

HANDBOOK FOR BIOLOGY AND BEHAVIORAL NEUROSCIENCE MAJORS 2008/2009

DEPARTMENT OF BIOLOGY WEBSITE:

The information provided in this handbook as well as updated Departmental news and information can be found on the Department of Biology website: http://www.rider.edu/172_1719.htm.

FACULTY:

Dr. Kelly Bidle (kbidle@rider.edu) – molecular genetics of extremeophile prokaryotes
Dr. Julie Drawbridge (drawbridge@rider.edu), Chairperson - vertebrate developmental biology
Dr. Jon Hayashi (johayashi@rider.edu), Visiting Professor – neural cell biology and physiology
Dr. Laura Hayatt (lhyatt@rider.edu) - ecology of invasive plants
Dr. Paul Jivoff (pjivoff@rider.edu) - ecology and behavior of marine invertebrates
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), Premedical, Pre-professional Studies Advisor - immunology and cancer
Dr. Todd Weber (tweber@rider.edu), Pre-allied Health Advisor - circadian behavior in mammals

OVERVIEW:

The educational goals of the Rider University Department of Biology 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 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 or Behavioral Neuroscience 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. Julie Drawbridge (drawbridge@rider.edu), Chair of the Biology Department, for more information.

COURSE OF STUDIES FOR THE BIOLOGY MAJOR:

A. All of the following:

BIO 115 & 115L Principles of Biology: Evolution, Diversity and Biology of Animals

BIO 116 & 116L Principles of Biology: Evolution, Diversity and Biology of Plants

BIO 117 & 117L Principles of Biology: Evolution, Diversity and Biology of Cells

B. Four of the following; at least one from each group:

Group I Courses:

BIO 272 & 272L Introduction to Marine Biology

BIO 321 & 321L Environmental Microbiology

BIO 335 & 335L Modern Plant Biology

BIO 340 & 340L Evolutionary Biology

BIO 350 & 350L General Ecology

BIO 372 & 372L Behavior of Marine Organisms: An Evolutionary Approach

MAR 325 & 325L Marine Vertebrates: Fish to Mammals

Group II Courses:

BIO 265 & 265L Genetics

BIO 300 & 300L Developmental Biology

BIO 305 & 305L Vertebrate Physiology

BIO 315 & 315L Medical Microbiology

BIO 370 & 370L Immunology

BNS 310 & 310L Neurobiology

BNS 360 & 360L Neurochemistry

BNS 375 & 375L Neuroethology

C. One of 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

BNS 415 Seminar in Behavioral Neuroscience

D. Chemistry requirements (ALL REQUIRED)

CHE 120 & 121 Principles of Chemistry and Lab

CHE 122 & 123 Introduction to Chemical Systems and Lab

CHE 211 & 213 Organic Chemistry I and Lab

CHE 214 & 216 Organic Chemistry II and Lab

E. Mathematics requirements (TWO REQUIRED)

ENV 200 & 200L Statistical & Computer Applications in the Natural Sciences or MTH 120

Introduction to Applied Statistics

MTH 105 Algebra and Trigonometry

MTH 210 Calculus I

MTH 211 Calculus II

F. Physics requirements (ALL REQUIRED)

PHY 100 & 100L or PHY 200 & 200L Principles of Physics I

PHY 101 & 101L or PHY 201 & 201L Principles of Physics II

COURSE OF STUDIES FOR THE BEHAVIORAL NEUROSCIENCE MAJOR

A. One of the following:

BNS 107 Life Science: Behavioral Neuroscience Emphasis
PSY 100 Introduction to Psychology

B. All of the following:

BIO 115 & 115L Principles of Biology: Evolution, Diversity and Biology of Animals
BIO 117 & 117L Principles of Biology: Evolution, Diversity and Biology of Cells
BNS 118 & 118L Behavioral Neuroscience
BNS 415 Seminar in Behavioral Neuroscience
CHE 120 & CHE-121 General Chemistry I with Lab
CHE 122 & CHE-123 General Chemistry II with Lab
MTH 105 Algebra and Trigonometry

C. One of the following:

ENV 200 & 200L Statistical & Computer Applications in the Natural Sciences
PSY 201 Statistics in Psychology

D. At least two of the following:

BNS 310 & 310L Neurobiology
BNS 360 & 360L Neurochemistry
BNS 375 & 375L Neuroethology

E. At least two of the following:

BIO 265 or higher with lab
PSY 200 or higher

F. At least one of the following:

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

LIBERAL ARTS AND SCIENCES CORE REQUIREMENTS:

In addition to major course requirements, all Biology and Behavioral Neuroscience majors must complete the liberal arts core requirements which can be found at: http://www.rider.edu/172_2605.htm. 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 of Biology 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/172_2142.htm or contact Dr. Arlene Wilner (wilner@rider.edu), the Director of Baccalaureate Honors.

Freshman Honors Research:

High achieving incoming freshmen are invited to apply for Science Honors Research during their freshman year. Students who participate in this program are paid a stipend during the regular semester and may elect to continue their research during the summer. Please contact Dr. Julie Drawbridge (drawbridge@rider.edu) or Dr. Todd Weber (tweber@rider.edu) for information about the Freshman Honors program.

Honors in Biology or Behavioral Neuroscience:

Qualified Biology or Behavioral Neuroscience 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. Julie Drawbridge (drawbridge@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. Philip Lowrey (plowrey@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 of Biology 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. James Riggs (riggs@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. Please contact Dr. Jonathan Yavelow (yavelow@rider.edu), Assistant Dean of Sciences, for information regarding off-campus internships.

ACADEMIC ADVISEMENT:

Academic decisions are the responsibility of each student. The Department, however, recognizes that 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/175_555.htm) for further information.

STUDENT LIFE:

Faculty from the Department of Biology serve as 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 Camden 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.