synergy, cooperativity), and the generation and analysis of large-scale datasets (e.g., protein-protein interaction, mRNA expression).  
*Lecture and Discussion*
A1 Siggers  Mon, Wed, Fri  11:00am - 12:00pm  
               Wed  12:00pm - 1:00pm

**CAS BI 572: ADVANCED GENETICS**  
*Prereq: CAS BI 206 and CAS BI 203; CAS BI 552 is recommended*  
An in-depth study of eukaryotic genetics, ranging from the history and basic principles to current topics and modern experimental approaches. Genetics of Drosophila, C. elegans, mice, and humans are explored in detail, including readings from primary literature.  
*Lecture*
A1 McCall  Tue, Thu  9:30am - 11:00am  
*Discussion*
B1 Wed  10:00am - 11:00am
CAS BI 211: HUMAN PHYSIOLOGY
Prereq: (CAS BI 105 or CAS BI 108) and CAS BI 106 or equivalent. Some knowledge of chemistry and anatomy assumed. Introduction to principles of systemic mammalian physiology with special reference to humans.

Lecture
A1 Co Mon,Wed,Fri 1:00pm - 2:00pm

Lab
B1 Mon 2:00pm - 5:00pm
B2 Mon 6:00pm - 9:00pm
C1 Tue 2:00pm - 5:00pm
D1 Wed 9:00am - 12:00pm
D2 Wed 2:00pm - 5:00pm
D3 Wed 6:00pm - 9:00pm
E1 Thu 9:00am - 12:00pm
E2 Thu 2:00pm - 5:00pm
F1 Fri 9:00am - 12:00pm

Notes: Not for Biology major or minor credit; Biology majors/minors should take CAS BI 315.

CAS BI 315: SYSTEMS PHYSIOLOGY
Prereq: (CAS BI 108 or CAS BI 209), and CAS CH 101 and CAS CH 102, or equivalent

An introduction to physiological principles applied across all levels of organization (cell, tissue, organ system). Preparation for more advanced courses in physiology. Topics include homeostasis and neural, muscle, respiratory, cardiovascular, renal, endocrine, gastrointestinal, and metabolic physiology.

Lecture
A1 Widmaier Tue,Thu 12:30pm - 2:00pm

Lab
B1 Fri 2:00pm - 5:00pm

CAS BI 325: PRINCIPLES OF NEUROSCIENCE
Prereq: CAS BI 203 or consent of instructor.

Fundamentals of the nervous system, emphasizing synaptic transmission; hierarchical organization; autonomic nervous system; mechanisms of sensory perception; reflexes and motor function; biorhythms; and neural mechanisms of feeding, mating, learning, and memory.

Lecture
A1 Gavornik Tue,Thu 12:30pm - 2:00pm

Discussion
B1 Wed 2:00pm - 3:00pm
B2 Wed 3:00pm - 4:00pm
B3 Fri 9:00am - 10:00am
B4 Fri 11:00am - 12:00pm
B5 Fri 1:00pm - 2:00pm
B6 Fri 2:00pm - 3:00pm

Notes: Students may elect to take NE 203, which features a laboratory component. Meets with NE 203.

CAS BI 445: CELLULAR AND MOLECULAR NEUROPHYSIOLOGY
Prereq: CAS BI 203, CAS BI 315, CAS NE 203, or consent of instructor

Cellular and molecular basis of neural excitability and synaptic transmission. The molecular understanding of ion channels is extrapolated to higher brain functions such as learning, memory, and sleep.

In the lab, we learn to obtain intracellular and extracellular recordings from muscle fibers and the third motor nerve of crayfish ventral nerve cord. The extracellular recordings allow us to monitor the network activity that controls the animal’s posture while the intracellular recordings allow us to investigate synaptic transmission. Quantitative analyses of experimental data will be performed. The entire class will contribute to a research project with the expectation that the data pooled from all students should be of sufficient quantity and quality for a publication.

Lecture
A1 Lin Mon,Wed,Fri 12:00pm - 1:00pm

Lab
B1 Fri 2:00pm - 5:00pm

Notes: Meets with BI 645 and NE 445.
CAS BI 455: DEVELOPMENTAL NEUROBIOLOGY
Prereq: CAS BI 203 or CAS BI 325 or CAS NE 203 or consent of instructor
Fundamental principles of developmental neurobiology, stressing molecular mechanisms that underlie early neural development, differentiation, process outgrowth, and behavior.
Lecture
A1 Man Mon 10:00am - 12:00pm
Fri 10:00am - 12:00pm
Notes: Meets with NE 455.

CAS BI 481: MOLECULAR BIOLOGY OF NEURONS
Prereq: CAS BI 203
Topics include electrical properties of neurons, a survey of neurotransmitters, molecular structure and function of receptors, synaptic transmission, intracellular signaling, and the molecular biology of sensory transduction.
Lecture
A1 Ho Mon, Wed, Fri 1:00pm - 2:00pm
Discussion
B1 Mon 3:00pm - 4:00pm
Notes: Meets with BI 681.

CAS BI 520: SENSORY NEUROBIOLOGY
Prereq: CAS BI 325 or CAS BI 203 or consent from instructor
A broad survey of sensory system function in model organisms and humans, focusing on fundamental principles of neural processing. Topics include basic cellular transduction, neural coding, and links between neural activity and sensory perception.
Lecture
A1 Davison Tue,Thu 11:00am - 12:30pm
Discussion
B1 Wed 4:00pm - 5:00pm
Notes: Meets with NE 520.

CAS BI 525: BIOLOGY OF NEURODEGENERATIVE DISEASES
Prereq: (CAS NE 102 or CAS BI 203) and (CAS NE 203 or CAS BI 325)
This course focuses on understanding the molecular mechanisms that are at the basis of neurodegenerative diseases and on their impact and relevance in clinical diagnosis and treatment. Neurodegenerative diseases like Alzheimer's disease, Parkinson's disease, Amyotrophic Lateral Sclerosis, Huntington's Disease and Creutzfeldt-Jakob disease are becoming more and more common since people are more exposed to pathogenic agents (as in Creutzfeldt-Jakob disease and Mad Cow disease) or just encounter these diseases as a result of aging (like Alzheimer's or Parkinson's disease). Although very different from one another, these diseases share common mechanisms and features leading to neuronal death, including protein misfolding and aggregation, oxidative stress, impaired protein degradation, and apoptosis. This course will study how these molecular pathways define each disease, contributing to neurodegenerative phenomena. Relevance will be given to Alzheimer's disease.
Independent
A1 Pastorino Mon, Fri 9:00am - 10:00am
Wed 9:00am - 11:00am
Notes: Meets with NE 525.

CAS BI 535: TRANSLATION RESEARCH IN ALZHEIMER'S DISEASE
Prereq: (CAS BI 203 or CAS BI 102) and (CAS BI 325 or CAS NE 203)
An introduction to translational research focused on Alzheimer's disease, with particular emphasis on the search for new therapeutic targets, from observations of pathogenic phenotypes in patients to the development of appropriate animal and cellular models of the disease.
Independent
A1 Pastorino Mon,Fri 2:00pm - 3:00pm
Wed 2:00pm - 4:00pm
Notes: Meets with NE 535.
CAS BI 545: NEUROBIOLOGY OF MOTIVATED BEHAVIOR
Prereq: CAS BI 315 or CAS BI 325 or CAS NE 201 or consent of instructor.

Molecular and neuroendocrine mechanisms controlling reproductive and parental behaviors, ingestive behaviors and metabolism, and circadian rhythms, pain perception, and reward in vertebrates.

Lecture
A1  Baum  Tue, Thu  2:00pm - 3:30pm

Discussion
B1  Thu  3:30pm - 5:00pm
B2  Thu  3:30pm - 5:00pm

Notes: Meets with NE 545.

CAS BI 581 C1: SEMINAR IN BIOLOGY: EXPLORING NEURAL CIRCUITS
Prereq: CAS BI 325 and consent of the instructor

[2 cr] A major goal of neuroscience research is to understand how the coordinated patterns of neural activity lead to complex behavior. This course will use current research articles to review the new tool sets that are being developed to dissect neural circuits, such as optogenetic and pharmacogenetic approaches, in vivo measurement strategies with genetically encoded calcium indicators (GECIs), viral tracing approaches to label and to manipulate neural activity and multiple mouse transgenic intersectional strategies. In addition, the course will rely heavily on discussion of recent literature that combines these approaches to dissect the function and wiring patterns of specific neural circuits.

Lecture
CI  Cruz-Martin  Tue, Thu  10:00am - 12:00pm
CAS BI 107: BIOLOGY I  
**Prereq:** None; high school biology assumed.

The evolution and diversity of life; principles of ecology; behavioral biology. For students who plan to major in the natural sciences or environmental science, and for premedical students. Required for biology majors. Carries natural science divisional credit (with lab) in CAS.

**Lecture**
- **A1** Schneider, Sorenson, Spilios, Wasserman  
  Tue, Thu 12:30pm - 2:00pm
- **A2** Schneider, Sorenson, Spilios, Wasserman  
  Mon, Wed, Fri 3:00pm - 4:00pm

**Lab**
- **B1** Mon 4:00pm - 7:00pm  
  D6 Wed 1:30pm - 4:30pm
- **B2** Mon 4:30pm - 7:30pm  
  D7 Thu 4:00pm - 7:00pm
- **C1** Tue 8:30am - 11:30am  
  E1 Thu 8:30am - 11:30am
- **C2** Tue 9:00am - 12:00pm  
  E2 Thu 9:00am - 12:00pm
- **C3** Tue 9:30am - 12:30pm  
  E3 Thu 9:30am - 12:30pm
- **C4** Tue 12:00pm - 3:00pm  
  E4 Thu 12:00pm - 3:00pm
- **C5** Tue 12:30pm - 3:30pm  
  E5 Thu 12:30pm - 3:30pm
- **C6** Tue 1:00pm - 4:00pm  
  E6 Thu 1:00pm - 4:00pm
- **C7** Tue 4:00pm - 7:00pm  
  E7 Thu 4:00pm - 7:00pm
- **D1** Wed 8:30am - 11:30am  
  E8 Thu 8:30am - 11:30am
- **D2** Wed 9:00am - 12:00pm  
  F1 Fri 8:00am - 11:00am
- **D3** Wed 9:30am - 12:30pm  
  F2 Fri 9:00am - 12:30pm
- **D4** Wed 12:00pm - 3:00pm  
  F3 Fri 10:00am - 1:00pm
- **D5** Wed 12:30pm - 3:30pm

CAS BI 225: BEHAVIORAL BIOLOGY  
**Prereq:** CAS BI 107 and CAS BI 108 and at least sophomore standing. CAS AN 102 may be accepted as a prerequisite with consent of instructor.

Introduction to the genetics, physiology, neurobiology, ecology, and evolution of behavior. Topics include gene/environment interaction, hormones and behavior, neuroethology, communication, reproductive behavior, evolution of cooperation and altruism, cognition and brain evolution. Emphasis on integrative analysis.

**Lecture**
- **A1** Traniello  
  Tue, Thu 12:30pm - 2:00pm

**Discussion**
- **B1** Tue, Thu 2:00pm - 2:30pm

CAS BI 306: BIOLOGY OF GLOBAL CHANGE  
**Prereq:** CAS BI 107; Recommended: CAS CH 101 or CH 171

The ecological impacts of human activity on terrestrial and aquatic ecosystems. Climate change, forest decline, eutrophication, acidification, loss of species diversity, and restoration of ecosystems.

**Lecture**
- **A1** Templer  
  Tue, Thu 11:00am - 12:30pm

**Lab**
- **B1** Tue 2:00pm - 5:00pm  
  **C2** Wed 2:00pm - 5:00pm
- **C1** Wed 10:00am - 1:00pm  
  **F1** Thu 2:00pm - 5:00pm

CAS BI 309: EVOLUTION  
**Prereq:** CAS BI 107 and CAS BI 108 or equivalent

Introduction to modern concepts, controversies, and analytical approaches in evolutionary biology. Topics include adaptation, natural and sexual selection, species and speciation, phylogenetics, comparative analysis, basic population and quantitative genetics, origin of novelty, adaptive radiation, development and evolution.

**Lecture**
- **A1** Mullen  
  Mon, Wed, Fri 10:00am - 11:00am

**Discussion**
- **B1** Thu 3:00pm - 4:00pm  
  **B4** Thu 2:00pm - 3:00pm
- **B2** Wed 12:00pm - 1:00pm  
  **B5** Wed 4:00pm - 5:00pm
- **B3** Wed 1:00pm - 2:00pm  
  **B6** Fri 1:00pm - 2:00pm

CAS BI 407: ANIMAL BEHAVIOR  
**Prereq:** CAS BI 107

The science of ethology on a hormonal, neural, and evolutionary level. Special emphasis will be on significance and adaptiveness of an expressed behavior. Individual lab projects as well as some prepared labs may require more than the scheduled time.

**Lecture**
- **A1** Wasserman  
  Tue, Thu 3:30pm - 5:00pm

**Lab**
- **B1** Mon 2:00pm - 5:00pm  
  **F1** Fri 2:00pm - 5:00pm
- **D1** Wed 12:00pm - 3:00pm

**Notes:** Meets with BI 607.
CAS BI 443: TERRESTRIAL BIOGEOCHEMISTRY

Prereq: (CAS BI 107 or CAS ES 101 or CAS ES 105) and CH 101/102, or consent of instructor

The patterns and processes controlling carbon and nutrient cycling in terrestrial ecosystems. Links between local and global scales are emphasized. Topics include net primary production, nutrient use efficiency, and biogeochemical transformation.

Independent

A1 Finzi Mon, Wed, Fri 11:00am - 12:00pm

Notes: Meets with ES 443, BI 643, and ES 643.

CAS BI 448: BIODIVERSITY AND CONSERVATION BIOLOGY

Prereq: CAS BI 303 or CAS BI 306 or consent of instructor

The study of biological diversity and modern methods to protect endangered plant and animal species. The environment, population, and genetic and human factors that affect the survival of species are examined for temperate and tropical communities, as well as terrestrial and aquatic habitats.

Lecture and Discussion

A1 Primack Mon, Wed, Fri 11:00am - 12:00pm

Fri 1:00pm - 2:00pm

Notes: Meets with BI 648.
You do not need to be a Marine Science student to take these classes. However, you must apply for the Marine Program. For more information, go to http://www.bu.edu/bump/marine-semester/

**CAS BI 523: MARINE URBAN ECOLOGY**
*Prereq: None*

Marine Urban Ecology is an emerging, interdisciplinary field that aims to understand how human and ecological processes can coexist in human-dominated systems. Topics, ecosystems, and organisms associated with urbanization in the Greater Boston area. Also offered as CAS GE 523.

**Lecture**
- **MS** Rotjan  
- **Arranged**  
- **Oct. 3 - Oct. 28**

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**CAS BI 531: ICHTHYOLOGY: BEHAVIOR, ECOLOGY, AND EVOLUTION OF FISH**
*Prereq: CAS BI 206 and consent of instructor*

A comprehensive introduction to fish biology and systematics. Emphasis on phylogenetic relationships, ecology, and behavior. Labs include morphological studies of specimens and behavioral studies of live fish. This course is a prerequisite for the field course.

**Lecture**
- **MS** Lobel  
- **Arranged**  
- **Nov. 28 - Dec. 21**

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**CAS BI 539: CORAL REEF DYNAMICS: SHALLOW WATERS, DEEP TIME**
*Prereq: None*

Tropical reefs—diverse, complex, and ancient—exhibit lawful cycles of growth, degradation, and regeneration. Explore these through observations on the Belize Barrier Reef in fossil reef environments and through laboratory experiments. Insights are applied to reef conservation in today’s changing world. Also offered as CAS ES 539.

**Lecture**
- **MS** Stewart  
- **Arranged**  
- **Nov. 28 - Dec. 21**

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**CAS BI 541: CORAL REEF RESILIENCE AND RESTORATION**
*Prereq: Junior or senior standing*

Caribbean coral reefs have fallen into ruin. Students develop methods to restore reef health by applying genomics, life history theory, landscape ecology and climatology. This course is an advanced follow-on to CAS BI/ES 539 (Coral Reef Dynamics), and includes field work in Belize.

**Lecture**
- **MS** Kaufman  
- **Arranged**  
- **Nov. 28 - Dec. 21**

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**CAS BI 546: MARINE MEGAFAUNAL ECOLOGY: STELLWAGEN BANK NATIONAL MARINE SANCTUARY AND SURROUNDING WATERS**
*Prereq: (CAS BI 260 and CAS MA 213) or consent of the instructor*

Marine macrofauna: whales, seals, seabirds, fishes, turtles, jellies, and people in Stellwagen Bank National Marine Sanctuary. Evolution, food webs, and distributional ecology; physical and human influences on foraging and movement behavior. Student research builds ecosystem-based science for Sanctuary management.

**Lecture**
- **MS** Biedron  
- **Arranged**  
- **Sept. 5 - Oct. 7**

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**CAS BI 550: MARINE GENOMICS**
*Prereq: None*

Covers the evolution of genomes, the architecture of gene networks, and the connection between genotype and phenotype in marine organisms, as well as the technical development of modern genomics. Student research projects utilize modern genomics experimental approaches.

**Lecture**
- **MS** Finnerty  
- **Arranged**  
- **Nov. 28 - Dec. 21**
CAS BI 563: SENSORY BIOLOGY OF AQUATIC ANIMALS  
*Prereq: CAS BI 260 and junior and senior standing or consent of the instructor*

Underwater signals, physics of signal transmission, receptors, sense organs, animal behavior. Focus on student-generated research projects: design, animal care, data collection, analysis and presentation.

*Lecture*
- MS Atema  
- Arranged  
- Oct. 3 - Oct. 28

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CAS BI 569: TROPICAL MARINE INVERTEBRATES  
*Prereq: CAS BI 107 and CAS BI 260*

Explores the diversity of marine invertebrates, including body plans, feeding biology, reproductive strategies, and developmental programs. Field biodiversity surveys and behavioral studies in shallow water tropical marine environments, especially seagrass beds and mangrove.

*Lecture*
- MS Stewart  
- Arranged  
- Oct. 31 - Nov. 23

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CAS BI 578: MARINE GEOGRAPHIC INFORMATION SCIENCE  
*Prereq: CAS BI 107 and CAS ES 114; CAS MA 213 is strongly recommended*

Introduction to marine geographic information systems and spatial analysis for conservation, management, and marine landscape ecology. Comparative examples from Gulf of Maine and tropics. Solve problems in coastal zoning and marine park design, whale and coral reef conservation. Also offered as CAS GE 578.

*Lecture*
- MS Wikgren  
- Arranged  
- Oct. 31 - Nov. 23
MET courses cover the same material as CAS courses but offer alternative schedules.

**MET BI 105: INTRODUCTORY BIOLOGY FOR HEALTH SCIENCES**

*Prereq: High school biology and chemistry are assumed.*

Principles of biology: emphasis on cellular structure, heredity, development, and organic evolution. Intended for non-majors as well as for those concentrating in the health and paramedical sciences.

*Note:* Not for Biology or BMB major credit.

**Lecture**
A1 Stanford  
Mon 6:00pm - 9:00pm

**Lab**
C1 Wed 6:00pm - 9:00pm

**MET BI 107: BIOLOGY I**

*Prereq: Assumes year of high school biology and chemistry*

The evolution and diversity of life; principles of ecology; behavioral biology. For premedical students and students who plan to concentrate in the natural sciences.

*Note:* BI 107 is required of Biology majors. It is recommended that CH 101 and CH 102 be taken prior to or concurrently.

**Lecture**
A1 Lavali  
Mon 6:00pm - 9:00pm

**Lab**
C1 Wed 6:00pm - 9:00pm

**MET BI 203: CELL BIOLOGY**

*Prereq: BI 108 and CH 102 or equivalent*

Principles of cellular organization and function: biological molecules, enzymes, bioenergetics, membranes, motility, regulatory mechanisms.

**Lecture**
B1 Adams  
Tue 6:00pm - 8:00pm

**Discussion**
D1 Thu 7:00pm - 8:00pm

**MET BI 211: HUMAN PHYSIOLOGY**

*Prereq: BI 105 or equivalent.*


**Lecture**
D1 Vyshedskiy  
Thu 6:00pm - 9:00pm

**Lab**
B1 Tue 6:00pm - 9:00pm

**MET BI 407: ANIMAL BEHAVIOR**

*Prereq: BI 105 or equivalent*

Ethological approach to animal behavior, including humans; physiological, ontogenetic, and phylogenetic causes and adaptive significance of behavior within an evolutionary framework.

**Lecture**
A1 Wasserman  
Mon 6:00pm - 9:00pm

**Lab**
C1 Wed 6:00pm - 9:00pm

**MET BI 426: NEUROBIOLOGY OF CONSCIOUSNESS**

*Prereq: BI 108 or equivalent*

In this class we will dive into the neuroscience of imagination: from neurons to memory to neurological control of novel conscious experiences. We will study what makes your brain unique and the selectional forces that shaped the brains of our ancestors. We will discuss what makes human language special and how it evolved.

**Lecture**
C1 Vyshedskiy  
Wed 6:00pm - 9:00pm

Juniors and seniors can take one MET course per semester. All other students must request permission from Steve Jarvi, Associate Dean for Student Life, at sjarvi@bu.edu.
CAS BI 191: UNDERGRADUATE RESEARCH IN BIOLOGY I  
Prereq: freshman standing, consent of instructor, and completed application.  
[2 cr] Not for biology major or minor credit. Research in biological science for students at the freshman level. Students design and implement a research project with a faculty member.

CAS BI 291: UNDERGRADUATE RESEARCH IN BIOLOGY II  
Prereq: sophomore standing, consent of instructor, and completed application.  
[2 cr] Not for biology major or minor credit. Research in biological science for students at the sophomore level. Students design and implement a research project with a faculty member.

CAS BI 391: UNDERGRADUATE RESEARCH IN BIOLOGY III  
Prereq: junior standing, consent of instructor, and completed application.  
[2 or 4 cr] Two credit option not for Biology major or minor credit. Research in biological science for students at the junior level. Students design and implement a research project with a faculty member. One 4 credit research course can count toward the 3-lab requirement and fulfill an upper level elective. A second 4 credit research course can fulfill an upper level elective.

CAS BI 491: UNDERGRADUATE RESEARCH IN BIOLOGY IV  
Prereq: junior or senior standing, consent of instructor, and completed application.  
Research in biological science for students at the senior level. Students design and implement a research project with a faculty member. Research topic must be defined at the time of registration. Course grade is to be determined by laboratory performance and written report. One 4 credit research course can count toward the 3-lab requirement and fulfill an upper level elective. A second 4 credit research course can fulfill an upper level elective.

CAS BI 401: HONORS RESEARCH IN BIOLOGY  
Prereq: senior standing, cumulative GPA of at least 3.5, and approval of the Department of Biology Honors Committee.  
Mentored laboratory or field research with a faculty member of the Biology Department leading to graduation with Honors in Biology. One 4 credit research course can count toward the 3-lab requirement and fulfill an upper level elective. A second 4 credit research course can fulfill an upper level elective.

CAS BI 171: READINGS IN BIOLOGY I  
Prereq: freshman standing, consent of instructor, and completed application.  
[2 cr] Not for biology major or minor credit. Library research on a well-defined topic in biological sciences, chosen in conjunction with a faculty member. Individual conferences and discussion with the faculty member are required as well as a paper presentation.

CAS BI 271: READINGS IN BIOLOGY II  
Prereq: sophomore standing, consent of instructor, and completed application.  
[2 cr] Not for biology major or minor credit. Library research on a well-defined topic in biological sciences, chosen in conjunction with a faculty member. Individual conferences and discussion with the faculty member are required as well as a paper presentation.

CAS BI 371: READINGS IN BIOLOGY III  
Prereq: junior standing, consent of instructor, and completed application.  
[2 cr] Not for biology major or minor credit. Library research on a well-defined topic in biological sciences, chosen in conjunction with a faculty member. Individual conferences and discussion with the faculty member are required as well as a paper presentation.

CAS BI 471: READINGS IN BIOLOGY IV  
Prereq: junior or senior standing, cumulative GPA in biology of at least 3.0, and consent of instructor.  
[2 cr] Not for biology major or minor credit. Intensive library research on a well-defined subject, followed by individual conferences and discussion with a faculty member. May be taken as preparation for CAS BI 401, 402, 491, and 492.

CAS BI 497: HONORS RESEARCH IN BIOLOGY SEMINAR  
Prereq: CAS BI 107 & CAS BI 108 and at least two additional biology courses. For students currently enrolled in or intending to apply to the Honors in Biology Program.  
[2 cr] A 2-credit weekly research seminar for students in the Honors in Biology Program. A minimum grade of B+ and a written assignment based on a research topic in one of the seminars is required to graduate with honors. Juniors enrolled in BI 497 or 498 must have a current faculty research mentor (See the Biology website or contact the Undergraduate Program Specialist in the Department of Biology).
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* Marine Semester