MICHIGAN STATE UNIVERSITY | Lyman Briggs College

# BACHELOR OF SCIENCE DEGREE
# NEUROSCIENCE
## COORDINATE MAJOR

## FOR ADDITIONAL INFORMATION, PLEASE CONTACT THE NEUROSCIENCE PROGRAM ADVISING OFFICE

**(1) UNIVERSITY REQUIREMENTS**

*Writing Requirement*
Tier I: LB 133 4
Tier II: Satisfied by completing the Lyman Briggs College History, Philosophy and Sociology of Science and Senior requirements listed below.

*Integrative Studies in Arts & Humanities (IAH)*
IAH 201-210* 4
IAH 211-241* †# 4

*Integrative Studies in Social, Behavioral & Economic Sciences (ISS)*
ISS 200-level course* 4
ISS 300-level course*‡@ 4

*National, International, & Multicultural Diversity
Students must include at least one "N" course and one "I" course in their Integrative Studies programs. A "D" course may meet either an "N" or an "I" requirement, but not both.

†Summer 2013 to Summer 2017: LB 331, 333, and 336 will fulfill the IAH "B" university requirement (IAH 211 or higher). Please consult your LBC Academic Advisor for specific details for your program.

‡Summer 2013 to Summer 2017; LB 332, 334, and 335 will fulfill the ISS 300-level university requirement. Please consult your LBC Academic Advisor for specific details for your program.

# Beginning Fall 2017; LB 321a, 322a, 323a, 324a, 325a, 326a and 327a will fulfill the IAH university requirement (IAH 211 or higher).

@ Beginning Fall 2017; LB 321b, 322b, 323b, 324b, 325b, 326b and 327b will fulfill the ISS 300-level university requirement.

Please contact your LBC Academic Advisor for specific details for your program. If you fulfilled the LB 331, 332, 333, 334, 335 or 336 requirement you do not need the new Fall 2017 courses.

*Mathematics, Biological and Physical Sciences*
Satisfied by the Lyman Briggs College requirements in Mathematics, Biological and Physical Sciences (see next section).

**(2) LYMAN BRIGGS COLLEGE REQUIREMENTS**

*Biological Sciences (9 cr.)*
Complete ONE of the following groups of courses
(1) LB 144 & 145 9
(2) BS 161, 162, 171, & 172 10

*Chemistry (8-9 cr.)^*
Complete ONE of the following groups of courses
(1) LB 171 & 171L 8
(2) CEM 141 & 161 7

*Physics (8 cr.)*
Complete ONE of the following groups of courses
(1) LB 273, 274 8
(2) PHY 231, 232, 251, & 252 8

*Mathematics (6-7 cr.)*
Complete ONE of the following groups of courses
(1) LB 118 & STT 231 7
(2) MTH 132 & STT 231 6

*History, Philosophy & Sociology of Science (11-12 cr.)*
LB 133 4
LB 321-327, 330-336, 355, 490E; ENG 473A; HST 425; SOC 368 7-8

*Senior Seminar (4 cr.)*
LB 492 4

Biology, Chemistry, and Physics college courses (above) also meet graduation requirements for major.

^LBC Chemistry requirement met with completion of CEM 251

Minimum number of credits required: 120

Minimum cumulative and major grade point average: 2.0

**(3) MAJOR REQUIREMENTS**

Complete ALL of the following courses (16 cr.)

| | | | |
|---|---|---|---|
| PSY | 101 | Introductory Psychology | 4 |
| BMB | 401 | Comprehensive Biochemistry | 4 |
| NEU | 301 | Introduction to Neuroscience I | 3 |
| NEU | 302 | Introduction to Neuroscience II | 3 |
| NEU | 311L | Neuroscience Laboratory (W) | 2 |

Complete ONE of the following options (6 cr.)

| | | | |
|---|---|---|---|
| CEM | 251 | Organic Chemistry I | 3 |
| CEM | 252 | Organic Chemistry II | 3 |
| | | or | |
| CEM | 351 | Organic Chemistry I | 3 |
| CEM | 352 | Organic Chemistry II | 3 |

Complete ONE of the following options (4-6 cr.)

| | | | |
|---|---|---|---|
| PSL | 310 | Physiology for Pre-Health Professionals | 4 |
| | | or | |
| PSL | 431 | Human Physiology I | 4 |
| PSL | 432 | Human Physiology II | 4 |

Complete ONE course from each of the following groups (6 cr.)

| | | | |
|---|---|---|---|
| 1. PHM | 350 | Introductory Human Pharmacology | 3 |
| PHM | 431 | Pharmacology of Drug Addiction | 3 |
| PHM | 480 | Special Problems | 3 |
| 2. IBIO | 341 | Human Genetics | 4 |
| MMG | 409 | Eukaryotic Cell Biology | 3 |

Complete 15 credits from ONE of the following three concentrations

**(A) Cellular and Developmental Neuroscience**

Complete 15 credits from the following courses

| | | | |
|---|---|---|---|
| MMG | 404 | Human Genetics | 3 |
| MMG | 409 | Eukaryotic Cell Biology | 3 |
| NEU | 420 | Neurobiology of Disease | 3 |
| NEU | 490* | Special Problems in Neuroscience | 1-3 |
| NEU | 492* | Special Topics in Neuroscience | 1-3 |
| IBIO | 341 | Fundamental Genetics | 4 |
| IBIO | 343 | Genetics Laboratory | 3 |
| IBIO | 425 | Cells and Development (W) | 4 |
| NEU | 416 | Development Nervous System | 3 |
| PLB | 400 | Introduction to Bioinformatics | 3 |
| NEU | 425 | Computational Modeling in NEU | 3 |
| NEU | 430 | Genomics of Brain & Behavior | 3 |
| NEU | 435 | Ion Channels of Excitable Membranes | 3 |
| NEU | 440 | Synaptic Transmission | 3 |
| PHM | 422 | Fundamental of Neuropharmacology | 2-3 |
| PHM | 431 | Pharmacology of Drug Addiction | 3 |
| PHM | 480* | Special Problems (need advisor approval) | 3 |

IBIO 341, PHM 431, PHM 480 and MMG 409 cannot be double-counted with major requirements listed above. No more than 3 credits each of NEU 490 and NEU 492 may count toward this requirement.

**(B) Behavioral and Systems Neuroscience**

Complete 15 credits from the following courses

| | | | |
|---|---|---|---|
| NEU | 420 | Neurobiology of Disease | 3 |
| NEU | 490* | Special Problems in Neuroscience | 1-3 |
| NEU | 492* | Special Topics in Neuroscience | 1-3 |
| PHM | 431* | Pharmacology of Drug Addiction | 3 |
| PHM | 480* | Special Problems | 1-3 |
| PSY | 209 | Brain and Behavior | 3 |
| IBIO | 405 | Neural Basis of Animal Behavior | 3 |
| NEU | 310 | Psychobiology of Human Behavior | 3 |
| NEU | 416 | Development of the Nervous System | 3 |
| NEU | 425 | Computational Modeling in NEU | 3 |
| NEU | 430 | Genomics of Brain & Behavior | 3 |
| PHM | 422 | Fundamental of Neuropharmacology | 2-3 |
| PSY | 333 | Psychology of Food Intake | 3 |
| PSY | 402 | Sensation and Perception (W) | 3 |
| PSY | 409 | Psychobiology 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 |
| IBIO | 313 | Animal Behavior | 3 |
| IBIO | 403 | Integrative Neurobiology | 3 |

PHM 431 cannot be double-counted with major requirements listed in 3B. No more than 3 credits each of NEU 490 and NEU 492 may count toward this requirement.

**(C) Cognitive and Occupational Neuroscience**

Complete 15 credits from the following courses

| | | | |
|---|---|---|---|
| NEU | 425 | Computational Modeling in NEU | 3 |
| NEU | 430 | Genomics of Brain and Behavior | 3 |
| LIN | 455 | Neurolinguistics | 3 |
| LIN | 463 | Introduction to Cognitive Science | 3 |
| NEU | 490* | Special Problems in Neuroscience | 1-3 |
| NEU | 492* | Special Topics in Neuroscience | 1-3 |
| 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 | Memory 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 Academic Advisor pre-approval required. No more than 3 credits each of NEU 490 and NEU 492 may count toward this requirement.

**IMPORTANT: This advising guide is presented for planning purposes only. It is the student's responsibility for knowing and following University, college and departmental requirements as stated in the** Academic Programs Catalog**.**

**The Academic Advisors will provide information and suggest others based on expressed interests. It is the student's responsibility for enrolling in classes and selecting the number of credits per semester for success. Appointments are made using the** Student Success Dashboard**.**

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# Planning Guide

**Major Requirements to be completed within Year 1 and 2:**
**Calculus and Statistics** (LB 118 & STT 231)
**Chemistry** (LB 171/171L & LB 172/LB 172L)
**Psychology** (PSY 101)
**Biology** (LB 144 & 145)
**Organic Chemistry** (CEM 251 & 252)
**Physics** (LB 273 & 274)

**Major Requirements to be completed within Year 3 and 4:**
**Neuroscience** (NEU 301, NEU 302, & NEU 311L)
**Physiology** (PSL 310 OR PSL 431 & 432)
**Biochemistry** (BMB 401 OR BMB 461 & 462)
**Pharmacology** (PHM 350 OR PHM 431 OR PHM 480*)
**Genetics/Cell Biology** (IBIO 341 OR MMG 409)
**Concentration Courses** (15 credits from one of the three concentrations)

**University/College Requirements to be completed prior to graduation:**
**Tier I Writing** (LB 133)
**Integrative Studies in Social Science** (ISS 200-level & ISS 300-level OR LB 32XB)
**Integrative Studies in Arts & Humanities** (IAH 201-210 & IAH 211+ OR LB 32XA)
**History, Philosophy, Sociology of Science** (2 upper-level HPS courses**)
**Senior Seminar/Capstone** (LB 492)

*Prior approval from NEU advisor needed **Can double as ISS 3XX and IAH 211+

IMPORTANT: This sample plan is to generate ideas for scheduling your courses and is based on a 15-credit-per-semester model for 4-year graduation. Each student's plan will be different and based on individual needs, careers goals, math placement, and other factors. The minimum number of credits for graduation is 120.