BS in Neuroscience (285620) MAP Sheet
Family Home and Social Sciences, Neuroscience Center
For students entering the degree program during the 2020-2021 curricular year.

The neuroscience undergraduate program is an interdisciplinary program that allows students to seek advisement at the Liberal Arts Advisement and Careers or the College of Life Sciences Student Services.

### University Core and Graduation Requirements

#### University Core Requirements:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>#Classes</th>
<th>Hours</th>
<th>Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion Cornerstones</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Teachings and Doctrine of The Book of Mormon</td>
<td>1</td>
<td>2.0</td>
<td>REL A 275</td>
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<tr>
<td>Jesus Christ and the Everlasting Gospel</td>
<td>1</td>
<td>2.0</td>
<td>REL A 250</td>
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<tr>
<td>Foundations of the Restoration</td>
<td>1</td>
<td>2.0</td>
<td>REL C 225</td>
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<tr>
<td>The Eternal Family</td>
<td>1</td>
<td>2.0</td>
<td>REL C 200</td>
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<tr>
<td>The Individual and Society</td>
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<tr>
<td>American Heritage</td>
<td>1-2</td>
<td>3-6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Global and Cultural Awareness</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Skills</td>
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<tr>
<td>First Year Writing</td>
<td>1</td>
<td>3.0</td>
<td>NEURO 316, WRTG 315 or 316</td>
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<tr>
<td>Advanced Written and Oral Communications</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>0-1</td>
<td>0-3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Languages of Learning (Math or Language)</td>
<td>1</td>
<td>3-4.0</td>
<td>MATH 112* or STAT 121*</td>
</tr>
<tr>
<td>Arts, Letters, and Sciences</td>
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<tr>
<td>Civilization 1</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Civilization 2</td>
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<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Arts</td>
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<td>3.0</td>
<td>from approved list</td>
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<tr>
<td>Letters</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Biological Science</td>
<td>1</td>
<td>3.4</td>
<td>from approved list</td>
</tr>
<tr>
<td>Physical Science</td>
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<td>7.0</td>
<td>CHEM 105*, PHSCS 105* or 121*</td>
</tr>
<tr>
<td>Social Science</td>
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<td>3.0</td>
<td>PSYCH 111</td>
</tr>
<tr>
<td>Core Enrichment: Electives</td>
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<tr>
<td>Religion Electives</td>
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<tr>
<td>Open Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
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</tbody>
</table>

Note: NEURO 316 fulfills GE Advanced Written and Oral Communication requirement. English 315 will substitute for this course.

### Graduation Requirements:

Minimum residence hours required: 30.0
Minimum hours needed to graduate: 120.0

### Suggested Sequence of Courses

#### FRESHMAN YEAR

**1st Semester**
- PDBIO 120
- CHEM 105
- First-year Writing
- PSYCH 111
- Religion Cornerstone course

**Total Hours: 15.0**

**2nd Semester**
- CHEM 106
- CHEM 107
- MMBIO 240
- A HTG 100
- Religion Cornerstone course

**Total Hours: 15.0**

#### SOPHOMORE YEAR

**3rd Semester**
- CHEM 351
- PSYHC 105
- NEURO 205
- Religion Cornerstone course
- General electives

**Total Hours: 15.0**

**4th Semester**
- CHEM 352
- PSYHC 106
- PSYCH 275
- Religion Cornerstone course
- General electives

**Total Hours: 15.0**

#### JUNIOR YEAR

**5th Semester**
- NEURO 360
- STAT 121
- General elective
- NEURO 360

**Total Hours: 15.0**

**6th Semester**
- NEURO 316, WRTG 315 or 316
- General elective
- NEURO 360

**Total Hours: 15.0**

#### SENIOR YEAR

**7th Semester**
- NEURO 480
- General elective
- NEURO 360

**Total Hours: 15.0**

**8th Semester**
- Applied Neuroscience (NEURO 449R, 481, 496R)
- General elective
- NEURO 360

**Total Hours: 15.0**

Note: Students are encouraged to complete an average of 16 credit hours each semester or 32 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.
**BS in Neuroscience (285620)**

**2020-2021 Program Requirements (66 - 69 Credit Hours)**

The Neuroscience Center requires a minimum of 22 hours of neuroscience major credit to be taken in residence at BYU for this degree program. These hours may also go toward BYU's 30-hour residency requirement for graduation. Only 8 hours of Independent Study can be counted towards the major credit to be taken in residence at BYU for this degree program. These hours may also go toward BYU's 30-hour residency requirement for graduation. Only 8 hours of Independent Study can be counted towards the major credit to be taken in residence at BYU for this degree program.

**REQUIREMENT 1** Complete 4 courses

**MAJOR CORE COURSES:**
- NEURO 201 - Neuroscience 3.0
- NEURO 360 - Neuroanatomy 2.0
- NEURO 380 - Behavioral Neuroscience 3.0
- NEURO 480 - Advanced Neuroscience 3.0

**REQUIREMENT 2** Complete 4 courses

**LIFE SCIENCES COURSES:**
- MMBIO 240 - Molecular Biology 3.0
- PDBIO 120 - Science of Biology 3.0
- PDBIO 360 - Cell Biology 3.0
- PDBIO 362 - Advanced Physiology 3.0

**REQUIREMENT 3** Complete 2 courses

- PSYCH 111 - Introduction to Psychological Science 3.0
- PSYCH 375 - Cognition 3.0

**REQUIREMENT 4** Complete 5 courses

**CHEMISTRY COURSES:**
- CHEM 105 - General College Chemistry 1 with Lab (Integrated) 4.0
- CHEM 106 - General College Chemistry 2 3.0
- CHEM 107 - General College Chemistry Laboratory 1.0
- CHEM 351 - Organic Chemistry 1 3.0
- CHEM 352 - Organic Chemistry 2 3.0

**REQUIREMENT 5** Complete 1 option

**COMPLETE ONE OF THE FOLLOWING PHYSICS COURSE OPTIONS:**

**OPTION 5.1** Complete 2 courses
- PHSCS 105 - General Physics 1 3.0
- PHSCS 106 - General Physics 2 3.0

**OPTION 5.2** Complete 3 courses
- PHSCS 121 - Introduction to Newtonian Mechanics 3.0
- PHSCS 123 - Introduction to Waves, Optics, and Thermodynamics 3.0
- PHSCS 220 - Introduction to Electricity and Magnetism 3.0

**REQUIREMENT 6** Complete 2 courses

**NOTE: STUDENTS MAY SUBSTITUTE MATH 113 FOR MATH 112.**
- MATH 112 - Calculus 1 4.0
- STAT 121 - Principles of Statistics 4.0

**REQUIREMENT 7** Complete 1 hour from the following course(s)

**COMPLETE AT LEAST 1.0 HOUR OF THE FOLLOWING:**
- NEURO 449R - Undergraduate Research Experience 3.0
- NEURO 481 - Neuroscience Laboratory 1.0
- NEURO 496R - Neuroscience Academic Internship 12.0

**REQUIREMENT 8** Complete 1 option

**ELECTIVES: COMPLETE 9.0 HOURS FROM THE FOLLOWING ELECTIVE LIST:**

**OPTION 8.1** Complete 9.0 hours from the following course(s)
- CHEM 481 - Biochemistry 3.0
- CHEM 482 - Mechanisms of Molecular Biology 3.0
- COMD 334 - Hearing Science and Acoustics 3.0
- ME EN 552 - Neuroanatomical Movement 3.0
- NEURO 390R - Special Topics in Neuroscience 3.0v
- NEURO 420R - Senior Practicum: Community Projects 3.0v
- PDBIO 561 - Physiology of Drug Mechanisms 3.0
- PDBIO 565 - Endocrinology 3.0
- PDBIO 568 - Cellular Electrophysiology and Biophysics 3.0
- PSYCH 342 - Abnormal Psychology 3.0
- PSYCH 370 - Sensation and Perception 3.0
- PSYCH 377 - The Cognitive Neuroscience of Memory 3.0
- PSYCH 382 - Stress Psychology 3.0
- PSYCH 388 - Drugs, Reward and Addiction 3.0
- PSYCH 513R - (Not currently offered) 3.0
- PWS 340 - Genetics 3.0v

**Note 1:** Students should carefully consult with faculty regarding which electives they should take to best support their postgraduate plans.

**Note 2:** Me En 552, Neuro 449R, PDBio 565, and 568 require the instructor's signature before enrolling.

**Note 3:** PDBio 363, Phscs 105 lab, and Phscs 106 lab are required for most students applying for graduate training in medicine, dentistry, ophthalmology, or similar programs.

**Note 4:** Double counting: No more than 6 credits (or two courses) may be double counted between the Neuroscience major and another major or minor.

**Note 5:** It is strongly recommended that students take Neuro 316 to meet their GE Advanced Writing requirement rather than Engl 315 or 316.

**REQUIREMENT 9** Complete 2 options

**RECOMMENDED:** Complete 2 options

**OPTION 9.1** Complete 3 courses
- ME EN 552 - Neuromechanics of Movement 3.0
- NEURO 307 - Mechanisms of Molecular Biology 3.0
- NEURO 449R - Undergraduate Research Experience 3.0

**OPTION 9.2** Complete 6 courses
- ME EN 552 - Neuromechanics of Movement 3.0
- NEURO 307 - Mechanisms of Molecular Biology 3.0
- NEURO 449R - Undergraduate Research Experience 3.0
- NEURO 496R - Neuroscience Academic Internship 12.0

**Complete an exit interview.**

**RECOMMENDED:** Complete 9 courses

**NOTE:** STDEV 470 IS REQUIRED FOR MOST STUDENTS APPLYING FOR GRADUATE TRAINING IN MEDICINE, DENTISTRY, OPHTHALMOLOGY, PHYSICIAN ASSISTANT SCHOOL, OR SIMILAR PROGRAMS.

- CHEM 353 - Organic Chemistry Laboratory - Nonmajors 2.0v
- PDBIO 220 - Human Anatomy (with lab) 4.0
- STDEV 170 - Introduction to Health Professions 1.0
- STDEV 271 - Preview of Dentistry 1.0
- STDEV 272 - Preview of Medicine 1.0
- STDEV 273 - Preview of Optometry 1.0
- STDEV 375 - Dental School Preparation Laboratory Experience 2.0
- STDEV 399R - Health Professions Internship 3.0v

You may take this course up to 2 times.

- STDEV 470 - Health Professions Application 2.0

**THE DISCIPLINE:**

Neuroscience is the field of study that encompasses the development, structure, and function of the central nervous system and its connection to influencing/regulating behavior. The study of neuroscience examines topics such as neuroanatomy, physiology of nervous system, cells and circuits, molecular neuroscience, biochemistry, genetics, neuropharmacology, neuroimaging, systems and behavioral neuroscience, developmental neuroscience, social neuroscience, cognition, bioengineering, computational neuroscience, and neural dysfunction and disease. The interdisciplinary nature of neuroscience requires the tools provided by experience and training in biology, genetics, physiology, molecular biology, chemistry (general, organic, and biochemistry), physics, engineering, psychology (behavior, memory, cognition, sensation, and perception), statistics, calculus, and research design and analysis.

**RESEARCH OPPORTUNITIES:**

Neuroscience Center faculty members conduct research in a variety of neuroscience areas (for example, molecular neurobiology, developmental neuroscience, behavioral and cognitive neuroscience, cell and circuit electrophysiology, movement neuromechanics, neurochemistry, and biochemistry).
and neuroimaging. Please contact the neuroscience office or individual faculty members for more information.

CAREERS:
A major in neuroscience prepares students to pursue advanced degrees in neuroscience or biological or non-biological fields related to neuroscience or to enter into the pharmaceutical and biotechnology workforce. Neuroscience provides outstanding preparation for students seeking admittance into professional programs in medicine, dentistry, optometry, podiatry, or the chiropractic or pharmaceutical field. Neuroscience is an excellent preprofessional field of study for those interested in health professions, law, or business. Graduates of the program also have the academic skills for careers in business, consulting, global health, government and policy, non-profit programs, research, writing, and publishing.

FINANCING:
Various private, federal, and university sources of scholarships, fellowships, and grants are available. Some faculty have funds to hire undergraduates to help in their laboratories or with research.

MAP DISCLAIMER
While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

DEPARTMENT INFORMATION
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FAX: 801-422-0048
web site: http://lifesciences.byu.edu/studentservices/
e-mail: LifeSciences@byu.edu
Toll-free: 1-877-651-0293

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