



**Department of
Biology,
Behavioral Neuroscience
& Health Sciences**



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**GENERAL INFORMATION FOR BIOLOGY,
BEHAVIORAL NEUROSCIENCE,
& HEALTH SCIENCES MAJORS
2018-2019**

DEPARTMENT OF BIOLOGY WEBSITE:

The information provided in this handbook as well as updated Departmental news and information can be found on the Department website: <http://www.rider.edu/biology>.

CHAIR of the DEPARTMENT

Dr. Paul Jivoff (pjivoff@rider.edu) - ecology and behavior of marine invertebrates

FACULTY:

Dr. Kelly Bidle (kbidle@rider.edu) – molecular genetics of extremeophile prokaryotes

Dr. Julie Drawbridge (drawbridge@rider.edu) - vertebrate developmental biology

Dr. Rosemary Fliszar (rfliszar@rider.edu) – online RN-to-BSN nursing program

Dr. Jonathan Karp (jkarp@rider.edu) - psychoneuroimmunology

Dr. Philip Lowrey (plowrey@rider.edu) - cell and molecular biology of the circadian clock

Dr. James Riggs (riggs@rider.edu) - immunology and cancer

Dr. Drue Stapleton (dstapleton@rider.edu) – health sciences

Dr. Todd Weber (tweber@rider.edu) - Pre-allied Health Advisor; circadian behavior in mammals

Dr. Jonathan Yavelow (yavelow@rider.edu) - cell and molecular biology of cancer

OVERVIEW:

The educational goals of the Rider University Department of Biology, Behavioral Neuroscience and Health Sciences include:

- providing students with foundational instruction in the Biological sciences; and
- providing students with the opportunity to explore one or more sub-disciplines of Biology or Behavioral Neuroscience or Health Sciences in depth.

The most important ways the department meets these goals are through small class and laboratory size, the accessibility of faculty, and individualized guidance. Our curricula are designed to develop skills that students need to cope successfully with today's changing society. Students are expected to acquire factual knowledge, technical and analytical skills, and writing and speaking competence. Our faculty are research-oriented, and encourage all students to learn biology by doing biology. Currently, we enjoy approximately \$1 million in national and state research funding in ecology, immunology, neurobiology, developmental biology, and molecular genetics that supports our efforts to provide students with independent research opportunities.

A student who successfully completes the Biology, Behavioral Neuroscience or Health Sciences majors is well-prepared to enter professional or graduate school. Typical areas of graduate study include medical, dental veterinary school; allied health programs in optometry, podiatry, physical therapy, occupational therapy, nursing, etc.; programs leading to the M.S. or Ph.D. degrees in any of the sub-disciplines of the biological sciences; and programs in science education.

Interested students should contact Dr. Paul Jivoff (pjivoff@rider.edu), Chair of the Department for more information.

COURSE OF STUDIES FOR THE BIOLOGY MAJOR

(Revised for Fall 2017)

A. Both of the following (with grade of "C" or better prior to advancing into upper level Biology courses)

- BIO 115/L Principles of Biology I
- BIO 116/L Principles of Biology II

B. Five (5) courses, at least one from each group listed below:

Group I Courses

- BIO-272/L Introduction to Marine Biology
- BIO-321/L Environmental Microbiology
- BIO-335/L Plant Biology
- BIO-340/L Evolutionary Biology
- BIO-350/L General Ecology
- BIO-372/L Behavior of Marine Organisms: An Evolutionary Approach
- MAR-325/L Marine Vertebrates: Fish to Mammals

Group II Courses

- BIO 215/L Medical Microbiology (renumbered from BIO-315/L)
- BIO 260/L Cell & Molecular Biology (renumbered from BIO-117/L)
- BIO 265/L Genetics
- BIO 300/L Developmental Biology
- BIO 305/L Vertebrate Physiology
- BIO 370/L Immunology
- BNS 275/L Behavioral Neuroscience
- BNS 310/L Neurobiology
- BNS 360/L Neurochemistry
- BNS 375/L Neuroethology: The Neural Circuits of Behavior
- BCH 325/326 Biochemistry I & lab

C. Chemistry requirements (all required)

- CHE 120 Principles of Chemistry
- CHE 121 Principles of Chemistry Lab
- CHE 122 Introduction to Chemical Systems
- CHE 123 Quantitative Methods Lab
- CHE 211/L Organic Chemistry I & lab
- CHE 214/L Organic Chemistry II & lab

D. Mathematics requirements (two courses from the following)

- **MTH-105 Algebra and Trigonometry
- BNS-250/L Biostatistics, ENV-200/L Statistical and Computer Applications in the Natural Sciences, or MTH 120 Introduction to Applied Statistics
- MTH-210 Calculus I
- MTH-211 Calculus II

E. Physics requirements

- PHY-100/L Principles of Physics I & lab, or PHY 200/L General Physics I & lab
- PHY-101/L Principles of Physics II & lab, or PHY 201/L General Physics II & lab

F. Capstone Seminar (one course from the following)

- BIO 400 Seminar in Cellular and Molecular Biology
- BIO 416 Bioinformatics
- BIO 420 Seminar in Organismal Biology
- BIO 450 Seminar in Ecology and Evolution

Note: Students must earn a grade of "C" or better in BIO-115/L and BIO-116/L to meet their major requirements and before enrolling in upper-level courses for which these courses are prerequisites.

**Course also satisfies LAS general education requirement

COURSE OF STUDIES FOR THE BEHAVIORAL NEUROSCIENCE MAJOR

(Revised for Fall 2016)

A. One of the following

- BNS-107 Life Science: Brain & Behavior
- PSY-100 Introduction to Psychology

B. All of the following

- *BIO 115/L Principles of Biology I
- *BIO 116/L Principles of Biology II
- BNS 275/L Behavioral Neuroscience (renumbered from BNS 118/L)
- **MTH 105 Algebra and Trigonometry
- CHE 120/121 Principles of Chemistry & lab
- CHE 122/123 Introduction to Chemical Systems & Quantitative Methods Lab

C. Statistics (one of the following)

- BNS-250/L Biostatistics,
- ENV-200/L Statistical and Computer Applications in the Natural Sciences
- MTH 120 Introduction to Applied Statistics

D. Neuroscience (at least two of the following)

- BNS 310/L Neurobiology
- BNS 360/L Neurochemistry
- BNS 375/L Neuroethology

E. Biology/Psychology (at least two of the following)

- BIO 260 or higher with lab
- PSY 200 or higher

F. At least one of the following

- BNS 300 or higher with lab
- BCH 225 or higher with lab
- PSY 300 or higher with lab

G. Capstone Seminar

- BNS 415 Seminar in Behavioral Neuroscience

**Note: Students must earn a grade of "C" or better in BIO-115/L and BIO-116/L to meet their major requirements and before enrolling in upper-level courses for which these courses are prerequisites.*

*** Course also satisfies LAS general education requirement*

COURSE OF STUDIES FOR THE HEALTH SCIENCES MAJOR

(Revised for Fall 2017)

A. All of the following

- *BIO 115/L Principles of Biology plus lab
- *BIO 116/L Principles of Biology II plus lab
- BIO 221/L Human Anatomy and Physiology plus lab
- BIO 222/L Human Anatomy and Physiology plus lab
- CHE 120/121 General Chemistry I plus lab
- CHE 122/123 General Chemistry II plus lab
- **PSY 100 Introduction to Psychology
- PSY 345 Health Psychology
- **MTH 105 Algebra and Trig
- BNS 250/L Biostatistics, or (PSY 105 Intro to Research + PSY-201 Stats and Research Design)
- HSC 490 or 491 Senior Capstone

B. At least two of the following

- BCH 225/L Basic Biochemistry
- PHY 100/L or PHY-200/L Physics I + lab
- PHY 101/L or PHY-201/L Physics II + lab
- BIO 206 Pharmaceutical Industry
- CHE 211/L Organic I + lab
- CHE 214/L Organic II + lab
- PSY 220 Abnormal Psychology
- PSY 230 Child Development
- PSY 231 Adolescent Development

C. At least two of the following

- BIO 260/L Cell Biology plus lab
- BIO 265/L Genetics
- BIO 300/L Developmental Biology
- BIO 305/L Vertebrate Physiology
- BIO 215/L Medical Microbiology
- BIO 370/L Immunology
- BNS 310/L Neurobiology
- BNS 360/L Neurochemistry
- HSC 302/L Kinesiology

D. At least three of the following

- HTH 205 Introduction to Health Care
- HTH 215 Population HealthCare Management
- GLS 325 Global Health, or NUR 407 Cultural Diversity in Global Society
- **PHL 304 Medical Ethics or BHP 309 Honors Seminar: Genetic Engineering and the Philosophy of Science
- BIO 105 Life Science & Society
- **SOC 101 Sociological Imagination
- SOC 346 Health Care and Society
- HSC 100 Introduction to Human Nutrition
- HSC 200 Environmental Health & Human Health

* Note: Students must earn a grade of "C" or better in BIO-115/L and BIO-116/L to meet their major requirements and before enrolling in upper-level courses for which these courses are prerequisites.

**Course also satisfies LAS general education requirement

LIBERAL ARTS AND SCIENCES GENERAL EDUCATION REQUIREMENTS:

In addition to major course requirements, all Biology, Behavioral Neuroscience and Health Sciences majors must complete the liberal arts general education requirements which can be found at: <http://www.rider.edu/biology>. To graduate, students must complete 120 credits of coursework, maintain an overall grade point average of at least 2.0, and maintain a grade point average of at least 2.0 in courses required for their major.

HONORS:

Baccalaureate Honors Program (BHP):

Students are invited to the Rider University Baccalaureate Honors Program as entering freshmen, or may apply as freshmen or sophomores. Invited students are generally among the 10% of the entering class; students currently enrolled at Rider must have at least a 3.3 GPA at the time of application to the program. In order to graduate as a Baccalaureate Scholar, a student must earn an overall GPA of at least 3.3 as well as a 3.3 GPA in the eight required honors courses, including the Senior Capstone. The Department strongly encourages eligible students to participate in this program. For more information regarding the BHP, please see the BHP website at: <http://www.rider.edu/bhp> or contact Dr. Bryan Spiegelberg (bspiegelber@rider.edu), the Director of Baccalaureate Honors.

Honors in Biology, Behavioral Neuroscience or Health Sciences:

Qualified Biology, Behavioral Neuroscience or Health Sciences majors may participate in the Departmental Honors program. For consideration, a student must have at least a 3.25 overall grade point average at the end of their junior year. In the senior year, a student seeking Honors must write and orally defend a written Honors Thesis based upon their independent research. A candidate who has a 3.25 cumulative average, a 3.5 average in their science courses, and who has completed an acceptable Honors Thesis, will be awarded Honors in Biology upon graduation. Please contact Dr. Jonathan Karp (jkarp@rider.edu) for information on Departmental Honors.

Beta Beta Beta Biological Honor Society

"Tri-Beta" is a national honor society affiliated with the American Association for Advancement of Science and the American Institute of Biological Sciences. Invitations for membership are extended to majors in the life sciences who have demonstrated superior academic achievement. Students are usually invited to join in their sophomore year when they have accumulated 12 credits in the sciences. Active membership is available to those with an overall grade point average of at least 2.8, and at least 3.0 in their science courses. The benefits of membership include academic recognition; a subscription to the journal *Bios*, to which members may submit research articles; opportunities to present papers at conventions; and research awards. Biology and Behavioral Neuroscience majors should make membership in Tri-Beta one of their goals. Please contact Dr. Jonathan Yavelow (yavelow@rider.edu), Tri-Beta advisor, for information regarding the Rider University chapter of Tri-Beta.

EXPERIENTIAL LEARNING OPPORTUNITIES:

Independent Study

Juniors and seniors who have a grade point average of at least 3.0 are encouraged to perform independent research in the laboratory of a faculty member by enrolling in BIO 490. A maximum of 12 BIO 490 credits will count toward university graduation requirements. Our students regularly present their research at state, regional, and national biological society meetings, and a number of projects have resulted in peer-reviewed journal articles. Research experience can improve students' chances of admission to graduate programs, or improve employment prospects subsequent to graduation. Contact any Department faculty member for information regarding independent research.

Hospital Internship:

An intensive three-week January hospital internship course is offered for sophomores and juniors interested in health-related careers. Rotations through selected major departments in the Capital Health System Hospitals and field trips to area medical schools are included. Please contact Dr. Jonathan Karp (jkarp@rider.edu), the pre-medical studies advisor, for more information.

Summer Research:

Individual faculty research grants allow us to hire students for summer research fellowships. Summer research topics include microbiology, molecular biology, developmental biology, immunology, behavioral neuroscience, and ecology. Contact any Department of Biology faculty member for information regarding their summer research programs.

Off-campus Internships: Rider University has an active Science Advisory Board composed of executives from New Jersey-based pharmaceutical and biotechnology companies. Internships are frequently offered to our students as a result of our relationships with these companies. Students can arrange other off-campus internships in association with a faculty sponsor. Contact Dr. Julie Drawbridge (drawbridge@rider.edu) for information regarding off-campus internships.

ACADEMIC ADVISEMENT:

Academic decisions are the responsibility of each student. Nevertheless, the Department recognizes a certain amount of guidance is needed to insure that each student has been provided with all of the necessary information that will permit him/her to make sound academic and career decisions. The Biology faculty have a genuine concern for the education of the students at Rider University. Accordingly, students should not hesitate to talk with their professors and/or advisor whenever questions or problems arise. Furthermore, students who work to establish a collaborative relationship with faculty will find it much easier to request and receive positive letters of recommendation.

At times, students need advice concerning non-academic problems. In those cases, the student is encouraged to talk with his/her professors and also to seek advice through the Rider University Counseling Center. This center is located on campus and is open to students from 9:00 AM to 5:00 PM every school day. Students should refer to the Counseling Services website (<http://www.rider.edu/student-life/health-wellness/counseling-services>) for further information.

STUDENT LIFE:

Faculty from the Department of Biology are advisors to the Science Learning Community (SLC) which is housed in the first floor of the Switlik residence hall. The SLC was established to provide academic and social support for science majors at Rider and is open to all students studying science. SLC programs include residence hall-based tutoring and mentoring programs, as well as social programming for science majors. Past activities have included field trips to the Adventure Aquarium, Mutter Museum and Franklin Institute; Hamilton-Trenton Marsh and Jersey shore clean-up trips; SLC game and movie nights; and an SLC book club. Please contact Dr. Julie Drawbridge (drawbridge@rider.edu) or Dr. Todd Weber (tweber@rider.edu) for information on the Science Learning Community.