



<https://neuroscience.natsci.msu.edu/academics/undergraduate/>

## BACHELOR OF SCIENCE DEGREE REQUIREMENTS

### WRITING (4 credits)

\_\_\_\_\_ WRA 101 (4) Writing, Rhetoric, and American Cultures or \_\_\_\_\_ WRA 195H  
 \_\_\_\_\_ WRA 110–150 (4) Writing, Rhetoric, and American Cultures (Prior to Fall 2016)

### INTEGRATIVE STUDIES\*\*\*

\_\_\_\_\_ IAH 201–210 (4) Arts and Humanities  
 \_\_\_\_\_ IAH 211–241 (4) Arts and Humanities  
 \_\_\_\_\_ ISS 200 level (4) Social Science  
 \_\_\_\_\_ ISS 300 level (4) Social Science

**NOTE:** ISB & ISP requirements are fulfilled by the required Biology and Chemistry courses as part of the “Alternative Track” to Completion of the Integrated Science Requirements.

### GENERAL NEUROSCIENCE DEGREE REQUIREMENTS

**ONE (1)** of the following **pairs** of courses (5 or 6 credits):

1. CEM 141: General Chemistry (4)  
CEM 161: Chemistry Laboratory I (1)
2. CEM 151: General and Descriptive Chemistry (4)  
CEM 161: Chemistry Laboratory I (1)
- CEM 181H: Honors Chemistry I (4)  
CEM 185H: Honors Chemistry Laboratory (2)
- LB 171: Principles of Chemistry I (4)  
LB 171L: Introductory Chemistry Laboratory I (1)

**ONE (1)** of the following **pairs** of courses (6 or 8 credits):

1. PHY 231: Introductory Physics I (3)  
PHY 232: Introductory Physics II (3)  
PHY 241: Physics for Cellular and Molecular Biologists I (4)  
PHY 242: Physics for Cellular and Molecular Biologists II (4)
2. PHY 183: Physics for Scientists and Engineers I (4)  
PHY 184: Physics for Scientists and Engineers II (4)
- PHY 193H: Honors Physics I – Mechanics (4)  
PHY 294H: Honors Physics II – Electromagnetism (4)
- LB 273: Physics I (4)  
LB 274: Physics II (4)

**ONE (1)** of the following courses (3 or 4 credits):

1. STT 201: Statistical Methods (4)
2. STT 231: Statistics for Scientists (3)
3. STT 421: Statistics I (3)

**ONE (1)** of the following **groups** of courses (8 or 9 credits):

1. BS 161: Cell and Molecular Biology (3)  
BS 162: Organismal and Population Biology (3)  
BS 171: Cell and Molecular Biology Laboratory (2)
- BS 181H: Honors Cell and Molecular Biology (3)  
BS 182H: Honors Organismal and Population Biology (3)  
BS 191H: Honors Cell and Molecular Biology Laboratory (2)
- LB 144: Biology I – Organismal Biology (4)  
LB145: Biology II – Cellular and Molecular Biology (5)

**ONE (1)** of the following **pairs** of courses (6 credits):

1. CEM 251: Organic Chemistry I (3)  
CEM 252: Organic Chemistry II (3)
2. CEM 351: Organic Chemistry I (3)  
CEM 352: Organic Chemistry II (3)

**ONE (1)** of the following courses (3 or 4 credits):

1. MTH 124: Survey of Calculus I (3)
2. MTH 132: Calculus I (3)
  - MTH 152H: Honors Calculus I (3)
  - LB 118: Calculus I (4)

**BOTH** of the following courses (8 credits):

1. BMB 401: Comprehensive Biochemistry (4)
2. PSY 101: Introductory Psychology (4)

**ONE (1)** of the following (4 or 8 credits):

1. PSL 310: Physiology for Pre-Health Professionals (4)
2. PSL 431: Human Physiology I (4), **and**  
PSL 432: Human Physiology II (4)

**ONE (1)** course from **EACH** of the following **groups** of courses (6 credits):

1. PHM 350: Introductory Human Pharmacology (3)  
PHM 431: Pharmacology of Drug Addiction (3)  
PHM 480: Special Problems (3)\*  
\*Prior Approval from Neuroscience Academic Advisor is **REQUIRED!**
2. MMG 409: Eukaryotic Cell Biology (3)  
IBIO 341: Fundamental Genetics (4)

### Note:

**Bullet Points** = Course Options for Honors College and Lyman Briggs College Students.

**Pre-professional Students:** Additional admissions requirements may be necessary if you are a pre-professional student. Please consult your pre-professional advisor for more information.

**\*\*\*Students MUST** include at least one National (N) course and one International / Multicultural (I) course in their Integrative Studies programs. A National / International / Multicultural (D) course may meet either an (N) or (I) requirement, but not both. See course descriptions for details.

## NEUROSCIENCE CORE COURSES – REQUIRED FOR ALL CONCENTRATIONS

ALL of the following courses (8 credits):

\_\_\_\_\_ NEU 301: Introduction to Neuroscience I (3)

\_\_\_\_\_ NEU 302: Introduction to Neuroscience II (3)

\_\_\_\_\_ NEU 311L: Neuroscience Laboratory (W) (2)

### NEUROSCIENCE CORE – CONCENTRATIONS

**15 credits** in courses from ONE (1) of the following concentrations:

#### Cellular and Developmental Neuroscience

PLB 400: Introduction to Bioinformatics (3)  
IBIO 341: Fundamental Genetics (4)  
IBIO 343: Genetics Laboratory (3)  
IBIO 425: Cells and Development (W) (4)  
MMG 404: Human Genetics (3)  
MMG 409: Eukaryotic Cell Biology (3)  
NEU 416: Development of the Nervous System Across the Lifespan (3)  
NEU 417: Instrumental Methods of Analysis in Neuroscience (3)  
NEU 420: Neurobiology of Disease (3)  
NEU 425: Computational Modeling in Neuroscience (3)  
NEU 430: Genomics of Brain and Behavior (3)  
NEU 435: Ion Channels of Excitable Membranes (3)  
NEU 440: Synaptic Transmission (3)  
PHM 422: Fundamentals of Neuropharmacology (2-3)  
PHM 431: Pharmacology of Drug Addiction (3)  
PHM 480: Special Problems (3)\*  
NEU 490: Special Problems in Neuroscience\*  
NEU 492: Special Topics in Neuroscience\*

\*Prior Approval from Neuroscience Academic Advisor is **REQUIRED!**

**NOTE: MMG 409 and IBIO 341** may **NOT** be used for **both** the General Neuroscience Degree requirement **and** this concentration.

**NOTE: PHM 431 and PHM 480** may **NOT** be used for **both** the General Neuroscience Degree requirement **and** this concentration.

#### Cognitive and Computational Neuroscience

LIN 455: Neurolinguistics (3)  
LIN 463: Introduction to Cognitive Science (3)  
NEU 417: Instrumental Methods of Analysis in Neuroscience (3)  
NEU 425: Computational Modeling in Neuroscience (3)  
NEU 430: Genomics of Brain and Behavior (3)  
NEU 445: Analysis of Functional Neuroscience Data (3)  
PHL 200: Introduction to Philosophy (3)  
PHL 462: Philosophy of Mind (3)  
PSL 429: Biomedical Imaging Methods (3)  
PSY 200: Cognitive Psychology (3)  
PSY 209: Brain and Behavior (3)  
PSY 301: Cognitive Neuroscience (3)  
PSY 401: Expertise and Skill (W) (3)  
PSY 402: Sensation and Perception (W) (3)  
PSY 410: Neurobiology of Learning and Memory (W) (3)  
PSY 493: Issues in Psychology (W) (3)\*  
NEU 490: Special Problems in Neuroscience\*  
NEU 492: Special Topics in Neuroscience\*

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**NOTE: No more than 3 credits each of NEU 490 and NEU 492 may count towards the Neuroscience degree concentration requirements.**

#### Behavioral and Systems Neuroscience

IBIO 313: Animal Behavior (3)  
IBIO 403: Integrative Neurobiology (3)  
IBIO 405: Neural Basis of Animal Behavior (3)  
NEU 310: Psychobiology of Human Sexuality (3)  
NEU 416: Development of the Nervous System Across the Lifespan (3)  
NEU 417: Instrumental Methods of Analysis in Neuroscience (3)  
NEU 420: Neurobiology of Disease (3)  
NEU 425: Computational Modeling in Neuroscience (3)  
NEU 430: Genomics of Brain and Behavior (3)  
PHM 422: Fundamentals of Neuropharmacology (2-3)  
PHM 431: Pharmacology of Drug Addiction (3)  
PHM 480: Special Problems (1–3)\*  
PSY 209: Brain and Behavior (3)  
PSY 333: Neurobiology of Food Intake (3)  
PSY 402: Sensation and Perception (W) (3)  
PSY 409: Psychology of Behavioral Development (W) (3)  
PSY 410: Neurobiology of Learning and Memory (W) (3)  
PSY 411: Hormones and Behavior (W) (3)  
PSY 413: Laboratory in Behavioral Neuroscience (W) (4)  
PSY 493: Issues in Psychology (W) (3)\*  
NEU 490: Special Problems in Neuroscience\*  
NEU 492: Special Topics in Neuroscience\*

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**NOTE: PHM 431 and PHM 480** may **NOT** be used for **both** the General Neuroscience Degree requirement **and** this concentration.

#### We're Here to Serve You!

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