

# FALL 2018 BIOLOGY COURSE DIRECTORY

## For advising you will need:

- ✓ Degree Advice Report
- ✓ Transcript Preview
- ✓ Advising Worksheet
- ✓ Course Directory

## COURSE NOTES:

### Courses fulfilling breadth requirements:

#### Cell & Molecular (CM)

- CAS/MET BI 203 Cell Biology
- CAS BI 213 Intensive Cell Biology
- CAS BI 218 Cell Biology with ISE 2 Lab

#### Ecology, Behavior & Evolution (EBE)

- CAS BI 225 Behavioral Biology
- CAB BI 306 Biology of Global Change
- CAS BI 309 Evolution
- CAS/MET BI 407 Animal Behavior

#### Physiology & Neurobiology (PN)

- CAS BI 315 Systems Physiology
- CAS BI 325/NE 203 Principles of Neuroscience

### Upper Level Lab Courses Offered Fall 2018:

- CAS NE 203 Principles of Neuroscience
- CAS BI 218 Cell Biology with ISE 2 Lab
- CAS BI 306 Biology of Global Change
- CAS BI 311 General Microbiology
- CAS BI 315 Systems Physiology
- CAS/MET BI 407 Animal Behavior
- CAS/MET BI/CH 421 Biochemistry 1
- CAS BI 445 Cell & Molecular Neurophysiology
- CAS BI 513 Genetics Laboratory
- CAS BI 527 Biochemistry Lab 1
- CAS BI Marine Semester Courses
- CAS BI Tropical Ecology Program Courses
- CAS BI Undergraduate Research Courses (first 4-credit semester)

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## REGISTRATION NOTES:

- **Permission required courses:** Students may not register for these courses on their own. Students should have the instructor sign an [Add/Drop form](#) and then take the signed form to CAS Advising or the Registrar.
- **Full-time status** is 12-18 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 submit the Course Overload Fee Waiver Form on CAS Advising's website.
- **PDP, ROTC, and CAS FY/SY courses do not count** toward the 128 credits needed to graduate with a BA.
- **Non-majors courses:** The following courses do not count toward the Biology or BMB major or minor:

CAS/MET BI 105 Introductory Biology for Health Sciences  
CAS/MET BI 211 Human Physiology

# BIOCHEMISTRY & MOLECULAR BIOLOGY

## UNDERGRADUATE RESEARCH IN BMB

Undergraduate Research in Biochemistry and Molecular Biology courses (CAS BB 191 - CAS BB 491) require an application. For more information on research requirements and to apply, visit [www.bu.edu/bmb/research](http://www.bu.edu/bmb/research). Time commitment is a minimum of 6 hours a week for 2-credit research and 12 hours a week for 4-credit research, not including preparation and evaluation.

### CAS BB 191: UNDERGRADUATE RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY 1

*Prereq: freshman standing, GPA in biochemistry and molecular biology (BMB) courses of at least 3.0, consent of instructor (faculty research mentor/sponsor), 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 BMB faculty mentor. Research outside the BMB program is acceptable if approved and overseen by a BMB faculty sponsor.

**Grading:** Course grade is determined by laboratory performance.

### CAS BB 291: UNDERGRADUATE RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY 2

*Prereq: sophomore standing, GPA in biochemistry and molecular biology (BMB) courses of at least 3.0, consent of instructor (faculty research mentor/sponsor), 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 BMB faculty mentor. Research outside the BMB program is acceptable if approved and overseen by a BMB faculty sponsor.

**Grading:** Course grade is determined by laboratory performance.

### CAS BB 391: UNDERGRADUATE RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY 3

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

**[2 or 4 cr] Two-credit option not for BMB major credit.** Laboratory research under the supervision of a BMB faculty mentor. Research outside the BMB program is acceptable if approved and overseen by a BMB faculty sponsor. Students can use one semester of 4-credit research to fulfill a BMB elective if not using Undergraduate Research or Honors Research for the advanced lab elective.

**Grading:** Course grade is determined by laboratory performance.

### CAS BB 491: UNDERGRADUATE RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY 4

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

Laboratory research under the supervision of a BMB faculty mentor. Research outside the BMB program is acceptable if approved and overseen by a BMB faculty sponsor. Students can use one semester of 4-credit research to fulfill a BMB elective if not using Undergraduate Research or Honors Research for the advanced lab elective.

**Grading:** Course grade is determined by laboratory performance.

# BIOCHEMISTRY & MOLECULAR BIOLOGY

## HONORS RESEARCH IN BMB

Honors Research in BMB offers students the ability to participate in two semesters of mentored 4-credit research (CAS BB 401 and 402) and 1-credit research seminars (CAS BB 497 and 498). Students also write and defend an honors thesis on their research. For more information on research requirements and to apply, visit [www.bu.edu/bmb/research](http://www.bu.edu/bmb/research). Time commitment is a minimum of 12 hours a week, not including preparation and evaluation.

## 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 (faculty research mentor/sponsor), and approval of application by the BMB Research and Honors Committee.*

*Coreq: CAS BB 497*

Independent laboratory research under the supervision of a BMB faculty mentor. Research outside the BMB program is acceptable if approved and overseen by a BMB faculty sponsor. Successful completion of both CAS BB 401 and BB 402 may lead to a degree with honors in the major. Students must also present a research talk at the BMB symposium at the end of the spring semester of the academic year.

**Grading:** Course grade is determined by laboratory performance, oral presentation, written thesis, and defense of the thesis before a committee of three BMB faculty members.

## CAS BB 497: HONORS RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY SEMINAR 1

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

*Coreq: CAS BB 401*

[1 cr ] A one-credit research seminar for students enrolled in Honors Research in BMB (CAS BB 401) or Graduate Research in BMB (CAS BB 591). Students present at the BMB Symposium. A minimum grade of B+ in BB 497/498 and BB 401/402 is required to graduate with Honors in BMB.

**Grading:** Attendance and participation.

## GRADUATE RESEARCH IN BMB

Graduate Research in BMB is offered as part of the BA/MA program. This five-year program is only open to BMB majors and earns students a Bachelor's degree in BMB and a Master's degree in Biotechnology. For more information on the BA/MA program, visit [www.bu.edu/bmb/bama-bulletin](http://www.bu.edu/bmb/bama-bulletin).

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

*Prereq: Admission to the BA/MA Program.*

*Coreq: CAS BB 497 is encouraged.*

Laboratory research conducted under the supervision of a BMB faculty sponsor. Research outside the BMB Program is acceptable if approved and overseen by a BMB faculty sponsor. 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.

**Grading:** Course grade is determined by laboratory performance.

## Electives for the BMB major can be found in these sections:

Cell & Molecular (pgs. 4-8)  
Physiology & Neurobiology (pgs. 11-13)  
Metropolitan College (MET) (pgs. 17-18)

A list of courses accepted toward the BMB major can be found in the Bulletin at [www.bu.edu/bmb/bulletin](http://www.bu.edu/bmb/bulletin).

# CELL & MOLECULAR

## CAS BI 105: INTRODUCTORY BIOLOGY FOR HEALTH SCIENCES

*Prereq: None.*

**Not for Biology or BMB major/minor credit.** 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 BI 105 if BI 108 has already been passed. Carries natural science divisional credit (with lab) in CAS.

### Lecture

A1	Muscedere	Mon, Wed, Fri	9:05am - 9:55am
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### Lab

C1	Tue	9:00am - 10:45am
C2	Tue	1:30pm - 3:15pm
C3	Tue	3:30pm - 5:15pm
D1	Wed	10:10am - 11:55am
D2	Wed	2:30pm - 4:15pm
E1	Thu	9:00am - 10:45am
E2	Thu	1:30pm - 3:15pm
E3	Thu	3:30pm - 5:15pm

**Notes:** Not for Biology or BMB major or minor credit (BI 108 is recommended instead).

**Textbooks & Technology:** Brooker, Widmaier, Graham, and Stiling, *Principles of Biology*, 2nd ed., McGraw-Hill, 2018.

**Grading:** Three lecture exams (36%), lecture assignments and homework (11%), laboratory exercises and exam (35%), and course final exam (18%).

## CAS BI 194: TOPICS IN BIOLOGY: HUMAN GENETICS

*Prereq: None.*

**Not for Biology or BMB major/minor credit.** This course is designed to help you understand fundamental concepts of genetics so that you may comprehend how current advances in the field are affecting our society. Emphasis on classical and molecular genetics, advances in genetic technologies, and social and ethical issues related to genetic testing.

### Lecture and Discussion

A1	Faszewski	Tue, Thu	3:30pm - 4:45pm
		Thu	5:00pm - 5:50pm

**Notes:** Not for Biology or BMB major or minor credit.

**Textbook & Technology:** Lewis, R., *Human Genetics Concepts and Applications*, 12th ed., McGraw Hill, 2018. Relevant course content will be posted on Blackboard.

**Grading:** Three lecture exams (45%), cumulative final (15%), discussion (30%), and current event assignment (10%).

# CELL & MOLECULAR

## CAS BI 203: CELL BIOLOGY

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

*Coreq: CAS CH 203 or equivalent.*

Principles of cellular organization and function: biological molecules, flow of genetic information, membranes and subcellular organelles, and cell regulation. Three hours lecture, one hour discussion.

### *Lecture*

A1	Beffert	Tue, Thu	9:30am - 10:45am
		Mon	6:30pm - 8:00pm *
A2	Beffert	Tue, Thu	3:30pm - 4:45pm
		Mon	6:30pm - 8:00pm *

\*These time slots are reserved for exams.

### *Discussion*

B2	Mon	11:15am - 12:05pm	D3	Wed	3:35pm - 4:25pm
B3	Mon	12:20pm - 1:10pm	D4	Wed	4:40pm - 5:30pm
B4	Mon	1:25pm - 2:15pm	D5	Wed	3:35pm - 4:25pm
B5	Fri	3:35pm - 4:25pm	D6	Wed	12:20pm - 1:10pm
C1	Tue	11:15am - 12:05pm	D7	Wed	12:20pm - 1:10pm
D1	Wed	12:20pm - 1:10pm	E1	Thu	11:15am - 12:05pm
D2	Wed	1:25pm - 2:15pm	E2	Tue	11:15am - 12:05pm

**Notes:** Class meets with BI 281 and A1 also meets with BI 218. Students may receive credit for CAS BI 203 or 213, but not both courses.

**Textbook & Technology:** Cooper and Hausman, *The Cell: A Molecular Approach*, 7th ed., Sinauer Associates, 2015

**Grading:** Four midterm exams and final examination.

## CAS BI 213: INTENSIVE CELL BIOLOGY

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

*Coreq: CAS CH 203 or equivalent.*

Recommended for students in BMB and the specialization in Cell Biology, Molecular Biology & Genetics. Alternative to CAS BI 203 emphasizing experimental approaches and in-depth discussion. Molecular basis of cell biology, including genomics, subcellular organelles, cell signaling, stem cells, and cancer.

### *Lecture*

A1	Naya	Tue, Thu	9:30am - 10:45am
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### *Discussion*

B1	Mon	1:25pm - 2:15pm	B3	Wed	4:40pm - 5:30pm
B2	Wed	12:20pm - 1:10pm	B4	Thu	3:35pm - 4:25pm

**Notes:** This course meets with CAS BI 218. Students may receive credit for CAS BI 213 or 203, but not both courses.

**Textbook & Technology:** Cooper and Hausman, *The Cell: A Molecular Approach*, 7th ed., Sinauer Associates, 2015

**Grading:** 2 midterms, final exam, and discussion.

# CELL & MOLECULAR

## CAS BI 218: CELL BIOLOGY WITH INTEGRATED SCIENCE EXPERIENCE 2 LAB

*Prereq:* CAS BI 116 and CAS CH 116 (or equivalent) or consent of instructor.  
*Coreq:* CAS CH 218.

[5 cr] Integration of cell biology with organic chemistry and neuroscience, with emphasis on how each discipline interacts experimentally. Laboratory focuses on synthesizing compounds and testing in biological systems.

### Lecture

A1	Beffert	Tue, Thu	9:30am - 10:45am
		Mon	6:30pm - 8:00pm

*Meets with BI 203 A1. Monday evening timeslot reserved for exams.*

A2	Beffert	Tue, Thu	3:30pm - 4:45pm
		Mon	6:30pm - 8:00pm

*Meets with BI 203 A2. Monday evening timeslot reserved for exams.*

A3	Naya	Tue, Thu	9:30 - 10:45am
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*Meets with BI 213.*

### Discussion

B1	Spilios	Register for a BI 203 or 213 discussion.	
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### Lab

L1	Spilios	Wed.	12:20pm - 4:20pm
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### Prelab

P1	Spilios	Fri	2:30pm - 4:15pm
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**Textbooks & Technology:** Cooper and Hausman, *The Cell: A Molecular Approach*, 7th ed., Sinauer Associates, 2015

**Grading:** Lecture (75%) and laboratory (25%).

## CAS BI 311: GENERAL MICROBIOLOGY

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

Organisms discussed include bacteria, archaea, viruses, fungi, protists, and algae. Course will cover microbial diversity, the environmental and human micro biomes, and technologies used to study microbes today. Global issues of emerging infectious disease, agriculture and microbial responses to global change are discussed.

### Lecture

A1	Bhatnagar	Mon, Wed, Fri	9:05am - 9:55am
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### Lab

B1	Mon, Wed	12:20pm - 2:05pm
B2	Mon, Wed	2:30pm - 4:15pm
B3	Tue, Thu	9:00am - 10:45am
B4	Tue, Thu	1:30pm - 3:15pm
B5	Tue, Thu	3:30pm - 5:15pm

**Textbooks & Technology:** Slonczewski and Foster, *Microbiology: An Evolving Science*, 4th ed., W.W. Norton & Company, Inc., 2017

**Grading:** Exams (21%), wiki assignment (13%), lab assignments (45%), participation (5%), and final exam (13%).

## CAS BI 410: DEVELOPMENTAL BIOLOGY

*Prereq:* CAS BI 203 or BI 213 or BI 218 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.

### Lecture

A1	Bradham	Tue, Thu	2:00pm - 3:15pm
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### Discussion

B1	Wed	2:30pm - 3:20pm
B2	Wed	3:35pm - 4:25pm

**Notes:** Meets with GRS BI 610.

**Textbooks & Technology:** Gilbert, *Developmental Biology*, 10th ed., Sinauer, 2013

**Grading:** Three exams plus discussion grade.

# CELL & MOLECULAR

## CAS BI 421: BIOCHEMISTRY 1

*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. See BI 527 for lab content.

### Lecture

A1	Perlstein	Tue, Thu	2:00pm - 3:15pm
		Mon	5:45pm - 7:45pm*

\*Time slot reserved for exams.

### Lab

B1	Wed	8:00am - 12:00pm	B8	Fri	6:30pm - 10:30pm
B2	Wed	1:25pm - 5:25pm	B9	Mon	10:10am - 2:10pm
B3	Wed	6:30pm - 10:30pm			
B4	Thu	9:05am - 1:05pm			

### Discussion

C1	Mon	9:05am - 9:55am	C3	Thu	11:15am - 12:05pm
C2	Mon	12:20pm - 1:10pm			

**Notes:** This class meets with CAS BI/CH 527, GRS BI/CH 621, and MET CH 421. Students may also register for the CH 421 laboratory and discussion sections; however, preference in registration for these sections will be given to chemistry majors.

**Textbooks & Technology:** Lehninger, *Principles of Biochemistry*, 7th ed., Nelson and Cox.

**Grading:** Exams (65%), and lab (35%).

## CAS BI 513: GENETICS LAB

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

Genetic techniques such as mutant selection and screening, complementation, mapping, recombinant DNA, and targeted mutagenesis 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	12:30pm - 3:15pm
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**Textbooks & Technology:** Class notes and assigned papers.

**Grading:** Lab reports, homework, notebook and attendance.

## CAS BI 527: BIOCHEMISTRY LAB 1

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

**[2 cr] Not for Biology major or minor credit unless both BI 527 and BI 528 are taken.** Emphasizes the purification and characterization of proteins and DNA. Development and use of modern instrumentation and techniques.

### Lecture

A1	Medrano	Mon	9:05am - 9:55am
A2	Medrano	Mon	12:20pm - 1:10pm
A3	Medrano	Thu	11:15am - 12:05pm

### Lab

B1	Wed	8:00am - 12:00pm
B2	Wed	1:25pm - 5:25pm
B3	Wed	6:30pm - 10:30pm

**Notes:** Meets with CAS CH 527, CAS BI 421, GRS BI/CH 621 and MET CH 421. Not for Biology major or minor credit unless both BI 527 and BI 528 are taken.

**Textbooks & Technology:** Tolan, *Biochemistry Laboratory Manual*, 3rd Ed., 2013.

**Grading:** Lab notebook, reports, attendance, safety, and participation.

## 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 and Discussion

A1	Frydman	Tue, Thu	9:30am - 10:45am
		Thu	11:15am - 12:05pm

**Textbooks & Technology:** Primary literature will be provided on the blackboard site.

**Grading:** Midterm, final, presentation, and participation.

# CELL & MOLECULAR

## CAS BI 552: MOLECULAR BIOLOGY 1

*Prereq: (CAS BI 203 or CAS BI 213) and CAS BI 206 or CAS BI 216.*

How cells synthesize biologically important macromolecules (DNA, RNA and proteins), as well as their structure, function and regulation. Both prokaryotic and eukaryotic molecular biology is discussed. Topics include: DNA replication, DNA repair, recombination, prokaryotic transcription/translation, as well as eukaryotic transcription/RNA processing, DNaseI hypersensitive sites, 5-methylcytosine, eukaryotic RNA polymerase structure/CTD modification, eukaryotic promoter structure, general transcription factors, enhancer-promoter loops, histone modification/chromatin remodeling, and non-coding RNA. Discussion of important molecular biological techniques, such as genetic and recombinant DNA techniques, including CRISPR/Cas9. Three hours of lecture, one hour of discussion per week.

### Lecture

A1	Loechler	Tue, Thu	11:00am - 12:15pm
		Thu	6:30pm - 10:30pm*
A2	Loechler	Tue, Thu	3:30pm - 4:45pm
		Thu	6:30pm - 10:30pm*

\*Time slot reserved for exams.

### Discussion

B1	Tue	5:00pm - 5:50pm
B2	Wed	10:10am - 11:00am
B3	Wed	2:30pm - 3:20pm
B4	Thu	5:00pm - 5:50pm
B5	Wed	3:35pm - 4:25pm
B6	Wed	1:25pm - 2:15pm

**Textbooks & Technology:** TBD.

**Grading:** 3 exams (25% each), homework (12.5%), and discussion participation (12.5%).

## 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	11:15am - 12:05pm
		Wed	12:20pm - 1:10pm

**Textbooks & Technology:** Course readings provided via Blackboard.

**Grading:** Midterm 1 (30%), midterm 2 (30%), final exam (40%), and class participation (30%).

### Additional electives for the CMG specialization can be found in these sections:

Ecology, Behavior & Evolution (pgs. 9-10)  
Physiology & Neurobiology (pgs. 11-13)  
Marine Semester (pgs. 14-15)  
Metropolitan College (MET) (pgs. 17-18)  
Research & Readings (pgs. 19-20)

A list of courses accepted toward the CMG specialization can be found in the Bulletin at [www.bu.edu/biology/cm-g-bulletin](http://www.bu.edu/biology/cm-g-bulletin).

# ECOLOGY, BEHAVIOR & EVOLUTION

## CAS BI 107: BIOLOGY 1

*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	Mullen, Sorenson Spilios, Wasserman	Tue, Thu	12:30pm - 1:45pm
A2	Mullen, Sorenson Spilios, Wasserman	Mon, Wed, Fri	2:30pm - 3:20pm

### Lab

B1	Mon	2:30pm - 5:15pm	D6	Wed	2:30pm - 5:15pm
B2	Mon	2:30pm - 5:15pm	D7	Wed	6:30pm - 9:15pm
B3	Mon	2:30pm - 5:15pm	E1	Thu	8:00am - 10:45am
C1	Tue	8:00am - 10:45am	E2	Thu	8:00am - 10:45am
C2	Tue	8:00am - 10:45am	E3	Thu	8:00am - 10:45am
C3	Tue	8:00am - 10:45am	E4	Thu	12:30pm - 3:15pm
C4	Tue	12:30pm - 3:15pm	E5	Thu	12:30pm - 3:15pm
C5	Tue	12:30pm - 3:15pm	E6	Thu	12:30pm - 3:15pm
C6	Tue	12:30pm - 3:15pm	E7	Thu	6:30pm - 9:15pm
D1	Wed	8:00am - 10:45am	E8	Thu	6:30pm - 9:15pm
D2	Wed	8:00am - 10:45am	F1	Fri	8:00am - 10:45am
D3	Wed	8:00am - 10:45am	F2	Fri	8:00am - 10:45am
D4	Wed	2:30pm - 5:15pm	F3	Fri	8:00am - 10:45am
D5	Wed	2:30pm - 5:15pm			

**Grading:** 4 Lecture exams and Lab assignments.

## CAS BI 225: BEHAVIORAL BIOLOGY

*Prereq: CAS BI 107 and CAS BI 108 and at least sophomore standing. Enrollment limited to students specializing in behavioral biology. Other students must receive consent of instructor. CAS AN 102 may be accepted as a prerequisite with consent of instructor.*

Introduction to the evolution, ecology, physiology, neurobiology and genetics of behavior. Topics include behavioral ecology, sociobiology, hormones and behavior, neuroethology, behavioral genetics, development, communication, reproductive behavior, cooperation and altruism, cognition and brain evolution. Emphasis on integrative analysis.

### Independent

A1	Traniello	Tue, Thu	1:30pm - 3:15pm
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**Textbooks & Technology:** Primary literature and complementary readings; Traniello, *Introduction to Behavioral Biology*, 1st ed., 2012; Alcock, *Animal Behavior*, edition TBA

**Grading:** 3 quizzes, research paper, class presentations, engagement, and participation.

## 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 - 12:15pm
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### Lab

B1	Tue	12:30pm - 3:15pm	C2	Fri	11:15am - 2:00pm
C1	Wed	2:30pm - 5:15pm	F1	Thu	12:30pm - 3:15pm

**Textbooks & Technology:** Wright, *Environmental Science: Toward a Sustainable Future*, 12th ed., Pearson, 2013

**Grading:** 2 midterms (40%), final examination (20%), and laboratory (included paper and presentation) (40%).

## 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	10:10am - 11:00am
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### Discussion

B1	Wed	12:20pm - 1:10pm	B3	Thu	11:15am - 12:05pm
B2	Wed	1:25pm - 2:15pm	B4	Thu	3:35pm - 4:25pm

**Textbooks & Technology:** Herron and Freeman, *Evolutionary Analysis*, 5th ed., Pearson, 2013

**Grading:** 2 midterms (40%), final exam (20%), discussion (20%), and paper assignment (20%).

# ECOLOGY, BEHAVIOR & EVOLUTION

## 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 - 4:45pm

### Lab

B1 Mon 2:30pm - 5:15pm F1 Fri 2:30pm - 5:15pm

D1 Thu 12:30pm - 3:15pm

**Notes:** Meets with BI 607.

**Textbooks & Technology:** None.

**Grading:** 3 Lecture exams (66%) and lab (34%).

## CAS BI 443: TERRESTRIAL BIOGEOCHEMISTRY

*Prereq: (CAS BI107 or CAS ES 101 or CAS ES 105) and CH 101/102, or consent of instructor.*

The patterns and processes controlling earth's element cycles with application to global change. Scales range from planetary development through earth's future climate. Topics include net primary production, nutrient cycling and ecosystem science.

### Independent

A1 Finzi Mon, Wed, Fri 11:15am - 12:05pm

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

**Textbooks & Technology:** W.H. Schlesinger, *Biogeochemistry: An Analysis of Global Change*. 3rd Edition. Academic Press. 2013

**Grading:** 3 In-class exams, class participation, notebooks and problem sets.

## 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 1:25pm - 2:15pm

Wed 2:30pm - 3:20pm

**Notes:** Meets with BI 648.

**Textbooks & Technology:** Primack, *Essentials of Conservation Biology*, 6th ed., 2017

**Grading:** Two hour exams, oral presentation, term paper, and quizzes.

### Additional electives for the ECB specialization can be found in these sections:

Cell & Molecular (pgs. 4-8)  
Marine Semester (pgs. 14-15)  
Tropical Ecology Program (pg. 16)  
Metropolitan College (MET) (pgs. 17-18)  
Research & Readings (pgs. 19-20)

A list of courses accepted toward the ECB specialization can be found in the Bulletin at [www.bu.edu/biology/ecb-bulletin](http://www.bu.edu/biology/ecb-bulletin).

### Additional electives for the SBB specialization can be found in these sections:

Physiology & Neurobiology (pgs. 11-13)  
Marine Semester (pgs. 14-15)  
Tropical Ecology Program (pg. 16)  
Research & Readings (pgs. 19-20)

A list of courses accepted toward the SBB specialization can be found in the Bulletin at [www.bu.edu/biology/sbb-bulletin](http://www.bu.edu/biology/sbb-bulletin).

# PHYSIOLOGY & NEUROBIOLOGY

## 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.*

**Not for Biology or BMB major/minor credit.** Introduction to principles of systemic mammalian physiology with special reference to humans.

### Lecture

A1 Co Mon, Wed, Fri 1:25pm - 2:15pm

### Lab

B1 Mon 2:30pm - 5:15pm D3 Wed 6:30pm - 9:15pm

B2 Mon 6:30pm - 9:15pm E1 Thu 12:30pm - 3:15pm

C1 Tue 12:30pm - 3:15pm E2 Thu 6:30pm - 9:15pm

D1 Wed 8:00am - 10:45am

D2 Wed 2:30pm - 5:15pm

**Notes:** Not for Biology or BMB major/minor credit (BI 315 is recommended instead).

**Textbooks & Technology:** Sherwood, *Fundamentals of Human Physiology*, 4th ed., Brooks Cole, 2011; Seliga *et al.*, *Human Physiology Lab Manual*, 3rd ed.

**Grading:** Lecture (70%: 3 midterm exams, 1 cumulative final, small assignments); Lab (30%: 2 lab exams and assignments).

## CAS BI 315: SYSTEMS PHYSIOLOGY

*Prereq: (CAS BI 108 or ENG BE 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 Co Mon, Wed, Fri 11:15am - 12:05pm

### Lab

B1 Mon 2:30pm - 5:15pm D3 Wed 6:30pm - 9:15pm

B2 Mon 6:30pm - 9:15pm E1 Thu 8:00am - 10:45am

C1 Tue 8:00am - 10:45am E2 Thu 12:30pm - 3:15pm

C2 Tue 6:30pm - 9:15pm E3 Thu 6:30pm - 9:15pm

D1 Wed 8:00am - 10:45am

D2 Wed 2:30pm - 5:15pm

**Textbooks & Technology:** Widmaier *et al.*, *Vander's Human Physiology: The Mechanisms of Body Function*, 15th ed., McGraw-Hill Education, 2013; Seliga *et al.*, *Systems Physiology Lab Manual*, 3rd ed.

**Grading:** Lecture (70%: 3 midterm exams, 1 cumulative final, small assignments); Lab (30%: 1 lab exams and assignments).

## CAS BI 325: PRINCIPLES OF NEUROSCIENCE

*Prereq: CAS BI 203 or consent of instructor.*

This course will introduce the fundamentals of the nervous system at levels of description ranging from the biophysics of individual neurons to behavior. Topics will include excitable membranes, synaptic transmission, sensory and motor systems, learning and memory, the autonomic nervous system, and the neural basis of conscious and unconscious behavior.

### Lecture

A1 Gavornik Tue, Thu 12:30pm - 1:45pm

### Discussion

B1 Wed 12:20pm - 1:10pm B4 Fri 10:10am - 11:00am

B2 Wed 1:25pm - 2:15pm B5 Fri 11:15am - 12:05pm

B3 Fri 9:05am - 9:55am B6 Fri 12:20pm - 1:10pm

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

**Textbooks & Technology:** Bear, Connor, and Paradiso, *Neuroscience: Exploring the Brain*, 4th ed., Lippincott Williams & Wilkins, 2015.

**Grading:** Texts, quizzes, and participation.

# PHYSIOLOGY & NEUROBIOLOGY

## CAS BI 445: CELLULAR AND MOLECULAR NEUROPHYSIOLOGY

*Prereq: CAS BI 203 or CAS BI 315 or BI 325 or CAS NE 203 or consent of instructor.*

We focus on how different neurons in mammalian CNS generate their unique firing patterns and how these patterns shape network outputs through synapses. Our approach to these questions is to start from the perspective of ion channel kinetics and build up from there to gain insights to whole brain functions—such as learning, sleeping and epilepsy. In the laboratory, we perform extracellular and intracellular recordings from motor axons and muscle fibers of crayfish ventral superficial flexor. This nerve-muscle system remains active in vitro and allows us to examine how drugs used to treat seizure affect outputs of an active network. The entire class will contribute to a project with the expectation that, collectively, the data should be of sufficient quantity and quality for a publication.

### Lecture

A1 Lin Tue, Thu 2:00pm - 3:15pm

### Lab

B1 Fri 2:30pm - 5:15pm

**Notes:** Meets with NE 445 and BI 645.

**Textbooks & Technology:** Purves et al., *Neuroscience*, 4th or 5th ed., Sinauer Associates.

**Grading:** Midterm 1 (15%), midterm 2 (25%), final (25%), lab reports, presentations, and participation (35%: 15% oral, 20% written).

## CAS BI 455: DEVELOPMENTAL NEUROBIOLOGY

*Prereq: CAS BI 203 or CAS BI 325 or CAS NE 203 or consent of instructor.*

This course will introduce current theories regarding the formation of the nervous system. Emphasis will be placed on the cellular and molecular mechanisms underlying events including neuronal determination, neurogenesis, patterning, axonal growth and guidance, polarity, synaptogenesis, synaptic modification, and cell death.

### Lecture and Discussion

A1 Man Fri 10:10am - 11:55am  
Wed\* 10:10am - 11:55am

\*Also includes paper presentation

**Notes:** Meets with NE 455.

**Textbooks & Technology:** (Recommended) Sanes, Reh, and Harris, *Development of the Nervous System*, 3rd ed., Academic Press, 2011; (Optional) Rao and Jacobson, *Developmental Neurobiology*, 4th ed., Springer, 2005.

**Grading:** One midterm and one final exam.

## CAS BI 520: SENSORY NEUROBIOLOGY

*Prereq: (CAS BI 325 OR CAS NE 203) or consent of 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 - 12:15pm

### Discussion

B1 Wed 4:40pm - 5:30pm

**Notes:** Meets with NE 520.

**Textbooks & Technology:** All material provided by instructor through blackboard.

**Grading:** Midterm (20%), project and presentation (35%), final exam (30%), and class presentation (15%).

## 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 Cruetzfeldt-Jakob disease are becoming more and more common since people are more exposed to pathogenic agents (as in Cruetzfeldt-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, Wed, Fri 9:05am - 9:55am  
Wed 10:10am - 11:00am

**Notes:** Meets with NE 525.

**Textbooks & Technology:** Powerpoint presentations on research articles will be provided to students the day before class.

**Grading:** Exams (66%), assignments (13%), paper presentation (13%), and participation in class (8%).

# PHYSIOLOGY & NEUROBIOLOGY

## CAS BI 535: TRANSLATIONAL RESEARCH IN ALZHEIMER'S DISEASE

*Prereq: (CAS BI 203 or CAS NE 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, Wed, Fri	1:25pm - 2:15pm
		Wed	2:30pm - 3:20pm

**Notes:** Meets with NE 535.

**Textbooks & Technology:** Powerpoint presentations on research articles will be provided to students the day before class.

**Grading:** Exams (66%), assignments (13%), paper presentation (13%), and participation in class (8%).

## CAS BI 545: NEUROBIOLOGY OF MOTIVATED BEHAVIOR

*Prereq: (CAS BI 315 or CAS BI 325 or CAS NE 201) or consent of instructor.*

An in-depth exploration of the neural circuits and neuroendocrine mechanisms controlling motivation and reward in animals, with an emphasis on vertebrates. Topics include reproductive, parental, and affiliative behaviors, ingestive behaviors and metabolism, circadian rhythms, and value—based decision making. Lectures are integrated with student-led discussions of recent research papers in the field.

*Independent*

A1	Muscudere	Tue, Thu	3:30pm - 5:15pm
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**Notes:** Meets with NE 545.

**Textbooks & Technology:** None.

**Grading:** Two lecture exams (40%), class presentations and participation in daily literature discussions (30%), and course final exam (30%) literature discussions.

## CAS BI 581 H1: SEMINAR IN BIOLOGY: NEUROBIOLOGY OF BRAIN DISORDERS

*Prereq: Consent of instructor.*

**[2 cr] Not for Biology major or minor credit unless two semesters of different topics are taken.** This course reviews recent topics and readings in the field of neurodegeneration that span disorders affecting neurodevelopment, learning and memory and aging. Specifically, the course will probe cellular and molecular mechanisms underlying cell death. In addition, the class will probe commonalities of the diseases, genetic risk factors and the usefulness and limitations of animal models. Also, we will discuss different interdisciplinary approaches that include molecular genetics tools in mice, biochemistry, cell biology and electrophysiology in addressing biomedical-related problems in neuroscience

*Independent*

H1	Ho	Mon	2:30pm - 4:15pm
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**Notes:** Not for Biology major or minor credit unless two semesters of different topics are taken.

**Textbooks & Technology:** None.

**Grading:** Participation (50%), Oral Presentation (50%).

## CAS BI 598: NEURAL CIRCUITS

*Prereq: (CAS BI 325 or CAS NE 203) and PY 106.*

This course reviews modern techniques and toolsets that are capable of dissecting neural circuits, which are critical for understanding how coordinated patterns of neural activity lead to complex behavior. Recent literature on information processing, guided behavior and cognition is discussed.

*Independent*

A1	Cruz-Martin	Tue, Thu	9:00am - 10:45am
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**Notes:** Meets with NE 598.

**Textbooks & Technology:** None.

**Grading:** Presentations and discussion.

### Additional electives for the Neurobiology specialization can be found in these sections:

Cell & Molecular (pgs. 4-8)  
Ecology, Behavior & Evolution (pgs. 9-10)  
Metropolitan College (MET) (pgs. 17-18)  
Research & Readings (pgs. 19-20)

A list of courses accepted toward the Neurobiology specialization can be found in the Bulletin at [www.bu.edu/biology/nb-bulletin](http://www.bu.edu/biology/nb-bulletin).

# MARINE SEMESTER

**The BU Marine Semester** is a fall semester study abroad program consisting of month-long, research-oriented marine courses, chosen from a set of diverse course offerings. Courses take place on campus in BU's Marine Research Teaching Lab and off campus at field sites in New England and Belize (Central America). For more information, visit [www.bu.edu/biology/ms](http://www.bu.edu/biology/ms). All CAS BI Marine Semester courses count as lab electives toward the Biology, Behavioral Biology, and Ecology & Conservation Biology majors.

## CAS BI 523: MARINE URBAN ECOLOGY

*Prereq: Acceptance into the Marine Semester.*

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. 2 - Oct. 26

## CAS BI 531: ICHTHYOLOGY: BEHAVIOR, ECOLOGY, AND EVOLUTION OF FISH

*Prereq: CAS BI 260 and consent of instructor; acceptance into the Marine Semester.*

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.

*Lecture*

MS Lobel Arranged Nov. 26 - Dec. 21

## CAS BI 539: CORAL REEF DYNAMICS: SHALLOW WATERS, DEEP TIME

*Prereq: Acceptance into the Marine Semester.*

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. This course involves a 12-day field trip to Belize.

*Lecture*

MS Rotjan Arranged Nov. 26 - Dec. 21

## CAS BI 541: CORAL REEF RESILIENCE AND RESTORATION

*Prereq: Junior or senior standing; acceptance into the Marine Semester.*

Caribbean coral reefs have fallen into ruin. Students develop methods to restore reef health by applying natural history and home aquarium skills, genomics, community and landscape ecology, and climatology. This is the clinical (conservation applications) sister course to CAS BI/ES 539 (Coral Reef Dynamics), and includes field work in Belize.

*Lecture*

MS Kaufman Arranged Oct. 29 - Nov. 20

## 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; acceptance into the Marine Semester.*

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. 6 - Oct. 1

## CAS BI 550: MARINE GENOMICS

*Prereq: Acceptance into the Marine Semester.*

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 Oct. 2 - Oct. 26

# MARINE SEMESTER

## CAS BI 569: TROPICAL MARINE INVERTEBRATES

*Prereq: CAS BI 107 and CAS BI 260; acceptance into the Marine Semester.*

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. This course involves a 12-day field trip to Belize.

*Lecture*

MS Finnerty Arranged Nov. 26 - Dec. 21

## CAS BI 578: MARINE GEOGRAPHIC INFORMATION SCIENCE

*Prereq: CAS BI 260 and CAS ES 145; CAS MA 213 is strongly recommended; acceptance into the Marine Semester.*

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.

*Lecture*

MS Wiggren Arranged Nov. 26 - Dec. 21

## CAS BI 593: MARINE PHYSIOLOGY AND CLIMATE CHANGE

*Prereq: CAS BI 108 or consent of instructor; acceptance into the Marine Semester.*

Explores the range of physiological responses marine organisms exhibit in response to climate change. Investigates phenotypic plasticity exhibited across different organisms and how this plasticity can influence an organism's resilience to its changing environment.

*Lecture*

MS Davies Arranged Oct. 29 - Nov. 20

**Please note:** CAS MR courses offered in the Marine Semester are not accepted as Biology, ECB, or SBB electives. If students submit a [Department Petition](#) well in advance, the CAS MR courses will be reviewed and a decision will be made about whether the courses can count as major electives.

# TROPICAL ECOLOGY PROGRAM

**The Tropical Ecology Program (TEP)** is a fall and spring study abroad program in Quito, Ecuador. Students engage in intensive, field-based scientific investigation of Ecuador's vast and diverse ecosystems, from the Galápagos Islands to the Andean highlands to the Amazon basin. For more information, visit [www.bu.edu/biology/tep](http://www.bu.edu/biology/tep). All TEP courses count as lab electives toward the Biology, Behavioral Biology, and Ecology & Conservation Biology majors.

## CAS BI 438: TROPICAL MONTANE ECOLOGY

Ecology of the montane zone of Ecuador including grassland, subalpine, and alpine scrub ecosystems. Examines the interrelationship of the flora and fauna of montane ecosystems, the exploitation of these environments for natural resources and agriculture, and the impending ecological consequences of such exploitation. Includes 15 hours of lecture presented during a two-week period, interspersed with several one- and two-day field trips to surrounding mountains. A total of two weeks is spent in the field. The field trips are dedicated to field activities and individual and group projects.

### Lecture

EQT Staff Arranged Aug. - Dec.

## CAS BI 440: TROPICAL COASTAL ECOLOGY

Ecology of the coastal zone of Ecuador, including a survey of terrestrial and shallow marine ecosystems. Examines the interrelationship of the flora and fauna of coastal Ecuador, the exploitation of this environment for natural resources, and the impending ecological consequences of such exploitation. Includes 25 hours of lecture presented during a two-week period in Quito, followed by two weeks of intensive study along the coast of Ecuador. The field trips are dedicated to sampling and observation and both individual and group projects.

### Lecture

EQT Staff Arranged Aug. - Dec.

## CAS BI 439: TROPICAL RAINFOREST ECOLOGY

Ecology of the Ecuadorian rainforest including principles applied to the function of the tropical rainforest, using the Amazon basin as an example. Examines the interrelationship of the flora and fauna of the rainforest ecosystems, the exploitation of these environments for natural resources, and the impending ecological consequences of such exploitation. Includes 35 hours of lecture presented during a two-week period in Quito, followed by three weeks of intensive study in the Ecuadorian rainforest. Time in the field is dedicated to field activities, with exposure to different habitats and their respective flora and fauna. A series of directed individual research projects is completed in the field.

### Lecture

EQT Staff Arranged Aug. - Dec.

## CAS BI 441: STUDIES IN TROPICAL ECOLOGY

Ecology of tropical Ecuador. A capstone course in tropical ecology that immediately follows the series of the three field-based courses: Tropical Rainforest Ecology, Tropical Montane Ecology, and Tropical Coastal Ecology. Focuses on the evaluation and statistical analysis of previous data collected in the field, extensive library research, and preparation of individual and group reports.

### Lecture

EQT Staff Arranged Aug. - Dec.

# METROPOLITAN COLLEGE (MET)

**Metropolitan College (MET)** offers evening versions of several Biology courses, often taught by Biology Department faculty. The MET courses listed here count toward a student's major the same way the corresponding CAS BI courses do. Juniors and seniors can take one MET course per semester. All other students should fill out the Petition to Take Course at Metropolitan College form at [www.bu.edu/biology/cas-forms](http://www.bu.edu/biology/cas-forms).

## MET BI 105: INTRODUCTORY BIOLOGY FOR HEALTH SCIENCES

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

**Not for Biology or BMB major/minor credit.** 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 BI 105 if BI 108 has already been passed. Carries natural science divisional credit (with lab) in CAS.

### Lecture

A1 Muscedere Mon 6:00pm - 8:45pm

### Lab

C1 Wed 6:00pm - 7:45pm

**Notes:** Not for Biology or BMB major/minor credit.

**Grading:** Two lecture exams (31%), lecture assignments and homework (11%), laboratory exercises and exam (35%), and course final exam (23%).

## MET BI 107: BIOLOGY 1

*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.

### Lecture

A1 Lavalli Mon 6:00pm - 8:45pm

### Lab

C1 Wed 6:00pm - 8:45pm

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

## 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 Tullai Tue 6:00pm - 7:45pm  
Thu 6:00pm - 6:50pm

### Discussion

D1 Thu 7:05pm - 7:55pm

## MET BI 211: HUMAN PHYSIOLOGY

*Prereq: BI 105 or equivalent.*

**Not for Biology or BMB major/minor credit.** Designed for non-biology majors. Introduction to physiology. Principles of physiology with special reference to humans.

### Lecture

D1 Vyshedskiy Thu 6:00pm - 8:45pm

### Lab

B1 Tue 6:00pm - 8:45pm

**Notes:** Not for Biology or BMB major/minor credit.

## 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 - 8:45pm

### Lab

C1 Wed 6:00pm - 8:45pm

# METROPOLITAN COLLEGE (MET)

## MET CH 421: BIOCHEMISTRY 1

*Prereq: CAS CH 204, CH 212, CH 214, or CH 282.*

Introductory biochemistry. Protein structure and folding, enzyme mechanisms, kinetics, and allostery; nucleic acid structure; lipids and membrane structure; bioenergetics; vitamins and coenzymes; introduction to intermediary metabolism. Students must register for two sections: lecture and laboratory.

### *Lecture*

A1 Perlstein Tue, Thu 2:00pm - 3:15pm  
Mon 5:45pm - 7:45pm\*

\*Time slot reserved for exams.

### *Lab*

B1 Wed 8:00am - 12:00pm B8 Fri 6:30pm - 10:30pm  
B2 Wed 1:25pm - 5:25pm B9 Mon 10:10am - 2:10pm  
B3 Wed 6:30pm - 10:30pm  
B4 Thu 9:05am - 1:05pm

### *Discussion*

C1 Mon 9:05am - 9:55am C3 Thu 11:15am - 12:05pm  
C2 Mon 12:20pm - 1:10pm

**Notes:** Meets with CAS BI 421.

## MET BI 566: 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.

### *Independent*

C1 Vyshedskiy Wed 6:00pm - 8:45pm

# RESEARCH & READINGS

## UNDERGRADUATE RESEARCH IN BIOLOGY

*Undergraduate Research in Biology courses (CAS BI 191 - CAS BI 491) require an online application. For more information on research requirements and to apply, visit [www.bu.edu/biology/ug-research](http://www.bu.edu/biology/ug-research). Time commitment is a minimum of 6 hours a week for 2-credit research and 12 hours a week for 4-credit research.*

### CAS BI 191: UNDERGRADUATE RESEARCH IN BIOLOGY 1

*Prereq: freshman standing, consent of instructor (faculty research mentor/sponsor), and approved application.*

**[2 cr] Not for Biology major or minor credit.** Laboratory research or field work under the supervision of a Biology faculty mentor. Research outside of the Biology Department is acceptable if approved and overseen by a Biology faculty sponsor.

**Grading:** Course grade is determined by laboratory/field work performance.

### CAS BI 291: UNDERGRADUATE RESEARCH IN BIOLOGY 2

*Prereq: sophomore standing, consent of instructor (faculty research mentor/sponsor), and approved application.*

**[2 cr] Not for Biology major or minor credit.** Laboratory research or field work under the supervision of a Biology faculty mentor. Research outside of the Biology Department is acceptable if approved and overseen by a Biology faculty sponsor.

**Grading:** Course grade is determined by laboratory/field work performance.

### CAS BI 391: UNDERGRADUATE RESEARCH IN BIOLOGY 3

*Prereq: junior standing, consent of instructor (faculty research mentor/sponsor), and approved application.*

**[2 or 4 cr] Two-credit option not for Biology major or minor credit.** Laboratory research or field work under the supervision of a Biology faculty mentor. Research outside of the Biology Department is acceptable if approved and overseen by a Biology faculty sponsor. Up to two 4-credit research courses may be counted as electives and one of those can apply towards the three-lab requirement.

**Grading:** Course grade is determined by laboratory/field work performance.

## CAS BI 491: UNDERGRADUATE RESEARCH IN BIOLOGY 4

*Prereq: junior or senior standing, consent of instructor (faculty research mentor/sponsor), and approved application.*

Laboratory research or field work under the supervision of a Biology faculty sponsor. Research outside of the Biology Department is acceptable if approved and overseen by a Biology faculty sponsor. Up to two 4-credit research courses may be counted as electives and one of those can apply towards the three-lab requirement.

**Grading:** Course grade is determined by laboratory/fieldwork performance and written report.

## HONORS RESEARCH IN BIOLOGY

*Honors Research in Biology offers students the ability to participate in two semesters of mentored 4-credit research (CAS BI 401 and 402) and a 2-credit research seminar (CAS BI 497 or 498). Students also write and defend an honors thesis on their research. For more information on research requirements and to apply, visit [www.bu.edu/biology/research-credit](http://www.bu.edu/biology/research-credit).*

## 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. Up to two 4-credit research courses may be counted as electives and one of those can apply towards the three-lab requirement.

**Grading:** Course grade is determined by laboratory/fieldwork performance, written thesis, and defense of the thesis before a committee of three Biology faculty members.

## CAS BI 497: HONORS RESEARCH IN BIOLOGY SEMINAR

*Prereq: 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 written assignments based on research topics in the seminar are required to graduate with departmental honors.

A1 Wasserman Arr.

**Notes:** A minimum grade of B+ is required to graduate with Honors in Biology.

**Grading:** Attendance and written assignments.

# RESEARCH & READINGS

## READINGS IN BIOLOGY

*Readings in Biology offers students the opportunity to do library research on a chosen topic in the biological sciences. Students must ask a Biology faculty member familiar with the topic to be their sponsor and submit the application found at [www.bu.edu/biology/forms](http://www.bu.edu/biology/forms). These courses are often used as preparation for Undergraduate Research in Biology or Honors Research in Biology.*

### CAS BI 171: READINGS IN BIOLOGY 1

*Prereq: freshman standing, consent of instructor (Biology faculty mentor), and approved application.*

[2 cr] **Not for biology major or minor credit.** Library research on a well-defined topic in the biological sciences, chosen in conjunction with a Biology faculty member.

**Grading:** Individual discussions and/or a paper presentation may be required.

### CAS BI 271: READINGS IN BIOLOGY 2

*Prereq: sophomore standing, consent of instructor (Biology faculty mentor), and approved application.*

[2 cr] **Not for biology major or minor credit.** Library research on a well-defined topic in the biological sciences, chosen in conjunction with a Biology faculty member.

**Grading:** Individual discussions and/or a paper presentation may be required.

### CAS BI 371: READINGS IN BIOLOGY 3

*Prereq: junior standing, consent of instructor (Biology faculty mentor), and approved application.*

[2 cr] **Not for biology major or minor credit.** Library research on a well-defined topic in the biological sciences, chosen in conjunction with a Biology faculty member.

**Grading:** Individual discussions and/or a paper presentation may be required.

### CAS BI 471: READINGS IN BIOLOGY 4

*Prereq: junior or senior standing, cumulative GPA in biology of at least 3.0, and consent of instructor (Biology faculty mentor).*

[2 cr] **Not for biology major or minor credit.** Intensive library research on a well-defined topic in the biological sciences, chosen in conjunction with a Biology faculty member. May be taken as preparation for BI 401/402 or BI 491/492.

**Grading:** Individual discussions and/or a paper presentation may be required.

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BB 497	Honors Research in BMB Seminar	Pg. 3
BB 591	Graduate Research in BMB	Pg. 3
BI 105	Introductory Biology for Health Sciences	Pg. 4
BI 107	Biology 1	Pg. 9
BI 171	Readings in Biology 1	Pg. 20
BI 191	Undergraduate Research in Biology 1	Pg. 19
BI 194	Topics in Biology: Human Genetics	Pg. 4
BI 203	Cell Biology	Pg. 5
BI 211	Human Physiology	Pg. 11
BI 213	Intensive Cell Biology	Pg. 5
BI 218	Cell Biology with ISE 2 Lab	Pg. 6
BI 225	Behavioral Biology	Pg. 9
BI 271	Readings in Biology 2	Pg. 20
BI 291	Undergraduate Research in Biology 2	Pg. 19
BI 306	Biology of Global Change	Pg. 9
BI 309	Evolution	Pg. 9
BI 311	General Microbiology	Pg. 6
BI 315	Systems Physiology	Pg. 11
BI 325	Principles of Neuroscience	Pg. 11
BI 371	Readings in Biology 3	Pg. 20
BI 391	Undergraduate Research in Biology 3	Pg. 19
BI 401	Honors Research in Biology	Pg. 19
BI 407	Animal Behavior	Pg. 10
BI 410	Developmental Biology	Pg. 6
BI 421	Biochemistry 1	Pg. 7
BI 438	Tropical Montane Ecology <sup>^</sup>	Pg. 16
BI 439	Tropical Rainforest Ecology <sup>^</sup>	Pg. 16
BI 440	Tropical Coastal Ecology <sup>^</sup>	Pg. 16
BI 441	Studies in Tropical Ecology <sup>^</sup>	Pg. 16
BI 443	Terrestrial Biogeochemistry	Pg. 10
BI 445	Cellular and Molecular Neurophysiology	Pg. 12
BI 448	Biodiversity and Conservation Biology	Pg. 10
BI 455	Developmental Neurobiology	Pg. 12
BI 471	Readings in Biology 4	Pg. 20
BI 491	Undergraduate Research in Biology 4	Pg. 19
BI 497	Honors Research in Biology Seminar	Pg. 19
BI 513	Genetics Lab	Pg. 7

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BI 520	Sensory Neurobiology	Pg. 12
BI 523	Marine Urban Ecology *	Pg. 14
BI 525	Biology of Neurodegenerative Diseases	Pg. 12
BI 527	Biochemistry Lab 1	Pg. 7
BI 531	Ichthyology*	Pg. 14
BI 535	Translational Research in Alzheimer's Disease	Pg. 13
BI 539	Coral Reef Dynamics*	Pg. 14
BI 541	Coral Reef Resilience and Restoration *	Pg. 14
BI 545	Neurobiology of Motivated Behavior	Pg. 13
BI 546	Marine Megafaunal Ecology*	Pg. 14
BI 550	Marine Genomics *	Pg. 14
BI 551	Biology of Stem Cells	Pg. 7
BI 552	Molecular Biology 1	Pg. 8
BI 560	Systems Biology	Pg. 8
BI 569	Tropical Marine Invertebrates *	Pg. 15
BI 578	Marine Geographic Information Science *	Pg. 15
BI 581	Seminar in Biology: Neurobiology of Brain Disorders	Pg. 13
BI 593	Marine Physiology and Climate Change	Pg. 15
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BI 107	Biology 1	Pg. 17
BI 203	Cell Biology	Pg. 17
BI 211	Human Physiology	Pg. 17
BI 407	Animal Behavior	Pg. 17
CH 421	Biochemistry 1	Pg. 18
BI 566	Neurobiology of Consciousness	Pg. 18

\* Marine Semester  
<sup>^</sup> Tropical Ecology Program