

Bucknell UNIVERSITY

2009-10 Catalog

College of Arts and Sciences

Animal Behavior (ANBE)

Coordinating Committee: Warren G. Abrahamson, Elizabeth C. Evans, Donald C. Dearborn, Owen R. Floody, Peter G. Judge (Director), Kevin P. Myers, DeeAnn Reeder

The program in animal behavior offers an interdisciplinary major that includes the subject matters of biology, chemistry, mathematics, physics, and psychology. The focus is directed toward understanding behavior and providing the student with a background uniting ecological, ethological, environmental, evolutionary, and experimental approaches to the study of animal life.

During the more than 30 years that Bucknell University has offered this major, animal behavior has been chosen by students seeking a broad background in the natural and social sciences, by those who become researchers, occasionally as a background for medicine or veterinary science, and because of the breadth of requirements, by persons filling a variety of positions in commerce, law, and public service.

The major may be pursued under either the bachelor of arts or the bachelor of science programs. The programs differ chiefly in the number of advanced science courses and laboratories. All students are encouraged to seek laboratory and field experiences in addition to required course work. The Bucknell laboratories, as well as opportunities abroad, are well suited to so complement the student's education. Research culminating in an honors thesis is especially recommended.

The **bachelor of arts major** consists of ANBE 266; any three from BIOL 205, BIOL 206, BIOL 207, or BIOL 208. (BIOL 205 and BIOL 208 are strongly recommended. Students should consult with an academic adviser in animal behavior to determine the most appropriate biology course selections given their academic goals); CHEM 211 and CHEM 212 or CHEM 201 and 202; PSYCH 203; PSYCH 250; either PSYC 215 or MATH 216; ANBE/PSYC 296; three animal behavior electives from the set consisting of BIOL 303, BIOL 313, ANBE/PSYC 317, BIOL 318, ANBE 319 or ANBE 320, ANBE/BIOL 321, BIOL 324, ANBE/BIOL 341, ANBE/BIOL 342, ANBE/BIOL 354, ANBE/BIOL 355, ANBE/BIOL 356, ANBE/BIOL 357, BIOL 358, ANBE/BIOL/PSYC 370, ANBE/BIOL 415, PSYC 324, PSYC/BIOL 343, ANBE 391, ANBE 399. With special permission, other PSYC/BIOL courses can be considered as electives.

The **bachelor of science major** consists of the same course credits noted above plus: all four biology core courses, rather than three; PHYS 211 and PHYS 212; MATH 201; either PSYC 290 or PSYC 293; and four electives rather than three.

The recommended sequence for the bachelor of science major is as follows:

First Year	First Semester: ANBE 266, BIOL 205, MATH 201 Second Semester: BIOL 206
Sophomore Year	First Semester: BIOL 207, either PSYC 215 or MATH 216, CHEM 211 or CHEM 201 Second Semester: BIOL 208, PSYC 203, PSYC 250, CHEM 212 or CHEM 202
Junior Year	First Semester: Research Methods course (PSYC 290, PSYC 293, or PSYC 296), one animal behavior elective; PHYS 211 Second Semester: Research methods course (PSYC 290, PSYC 293, or PSYC 296), one animal behavior elective, PHYS 212
Senior Year	First Semester: Animal behavior elective, research methods course (PSYC 290, 293, or PSYC 296 if not taken previously) Second Semester: Animal behavior elective

All students are advised to take the biology core courses in sequence, starting with BIOL 205. BIOL 208 serves as the prerequisite for most of the elective courses. A student's choice of the chemistry sequence (either CHEM 201-202 or CHEM 211-212) should be made in consultation with the student's academic adviser. Note that for both programs only one semester of independent research or honors credit may count toward the major.

Off campus study and research is encouraged. Students may enroll in any number of programs emphasizing animal life; recent students have studied in Africa, Australia, and New Zealand. Other programs in Europe, Asia, South and Central America also are appropriate. Students are advised to explore opportunities through the Office of International Education and to coordinate off-campus coursework in consultation with a faculty adviser. Many minors complement studies in animal behavior; students are encouraged to explore options within the humanities and social sciences in consultation with a faculty adviser.

Asterisks (*) indicate courses in which animal dissection **OR** experimentation with living animals may be involved in the course or laboratory.

266. Animal Behavior (I; 3, 0)

A survey of important theories, issues, and empirical techniques in the interdisciplinary field of animal behavior emphasizing both proximate and ultimate mechanisms and explanations for behavior. Crosslisted as BIOL 266 and PSYC 266.

continued

296. Applied Research Methods Seminar in Animal Behavior (I or II; 0; 3*)

Laboratory and/or field research to accompany ANBE/BIOL/PSYC 266 (Animal Behavior) Prerequisite: PSYC 215 and prerequisite or corequisite ANBE/BIOL/PSYC 266. Crosslisted as PSYC 296.

317. Comparative Animal Cognition (I or II; 3, 0)

Advanced seminar in issues of nature/nurture, learning, development, and adaptation, in behaviors such as foraging, mating and communication in several species. Prerequisites: ANBE/BIOL/PSYC 266 and PSYC 203 or permission of the instructor. Crosslisted as PSYC 317.

319 and 320. Topics in Animal Behavior (I and II; R; 3, 0) Half to full course.

Occasional seminars on selected topics of current interest in animal behavior. Prerequisites: ANBE/BIOL/PSYC 266, junior or senior status and permission of the instructor.

321. Behavioral Ecology (I; 3, 0)

The consideration of behavioral adaptations to various ecological situations. Topics include habitat choice, foraging behavior, defenses against predation, mate choice, and brood care. Prerequisites: BIOL 208 and permission of the instructor. Crosslisted as BIOL 321.

341. Organic Evolution (AI; 4, 0)

The principles and mechanisms of evolution in plants and animals, covering population phenomena, speciation, life history strategies, adaptation, systematics, and biogeography. Prerequisites: BIOL 208 and permission of the instructor. Crosslisted as BIOL 341.

342. Neuroethology (I or II; 3, 0)

A course that integrates neurobiology and behavior in natural contexts. Emphasis on signal detection, recognition, discrimination, localization, orientation, and the control of complex acts. Neuronal and hormonal mechanisms, ontogeny and evolution of behavior will be considered. Prerequisites: BIOL 206, BIOL 208 and permission of the instructor. Crosslisted as BIOL 342.

354. Tropical Ecology (II; 3, 0)

Introduction to tropical ecology, including life history strategies of vertebrates and invertebrates, biodiversity management and conservation. Emphasis on class and individual projects, data collection, and journal keeping. Prerequisites: BIOL 208 and permission of the instructor. Crosslisted as BIOL 354.

355. Social Insects (I; 3, 3)

Evolution and genetics of social behavior, caste, communication in foraging and colony defense, queen and worker control over reproduction, social homeostasis, and population dynamics. Occasionally may be taught as a laboratory science. Prerequisites: BIOL 208 and permission of the instructor. Crosslisted as BIOL 355. Juniors and seniors only.

356. Plant-Animal Interactions (I; 3, 3)

The coevolution and ecology of plants and animals covering pollination ecology, seed dispersal, plant-herbivore interactions, and habitat constraints on the behavioral ecology of animals. Prerequisites: BIOL 122 or BIOL 208 and permission of the instructor. Crosslisted as BIOL 356.

357. Ornithology (II; 3, 3)

The biology of birds, including evolution, behavior, anatomy, physiology, ecology, and conservation; lab trips focus on identification of birds in the field. Prerequisites: BIOL 206 and BIOL 208 or permission of the instructor. Crosslisted as BIOL 357.

370. Primate Behavior and Ecology (I; 3, 3*)

Introduction to research on prosimians, monkeys, and apes, including diversity, social evolution, sexual selection, reproduction, social behavior, and cognitive abilities. Prerequisites: BIOL 122, or BIOL 208, or BIOL 266 and permission of the instructor. Crosslisted as BIOL/PSYC 370.

391. Research (I, II, and S; R; 1-3, 1-3) Half to full course.

Independent research, with faculty supervision, in the study of animal behavior. Prerequisite: permission of the instructor.

399. Senior Thesis (I, II, and S; R; 2, 10)

Original research leading to a thesis presentation on a topic related to the study of animal behavior. Prerequisite: permission of the instructor. Seniors only.

415. Conservation Biology (II; 4, 0)

A synthesis of topics relating to the conservation of plants and animals including extinction, genetics, demography, insularization, threats to biodiversity, conservation economics, environmental ethics, and strategies for conservationists. Prerequisites: BIOL 208 or BIOL 122 and permission of the instructor. Crosslisted as BIOL 415.