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RESEARCH FOR CREDIT
If you are working or intend to work in a lab during the Fall 2024 semester, you are welcome to apply for a research-for-credit class in order to receive academic credits towards graduation. Guidelines and the application will be available here: https://www.bu.edu/upn/undergraduate-research/

REGISTRATION DATES
<table>
<thead>
<tr>
<th>Class Year</th>
<th>Start Date</th>
<th>Start Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seniors</td>
<td>April 14th</td>
<td>9:00a</td>
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<tr>
<td>Juniors</td>
<td>April 21st</td>
<td>9:00a</td>
</tr>
<tr>
<td>Sophomores</td>
<td>April 28th</td>
<td>9:00a</td>
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WAITLISTS
You can find more information about waitlists here: https://www.bu.edu/upn/advising/undergraduate-waitlists/

REGISTRATION NOTES
- You must schedule an advising appointment with your assigned advisor prior to registration at bu.joinhandshake.com
- Full time status is a minimum of 12 credits per semester.
- To change your class standing, apply for an overload fee waiver, and more, visit the CAS Advising page: http://www.bu.edu/cas/current-students/undergraduate/casadvising/forms/
- PDP, ROTC, and CAS FY/SY courses do not count toward the 128 credits needed to graduate.
- Find more info about the Undergraduate Neuroscience Program at https://www.bu.edu/upn/
- Learn more about the BU Hub at bu.edu/hub
- Declare a second major, change your major, or add a minor here:
  Major: https://www.bu.edu/cas/cas-advising-major-declaration-form/
  Minor: https://www.bu.edu/cas/academics/undergraduate-education/academic-advising/advising/minor-declaration-form/
- Change your class standing here: http://www.bu.edu/cas/current-students/casadvising/forms/cas-advising-change-of-class-year-form/
- Search for classes using the Course Search tool here: https://www.bu.edu/phpbin/course-search/

Last Updated: 4/10/24
Check MyBU Student for the most up to date scheduling information.
### Core Neuroscience Courses

#### Boston University College of Arts and Sciences
Undergraduate Program in Neuroscience

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Hub</th>
<th>Div Studies</th>
<th>Prereq</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE 101: Introduction to Neuroscience</td>
<td>4 cr</td>
<td>SI1</td>
<td>NS</td>
<td>None</td>
<td>An introduction to the biological basis of behavior and cognition. Includes theoretical and practical foundations rooted in psychology, biology, neuropharmacology, and clinical sciences (e.g., neurology and neuropsychiatry). Neuroethical dilemmas are highlighted and integrated when relevant to discussion topics. Note: You cannot receive credit for NE 101 and PS 231.</td>
<td></td>
</tr>
<tr>
<td>NE 202: Intro. to Cognitive Neuroscience</td>
<td>4 cr</td>
<td></td>
<td></td>
<td>CAS NE 101 or PS 231; sophomore standing</td>
<td>Cognitive neuroscience seeks to understand the brain basis of cognition. This course introduces research methods and human neuroanatomy, and provides a survey of topics including learning and memory, attention, perception, language, social cognition, and executive function. Also offered as CAS PS 339.</td>
<td></td>
</tr>
<tr>
<td>NE 203: Principles of Neuroscience</td>
<td>4 cr</td>
<td>RIL, TWC, WIN</td>
<td></td>
<td>Sophomore standing &amp; NE 101 &amp; (BI 203 or NE 102) &amp; First Year Writing Seminar (WR 120)</td>
<td>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. Project labs focus on behavioral neurobiology through inquiry-based experiments. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Writing-Intensive Course, Research and Information Literacy, and Teamwork/Collaboration.</td>
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</tbody>
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<thead>
<tr>
<th>Lecture</th>
<th>Discussion</th>
<th>Lab</th>
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<tbody>
<tr>
<td>NE 101: Introduction to Neuroscience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lecture A1</td>
<td>Bushell</td>
<td>MWF 12:20p-1:10p</td>
</tr>
<tr>
<td>Discussion B1</td>
<td>Bushell</td>
<td>M 1:25p-2:15p</td>
</tr>
<tr>
<td>Discussion B3</td>
<td>Bushell</td>
<td>M 2:30p-3:20p</td>
</tr>
<tr>
<td>Discussion B4</td>
<td>Bushell</td>
<td>M 2:30p-3:20p</td>
</tr>
<tr>
<td>Discussion B5</td>
<td>Bushell</td>
<td>M 3:35p-4:25p</td>
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<tr>
<td>Discussion B6</td>
<td>Bushell</td>
<td>M 3:35p-4:25p</td>
</tr>
<tr>
<td>Discussion B7</td>
<td>Bushell</td>
<td>M 4:40p-5:30p</td>
</tr>
<tr>
<td>Discussion B8</td>
<td>Bushell</td>
<td>M 4:40p-5:30p</td>
</tr>
</tbody>
</table>

| NE 202: Intro. to Cognitive Neuroscience | | |
| Lecture A1 | Somers | TR 11:00a-12:15p |
| Discussion A2 | Staff | F 12:20p-1:10p |
| Discussion A3 | Staff | F 1:25p-2:15p |
| Discussion A4 | Staff | F 2:30p-3:20p |
| Discussion A5 | Staff | F 3:35p-4:25p |

| NE 203: Principles of Neuroscience | | |
| Lecture A1 | Tullai | TR 11:00a-12:15p |
| Lab L1 | Staff | M 6:30p-9:15p |
| Lab L2 | Staff | T 12:30p-3:15p |
| Lab L3 | Staff | T 6:30p-9:15p |
| Lab L4 | Staff | W 8:00a-10:45p |
| Lab L5 | Staff | W 2:30p-5:15p |
| Lab L6 | Staff | W 6:30p-9:15p |
| Lab L7 | Staff | R 12:30p-3:15p |
| Lab L8 | Staff | R 6:30p-9:15p |

Last Updated: 4/10/24
Check MyBU Student for the most up to date scheduling information.
# Core Neuroscience Courses

**NE 204: Intro. to Computational Models of Brain and Behavior**  
4 cr | Prereq: CAS MA 121 and MA 122; or CAS MA 123 and CAS MA 124; or NE 212; and sophomore standing; or consent of instructor

Introduction to important concepts in cognitive neuroscience and computational modeling of biological neural systems. Combines a systems-level overview of brain function with an introduction to modeling of brain and behavior using neural networks.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Discussion</th>
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<tbody>
<tr>
<td>A1</td>
<td>TBA</td>
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<td>B1</td>
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<td>B2</td>
<td>TBA</td>
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<tr>
<td>B3</td>
<td>TBA</td>
</tr>
<tr>
<td>B4</td>
<td>TBA</td>
</tr>
</tbody>
</table>

**NE 212: Intro to MATLAB Programming**  
4 cr | Hub: QR1, CRT | Prereq: (NE 101 or PS 101) & one semester of calculus

Teaches computer programming concepts, core statistical concepts, and related skills via MATLAB. Programming examples that cover four steps of neuroscience research (experiment control; random samples; data analysis; brain process simulation) promote "constructive" understanding of the quantitative reasoning behind decisions based on descriptive and inferential statistics (e.g., confidence intervals, linear regression models, model-specific anovas). Explains numerical integration programs in two settings: probability distributions, and simulations of neural dynamics. Does not count toward the principal courses required for the major or minor. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: Quantitative Reasoning I, Critical Thinking.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Discussion</th>
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<tbody>
<tr>
<td>A1</td>
<td>Yazdanbakhsh</td>
</tr>
<tr>
<td>B1</td>
<td>Yazdanbakhsh</td>
</tr>
<tr>
<td>B2</td>
<td>Yazdanbakhsh</td>
</tr>
<tr>
<td>B3</td>
<td>Yazdanbakhsh</td>
</tr>
<tr>
<td>B4</td>
<td>Yazdanbakhsh</td>
</tr>
</tbody>
</table>

**NE 218: Integrated Science Experience II**  
5 cr | Hub: TWC, WIN | Prereq: NE 116 & CH 116 | Coreq: CH 218

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. 3 lecture hours (meets with CAS NE 203 lecture), 1 discussion hour, 4 hours lab, 2 hour lab discussion.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Lab</th>
<th>Pre-Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Tullai</td>
<td>TR 11:00a-12:15p</td>
</tr>
<tr>
<td></td>
<td>Bushell</td>
<td>W 1:25p-5:25p</td>
</tr>
<tr>
<td></td>
<td>Bushell</td>
<td>M 2:30p-4:15p</td>
</tr>
</tbody>
</table>

Last Updated: 4/10/24  
Check MyBU Student for the most up to date scheduling information.
## Group 1: Neurobiology

### NE 445: Neurophysiology
4 cr | Prereq: BI 203 or BI 315 or BI 325 or NE 203, or consent of instructor.

Cellular and molecular basis of neural excitability and synaptic transmission. The molecular understanding of ion channels is extrapolated to higher brain functions such as learning, memory, and sleep. Three hours lecture, three hours lab, one hour pre-lab. Also offered as CAS BI 445.

### NE 455: Developmental Neurobiology
4 cr | Prereq: BI 203 or BI 325 or NE 203, or consent of instructor.

Fundamental principles of developmental neurobiology, stressing molecular mechanisms that underlie early neural development, differentiation, process outgrowth, and behavior. Three hours lecture, one hour discussion. Also offered as CAS BI 455.

### NE 481: Molecular Biology of the Neuron
4 cr | Hub: OSC, SI2, RIL | Prereq: (NE 102 or BI 203) or equivalent

Topics include electrical properties of neurons, a survey of neurotransmitters, molecular structure and function of receptors, synaptic transmission, intracellular signaling, and the molecular biology of sensory transduction. Three hours lecture, one hour discussion. Also offered as CAS BI 481.

### NE 503: Neuroimmunology
4 cr | Prereq: BI 203 or NE 102, or BI 213, and BI 325 or NE 203.

Neuroimmunology is a burgeoning field in neuroscience. This course examines current topics including the role of glia in brain development, health, and disease, glia-neuron crosstalk, impact of stress and environment on the neuroimmune system, and cell trafficking into the brain.

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Last Updated: 4/10/24
Check MyBU Student for the most up to date scheduling information.
**Group 1: Neurobiology**

**NE 520: Sensory Neurobiology**
4 cr | Prereq: BI 325 or NE 203, or consent of instructor.

A broad survey of sensory system function in model organisms and humans, focusing on fundamental principles of neural processing. Topics include basic cellular transduction, neural coding, and links between neural activity and sensory perception. Also offered as CAS BI 520.

**NE 535: Translational Research in Alzheimer's Disease**
4 cr | Hub: OSC, ETR, RIL | Prereq: (BI 203 or NE 102) & (BI 325 or 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. Also offered as CAS BI 535.

**NE 561: Proteostasis in the Biology of Neurodegenerative Diseases**
4 cr | Hub: SI2, CRI, RIL | Prereq: (BI 108 or NE 102), BI 203 or BI 213 recommended. | Satisfies Neuro Research Requirement

A hands-on class focusing on the mechanisms that control protein homoestasis, and on the approaches that we can use to study how it may change in conditions associated with neurodegenerative diseases. The class mimics, as much as possible, a real research environment, as students carry out experiments throughout the semester, learn how to develop and test new hypotheses, and also share knowledge through weekly readings and presentation of research articles inherent to the topics of the class. Effective Fall 2021, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry II, Creativity/Innovation, Research and Information Literacy.
NE 589: Neural Impacts on Tumorigenesis
4 cr | Hub: OSC, SI2, RIL | Prereq: (NE 203 or BI 325)

Explores neuronal invasion and mechanisms of neurogenesis into solid tumors, cross-talk in tumor microenvironments, and nervous system influence on cancer modulators that enhance tumorigenesis. Enhancement of cancer from environmental stress at this interface is also examined. Effective Fall 2021, this course fulfills a single unit in each of the following BU Hub areas: Oral and/or Signed Communication, Scientific Inquiry II, Research and Information Literacy.
NE 234: Psychology of Learning  
4 cr | Hub: SI1, SO1, CRT | Div Studies: SS | Prereq: PS 101

The aim of this course is to review the major traditional and current theories of learning and memory. Students will begin with an understanding of simple learning, including theories and basic principles of classical and operant conditioning. Students will then be introduced to the memory system, the three stages of memory, implicit and explicit memory processes.

NE 327: Experimental Psychology: Perception  
4 cr | Prereq: PS 101 & (PS211 or NE 212 or (MA 115 & MA 116)) & PS 222 | Satisfies Neuro Research Requirement

Introduces psychophysical methods and their use in the study of perceptual processes: Students learn to think critically about the relation between theory and experiment, conduct perception experiments, and write experimental reports. Also offered as CAS PS 327.

NE 333: Drugs & Behavior  
4 cr | Prereq: PS 101 & (PS 231 or NE 101) & Junior/Senior Standing

Comprehensive survey of drug influences on behavior; introduces a neuroscience approach to behavior. Several classes of drugs are discussed, including abused and addictive substances and psychoactive and therapeutic agents. Also offered as CAS PS 333.
Group 2: Cognitive

**NE 338: Neuropsychology**  
4 cr | Prereq: PS 231 or BI 325 or NE 203  
Survey of theoretical aspects and major empirical findings in human neuropsychology, including memory, language, spatial function, attention, emotion, and abstract thought. Emphasis is on the relation between brain disorders (resulting from head injury, stroke, degenerative disease, etc.) and abnormal behavior. Also offered as CAS PS 338.

**NE 456: Neurobiology of Sex & Aggression**  
4 cr | Hub: OSC, HCO, SI2 | Prereq: PS 231 or NE 203 or BI 325 or permission of instructor  
Examines neurobiological and genetic factors that influence sex and violence. Students review primary literature from the past century that highlights major scientific discoveries that have reconceptualized our understanding of the origins of sexual-determination, -attraction and -aggression.

**NE 531: Imaging and Manipulating Memories**  
4 cr | Prereq: PS 231 or NE 101 or PS/NE 327 or PS 339/NE 202 or NE 203/BI 325 or permission of instructor  
The nature of memory engrams, the physical manifestations of experiences in the brain, will be explored at the systems neuroscience level by surveying primary literature.

**NE 544: Developmental Neuropsychology**  
4 cr | Prereq: PS 241 or consent of instructor  
Study of the neural mechanisms underlying behavioral development. Topics include the plasticity of the developing brain in response to deprivation or damage and mechanisms underlying specific syndromes (e.g., aphasia, dyslexia, learning disabilities, hyperactivity, autism, and Tourette's syndrome). Also offered as CAS PS 544.

**Lecture**  
A1 Cronin-Golom TR 11:00a-12:15p

**Discussion**  
A2 Cronin-Golom W 9:05a-9:55a  
A3 Cronin-Golom W 10:10a-11:00a  
A4 Cronin-Golom W 11:15a-12:05p

**Independent**  
A1 Gobrogge TR 5:00p-6:15p  
A1 Ramirez TR 11:00a-12:15p  
A1 Carrillo T 12:30p-3:15p

Last Updated: 4/10/24  
Check MyBU Student for the most up to date scheduling information.
## MA 242: Linear Algebra

4 cr  | Hub: QR2, CRT  | Prereq: (CASMA122 OR CASMA124 OR CASMA127 OR CASMA129)

Cannot be taken for credit in addition to CAS MA 442 or ENG EK 103. Matrix algebra, solution of linear systems, determinants, Gaussian elimination, fundamental theory, row-echelon form. Vector spaces, bases, norms. Computer methods. Eigenvalues and eigenvectors, canonical decomposition. Applications. Effective Fall 2019, this course fulfills a single unit in the following BU Hub area: Quantitative Reasoning II.

### Lecture

<table>
<thead>
<tr>
<th>Section</th>
<th>Instructor</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Bourguin</td>
<td>TR</td>
<td>3:30p-4:45p</td>
</tr>
<tr>
<td>B1</td>
<td>Fried</td>
<td>MWF</td>
<td>9:00a-9:55a</td>
</tr>
<tr>
<td>C1</td>
<td>Weinstein</td>
<td>TR</td>
<td>5:00p-6:15p</td>
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### Discussion

<table>
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<th>Section</th>
<th>Instructor</th>
<th>Days</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>A2</td>
<td>Bourguin</td>
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<td>11:15a-12:05p</td>
</tr>
<tr>
<td>B2</td>
<td>Fried</td>
<td>W</td>
<td>2:30p-3:20p</td>
</tr>
<tr>
<td>C2</td>
<td>Weinstein</td>
<td>M</td>
<td>8:00a-8:50a</td>
</tr>
<tr>
<td>C3</td>
<td>Weinstein</td>
<td>M</td>
<td>9:05a-9:55a</td>
</tr>
<tr>
<td>C4</td>
<td>Weinstein</td>
<td>M</td>
<td>10:10a-11:00a</td>
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<tr>
<td>C5</td>
<td>Weinstein</td>
<td>M</td>
<td>3:35p-4:25p</td>
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<tr>
<td>C6</td>
<td>Weinstein</td>
<td>M</td>
<td>4:40p-5:30p</td>
</tr>
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## MA 573: Qualitative Theory of Differential Equations

4 cr  | Prereq: (MA 226 OR MA 231) & (MA 242 OR MA 442)

It's often said that "The only constant in life is change" (attributed to Heraclitus). Ordinary differential equations (ODEs) arise ubiquitously to describe the rates of change of all manner of quantities, including in biomedical engineering, mathematics, mechanical engineering, neurosciences, and physics. We will learn lots of fascinating and powerful mathematical tools for linear and nonlinear ODEs. Examples will be chosen based on student background and interest.

### Independent

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<thead>
<tr>
<th>Section</th>
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<th>Days</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>A1</td>
<td>Fried</td>
<td>MWF</td>
<td>10:10a-11:00a</td>
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</table>

## MA 578: Bayesian Statistics

4 cr  | Prereq: (MA 581 & MA 582)


### Lecture

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<th>Section</th>
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<tbody>
<tr>
<td>A1</td>
<td>Atchade</td>
<td>TR</td>
<td>12:30p-1:45p</td>
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### Discussion

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<th>Section</th>
<th>Instructor</th>
<th>Days</th>
<th>Time</th>
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<tbody>
<tr>
<td>B1</td>
<td>Atchade</td>
<td>W</td>
<td>9:05a-9:55a</td>
</tr>
</tbody>
</table>

Last Updated: 4/10/24
Check MyBU Student for the most up to date scheduling information.
CN 510: Principles and Methods of Cognitive and Neural Modeling I
4 cr | Prereq: CAS MA 226 or equivalent, CS 108 or CS 111, NE 101 or equivalent

Explores psychological, biological, mathematical, and computational foundations of behavioral and brain modeling. Topics include organizational principles, mechanisms, local circuits, network architectures, cooperative and competitive non-linear feedback systems, associative learning systems, and self-organizing code-compression systems. The adaptive resonance theory model unifies many course themes. CAS CN 510 and 520 may be taken concurrently.

CS 542: Machine Learning
4 cr | Prereq: CASCS112, CASCS132 or equivalent, CASCS237 or equivalent; CASMA225 highly recommended. | Satisfies Neuro Research Requirement

Introduction to modern machine learning concepts, techniques, and algorithms. Topics include regression, kernels, support vector machines, feature selection, boosting, clustering, hidden Markov models, and Bayesian networks. Programming assignments emphasize taking theory into practice, through applications on real-world data sets.

Independent
A1 Yazdanbakhsh TR 11:00a-12:15p

Lecture
A1 Saenko MW 11:00a-12:15p

Lab
A2 Saenko R 8:00a-8:50a
A3 Saenko R 9:05a-9:55a
A4 Saenko R 10:10a-11:00a
A5 Saenko R 11:15a-12:05p

Check MyBU Student for the most up to date scheduling information.
## BI 203: Cell Biology

**4 cr**  |  **Hub:** SI1, QR1, CRT  |  **Prereq:** (CASBI108 & CASCH102) or equivalent  |  **Coreq:** (CASCH203) 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. Students may receive credit for CAS BI 203 or 213, but not both courses. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry I, Quantitative Reasoning I, Critical Thinking.

### Lecture
- A1: Beffert  |  TR  |  9:30a-10:45a
- A2: Beffert  |  TR  |  3:30p-4:45p

### Discussion
*See MyBU Student for full list of options.*

## BI 213: Intensive Cell Biology

**4 cr**  |  **Hub:** SI1, QR1, RIL  |  **Prereq:** (CASBI108 & CASCH102) or equivalent  |  **Coreq:** (CASCH203) 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. Students may receive credit for CAS BI 213 or 203, but not both courses. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry I, Quantitative Reasoning I, Research and Information Literacy

### Lecture
- A1: Naya  |  TR  |  9:30a-10:45a

### Discussion
- B1: Naya  |  M  |  12:20p-1:10p
- B3: Naya  |  M  |  4:40p-5:30p
- B4: Naya  |  W  |  12:20p-1:10p

## BI 315: Systems Physiology

**4 cr**  |  **Hub:** SI2, WRI, CRT, TWC  |  **Prereq:** (CASBI108 OR ENGBE209), and CASCH101 and CASCH102, or equivalent. First Year Writing Seminar (e.g., WR 100 or WR 120)

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. Three hours lecture, three hours lab. 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  |  MWF  |  11:15a-12:05p

### Lab
*See MyBU Student for full list of options.*

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Last Updated: 4/10/24
Check MyBU Student for the most up to date scheduling information.
**CH 203: Organic Chemistry I**  
4 cr | SI1, QR1 | Prereq: (CASCH102 OR CASCH110 OR CASCH112)  
Fundamentals of contemporary organic chemistry, including skeletal and electronic structure, stereochemistry, and reactions of important functional groups. Applications of organic reactions to important synthetic targets in materials and drug discovery will be highlighted, as will reactions pertinent to biochemistry. Laboratory includes training in basic organic chemistry skills, such as extraction, reaction performance, spectroscopy interpretation and chromatography. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry I, Quantitative Reasoning I.

**CH 218: Organic Chemistry 1 with Integrated Science Experience II Lab**  
4 cr | Hub: SI1, QR1, CRT, RIL | Prereq: CH 116/CH 102 and either BI 107/BI 116 or NE 102/116 | Coreq: NE 218 or BI 218  
Integration of organic chemistry with cell biology and neuroscience, with emphasis on how each discipline interacts experimentally. Laboratory focuses on synthesizing compounds and testing in biological systems. 3 lecture hours (meets with CH 203 lecture), 1 discussion hour, 4 hours lab, 2 hour lab discussion. 4 Credits Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Scientific Inquiry I, Quantitative Reasoning I, Critical Thinking, Research and Information Literacy. Click here to learn more about Integrated Science Experience and how to register.
CS 111: Introduction to Computer Science I
4 cr | Hub: QR2, CRI, CRT

The first course for computer science majors and anyone seeking a rigorous introduction. Develops computational problem-solving skills by programming in the Python language, and exposes students to a variety of other topics from computer science and its applications. Carries MCS divisional credit in CAS. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: Quantitative Reasoning II, Creativity/Innovation, Critical Thinking.

CS 112: Introduction to Computer Science II
4 cr | Hub: QR2, CRI, CRT | Prereq: (CASCS111) or equivalent.
Covers advanced programming techniques and data structures. Topics include recursion, algorithm analysis, linked lists, stacks, queues, trees, graphs, tables, searching, and sorting. Carries MCS divisional credit in CAS. Effective Fall 2018, this course fulfills a single unit in the following BU Hub area: Quantitative Reasoning II, Creativity and Innovation, Critical Thinking.

Lecture
A1  TBA     MWF     10:10a-11:00a
A2  TBA     MWF     11:15a-12:05p

Lab
*See MyBU Student for full list of options.

Lecture
A1  TBA     TR      11:00a-12:15p
A2  TBA     TR      12:30p-1:45p

Lab
*See MyBU Student for full list of options.

Last Updated: 4/10/24
Check MyBU Student for the most up to date scheduling information.
**MA 226: Differential Equations**  
4 cr | Hub: CRT | Prereq: (CASMA225 OR CASMA230)

First-order linear and separable equations. Second-order equations and first-order systems. Linear equations and linearization. Numerical and qualitative analysis. Laplace transforms. Applications and modeling of real phenomena throughout. (Cannot be taken for credit in addition to CAS MA 231.)

**Lecture**
- A1 Avery TR 9:30a-10:45a
- B1 TBA MWF 9:05a-9:55a

**Discussion**  
*See MyBU Student for full list of options.*  
- A2-A6 Avery
- B2-B5 TBA

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**MA 416: Analysis of Variance**  
4 cr | Hub: CRT | Prereq: (MA116 or MA214) or equivalent

Fundamental concepts and analytical skills in analysis of variance, including crossed and nested designs, as well as fixed- and random-effect models. Trend analysis for repeated measures, expected mean squares, and non-parametric techniques. SAS is used throughout the course. Effective Fall 2020, this course fulfills a single unit in the following BU Hub area: Critical Thinking.

**Lecture**
- A1 Moore TR 3:30p-4:45p

**Discussion**
- A2 Moore W 1:25p-2:15p
- A3 Moore W 2:30p-3:20p
- A4 Moore W 3:35p-4:25p
- A5 Moore W 4:40p-5:30p
- A6 Moore R 8:00a-8:50a

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Last Updated: 4/10/24  
Check MyBU Student for the most up to date scheduling information.
Remaining on track to complete your Hub requirements requires thoughtful planning, including knowing what Hub units you will satisfy by courses needed for your major.

Students majoring in Neuroscience who complete the core neuroscience courses and foundational requirements in writing, chemistry, physics, calculus, and statistics generally have 8-11 Hub units left to satisfy:

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philosophical Inquiry and Life's Meaning (PLM)</td>
<td>1 unit</td>
</tr>
<tr>
<td>Aesthetic Exploration (AEX)</td>
<td>1 unit</td>
</tr>
<tr>
<td>Historical Consciousness (HCO)*</td>
<td>1 unit</td>
</tr>
<tr>
<td>Social Inquiry (SO1)*</td>
<td>1 unit</td>
</tr>
<tr>
<td>Individual in Community (IIC)</td>
<td>1 unit</td>
</tr>
<tr>
<td>Global Citizenship and Intercultural Literacy (GCI)</td>
<td>2 units</td>
</tr>
<tr>
<td>Oral and/or Signed Communication (OSC)*</td>
<td>1 unit</td>
</tr>
<tr>
<td>Digital Multimedia Expression (DME)*</td>
<td>1 unit</td>
</tr>
<tr>
<td>Creativity/Innovation (CRI)*</td>
<td>2 units</td>
</tr>
</tbody>
</table>

You may satisfy some of the above units with your choice of neuroscience required courses and/or electives, 2nd language requirement, and additional academic tracks (minors, pre-health, KHC, etc.), but you will likely need to search outside your normal scheduling path to satisfy at least some Hub units.

*OSC, DME, and CRI hub unit(s) have the potential to be met through your choice in WR 15X course. HCO, SO1, OSC, DME, and CRI hub units have the potential to be met through your selection of Neuroscience electives. SO1 and CRI hub units have potential to be met through your choice of calculus/computer science courses which count as part of your basic science courses for the major.

It is encouraged to spread your Hub courses throughout your time at Boston University, so that you are not scrambling to take all your Hub courses or find seats in courses that meet a specific permutation of 3 Hub units your final year.

You can also leverage the Course Description Search tool to identify other courses that meet specific Hub units. Some courses are still in process of being evaluated for Hub, but should get approval throughout March, so keep checking the Course Description Search as new courses get added!

We've included a list of courses on the next few pages which are running in Fall 2024 that are helpful in satisfying some of your Hub Units that are not met by Neuroscience. **This list is by no means exhaustive and you should continue to do your own research, including looking at classes outside of CAS.**

Last Updated: 4/10/24
Check MyBU Student for the most up to date scheduling information.
Select Hub Courses

**AH 111: Pyramids to Cathedrals: An Introduction to Ancient and Medieval Art**  
4 cr | Hub: AEX, HCO

A chronological examination of the fundamentals of art and architectural history, this course introduces students to major monuments and works of art from antiquity to the middle ages in their social, religious and historical contexts.

**AH 114: Kongo to Cuba: Art, Exchange, and Self-Determination in Africa and Latin America**  
4 cr | Hub: AEX, GCI, CRT

This course introduces the arts of Africa and Latin America. It explores the rich diversity of each continent's artistic production and highlights the impact of their intertwining histories on visual expression in the wake of transcontinental exchange and globalization. Effective Fall 2022, this course fulfills a single unit in each of the following BU Hub areas: Global Citizenship and Intercultural Literacy, Aesthetic Exploration, Critical Thinking.

**AN 101: Introduction to Sociocultural Anthropology**  
4 cr | Hub: SOI, GCI, RIL

Introduction to the basic concepts, principles, and problems of sociocultural anthropology, emphasizing the study of traditional and complex societies. Special attention to the organization and meaning of religion, economic life, kinship and political order; and the problem of cultural variation in the contemporary world. Carries social science divisional credit in CAS.

**AN 211: Humans Among Animals**  
4 cr | Hub: PLM, ETR, CRT

Examines how humans understand (other) animals and their thought, feeling, and communication and the ways we humans in varied cultures and societies use animals for interaction and self-understanding. Interdisciplinary approach that considers language, aesthetics, ideology, practice, and regulation. Effective Fall 2018, this course fulfills units in the following BU Hub areas: Philosophical Inquiry and Life's Meanings, Ethical Reasoning, and Critical Thinking.

**AH 201: Understanding Architecture**  
4 cr | Hub: AEX, HCO, RIL

Introduces a range of approaches to understanding architecture in an historical perspective. Learn how architects and others have interpreted meaning through rubrics of art, nature, and culture, focused upon European and American architecture from 1400 to the present.

**AN 252: Ethnicity and Identity**  
4 cr | Hub: IIC, GCI

Explores anthropological approaches to community, belonging, and difference using case studies from the South Pacific, Europe, North America, and Africa. Special attention paid to how contemporary economic and political changes impact the ways people think about and belong to communities. Carries social science divisional credit in CAS. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: The Individual in Community, Global Citizenship and Intercultural Literacy.

*Last Updated: 4/10/24*  
*Check MyBU Student for the most up to date scheduling information.*
Select Hub Courses

**AN 290: Children and Culture**  
*4 cr | Hub: SO1, GCI*

Explores the way cultures shape the social development and caregiving of children. Topics include cultural concepts of childhood; the acquisition of culture; socialization and moral development; childhood cognition, emotion, and behavior; children’s language and play; and the cultural shaping of gender and personality. Carries social science divisional credit in CAS. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: Social Inquiry I, Global Citizenship and Intercultural Literacy.

**AN 308: Food In Place(s): Identity, Location, and the Culture of Taste**  
*4 cr | Hub: AEX, GCI, WIN | Pre-req: First Year Writing Seminar (WR 100 or WR 120)*

Explores foodways, culinary history, personal, social, and cultural identity, as well as sensory experiences of taste. Special attention given to communities in the Boston area as locations of cultural and culinary diversity. Effective Fall 2019, this course fulfills a single unit in each of the following BU Hub areas: Aesthetic Exploration, Global Citizenship and Intercultural Literacy, Writing-Intensive Course.

**BI 310: Human Structure & Function: Anatomy, Histology, and Pathology**  
*4 cr | Hub: SI1, DME, CRI | Pre-req BI 108 and 203 or equivalent*

Examines the cells and tissues that make up our organs (histology), the structure and interactions of the organ systems (anatomy), and how disease reshapes our bodies (pathology). As a secondary focus, this course also studies and critiques educational media related to human anatomy, and builds introductory competency in health communication.

**CI 200: Introduction to Film & Media Aesthetics**  
*4 cr | Hub: AEX, DME, CRT*

Introduction to fundamental concepts for the analysis/understanding of film and media. Key concepts of formal composition (e.g. editing, mise-en-scene, cinematography, sound and more) over a diverse set of media texts. Foundational skills in analysis appropriate to film, television and moving-image media.

**CL 101: The World of Greece**  
*4 cr | Hub: PLM, HCO, CRT*

The literature, philosophy, art, and culture of ancient Greece and their impact on the Western tradition. Topics covered include the emergence of epic poetry; art and lyric in the Archaic Age; drama, architecture, philosophy, and political developments of classical Athens and Greece. All texts in translation. Carries humanities divisional credit in CAS. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: Historical Consciousness, Philosophical Inquiry and Life's Meanings, Critical Thinking.

**CL 213: Greek and Roman Mythology**  
*4 cr | Hub: PLM, HCO*

A general introduction to the myths of the ancient classical world, with particular regard to the patterns of experience, both religious and psychological, from which they evolved. All texts in translation.
Select Hub Courses

EN 121: Reading World Literature
4 cr | Hub: AEX, GCI, RIL

Study of literature in English or English translation -- poetry, drama, and prose narrative -- outside of British and American traditions. Attention to such topics as cultural self-construction, relationships of historical context to artistic expression, and development of literary forms.

EN 122: Medieval Worlds
4 cr | Hub: AEX, HCO, TWC

Why does the deep medieval past continue to haunt our dreams? In novels, games, and on TV? Medieval literature and its afterlives. Topics may include Arthurian romance, otherworld visions, monsters and heroes, women's lives and writing, modern medievalism. Carries humanities divisional credit in CAS. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: Aesthetic Exploration, Historical Consciousness, Teamwork/Collaboration.

EN 132: Write Back Soon: Blackness and the Prison
4 cr | Hub: AEX, IIC, CRT

This course interrogates the theme of black containment from slavery and Jim Crow to, principally, mass incarceration. The topic is explored in tandem with the development of open letter writing skills. This epistolary form allows both for the intimate engagement of individual, familiar contact and the deft inclusion of targeted eavesdroppers in order to raise the consciousness of listeners and affirm the value of personal relationships. Course texts include letters to and from prison, poetry, short stories, memoir, social science, documentaries, and critical theory. Effective Fall 2021, this course fulfills a single unit in each of the following BU Hub areas: The Individual in Community, Aesthetic Exploration, Critical Thinking.

EN 170: The Graphic Novel
4 cr | Hub: AEX, DME, CRI

Examination of the rise, nature, and status of the contemporary book-length graphic novel. Topics include graphic vs. traditional novel, word and image, style and space, representations of subjectivity, trauma, and history.

EN 176: Introduction to Film & Media Aesthetics
4 cr | Hub: DME, AEX, CRT

Introduction to fundamental concepts for the analysis/understanding of film and media. Key concepts of formal composition (e.g. editing, mise-en-scene, cinematography, sound and more) over a diverse set of media texts. Foundational skills in analysis appropriate to film, television and moving- image media. Effective Fall 2022, this course fulfills a single unit in each of the following BU Hub areas: Digital/Multimedia Expression, Aesthetic Exploration, and Critical Thinking.

HI 190: History of Boston: Community and Conflict
4 cr | Hub: HCO, IIC, TWC

Explores the history of Boston and the city’s changes over time. Students work with archival objects, maps, and manuscripts. Topics include Native American history, colonial settlement, revolution, immigration, urban development, and race. Students visit nearby historical sites and museums.

Last Updated: 4/10/24
Check MyBU Student for the most up to date scheduling information.
Select Hub Courses

**HI 203: Magic, Science, and Religion**  
4 cr | Hub: HCO, PLM, CRT  
Boundaries and relationships between magic, science, and religion in Europe from antiquity through the Enlightenment. Explores global cultural exchange, distinctions across social, educational, gender, and religious lines, the rise of modern science, and changing assumptions about God, Nature, and humanity.

**HI 207: Game of Thrones: Power and Politics in Pre-Modern Europe**  
4 cr | Hub: ETR, HCO, CRI  
This course employs medieval and early modern authors, as well as contemporary scholars, as vehicles for understanding the dynamics of power, gender, violence and politics in George Martin's novel, Game of Thrones. Effective Fall 2023 this course fulfills a single unit in each of the following BU Hub areas: Ethical Reasoning, Historical Consciousness, Creativity/Innovation.

**HI 151: The Emerging United States to 1865**  
4 cr | Hub: HCO, SO1  
Explores how the United States, at first only a series of borderland outposts, became a sprawling national republic. Investigates factors that brought Americans together and those that tore them apart, as they struggled passionately over racial, religious, and sectional values. Carries social science divisional credit in CAS.

**PH 150: Introduction to Ethics**  
4 cr | Hub: PLM, ETR, CRT  
Many of us want to lead meaningful lives. But what is it for a life to be meaningful? What makes some lives better or more meaningful than others? Can life as a whole have some significance or meaning? Carries humanities divisional credit in CAS. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: Philosophical Inquiry and Life's Meanings, Ethical Reasoning, Critical Thinking.

**PH 251: Medical Ethics**  
4 cr | Hub: PLM, ETR, CRT  
This course will survey ethical issues that arise in connection with medicine and emerging biotechnologies. It will examine topics such as the right to healthcare, research on human subjects, euthanasia, abortion, cloning, genetic selection, disabilities, and the biomedical enhancement of human capacities. Students can expect to gain not only training in the concepts and methods of moral philosophy and the logic of argumentation, but also the resources needed for assessing ethically difficult questions that healthcare professionals routinely face.

**PH 256: Philosophy of Sex and Gender**  
4 cr | Hub: PLM, IIC, CRT  
This course explores philosophical questions that arise about gender and sexuality. What is sexism? What is oppression? What is the relationship between sexism and other forms of oppression? What is the correct response to sexism and oppression? How many sexes are there? How many genders? What is sexual orientation? What is sexual perversion? What are sexual ethics, including questions about the value and status of monogamy, polyamory, promiscuity, and adultery? What is the moral status of practices such as sex work and pornography?

Last Updated: 4/10/24  
Check MyBU Student for the most up to date scheduling information.
### Select Hub Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Hub Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN 100</td>
<td>Introduction to Religion</td>
<td>4 cr</td>
<td>PLM, GCI, CRI</td>
</tr>
<tr>
<td>RN 106</td>
<td>Death and Immortality</td>
<td>4 cr</td>
<td>PLM, GCI, CRI</td>
</tr>
<tr>
<td>RN 101</td>
<td>The Bible</td>
<td>4 cr</td>
<td>AEX, HCO, CRI</td>
</tr>
<tr>
<td>RN 242</td>
<td>Magic, Science, and Religion</td>
<td>4 cr</td>
<td>HCO, PLM, CRT</td>
</tr>
<tr>
<td>RN 103</td>
<td>Religions of Asia</td>
<td>4 cr</td>
<td>GCI, AEX, TWC</td>
</tr>
<tr>
<td>WS 240</td>
<td>Sexuality and Social Life</td>
<td>4 cr</td>
<td>S01, CRT, DME</td>
</tr>
</tbody>
</table>

**Boston University** College of Arts and Sciences
Undergraduate Program in Neuroscience

**RN 100: Introduction to Religion**
4 cr | Hub: PLM, GCI, CRI

Religion matters. It makes meaning and provides structure to life, addressing fundamental questions about body, spirit, community, and time. But what is it? How does it work in our world? This course explores religion in ritual, philosophical, experiential, and ethical dimensions.

**RN 106: Death and Immortality**
4 cr | Hub: PLM, GCI, CRI

Examines death as religious traditions have attempted to accept, defeat, deny, or transcend it. Do we have souls? Do they reincarnate? What to do with a corpse? Other topics include mourning, burial, cremation, martyrdom, resurrection, near-death experiences.

**RN 101: The Bible**
4 cr | Hub: AEX, HCO, CRI

Introduction to the great canonical anthologies of Jews and Christians. Students will learn to read for historical context and genre conventions; study classical and modern strategies of interpretation; and create a collaborative commentary or piece of "fan-fiction." Carries humanities divisional credit in CAS. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: Aesthetic Exploration, Historical Consciousness, Creativity/Innovation.

**RN 242: Magic, Science, and Religion**
4 cr | Hub: HCO, PLM, CRT

Boundaries and relationships between magic, science, and religion in Europe from antiquity through the Enlightenment. Explores global cultural exchange, distinctions across social, educational, gender, and religious lines, the rise of modern science, and changing assumptions about God, Nature, and humanity.

**RN 103: Religions of Asia**
4 cr | Hub: GCI, AEX, TWC

Study of Hinduism, Buddhism, Daoism, Confucianism, and Shinto. Focus on the world view of each tradition and the historical development of that world view. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: Global Citizenship and Intercultural Literacy, Historical Consciousness, Critical Thinking. Effective Fall 2023, this course fulfills a single unit in each of the following BU Hub areas: Global Citizenship and Intercultural Literacy, Aesthetic Exploration, Teamwork/Collaboration.

**WS 240: Sexuality and Social Life**
4 cr | Hub: S01, CRT, DME

Introduction to sociological perspectives on sexuality. Historical and comparative analysis of sexuality, with a focus on the social and cultural institutions that shape sexuality in the contemporary U.S. Effective Fall 2018, this course fulfills a single unit in each of the following BU Hub areas: Social Inquiry I, Critical Thinking. Effective Fall 2021, this course fulfills a single unit in each of the following BU Hub areas: Social Inquiry I, Critical Thinking, Digital/Multimedia Expression.

Last Updated: 4/10/24
Check MyBU Student for the most up to date scheduling information.