Behavioral Neuroscience

A major for students interested in the biological basis of human and animal behavior

For more information contact:

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Behavioral Neuroscience is the study of nervous system regulation of behavior.

Behavioral Neuroscience majors have a fascination with how the brain works. Behavioral Neuroscience majors are interested in questions such as:

- How can we explain the behavior of animals and people?
- Why does behavior change when people take alcohol and/or drugs?
- What is happening in the nervous system of someone is emotionally disturbed?
- How important are genes in regulating human and animal behavior?
- What makes humans different than other animals?
- What is the physiological basis for the mind-body connection?
- Is free will more than a neurochemical event?

Behavioral Neuroscientists addresses these and similar questions through the study of the brain-behavior relationships.

What is Behavioral Neuroscience?

The Behavioral Neuroscience major began at Rider University in 1997. Originally named Biopsychology, the major was housed in the Department of Psychology. Program oversight of the major moved to the Department of Biology in 1998.

In 2000, over 25 students were enrolled in the major and the first graduates earned a B.S. degree in Biopsychology. In 2001, a new faculty position was created to support the growth of the major and new courses were introduced into the major.

In 2004, over 50 students were enrolled in the major, a second new faculty member was hired, and a third upper level laboratory course in neuroscience was added to the curriculum.

The name of the major was changed from Biopsychology to Behavioral Neuroscience in the fall 2008. The change was made to more accurately reflects the interests of the students, the types of courses offered by the faculty, and the career paths chosen by graduates of the program.

There have been over 100 Rider graduates of the major. Our graduates are successful in gaining employment as well as earning admission to graduate or professional post baccalaureate programs.
What can I do with a BS in BNS?

Typical career plans for graduates with a B.S. in Behavioral Neuroscience include one of the pre-allied health professions such as occupational therapy or physical therapy, teaching, research, medicine, professional psychology, or pharmaceutical sales. The major is excellent preparation for graduate school or professional careers in biology, neuroscience, psychology, science teaching, and related fields.

Behavioral Neuroscience majors are eligible for almost any career path open to graduates from a liberal arts university as well as those available to Biology and/or Psychology students. In fact, many potential employers seek out students with interdisciplinary training.

The key to success in this major is to study things that interest you. If you enjoy thinking and learning about a topic, you are likely to do well. If you earn high grades, you are basically showing a potential employer or the admissions office at a graduate school that you know how to work hard and succeed. Our graduates who take advantage of the classroom, laboratory, and research opportunities typically have many options to choose from upon graduation.

Careers of BNS graduates:

- Laboratory or Research Technician
- Clinical Research Associate
- Graduate program to be a Physician’s Assistant (P.A.)
- Medical School (M.D. or D.O.)
- Graduate School in the sciences (Ph.D. or M.S.)
- Graduate program in Nursing (R.N.)
- Graduate program for Social Work (M.S.W.)
- Graduate program for Occupational Therapy (O.T.)
- Graduate program for Physical Therapy (P.T.)
- K-12 Science Teacher
- Human Resources
- Marketing or Community Service
The BNS program is flexible.

- A wide variety of courses will meet most major requirements
- Course selection can be based on individual interests in biology, neuroscience, or psychology
- Appropriate for transfer students
- Curriculum can accommodate a minor or second major
- Appropriate as a second major for middle school and elementary school teachers
- Major requirements can be completed in 2-3 academic years

BNS students have One-on-One Advising.

Working in association with a faculty advisor, Behavioral Neuroscience majors plan a path to graduation based on the major requirements, the Rider University Liberal Arts core curriculum, and electives. Behavioral Neuroscience students are encouraged to take courses in a wide variety of disciplines.

Behavioral Neuroscience students are encouraged to explore a variety of science and liberal arts subjects in preparation for their post-graduate careers

Your advisor will suggest classes based on your interests and your career plans. Your advisor will also help you select courses needed for admission to graduate or professional schools. Your advisor is also a source of information should any problems arise during your college experience.

What types of experiences will I have as a BNS major?

Rider students earn a B.S. in Behavioral Neuroscience by taking courses in behavioral neuroscience, biology, chemistry, math, and psychology in addition to the Rider Liberal Arts core. Many of the courses include laboratories in which students gain hands-on experience in experiments examining human and animal behavior; measuring brain chemicals; evaluating drug effects on behavior; working with neurons; manipulating genes that influence behavior; as well as using computers to design stimuli and record behavior. Students who pursue independent research projects are often eligible to travel to off-campus scientific conferences to present their research.
Recent research projects of BNS students:

- Recording circadian rhythms in mice
- Effects of stress on the immune system
- Drug influences on physiology and behavior
- Measuring new neurons in the brain
- Human electrophysiology
- Studies of brain neurochemistry
- Molecular biology of biological rhythms
- Animal models of psychiatric dysfunction
- Studies of alternative medicine

Awards & Honors

Behavioral Neuroscience students who meet certain requirements are eligible for honor societies associated with the Department of Biology and Rider University.

Behavioral Neuroscience majors are eligible for admission to Beta Beta Beta (βßβ, TriBeta), the Biological Honor Society. For active membership, students must have completed 12 or more credits in Biology (with ≥ 3.0 gpa) and have an overall >2.5 gpa. Behavioral Neuroscience majors with a gpa between 2.5 and 3.0 in Biology may become associate members in TriBeta.

Behavioral Neuroscience majors who demonstrate proficiency in research are eligible to be admitted into the Rider chapter of Sigma Xi (ΣΧ) National Scientific Research Society. Students are typically nominated by faculty after having published their work or having presented their research on campus or at a local, state, or national scientific meeting.

Behavioral Neuroscience majors who have a cumulative ≥3.25 gpa, a ≥3.5 gpa in Biology and Behavioral Neuroscience courses, and who have completed an Honors Thesis will be eligible to graduate with honors in Behavioral Neuroscience. Participating students must complete an independent research project and present to the Department of Biology a written thesis, which is orally defended.

Behavioral Neuroscience students have access to all the labs, equipment, and faculty of the department. Consult the official Biology web pages for more details at http://www.rider.edu/172_1719.htm
Behavioral Neuroscience

**Required Courses 2008-2009** (TOTAL CREDITS: 51-54)

**At least one of the following (3 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY</td>
<td>100</td>
<td>Introduction to Psychology, or</td>
</tr>
<tr>
<td>BNS</td>
<td>107</td>
<td>Life Science: Behavioral Neuroscience Emphasis</td>
</tr>
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**All of the following (27 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>BIO</td>
<td>115</td>
<td>Principles of Biology I: Biology of Animals with Lab</td>
</tr>
<tr>
<td>BIO</td>
<td>117</td>
<td>Principles of Biology III: Biology of Cells with Lab</td>
</tr>
<tr>
<td>BNS</td>
<td>118</td>
<td>Behavioral Neuroscience with Lab</td>
</tr>
<tr>
<td>BNS</td>
<td>415</td>
<td>Topics in Behavioral Neuroscience</td>
</tr>
<tr>
<td>CHE</td>
<td>120</td>
<td>Principles of Chemistry</td>
</tr>
<tr>
<td>CHE</td>
<td>121</td>
<td>Principles of Chemistry Lab</td>
</tr>
<tr>
<td>CHE</td>
<td>122</td>
<td>Introduction to Chemical Systems</td>
</tr>
<tr>
<td>CHE</td>
<td>123</td>
<td>Quantitative Methods Lab</td>
</tr>
<tr>
<td>MTH</td>
<td>105</td>
<td>Algebra &amp; Trigonometry</td>
</tr>
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**At least one of the following (3-4 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>PSY</td>
<td>201</td>
<td>Statistics &amp; Research Design</td>
</tr>
<tr>
<td>ENV</td>
<td>200</td>
<td>Computer Applications in the Natural Sciences with lab</td>
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</tbody>
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**At least two of the following (8 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>BNS</td>
<td>310</td>
<td>Neurobiology with Lab</td>
</tr>
<tr>
<td>BNS</td>
<td>360</td>
<td>Neurochemistry with Lab</td>
</tr>
<tr>
<td>BNS</td>
<td>375</td>
<td>Neuroethology with Lab</td>
</tr>
</tbody>
</table>

**At least two of the following: (6-8 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO</td>
<td>200 or higher</td>
<td>(e.g., Genetics, Vertebrate Physiology, Behavior Marine Organisms, etc.)</td>
</tr>
<tr>
<td>PSY</td>
<td>200 or higher</td>
<td>(e.g., Sensation &amp; Perception, Abnormal Psychology, Learning &amp; Memory, etc.)</td>
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**At least one of the following (4 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNS</td>
<td>3##</td>
<td>any additional Behavioral Neuroscience course with Lab</td>
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<tr>
<td>BCH</td>
<td>3##</td>
<td>any Biochemistry course with Lab</td>
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<tr>
<td>PSY</td>
<td>3##</td>
<td>any 300-level Psychology Course with Lab</td>
</tr>
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**Note:**
1) Biopsychology (BPY) was renamed Behavioral Neuroscience (BNS) beginning in 2008-2009
2) BNS courses are cross-listed with the BIO prefix for education double majors