

# SPRING 2020 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 BI 206 Genetics  
CAS BI 216 Intensive Genetics

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

CAS BI 225 Behavioral Biology  
CAS BI 260 Marine Biology  
CAS BI 303 Evolutionary Ecology  
CAS BI 306 Biology of Global Change

#### Neurobiology & Physiology (PN)

CAS BI 315 Systems Physiology  
CAS BI 325 Principles of Neuroscience

### Upper Level Lab Courses Offered Spring 2020:

CAS BB 522 Molecular Biology Lab  
CAS BI 302 Vertebrate Zoology  
CAS/MET BI 303 Evolutionary Ecology  
CAS BI 306 Biology of Global Change  
CAS/MET BI 315 Systems Physiology  
CAS/MET BI/CH 422 Biochemistry 2  
CAS BI/NE 449 Neuroscience Design Lab  
CAS BI 519 Theoretical Evolutionary Ecology  
CAS BI 528 Biochemistry Lab 2  
CAS BI Undergrad. Research Courses (first 4-credit semester)  
CAS BI Tropical Ecology Program Courses

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## REGISTRATION NOTES:

- **Permission required courses:** Students may not register for these courses on their own, but need the instructor to sign an [Add/Drop form](#) which the student would take 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 with a 3.3 GPA may submit the [CAS Course Overload Fee Waiver form](#).
- **PDP, ROTC, and CAS FY/SY courses do not count** toward the 128 credits needed to graduate with a BA.
- The following courses **do not count** toward the Biology or BMB major or minor:

CAS BI 114 Human Infectious Diseases  
CAS BI 210 Human Anatomy  
CAS BI 582 (unless two sections of BI 581/582 are taken)  
CAS BI Undergrad. Research Courses (2-credit option)

# 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 192: UNDERGRADUATE RESEARCH IN BMB 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 292: UNDERGRADUATE RESEARCH IN BMB 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 392: UNDERGRADUATE RESEARCH IN BMB 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 is 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 492: UNDERGRADUATE RESEARCH IN BMB 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 402: 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 498: HONORS RESEARCH IN BIOCHEMISTRY AND MOLECULAR BIOLOGY SEMINAR 2

*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 592: 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. 13-15)  
Metropolitan College (MET) (pgs. 16-17)

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 108: BIOLOGY 2

*Prereq: High school biology and one semester college chemistry strongly recommended.*

For students planning to major in the natural sciences and for premedical students. Required for biology majors. It is strongly recommended students complete CAS CH 101 (or equivalent) before this course. High school biology is assumed. Biochemistry, cell & molecular biology, Mendelian & molecular genetics, physiology, and neurobiology. Three hours lecture, three hours lab. Carries natural science divisional credit (with lab) in CAS. This course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry II, Quantitative Reasoning II, Teamwork/Collaboration, Critical Thinking

### Lecture

A1	Loechler, Tolan	Mon,Wed,Fri	10:10am - 11:00am
A2	Loechler, Tolan	Mon,Wed,Fri	12:20pm - 1:10pm
A3	Spilios	Mon,Wed,Fri	1:25pm - 2:15pm

### Lab

B1	Mon	2:30pm - 5:15pm	D4	Wed	2:30pm - 5:15pm
B2	Mon	2:30pm - 5:15pm	D5	Wed	2:30pm - 5:15pm
B3	Mon	2:30pm - 5:15pm	D6	Wed	2:30pm - 5:15pm
B4	Mon	6:30pm - 9:15pm	D7	Wed	6:30pm - 9:15pm
B5	Mon	6:30pm - 9:15pm	D8	Wed	6:30pm - 9:15pm
B6	Mon	6:30pm - 9:15pm	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	3:30pm - 6:15pm
C5	Tue	3:30pm - 6:15pm	E6	Thu	3:30pm - 6:15pm
C6	Tue	3:30pm - 6:15pm	E7	Thu	3:30pm - 6:15pm
C7	Tue	3:30pm - 6:15pm	E8	Thu	6:30pm - 9:15pm
C8	Tue	6:30pm - 9:15pm	E9	Thu	6:30pm - 9:15pm
C9	Tue	6:30pm - 9:15pm	F1	Thu	6:30pm - 9:15pm
D2	Wed	8:00am - 10:45am	F2	Fri	8:00am - 10:45am
D3	Wed	8:00am - 10:45am			

**Notes:** Meets with BI 116.

**Textbooks & Technology:** Hillis et al, *Principles of Life*, 3rd ed, Sinauer, 2019; TopHat Account; ExamSoft Account.

**Grading:** Four hourly exams, lecture 68%, lab 32%.

## CAS BI 114: HUMAN INFECTIOUS DISEASES: AIDS TO TUBERCULOSIS

*Prereq: None*

**Not for Biology major or minor credit.** A study of the world's major human diseases, their causes, effects on history, pathology, and cures. Principles of immunology. Emphasis on present maladies such as AIDS, herpes, cancer, mononucleosis, tuberculosis, influenza, and hepatitis. This course is appropriate for non- majors and students in the health and paramedical sciences (Sargent College). Three hours lecture, three hours lab. Carries natural science divisional credit (with lab) in CAS. This course fulfills a single unit in the following BU Hub area(s): Scientific Inquiry I, Quantitative Reasoning II, Critical Thinking.

### Lecture

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

C2	Tue,Thu	1:30pm- 3:15pm	D1	Mon,Wed	10:10am - 11:55am
C3	Tue,Thu	3:30pm - 5:15pm	D2	Mon,Wed	12:20pm - 2:05pm

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

**Textbooks & Technology:** *Microbiology Basic and Clinical Principles* - Norman McKay, TopHat Account, ExamSoft Account.

**Grading:** 4 lecture exams; laboratory.

## CAS BI 116: BIOLOGY 2 WITH ISE LAB

*Prereq: CH 101*

*Coreq: CH 116*

Integration of general chemistry with biology and neuroscience, with an emphasis on how each discipline interacts experimentally. Laboratory focuses on projects relating to enzymes and their function. 3 lecture hours (meets with CAS BI 108 lecture), 3 hours lab. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry II, Quantitative Reasoning II, Writing-Intensive Course, Critical Thinking.

### Lecture

A1	Loechler, Tolan	Mon,Wed,Fri	10:10am - 11:00am
A2	Loechler, Tolan	Mon,Wed,Fri	12:20pm - 1:10pm
A3	Spilios	Mon,Wed,Fri	1:25pm - 2:15pm

### Lab

L1	Wed, Fri	8:00am - 10:45am	L2	Wed, Fri	2:30pm - 5:15pm
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**Notes:** Meets with BI 108 Lecture.

**Textbooks & Technology:** Hillis et al, *Principles of Life*, 3rd ed, Sinauer, 2019; TopHat Account; ExamSoft Account.

**Grading:** 4 lecture exams (52%), lecture homework (2%), in-lecture quizzes (4%), in-lecture TopHat questions (2%), lab (40%).

# CELL & MOLECULAR

## CAS BI 206: GENETICS

*Prereq: CAS BI 108 and CAS CH 203 or equivalent*

Principles of classical, molecular, and evolutionary genetics derived from analytical, molecular, and whole genome cytological evidence in animals, plants, and microorganisms. For CMG and BMB majors, BI 216 is highly recommended instead of BI 206. Three hours lecture, one hour discussion. Students may receive credit for CAS BI 206 or 216, but not both courses. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Historical Consciousness, Quantitative Reasoning II, Critical Thinking.

### Lecture

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

### Discussion

B1	Mon	12:20pm - 1:10pm	D1	Wed	8:00am - 8:50am
B2	Mon	12:20pm - 1:10pm	D2	Wed	12:20pm - 1:10pm
B3	Mon	1:25pm - 2:15pm	D3	Wed	1:25pm - 2:15pm
B4	Mon	2:30pm - 3:20pm	D5	Wed	2:30pm - 3:20pm
C1	Tue	8:00am - 8:50am			

**Notes:** Meets with BI 282 and with BI 216 for the first half of the semester.

**Textbooks & Technology:** 1) Required: Hartwell et al. *Genetics: from Genes to Genomes*. McGraw-Hill: 6th edition, book or ebook. 2) Recommended, but not required: Connect subscription that includes Smartbook. Both will be available through the BU Bookstore and other sources.

**Grading:** Average of four exam scores given during the semester (75%); discussion (25%)

## CAS BI 216: INTENSIVE GENETICS

*Prereq: CAS BI 108/116 and BI 203/213, and CAS CH 203 or consent of instructor*

Advanced alternative to CAS BI 206, emphasizing depth of coverage, class discussion, and reading research papers. BI216 (instead of BI206) is highly recommended for BMB majors and Biology majors in the CMG track. Principles of classical, molecular, and evolutionary genetics derived from analytical, molecular, and whole genome cytological evidence in animals, plants, and microorganisms. Three hours lecture, one hour discussion. Students may receive credit for CAS BI 216 or 206, but not both courses. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Historical Consciousness, Quantitative Reasoning II, Research and Information Literacy.

### Lecture

A1 Celenza, Loechler Tue,Thu 12:30pm - 1:45pm  
Thu 6:30pm - 8:15pm\*

\* This block of time is reserved for instructor-led discussion and the giving of exams.

### Discussion

B1	Mon	12:20pm - 1:10pm	D2	Mon	11:15am - 12:05pm
B2	Mon	2:30pm - 3:20pm	E1	Wed	10:10am - 11:00am
D1	Wed	2:30pm - 3:20pm	E2	Tue	3:35pm - 4:25pm

**Notes:** Meets with BI206/282 for the first half of the semester

**Textbooks & Technology:** 1) Required: Hartwell et al. *Genetics: from Genes to Genomes*. McGraw-Hill: 6th edition, book or ebook. 2) Recommended, but not required: Connect subscription that includes Smartbook. Both will be available through the BU Bookstore and other sources.

**Grading:** Average of four exam scores given during the semester (75%); discussion (25%)

## CAS BI 282: FUNDAMENTALS OF BIOLOGY 2

*Prereq: (CASCH182) or equivalent, and consent of instructor.*

Principles of classical, molecular, and evolutionary genetics derived from analytical, molecular, and whole genome cytological evidence in animals, plants, & microorganisms. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Historical Consciousness, Quantitative Reasoning II, Critical Thinking.

### Lecture

A1 Celenza Tues, Thu 12:30pm - 1:45pm

### Lab

B1	Mon	12:20- 1:10pm	C1	Tue	8:00am - 8:50am
B4	Mon	2:30pm - 3:20pm	D3	Wed	1:25pm - 2:15pm

**Notes:** Limited to seven-year medical students. Meets with BI 206.

**Textbooks & Technology:** See BI 206.

**Grading:** See BI 206.

# CELL & MOLECULAR

## CAS BI 385: IMMUNOLOGY

Prereq: CAS BI 203, CAS BI 206 and junior standing

The constituents and regulation of mammalian immune systems are described at the levels of the gene, protein, and cell. Topics include nonspecific, T cell and B cell recognition and responses, genetics of immune receptors, inflammation, tolerance, memory, and evolution and manipulation of defense systems. Three hours lecture, one hour discussion.

### Lecture

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

### Discussion

C1 Wed 12:20pm - 1:10pm G1 Wed 11:15am - 12:05pm

D1 Thu 8:00am - 8:50am H1 Wed 12:20pm - 1:10pm

E1 Fri 2:30pm - 3:20pm I1 Fri 3:35pm - 4:25pm

**Textbooks & Technology:** Peter Parham. *The Immune System*. 4th Edition. Garland Science Publishing, NY, NY; TopHat Account.

**Grading:** 3 exams (2 midterms and 1 final) 80%; discussion/participation 20%.

## CAS BI 411: MICROBIOME: OUR INTIMATE RELATIONSHIP WITH MICROORGANISMS

Prereq: CAS BI 203 (or equivalent) and CAS BI 206 (or equivalent) or consent of instructor

There are more bacterial cells inhabiting our bodies than actual human cells. This abundant and diverse population of microbes – referred to as the “microbiome” – colonizes several tissues in our body and plays important roles in maintaining our health. Topics will include the evolutionary, ecological, cellular, molecular and medical aspects of the interactions between animals and the bacterial communities that have evolved with them. Three hours lecture; one hour discussion.

### Lecture and Discussion

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

**Notes:** Meets with GRS BI 611.

**Textbooks & Technology:** Scientific papers will be made available to the students throughout the course via Blackboard.

**Grading:** Midterm 30%; Oral Presentation and Discussion 20%; Final Exam 40%; Participation 10%.

## CAS BI 422: BIOCHEMISTRY 2

Prereq: CAS BI 421 or CAS CH 421 or equivalent

Cell metabolism, with special emphasis on the uptake of food materials, the integration and regulation of catabolic, anabolic, and anaplerotic routes, and the generation and utilization of energy. Lectures include consideration of events in prokaryotic and eukaryotic organisms.

### Lecture

A1 Tolan Mon,Wed,Fri 9:05am - 9:55am

### Lab & Discussion

B1 Mon 12:20pm - 4:20pm Lab

B2 Mon 5:30pm - 9:30pm Lab

B3 Wed 2:30pm - 6:30pm Lab

B4 Thu 5:30pm - 9:30pm Lab

B5 Fri 12:20pm - 4:20pm Lab

B6 Fri 5:30pm - 9:30pm Lab

C1 Fri 10:10am - 11:55am Discussion

C2 Thu 3:30pm - 5:15pm Discussion

C3 Wed 12:20pm - 2:05pm Discussion

**Notes:** Meets with CAS CH 422 A1, GRS BI/CH 622 A1 and MET CH 422.

**Textbooks & Technology:** 1) Lehninger: *Principles of Biochemistry* Seventh Edition. David L. Nelson & Michael M. Cox. W.H. Freeman & Company (2007). 2) *The Absolute, Ultimate Guide to Principles of Biochemistry Study Guide and Solutions Manual* Seventh Edition. David L. Nelson & Michael M. Cox. W.H. Freeman & Company (2017).

**Grading:** Hour exams, lab, final.

# CELL & MOLECULAR

## CAS BB 522: MOLECULAR BIOLOGY LAB

Prereq: CAS BI 552

Introduction to techniques of cellular and molecular biology research, including analysis of DNA and protein molecules, by techniques such as plasmid isolation, restriction enzyme digestions, PCR, subcloning, DNA sequence analysis, reporter gene assays, mammalian cell culturing, immunofluorescence, yeast molecular biology, RNA isolation and quantification, RT-qPCR analysis and introduction to RNA-seq bioinformatic analysis.

### Lab

A1 Gilmore Tue,Thu 1:00pm - 4:45pm

**Notes:** Permission required.

**Textbooks & Technology:** Xeroxed lab note packet.

**Grading:** Midterm (20%); final (20%); lab reports (35%); lab participation and preparation (25%).

## CAS BI 528: BIOCHEMISTRY LABORATORY 2

Prereq: BI 421 or BI 527

**[2 cr] Not for Biology major or minor credit unless both BI 527 and BI 528 are taken.** Emphasizes protein, carbohydrate, nucleic acid, and lipid chemistry. Development and use of modern instrumentation and techniques. Same as CAS CH 528 and laboratory portion of CAS BI/CH 422.

### Lecture

A1 Medrano Fri 10:10am - 11:55am

A2 Medrano Thu 3:30pm - 5:15pm

A3 Medrano Wed 12:20pm - 2:05pm

### Lab

B1 Mon 12:20pm - 4:20pm B4 Thu 5:30pm - 9:30pm

B2 Mon 5:30pm - 9:30pm B5 Fri 12:20pm - 4:20pm

B3 Wed 2:30pm - 6:30pm B6 Fri 5:30pm - 9:30pm

**Notes:** Meets with CAS CH 422, CAS BI 422, CAS CH 528, GRS CH 622 and GRS BI 622. Not for Biology major or minor credit unless both BI 527 and BI 528 are taken.

**Textbooks & Technology:** 1) Lehninger: *Principles of Biochemistry* Seventh Edition. David L. Nelson & Michael M. Cox. W.H. Freeman & Company (2007). 2) *The Absolute, Ultimate Guide to Principles of Biochemistry Study Guide and Solutions Manual* Seventh Edition. David L. Nelson & Michael M. Cox. W.H. Freeman & Company (2017).

**Grading:** Lab preparation, lab reports, final exam.

## CAS BI 553: MOLECULAR BIOLOGY 2

Prereq: CAS BI 552, recommended: BI/CH 421/422

This course focuses on gene regulatory mechanisms with emphasis on eukaryotes, and current research in molecular biology. General areas of focus include genomics, gene regulation, and cell signaling. Course topics include genome organization and DNA rearrangement, RNA interference and noncoding RNAs, gene editing, mouse transgenic approaches, signal transduction pathways, chromatin structure, and cell cycle. Research articles and molecular biology approaches will be discussed.

### Independent

A1 Naya Tue,Thu 9:00am - 10:45am

**Textbooks & Technology:** none.

**Grading:** Three exams, discussion, participation.

# CELL & MOLECULAR

## CAS BI 565: FUNCTIONAL GENOMICS

*Prereq: CAS BI 552 or consent from instructor.*

Recent years have seen an explosion in the number of organisms for which sequenced genomes are available. However, we are only beginning to understand how the information encoded in the million/billion DNA bases of eukaryotic genomes is organized and how that information is translated into function. Throughout this course, we will start to answer central questions in the molecular biology and functional genomics fields, including: Given that only ~2% of the genome encodes for proteins, what is the function of the rest of the genome? How is it possible that yeast, worms and humans have a similar number of genes? What is the flow of information in the cell that controls gene function and activity? Which experimental approaches allow us to tackle these questions?

*Independent*

A1 Fuxman Bass Tue, Thu 9:00am - 10:45am

**Textbooks & Technology:** Review articles and research papers on Blackboard.

**Grading:** Exam I: 25 %, Exam II: 30 %, Project: 15 %, Assignments: 9%, Participation: 8%, Paper presentation: 8%, Quizzes: 5%.

## CAS BI 576: CARCINOGENESIS

*Prereq: BI 203, BI 206, BI 552*

The course covers multiple aspects of cancer biology with a focus on molecular mechanisms underlying cancer development and progression, and the implications for therapy. Topics include oncogenes, tumor suppressors, apoptosis, angiogenesis, metastasis, mouse models, cancer immunity, immunotherapy, and chemotherapy. Emphasis on current research.

*Lecture*

A1 Gilmore, Tullai Mon 2:30pm - 4:15pm  
Wed 2:30pm - 3:20pm

*Discussion*

B1 Wed 3:35pm - 4:25pm  
B2 Wed 4:40pm - 5:30pm  
B3 Thu 3:35pm - 4:25pm

**Notes:** No credit if CAS BI 327 or GMS BT 520 were taken previously.

**Textbooks & Technology:** Weinberg (2013). *The Biology of Cancer*. Garland Science.

**Grading:** Three exams, presentation, participation.

## CAS BI 594: TOPICS IN BIOLOGY: ADVANCED TOPICS IN DEVELOPMENT AND REGENERATION

*Prereq: BI 203/213 and one of the following: BI 410, BI 551, BI 552, or BI 576*

This course will cover advanced topics in Developmental Biology and Regeneration such as chromatin regulation, planar cell polarity, cell migration, tissue engineering, and bioelectrical regulation of regeneration. The course will focus largely on the primary literature, and will be discussion-based, with brief introductory lectures. The focus will be on molecular and cellular biology underlying development and regeneration in animal models in the current literature. Students should have some prior exposure to developmental, molecular, stem cell, cancer or systems biology.

*Independent*

B1 Bradham Tue, Thu 3:30pm - 5:15pm

**Textbooks & Technology:** Primary literature, to be provided during the course

**Grading:** Three exams (75%) and participation (25%)

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

Ecology, Behavior & Evolution (pgs. 9-12)  
Physiology & Neurobiology (pgs. 13-15)  
Metropolitan College (MET) (pgs. 16-17)  
Research & Readings (pgs. 18-19)

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 225: BEHAVIORAL BIOLOGY

*Prereq: CAS BI 107, CAS BI 108 and sophomore standing. Seats reserved for Behavioral Biology majors; other students must receive consent of instructor. BI 225 and BI 407 cannot be taken concurrently, and BI 225 cannot be taken following completion of BI 407.*

Introduction to the evolution, ecology, physiology, neurobiology and genetics of behavior, from classic studies to current trends. Topics include behavioral adaptation, hormones and behavior, nerve cells, circuits, neuromodulators and behavior, behavioral genetics and genomics, the development of behavior, communication, reproductive behavior, social evolution and culture, cooperation and altruism, sociality and brain evolution. Emphasis on the integrative analysis of behavior.

*Independent*

A1 Traniello Tue, Thu 1:30pm - 3:15pm

**Textbooks & Technology:** Primary literature and complementary readings; Traniello, *Behavioral Biology*, 1st ed., 2012; Alcock, *Animal Behavior*, edition TBA

**Grading:** 3 quizzes, research paper and class presentation, article analysis and discussion, engagement, and participation.

## CAS BI 260: MARINE BIOLOGY

*Prereq: CAS BI 107 or consent of instructor.*

Life in the seas: its ecology, evolution, and human impacts. Includes behavioral, physiological, structural, ecological, and evolutionary perspectives. A prerequisite for the Marine Semester. Effective Spring 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry I, Critical Thinking, Research and Information Literacy.

*Lecture*

A1 Rotjan Mon, Wed, Fri 10:10am - 11:00am

*Discussion*

B1 Mon 2:30pm - 3:20pm C3 Tue 3:35pm - 4:25pm

C2 Tue 11:15am - 12:05pm F1 Fri 11:15am - 12:05pm

**Textbooks & Technology:** Castro & Huber. *Marine Biology*. 9th Edition

**Grading:** Three exams, discussion, and participation.

## CAS BI 302: VERTEBRATE ZOOLOGY

*Prereq: CAS BI 107*

Methods and principles of comparative vertebrate zoology. Phylogeny, natural history, adaptation, and taxonomy. Laboratory emphasis on correlation among structural, physiological, and evolutionary features of selected vertebrates by both dissection and experimentation. Field trips. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Historical Consciousness, Scientific Inquiry II, Critical Thinking.

*Lecture*

A1 Wasserman Tue, Thu 11:00am - 12:15pm

*Lab*

B1 Tue, Thu 8:00am - 10:45am

B2 Tue, Thu 12:30pm - 3:15pm

**Textbooks & Technology:** Pough, et al. *Vertebrate Life*. 9th edition

**Grading:** Three exams, lab quizzes and participation.

## CAS BI 303: ECOLOGY

*Prereq: CAS BI 107 recommended: CAS BI 206, MA 121/123*

Investigation of ecological processes and patterns at the individual, population, and community level. An evolutionary approach is emphasized. One day-long field trip required. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry II, Quantitative Reasoning II, Digital/Multimedia Expression.

*Lecture*

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

*Lab*

B1 Mon 2:30pm - 5:15pm

C1 Tue 3:30pm - 6:15pm

E1 Thu 12:30pm - 3:15pm

**Textbooks & Technology:** Molles. *Ecology*. 6th Edition

**Grading:** Two exams, a final exam, lab, 3-minute video assignment, and participation.

# ECOLOGY, BEHAVIOR & EVOLUTION

## 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 the Earth's climate and terrestrial and aquatic ecosystems. Climate change, productivity and land-atmosphere feedbacks. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry II, Ethical Reasoning, Research and Information Literacy.

### Lecture

A1 Finzi Mon,Wed,Fri 10:10am - 11:00am

### Lab

B1 Mon 2:30pm - 5:15pm D1 Wed 2:30pm - 5:15pm

C1 Tue 12:30pm - 3:15pm E1 Thu 3:30pm - 6:15pm

**Textbooks & Technology:** There is no required textbook for this course. Readings will be assigned from the scientific literature and will be available through Blackboard.

**Grading:** Two exams (20%), final exam (30%), lab and participation (30%).

## CAS BI 423: MARINE BIOGEOCHEMISTRY

*Prereq: CAS ES 144 and (CH 102 or Marine Semester).*

Oceanic nutrient and biogeochemical cycling in the context of the marine response to global change. Links between local and global scales are emphasized. Topics include oceanic productivity, iron limitation, oceanic glacial carbon dioxide budget, biogenic particle fluxes, oceanic glacial-interglacial biogeochemistry.

### Independent

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

**Notes:** Meets with ES 423 and GRS BI/ES 623.

**Textbooks & Technology:** All readings will come from the primary literature and will be posted on Blackboard Learn.

**Grading:** Exams, class presentations, and participation in weekly literature journals and discussions.

## CAS BI 504: ADVANCED EVOLUTIONARY ANALYSIS

*Prereq: CAS BI 309 or consent of instructor*

Modern concepts, controversies, and analytical approaches in evolutionary biology. Topics include adaptation, natural and sexual selection, species and species formation, phylogenetics, origin of evolutionary novelty, adaptive radiation, basic population and quantitative genetics, development and evolution. Three hours lecture, one hour discussion.

### Lecture and Discussion

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

Mon 2:30pm - 3:20pm

**Textbooks & Technology:** Readings will be available through Blackboard.

**Grading:** Midterm Exams (50%); Discussion (25%); Paper (25%)

## CAS BI 515: POPULATION GENETICS

*Prereq: (BI 206 or BI 309) and (MA 121/123 or MA 115/213) or permission of instructor*

Examines evolutionary processes that give rise to genetic variation in populations, such as mutation, drift, and selection. Will cover theoretical basis of population genetics including Hardy-Weinberg equilibrium, coalescence, neutral theory, and quantitative genetics, as well as the application of these techniques to real datasets. Lecture and discussion (applied assignments and primary literature readings).

### Lecture and Discussion

A1 Rivera Mon, Wed, Fri 3:35pm - 4:25pm

Wed 10:10am - 11:00am

**Textbooks & Technology:** (Recommended texts): Nielsen, R. & Slatkin, M. 2013 *An Introduction to Population Genetics: Theory and Applications* and Gillespie 2004 *Population Genetics: A concise guide* (2nd Ed).

**Grading:** Assignments: 40%; Final exam: 25%; Discussion/participation: 20%; Final project: 15%

# ECOLOGY, BEHAVIOR & EVOLUTION

## CAS BI 519: THEORETICAL EVOLUTIONARY ECOLOGY

*Prereq: CAS BI 107 and CAS MA 121/123 (also recommended: CAS BI 225 or CAS BI 303 or CAS BI 309); or consent of the instructor.*

Familiarizes students with the theory of evolutionary ecology. Students gain enough background to read theoretical evolutionary ecology literature, do simple modeling, and move on to more complex theory. Students gain experience through homework assignments and computer labs.

### *Lecture and Lab*

A1	Buston	Mon, Wed, Fri	11:15am - 12:05pm
		Tue	3:30pm - 6:15pm

**Textbooks & Technology:** none

**Grading:** homework, labs, and three exams

## CAS BI 530: FOREST ECOLOGY

*Prereq: CAS BI 107 and (CAS BI 303 or CAS BI 306); or consent of instructor*

The major biotic and abiotic factors influencing forest ecosystem composition, structure, and function. Role of solar radiation, hydrology, soils, succession, and management of forest ecosystems. Includes New England case study.

### *Lecture and Discussion*

A1	Templer	Tue, Thu	11:00am - 12:15pm
		Fri	10:10am - 11:00am

**Notes:** Meets with GE 530.

**Textbooks & Technology:** DA Perry, R Oren and SC Hart, *Forest Ecosystems*. 2008, Johns Hopkins University Press.

**Grading:** Two exams (40%), Class assignments (55%), Class participation (5%)

## CAS BI 582: SEMINAR IN BIOLOGY: COMMUNITY ECOLOGY

*Prereq: BI 107 and senior standing (or consent of instructor). Some background in ecology and/or evolution recommended.*

**[2 cr] Not for Biology major or minor credit unless two sections of BI 581/582 are taken.** The objective of this course is to introduce students to concepts in Community Ecology, including patterns and mechanisms of community assembly, models of species interaction, and causes and consequences of diversity. The course is a seminar-style course in which students learn and teach concepts in community ecology in a self-directed way. Each week, we will cover one topic in community ecology via lecture, discussion, and teaching/presentation of ideas by student groups. Students will (1) read a papers from the primary literature and a book chapter on the topic, (2) attend a short lecture summarizing the readings, and (3) engage in a group discussion of the papers.

### *Independent*

B1	Bhatnagar	Fri	12:20pm - 2:05pm
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**Notes:** [2 cr] Not for Biology major or minor credit unless two sections of BI 581/582 are taken.

**Textbooks & Technology:** Mark Vellend's textbook, *Theory of Ecological Communities*, can be accessed online via the BU library website: [tinyurl.com/582-B1-text](http://tinyurl.com/582-B1-text)

**Grading:** attendance (33%); presentation and participation (33%); content and clarity of presentation (33%)

# ECOLOGY, BEHAVIOR & EVOLUTION

## CAS BI 594: TOPICS IN BIOLOGY: SHARK BIOLOGY & CONSERVATION

*Prereq: Some background in ecology and/or evolution recommended.*

This course explores the natural history and behavior of sharks and their relationship to other animals in the ecosystem. Conservation of sharks and other elasmobranchs is crucial to ecosystem function and requires accurate scientific knowledge of species in order to implement the best conservation practices. The course will delve in detail into the life, natural history, behavior and psychology of one of the best-known wide-ranging species, the Pacific grey reef shark (*Carcharhinus amblyrhynchos*). We will examine shark ecotourism case studies from Palau, Tahiti, Fiji and Belize. In class, you will be able to handle a variety of shark specimens, tracking technology, anti-shark shield and other devices used to study big wild animals in the open sea. We will include discussion on how to communicate fish natural history using videos and photos, which will be used extensively in lectures.

*Independent*

L1 Lobel Tues, Thurs 9:00am - 10:45am

**Textbooks & Technology:** Scientific papers will be made available to the students throughout the course

**Grading:** Midterm 40%; Project and Discussion 40%; Dissection lab 10%; Participation 10%.

## CAS BI 594: TOPICS IN BIOLOGY: SEX, SEXES, AND SEXUAL PHENOTYPES

*Prereq: Senior or graduate standing and at least one of the following courses or equivalent: BI 225, BI 309, BI 315, BI 407, or BI 410 (or consent of instructor).*

Course covers the integrative and comparative biology of sex and sexes based on readings drawn from recent primary literature, review papers, and book chapters.

*Independent*

W1 Warkentin Mon, Wed 4:30pm - 6:15pm

**Textbooks & Technology:** Blackboard readings drawn from primary literature, review papers, and book chapters.

**Grading:** TBA

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

Cell & Molecular (pgs. 4-8)  
Metropolitan College (MET) (pgs. 16-17)  
Research & Readings (pgs. 18-19)

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. 13-15)  
Research & Readings (pgs. 18-19)

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 210: HUMAN ANATOMY

Prereq: CAS BI 105 or equivalent

**Not for Biology major or minor credit.** Intensive pre-professional course for students whose programs require anatomy. Gross structure of the human body; skeletal, muscular, nervous, respiratory, circulatory, digestive, urinary, and reproductive systems. Lab requires dissection. Carries natural science divisional credit (with lab) in CAS. Effective Spring 2020, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry I, Digital/Multimedia Expression, Creativity/Innovation.

### Lecture

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

### Lab

B1	Mon	9:00am - 10:45am	D2	Wed	12:20pm - 2:05pm
B2	Mon	12:20pm - 2:05pm	D3	Wed	2:30pm - 4:15pm
B3	Mon	2:30pm - 4:15pm	E1	Thu	1:30pm - 3:15pm
C1	Tue	3:30pm - 5:15pm	E2	Thu	3:30pm - 5:15pm
C2	Tue	1:30pm - 3:15pm	F1	Fri	9:00am - 10:45am
D1	Wed	9:00am - 10:45am	F2	Fri	12:20pm - 2:05pm

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

**Textbooks & Technology:** *Human Anatomy* - Marieb, TopHat Account, ExamSoft Account.

**Grading:** 3 midterm lecture exams; 1 cumulative lecture final; 2 laboratory practical exams.

## CAS BI 230: BEHAVIORAL ENDOCRINOLOGY

Prereq: (BI 108 or NE 102) and sophomore standing.

Hormonal control of reproductive and parental behaviors, social affiliation, aggression, fluid homeostasis, biological rhythms including seasonal reproduction, stress, learning and memory, affective disorders and steroid abuse. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry I, Oral and/or Signed Communication, Teamwork/Collaboration.

### Lecture and Discussion

A1 DiBenedictis Mon, Wed, Fri 2:30pm - 3:20pm  
Mon 3:35pm - 4:25pm

**Notes:** Meets with NE 230.

**Textbooks & Technology:** R.J. Nelson. *Introduction to Behavioral Endocrinology*, 5th ed. Sinauer, 2017.

**Grading:** Two midterms (20% each), a final exam (30%), discussion presentation and participation (20%), quizzes (10%).

## CAS BI 315: SYSTEMS PHYSIOLOGY

Prereq: (CAS BI 108 or ENG BE 209) 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. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry II, Writing-Intensive Course, Critical Thinking, Teamwork/Collaboration.

### Lecture

A1 Muscedere Tue,Thu 11:00am - 12:15pm

### Lab

B1	Mon	2:30pm - 5:15pm	D2	Wed	2:30pm - 5:15pm
B2	Mon	2:30pm - 5:15pm	D3	Wed	2:30pm - 5:15pm
B3	Mon	6:30pm - 9:15pm	D4	Wed	6:30pm - 9:15pm
B4	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	12:30pm - 3:15pm	E3	Thu	6:30pm - 9:15pm
C3	Tue	6:30pm - 9:15pm	E4	Thu	6:30pm - 9:15pm
C4	Tue	6:30pm - 9:15pm	F1	Fri	8:00am - 10:45am
D1	Wed	8:00am - 10:45am			

**Textbooks & Technology:** 1) Vander's. *Human Physiology: The Mechanisms of Body Function*. 14th edition 2) Lab manual by Sanxaridis Mantis et al; TopHat Account; ExamSoft Account.

**Grading:** Three lecture exams, lecture assignments and homework, final exam, lab quizzes and write ups, cumulative lab final.

## 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. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry II, Critical Thinking.

### Lecture

A1 Cruz-Martin Tue,Thu 2:00pm - 3:15pm

### Discussion

B1	Mon	2:30pm - 3:20pm
B2	Wed	3:35pm - 4:25pm
B3	Thu	3:35pm - 4:25pm

**Textbooks & Technology:** Bear, et al. *Neuroscience: Exploring the Brain*. 4th Ed. Wolters Kluwer.

**Grading:** Three midterms.

# PHYSIOLOGY & NEUROBIOLOGY

## CAS BI 349: NEUROTOXINS IN BIOLOGY, MEDICINE, AGRICULTURE AND WAR

*Prereq: BI 108 or NE 102 or equivalent.*

We will start by examining how neurotoxins in different animals are used for distinct behavioral needs, such as defense versus predation. Examining evolutionary lineage of different types Neurotoxins will also be discussed and give us insights on how neurotoxins evolved and their roles in evolutionary "arm race". We will also cover mechanisms of neurotoxin actions at cellular and molecular levels. At system level, envenomation by poisonous animal is of clinical importance in many parts of the world, consequences of venoms on mammalian physiological systems will be discussed. In addition to naturally occurring neurotoxins, many synthetic chemicals used as pesticides and chemical weapons are also neurotoxins. We will discuss the history, mechanisms and physiological effects of these manmade agents. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Quantitative Reasoning I, Critical Thinking.

*Independent*

A1 Lin Tue,Thu 3:30pm - 5:15pm

**Notes:** Meets with CAS NE 349.

**Textbooks & Technology:** *Neuroscience: Exploring the Brain. Bear, Connors and Paradiso.* 4th ed.

**Grading:** Midterm 1 (25%); Midterm 2 (25%); Final (25%)  
Discussion/presentation (25%)

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## CAS BI 449: NEUROSCIENCE DESIGN LAB

*Prereq: (BI 315 OR BI 325 OR NE 203) or consent of instructor.*

Design and build devices for neuroscience experiments. Interface sensors with computers using Arduino microprocessors. Guided exercises followed by independent design projects to quantify human sensory and motor performance, or emulate animal sensory-motor circuits. All levels of programming experience accepted.

Lab

A1 Gavornik Tue,Thu 12:30pm- 3:15pm

**Notes:** Meets with CAS NE 449 and GRS BI/NE 649.

**Textbooks & Technology:** Purchase of an Arduino kit.

**Grading:** Lab notebook, project and participation.

# PHYSIOLOGY & NEUROBIOLOGY

## 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 CAS 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%).

## CAS BI 599: PHYSIOLOGY OF THE SYNAPSE

*Prereq:* Junior standing and CAS BI 325 or BI 481 or BI 445 recommended.

Neuron development and maturation, synapse formation, structure and molecular components of synapses, synaptic transmission, synaptic plasticity, neurotransmitter receptors, cellular basis for learning and memory, synaptic pathology in neurological diseases. Two hours lecture, two hours paper presentation and discussion.

### *Independent*

A1	Man	Wed, Fri	10:10am - 11:55am
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**Notes:** Wednesday meetings are for paper presentations and Friday meetings are for lecture

**Textbooks & Technology:** *Synapses* (2003) by W. Maxwell Cowan and Thomas C. Südhof

**Grading:** Midterm and final exams (85%); paper presentation and attendance (15%)

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

Cell & Molecular (pgs. 4-8)  
Ecology, Behavior & Evolution (pgs. 9-12)  
Metropolitan College (MET) (pgs. 16-17)  
Research & Readings (pgs. 18-19)

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).

# 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 courses do (although MET courses don't earn Hub units). If a student wishes to take more than one MET course a semester or is a freshman or sophomore, it is first necessary to get approval by filling out the Petition to Take Course at Metropolitan College form at [www.bu.edu/biology/met-petition](http://www.bu.edu/biology/met-petition).

## MET BI 108: BIOLOGY 2

*Prereq: One year of high school biology and chemistry strongly recommended.*

*Coreq: CH 101 and CH 102 recommended as prereqs or coreqs.*

For pre-med students and students who plan to major in the natural sciences. Required for Biology majors. Course examines cells, genetics, development, physiology, and neurobiology.

### Lecture

A1 Hulbert Tue 6:00pm - 8:45pm

### Lab

A2 Kieswetter Wed 6:00pm - 8:45pm

## MET BI 206: GENETICS

*Prereq: BI 108 or equivalent; CH 203 recommended.*

Principles of heredity as derived from genetic, biochemical, and cytological evidence in animals, plants, and microorganisms. For BMB majors and Biology majors in the CMG track, BI 216 is highly recommended instead of BI 206.

### Lecture and Discussion

A1 Celenza Tue, Thu 6:00pm - 7:30pm  
Tue 7:30pm - 8:30pm

## MET BI 210: HUMAN ANATOMY

*Prereq: BI 105*

**Not for Biology or BMB major/minor credit.** Gross structure of the human body: skeletal, muscular, nervous, respiratory, circulatory, digestive, urinary, and reproductive systems. Laboratory course.

### Lecture

A1 Kieswetter Wed 6:00pm - 8:45pm

### Lab

A2 Taylor Thu 6:00pm - 8:45pm

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

## MET BI 303: ECOLOGY

*Prereq: BI 107*

Basic principles of ecology, population dynamics and behavior, interrelationships of plants and animals and their physical and chemical environment. Structure and function of ecosystems and community dynamics. Laboratory course.

### Lecture

A1 Wasserman Tue 6:00pm - 8:45pm

### Lab

A2 Wasserman Wed 6:00pm - 8:45pm

## MET BI 315: SYSTEMS PHYSIOLOGY

*Prereq: BI 108 & BI 203*

An introduction to the basic physiological principles applied across all levels of organization (cell, tissue, organ system) and intended to prepare the student for more advanced courses in physiology. Topics include homeostasis, neural, muscle, cardiopulmonary, renal, endocrine, and reproductive physiology.

### Lecture

A1 Vyshedskiy Thu 6:00pm - 8:45pm

### Lab

A2 Seliga Wed 6:00pm - 8:45pm



# METROPOLITAN COLLEGE (MET)

## MET CH 422: BIOCHEMISTRY 2

*Prereq: BI/CH 421 or equivalent.*

Cell metabolism, with special emphasis on the uptake of food materials, the integration and regulation of catabolic, anabolic, and anaplerotic routes, and the generation and utilization of energy. Lectures include consideration of events in prokaryotic and eukaryotic organisms.

### *Lecture*

A1 Tolan Mon, Wed, Fri 9:05am - 9:55am

### *Lab*

B2 Mon 5:30pm - 9:30pm

B4 Thu 5:30pm - 9:30pm

B6 Fri 5:30pm - 9:30pm

### *Discussion*

C1 Fri 10:10am - 11:55am

C2 Thu 3:30pm - 5:15pm

C3 Wed 12:20pm - 2:05pm

**Notes:** Meets with CAS BI 422.

## MET BI 566: NEUROBIOLOGY OF CONSCIOUSNESS AND EVOLUTION OF LANGUAGE

*Prereq: BI 108 or equivalent.*

Your brain is a bizarre device, set in place through natural selection of your ancestors and your own experience. One thing that clearly separates your brain from the brain of any other nonhuman animal is the propensity of your brain for imagination and creativity. 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. This interdisciplinary class is intended for paleoanthropologists who want to learn neuroscience, psychologists who are interested in the question of the origin of language, biologists who are interested in the uniqueness of the human mind, neuroscientists who want an exposure to paleoanthropology and linguistics, philosophers fascinated by neurological basis of behavior and other students interested in an understanding of the mind of a man and the evolution of the brain.

### *Independent*

A1 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 192: 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 292: 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 392: 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 492: 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 402: 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.

**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 498: 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.

**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 172: 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 272: 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 372: 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 472: 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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