

FALL 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/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
CAS BI 306 Biology of Global Change
CAS BI 309 Evolution
CAS/MET BI 407 Animal Behavior

Physiology & Neurobiology (PN)

CAS BI 310 Human Structure & Function
CAS BI 315 Systems Physiology
CAS BI 325/NE 203 Principles of Neuroscience

Upper Level Lab Courses Offered Fall 2020:

CAS NE 203 Principles of Neuroscience
CAS BI 218 Cell Biology with ISE 2 Lab
CAS BI 306 Biology of Global Change
CAS BI 310 Human Structure & Function
CAS BI 311 General Microbiology
CAS BI 315 Systems Physiology
CAS/MET BI 407 Animal Behavior
CAS BI/MET CH 421 Biochemistry 1
CAS BI/NE 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)

TABLE OF CONTENTS:

| | |
|--|-----------|
| BMB Courses | Pg. 2-3 |
| Cell & Molecular Courses | Pg. 4-8 |
| Ecology, Behavior & Evolution Courses | Pg. 9-10 |
| Physiology & Neurobiology Courses | Pg. 11-14 |
| Marine Semester Courses | Pg. 15-16 |
| Tropical Ecology Program Courses | Pg. 17 |
| MET Biology Courses | Pg. 18-19 |
| Research & Readings Courses | Pg. 20-21 |
| Index | Pg. 22 |

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.
- **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
CAS BI 527 (unless both sections of BI 527 & 528 are taken)
CAS BI 581 (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. 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: first year standing, GPA in biochemistry and molecular biology (BMB major) 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 major) 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 major) 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 major) 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. 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 major) 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.

A1 Tolan Arranged

Grading: Attendance and participation.

GRADUATE RESEARCH IN BMB

Graduate Research in BMB is offered as part of the BA/MA program. This dual degree 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.

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. 11-14)
Metropolitan College (MET) (pgs. 18-19)

A list of courses accepted toward the BMB major can be found in the Bulletin at www.bu.edu/bmb/bulletin.

CELL & MOLECULAR

CAS 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 | Kristiansen | Mon, Wed, Fri | 9:05am - 9:55am |
|----|-------------|---------------|-----------------|

Lab

| | | |
|----|-----|-------------------|
| B1 | Mon | 2:30pm - 4:15pm |
| C1 | Tue | 1:30pm - 3:15pm |
| C2 | Tue | 3:30pm - 5:15pm |
| D1 | Wed | 10:10am - 11:55am |
| D2 | Wed | 12:20pm - 2:05pm |
| D3 | Wed | 2:30pm - 4:15pm |
| E1 | Thu | 1:30pm - 3:15pm |
| E2 | 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: Four lecture exams (54%), lecture assignments and homework (11%), and laboratory exercises and exams (35%).

Hub Units: Scientific Inquiry I, Quantitative Reasoning I, Research and Information Literacy.

CAS BI 126: HUMAN GENETICS

Prereq: None.

Classical and molecular genetics, advances in genetic technologies, and social/ethical issues related to genetic testing. Designed for science and non-science majors, but **cannot fulfill Biology/BMB major/minor or pre-medical requirements.** Students cannot receive credit for both CAS BI 126 and BI 206/216.

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%).

Hub Units: Oral and/or Signed Communication, Scientific Inquiry I, Research and Information Literacy.

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 | 1:25pm - 2:15pm |
| B3 | Mon | 12:20pm - 1:10pm | D5 | Wed | 2:30pm - 3:20pm |
| B4 | Mon | 1:25pm - 2:15pm | E1 | Thu | 11:15am - 12:05pm |
| B5 | Mon | 12:20pm - 1:10pm | E2 | Thu | 11:15am - 12:05pm |
| B6 | Mon | 1:25pm - 2:15pm | F1 | Fri | 11:15am - 12:05pm |
| B7 | Mon | 11:15am - 12:05pm | F2 | Fri | 1:25pm - 2:15pm |
| C1 | Tue | 11:15am - 12:05pm | | | |
| D1 | Wed | 11:15am - 12:05pm | | | |
| D2 | Wed | 12:20pm - 1:10pm | | | |

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: *The Cell 8e* by Geoffrey Cooper, Oxford University Press, 2018, electronic access to Dashboard (supplied with certain editions of the textbook available through the BU Bookstore)

Grading: Three midterm exams, homework, in class questions, and a final examination.

Hub Units: Scientific Inquiry 1, Quantitative Reasoning 1, Critical Thinking

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 |
|----|------|----------|------------------|

Discussion

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

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, *The Cell: A Molecular Approach*, 8th ed, Oxford University Press, 2019

Grading: Two midterms, final exam, and discussion.

Hub Units: Scientific Inquiry 1, Quantitative Reasoning 1, Research & Information Literacy

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 | 9:30am - 10:45am |
|----|------|----------|------------------|

Meets with BI 213.

Discussion

B1 Register for a BI 203 or 213 discussion.

Lab

| | | | |
|----|---------|------|------------------|
| L1 | Bushell | Wed. | 12:20pm - 4:20pm |
|----|---------|------|------------------|

Prelab

| | | | |
|----|---------|-----|-----------------|
| P1 | Bushell | Mon | 2:30pm - 4:15pm |
|----|---------|-----|-----------------|

Textbooks & Technology: Cooper, *The Cell: A Molecular Approach*, 8th ed, Oxford University Press, 2019

Grading: Lecture (75%) and laboratory (25%). See the BI 203 or BI 213 section that your section of BI 218 meets with for more details on grading.

Hub Units: Scientific Inquiry 2, Quantitative Reasoning 2, Teamwork/Collaboration, Writing-Intensive

CAS BI 281: FUNDAMENTALS OF BIOLOGY 1

Limited to seven-year medical students. 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, three hours lab.

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 |

*Time slot reserved for exams.

Lab

| | | |
|----|-----|------------------|
| C1 | Fri | 8:00am - 10:45am |
| C2 | Fri | 11:15am - 2:00pm |

Discussion

Please register for a BI 203 discussion.

Textbook & Technology: Cooper, *The Cell: A Molecular Approach*, 8th ed, Oxford University Press, 2019

Grading: Four midterm exams and final examination.

Hub Units: Scientific Inquiry 1, Quantitative Reasoning 1, Critical Thinking

CELL & MOLECULAR

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

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%).

Hub Units: Scientific Inquiry 2, Writing-Intensive, Teamwork/ Collaboration

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

Discussion

B1 Wed 1:25pm - 2:15pm

B2 Wed 2:30pm - 3:20pm

Notes: Meets with GRS BI 610.

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

Grading: Three exams plus discussion grade.

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 Tolan Mon 8:00am - 8:50am
Mon, Wed, Fri 9:05am - 9:55am

A2 Whitty Tue, Thu 12:30pm - 1:45pm

Lab

B1 Wed 8:00am - 12:00pm B8 Mon 11:15am - 3:15pm

B2 Wed 1:25pm - 5:25pm B9 Mon 4:30pm - 8:30pm

B3 Wed 6:30pm - 10:30pm BA Tue 8:00am - 12:00pm

B4 Thu 8:00am - 12:00pm

Discussion

C1 Mon 12:20pm - 2:05pm C3 Wed 2:30pm - 4:15pm

C2 Tue 5:00pm - 6:45pm C6 Thu 9:00am - 10:45am

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

A2 Celenza TBA

Textbooks & Technology: Class notes and assigned papers.

Grading: Lab reports, homework, notebook and attendance.

CELL & MOLECULAR

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 | 12:20pm - 2:05pm |
| A2 | Medrano | Tue | 5:00pm - 6:45pm |

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 & Medrano, *Biochemistry Laboratory Manual*, 5th Ed., 2020.

Grading: Attendance, pre-lab quizzes, lab notebooks and reports, 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.

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 are discussed. Topics include: DNA replication, DNA repair, recombination, prokaryotic transcription, translation, 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.

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 reserved for exams Oct. 8 and Nov. 12

Discussion

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

Textbooks & Technology: TBD and TopHat.

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

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

Ecology, Behavior & Evolution (pgs. 9-10)
Physiology & Neurobiology (pgs. 11-14)
Marine Semester (pgs. 15-16)
Metropolitan College (MET) (pgs. 18-19)
Research & Readings (pgs. 20-21)

A list of courses accepted toward the CMG specialization can be found in the Bulletin at 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, Spilios, Wasserman | Tue, Thu | 12:30pm - 1:45pm |
| A2 | Mullen, Spilios, Wasserman | Mon, Wed, Fri | 2:30pm - 3:20pm |

Lab

| | | | | | |
|----|-----|------------------|----|-----|------------------|
| B1 | Mon | 2:30pm - 5:15pm | D5 | Wed | 2:30pm - 5:15pm |
| B2 | Mon | 2:30pm - 5:15pm | D6 | Wed | 2:30pm - 5:15pm |
| B3 | Mon | 2:30pm - 5:15pm | D7 | Thu | 6:30pm - 9:15pm |
| C1 | Tue | 8:00am - 10:45am | D8 | Wed | 6:30pm - 9:15pm |
| C2 | Tue | 8:00am - 10:45am | E1 | Thu | 8:00am - 10:45am |
| C3 | Tue | 8:00am - 10:45am | E2 | Thu | 8:00am - 10:45am |
| C4 | Tue | 12:30pm - 3:15pm | E3 | Thu | 8:00am - 10:45am |
| C5 | Tue | 12:30pm - 3:15pm | E4 | Thu | 12:30pm - 3:15pm |
| C6 | Tue | 12:30pm - 3:15pm | E5 | Thu | 12:30pm - 3:15pm |
| C7 | Tue | 3:30pm - 6:15pm | E6 | Thu | 12:30pm - 3:15pm |
| C8 | Tue | 3:30pm - 6:15pm | E7 | Thu | 6:30pm - 9:15pm |
| D1 | Wed | 8:00am - 10:45am | E8 | Thu | 6:30pm - 9:15pm |
| D2 | Wed | 8:00am - 10:45am | E9 | Thu | 6:30pm - 9:15pm |
| D3 | Wed | 8:00am - 10:45am | F1 | Fri | 8:00am - 10:45am |
| D4 | Wed | 2:30pm - 5:15pm | | | |

Grading: 4 Lecture exams and Lab assignments.

Hub Units: Scientific Inquiry I, Quantitative Reasoning I, Critical Thinking, Research and Information Literacy.

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, 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, class presentation, 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 | Staff | Tue, Thu | 11:00am - 12:15pm |
|----|-------|----------|-------------------|

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: Two midterms (total of 40%), final examination (20%), and laboratory (included paper and presentation) (40%).

Hub Units: Scientific Inquiry II, Ethical Reasoning, Research and Information Literacy.

ECOLOGY, BEHAVIOR & EVOLUTION

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

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 (50%), final (25%), and discussion (25%)

Hub Units: Ethical Reasoning

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. BI 407 and BI 225 cannot be taken concurrently.

Lecture

A1 Wasserman Tue, Thu 3:30pm - 4:45pm

Lab

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

E1 Thu 12:30pm - 3:15pm

Notes: Meets with BI 607.

Textbooks & Technology: None.

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

Hub Units: Philosophical Inquiry & Life's Meanings, Ethical Reasoning, Research & Information Literacy

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

Cell & Molecular (pgs. 4-8)
Marine Semester (pgs. 15-16)
Tropical Ecology Program (pg. 17)
Metropolitan College (MET) (pgs. 18-19)
Research & Readings (pgs. 20-21)

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

CAS BI 443: TERRESTRIAL BIOGEOCHEMISTRY

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

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

Lecture

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

Textbooks & Technology: TBA

Grading: TBA

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: Sher and Primack, *Introduction to Conservation Biology*, 2nd ed., 2019.

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

Hub Units: Ethical Reasoning, Oral/Signed Communication

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

Physiology & Neurobiology (pgs. 11-14)
Marine Semester (pgs. 15-16)
Tropical Ecology Program (pg. 17)
Research & Readings (pgs. 20-21)

A list of courses accepted toward the SBB specialization can be found in the Bulletin at 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. Intro. to principles of systemic mammalian physiology with special reference to humans. 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 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 | F1 | Fri | 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 & Tech.: Silverthorn, *Human Physiology*, 8th ed., 2019

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

Hub Units: Scientific Inquiry 2, Writing-Intensive, Critical Thinking, Teamwork/Collaboration

CAS BI 310: HUMAN STRUCTURE & FUNCTION

Prereq: CAS BI 108 and CAS BI 203

Examines the structure of the body (anatomy) using a systems approach. Looks at the structure of cells and tissues (histology) and explores how they make up the body's organs/organ systems. Examines how disease reshapes the human body and tissues (pathology).

Lecture

A1 Kristiansen Mon, Wed, Fri 12:20pm - 1:10pm

Lab

B1 Tue 3:30pm - 6:15pm

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

Textbooks & Technology: Saladin, *Human Anatomy*, 5th ed. McGraw-Hill, 2017; Visible Body Virtual Dissection App; Co, Anatomy Course Manual

Grading: Exams (50%: 2 midterms + 1 cumulative final), Weekly labquizzes (17%), Homework (15%), classwork and small assignments (18%).

Hub Units: Scientific Inquiry I, Digital/Multimedia Expression, Creativity/Innovation

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. 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 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 | 12:30pm - 3:15pm | E3 | Thu | 6:30pm - 9:15pm |
| C3 | Tue | 6:30pm - 9:15pm | F1 | Fri | 8:00am - 10:45am |
| 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 exam and assignments).

Hub Units: Scientific Inquiry 2, Writing-Intensive, Critical Thinking, Teamwork/Collaboration

PHYSIOLOGY & NEUROBIOLOGY

CAS BI 325: PRINCIPLES OF NEUROSCIENCE

Prereq: CAS BI 203 or consent of instructor.

This course will introduce fundamentals of the nervous system at descriptive scales ranging from individual cells to the entire brain. Topics will include biophysics of excitable membranes, synaptic transmission, sensory and motor systems, learning and memory, plasticity, neuromodulation, and the biological basis of complex behaviors.

Lecture

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

Discussion

| | | | | | |
|----|-----|-------------------|----|-----|-------------------|
| B1 | Wed | 12:20pm - 1:10pm | B5 | Fri | 11:15am - 12:05pm |
| B2 | Wed | 1:25pm - 2:15pm | B6 | Fri | 12:20pm - 1:10pm |
| B3 | Fri | 9:05am - 9:55am | B7 | Wed | 9:05am - 9:55am |
| B4 | Fri | 10:10am - 11:00am | B8 | Wed | 3:35pm - 4:25pm |

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. ExamSoft account.

Grading: Texts, quizzes, and participation.

Hub Units: Scientific Inquiry 2, Critical Thinking

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.

This course examines two fundamental building blocks of brain function, voltage-gated ion channels and synaptic transmission. We first discuss basic properties of ion channels, namely their molecular structures and kinetics. Building on the basic properties, we then consider how ion channels shape firing patterns in neurons of mammalian CNS and how firing patterns can be modulated through subtle changes in ion channels. Second, we consider basic molecular processes underlying synaptic transmission. We then build on the understanding of neuronal firing patterns and synaptic transmission to explore how these basic properties shape neuronal communication at network level. We discuss examples where complex network functions such as brain waves, attention and auditory processing can be traced to, and explained by, basic properties of ion channels or synaptic functions. In the laboratory, we perform extracellular and intracellular recordings from motor axons and muscle fibers of crayfish, which allow us to observe how action potentials pair up with synaptic potentials in real time. The whole class will perform a project over the course of a semester with the expectation that, collectively, the data should be of sufficient quantity and quality for a publication. The class projects in the past had led to publications on effects of pesticides and on drugs treating epilepsy. In the coming semesters, we plan to examine the same nerve-muscle preparation of a parthenogenetic crayfish (marble crayfish). These animals are all females and are genetic clones of each other. We will start by examining electrophysiological and morphological properties of nerve-muscle preparation since no previous studies have been performed in this species, which is believed to appear through a mutation recently (1997). Furthermore, the genome of marble crayfish had been sequenced, which may be a valuable resource for molecular pharmacological studies of ion channels.

Lecture

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

Lab

D1 Mon 2:30pm - 6:15pm

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).

PHYSIOLOGY & NEUROBIOLOGY

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 CAS NE 455 and GRS BI 655.

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 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%).

Hub Units: Ethical Reasoning, Oral/Signed Communication, Research & Information Literacy

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%).

Hub Units: Ethical Reasoning, Oral/Signed Communication, Research & Information Literacy

PHYSIOLOGY & NEUROBIOLOGY

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 10:10am - 11:55am

Notes: [2 cr] Not for Biology major or minor credit unless two sections of BI 581/582 are taken.

Textbooks & Technology: None.

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

CAS BI 594 B1: TOPICS IN BIOLOGY: DRUG DISCOVERY IN THE NEUROSCIENCES

Prereq: BI 108 and CH 102 (and PS/NE 333 strongly recommended) or permission of instructor.

Drug discovery and development is a long, complex, and expensive process which involves many stages where potential problems must be addressed. This process is uniquely compounded when a drug is intended to treat a neurological disease due to the complexity of the nervous system. This course begins by examining the historical context through which most well-known nervous systems drugs were discovered. The course will then address specific challenges of modern drug discovery in the neurosciences including *target selection* (molecular target based screening vs. phenotypic screening); *managing pharmacodynamics* (absorption and distribution, getting drugs past the blood brain barrier); *animal models* (using representative animal models for the disease); and *clinical trials* (effective clinical endpoints, and placebo effects).

Independent

B1 Bushell Tue, Thu 9:00am - 10:45am

Notes: Meets with NE 594 B1.

Textbooks & Technology: TBA.

Grading: TBA.

CAS BI 594 T1: TOPICS IN BIOLOGY: NEURAL IMPACTS ON TUMORIGENESIS

Prereq: BI 108 and BI 203

It has been known for some time that cancer cells leverage the tissue around them in order to allow for the formation and growth of a tumor, and ultimately to aid in its invasion of adjacent tissue and metastasize. Recent studies have shown a novel symbiotic interaction between the peripheral nervous system and tumors using reciprocal cross-talk. Topics of discussion will include neuronal invasion and mechanisms of neurogenesis into solid tumors, cross-talk in tumor microenvironments, nervous system influence on cancer modulators such as stem cells, inflammation and immune surveillance and extracellular signaling events that enhance tumorigenesis with attention paid to potential therapeutic interventions. Finally, we will explore if this nervous system/cancer interface might be a mediator for the effects of stress-induced cancer.

Independent

T1 Tullai Tue, Thu 1:30pm - 3:15pm

Notes: Meets with NE 594 T1.

Textbooks & Technology: TBA.

Grading: TBA.

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-Martín Tue, Thu 9:00am - 10:45am

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. 18-19)
Research & Readings (pgs. 20-21)

A list of courses accepted toward the Neurobiology specialization can be found in the Bulletin at 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. All CAS BI Marine Semester courses count as electives toward the Biology, Behavioral Biology, and Ecology & Conservation Biology majors. All CAS BI Marine Semester courses will also count towards the three upper-level labs required for all Biology and all Specialization majors.

CAS BI 523: MARINE URBAN ECOLOGY

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. Effective Fall 2019, this course fulfills a single unit in the following BU Hub area: Teamwork/Collaboration.

Lecture

MS Rotjan Arranged Nov. 21 - Dec. 20

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. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry II, Creativity/Innovation.

Lecture

MS Lobel Arranged Nov. 21 - Dec. 20

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. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry II, Creativity/Innovation.

Lecture

MS Rotjan Arranged Nov. 21 - Dec. 20

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. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Oral and/or Signed Communication, Research and Information Literacy.

Lecture

MS Kaufman Arranged Oct. 28 - 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. Effective Fall 2019, this course is part of a Hub sequence.

Lecture

MS Staff Arranged Sept. 5 - Sept. 30

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. Effective Fall 2019, this course fulfills a single unit in the following BU Hub area: Teamwork/Collaboration.

Lecture

MS Finnerty Arranged Oct. 1 - Oct. 25

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. This course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry II, Creativity/Innovation.

Lecture

MS Finnerty Arranged Nov. 21 - Dec. 20

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. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Oral and/or Signed Communication, Research and Information Literacy.

Lecture

MS Staff Arranged Oct. 28 - Nov. 20

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. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Oral and/or Signed Communication, Research and Information Literacy.

Lecture

MS Davies Arranged Oct. 28 - 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. Students participating in the Marine Semester will earn the following Hub units: Teamwork/ Collaboration, Oral/Signed Communication, Research & Information Literacy, Scientific Inquiry 2, Creativity/Innovation.

TROPICAL ECOLOGY PROGRAM

The Tropical Ecology Program (TEP) is a fall or 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. All TEP courses count as electives toward the Biology, Behavioral Biology, and Ecology & Conservation Biology majors. All TEP courses will also count towards the three upper-level labs required for all Biology and all Specialization 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 courses do (although MET courses don't earn Hub units). If a student wishes to take more than one MET course in a semester or is a first year or a 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.

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 Kristiansen Mon 6:00pm - 8:45pm

Lab

A2 Wed 6:00pm - 7:45pm

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

Grading: Three lecture exams (54%), lecture assignments and homework (11%), and laboratory exercises and exams (35%).

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

A2 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

A1 Tullai Tue 6:00pm - 8:00pm
Thu 6:00pm - 7:00pm

Discussion

A2 Thu 7:00pm - 8:00pm

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

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

Lab

A2 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

A2 Wed 6:00pm - 8:45pm

METROPOLITAN COLLEGE (MET)

MET CH 421: BIOCHEMISTRY 1

Prereq: CAS CH 204, CH 212 or CH 214

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 | Tolan | Mon | 8:00am - 8:50am |
| | | Mon, Wed, Fri | 9:05am - 9:55am |
| A2 | Whitty | Tue, Thu | TBA |
| | | Mon | 6:30pm - 8:30pm* |

*Time slot reserved for exams.

Lab

| | | |
|----|-----|------------------|
| B1 | Wed | 8:00am - 12:00pm |
| B2 | Wed | 1:25pm - 5:25pm |
| B3 | Wed | 6:30pm - 10:30pm |
| B4 | Thu | 9:00am - 1:00pm |

Discussion

| | | |
|----|-----|------------------|
| C1 | Mon | 12:20pm - 2:05pm |
| C2 | Tue | 5:00pm - 6:45pm |

Notes: Meets with CAS BI 421.

MET BI 566: NEUROBIOLOGY OF CONSCIOUSNESS

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 non-human 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. 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: first year 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.

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 Arranged

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

Grading: Attendance and written assignments.

RESEARCH & READINGS

GRADUATE RESEARCH IN BIOLOGY

Graduate Research in Biology is offered as part of the BA/MS program. This dual degree program is only open to Biology and specialization majors. Students will receive both Bachelor's of Arts and Master's of Science degrees upon graduation. For more information on the BA/MS program, visit <https://www.bu.edu/biology/undergrad/bams/>.

CAS BI 595: MASTER'S RESEARCH IN BIOLOGY

Prereq: Admission into the MS or BA/MS combined program

Biology laboratory research conducted under supervision of a faculty member. Externships are acceptable with prior approval. Minimum of 7.5 or 15 hours per week in the lab, culminating in submission of a written progress report.

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. 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: first year 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.

GRADUATE READINGS IN BIOLOGY

Graduate Readings in Biology is offered as part of the BA/MS program. This dual degree program is only open to Biology and specialization majors. Students will receive both Bachelor's of Arts and Master's of Science degrees upon graduation. For more information on the BA/MS program, visit <https://www.bu.edu/biology/undergrad/bams/>.

GRS BI 701: GRADUATE READINGS IN BIOLOGY

Prereq: consent of instructor, limited to graduate students in the one-year, nonresearch MA program.

Library research on well-defined subjects determined in consultation with faculty member. Two such half courses may be used to partially satisfy the eight-full-course requirement for the one-year MA degree in Biology.

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

INDEX

CAS

| | | | |
|----|-----|--|--------|
| BB | 191 | Undergraduate Research in BMB 1 | Pg. 2 |
| BB | 291 | Undergraduate Research in BMB 2 | Pg. 2 |
| BB | 391 | Undergraduate Research in BMB 3 | Pg. 2 |
| BB | 401 | Honors Research in BMB | Pg. 3 |
| BB | 491 | Undergraduate Research in BMB 4 | Pg. 2 |
| 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 | 126 | Human Genetics | Pg. 4 |
| BI | 171 | Readings in Biology 1 | Pg. 21 |
| BI | 191 | Undergraduate Research in Biology 1 | Pg. 20 |
| 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. 21 |
| BI | 281 | Fundamentals of Biology 1 | Pg. 6 |
| BI | 291 | Undergraduate Research in Biology 2 | Pg. 20 |
| BI | 306 | Biology of Global Change | Pg. 9 |
| BI | 309 | Evolution | Pg. 10 |
| BI | 310 | Human Structure & Function | Pg. 11 |
| BI | 311 | General Microbiology | Pg. 7 |
| BI | 315 | Systems Physiology | Pg. 11 |
| BI | 325 | Principles of Neuroscience | Pg. 12 |
| BI | 371 | Readings in Biology 3 | Pg. 21 |
| BI | 391 | Undergraduate Research in Biology 3 | Pg. 20 |
| BI | 401 | Honors Research in Biology | Pg. 20 |
| BI | 407 | Animal Behavior | Pg. 10 |
| BI | 410 | Developmental Biology | Pg. 7 |
| BI | 421 | Biochemistry 1 | Pg. 7 |
| BI | 438 | Tropical Montane Ecology [^] | Pg. 17 |
| BI | 439 | Tropical Rainforest Ecology [^] | Pg. 17 |
| BI | 440 | Tropical Coastal Ecology [^] | Pg. 17 |
| BI | 441 | Studies in Tropical Ecology [^] | Pg. 17 |
| 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. 13 |
| BI | 471 | Readings in Biology 4 | Pg. 21 |
| BI | 491 | Undergraduate Research in Biology 4 | Pg. 20 |

CAS (cont.)

| | | | |
|----|-----|---|--------|
| BI | 497 | Honors Research in Biology Seminar | Pg. 20 |
| BI | 513 | Genetics Lab | Pg. 7 |
| BI | 523 | Marine Urban Ecology * | Pg. 15 |
| BI | 525 | Biology of Neurodegenerative Diseases | Pg. 13 |
| BI | 527 | Biochemistry Lab 1 | Pg. 8 |
| BI | 531 | Ichthyology* | Pg. 15 |
| BI | 535 | Translational Research in Alzheimer's Disease | Pg. 13 |
| BI | 539 | Coral Reef Dynamics* | Pg. 15 |
| BI | 541 | Coral Reef Resilience and Restoration * | Pg. 15 |
| BI | 546 | Marine Megafaunal Ecology* | Pg. 15 |
| BI | 550 | Marine Genomics * | Pg. 15 |
| BI | 551 | Biology of Stem Cells | Pg. 8 |
| BI | 552 | Molecular Biology 1 | Pg. 8 |
| BI | 569 | Tropical Marine Invertebrates * | Pg. 16 |
| BI | 578 | Marine Geographic Information Science * | Pg. 16 |
| BI | 581 | Seminar in Biology: Neurobiology of Brain Disorders | Pg. 14 |
| BI | 593 | Marine Physiology and Climate Change * | Pg. 16 |
| BI | 594 | Topics in Biology: Drug Discover in the Neurosciences | Pg. 14 |
| BI | 594 | Topics in Biology: Neural Impacts on Tumorigenesis | Pg. 14 |
| BI | 595 | Master's Research in Biology | Pg. 21 |
| BI | 598 | Neural Circuits | Pg. 14 |

MET

| | | | |
|----|-----|--|--------|
| BI | 105 | Introductory Biology for Health Sciences | Pg. 18 |
| BI | 107 | Biology 1 | Pg. 18 |
| BI | 203 | Cell Biology | Pg. 18 |
| BI | 211 | Human Physiology | Pg. 18 |
| BI | 407 | Animal Behavior | Pg. 18 |
| CH | 421 | Biochemistry 1 | Pg. 19 |
| BI | 566 | Neurobiology of Consciousness | Pg. 19 |

* Marine Semester
[^] Tropical Ecology Program