

Biology

College of Arts & Sciences

The Biology Graduate Program offers Doctor of Philosophy and Masters of Science degrees (thesis and non-thesis) in Biology, but doctoral training is strongly emphasized. Master's training is not a prerequisite for admission into our doctoral program. Applicants are selected for admission based on their overall academic record, GRE scores, letters or recommendation, prior research experience, and on their expressed interest in our graduate program training areas or the research of the Biology Department faculty members.

Training

Graduate students are trained through a combination of formal coursework and research experience. Research training consists of work on a research project under the guidance of one or more of our faculty members. The specific research project is chosen in consultation with the faculty mentor and typically is closely related to the research interests of that lab. A one-credit Biology Graduate Student Orientation seminar course is required for all first year graduate students admitted into the Biology program. All students must complete a set of common requirements for the Biology Graduate Program, including seminar courses, research, a qualifying exam (for Ph.D. candidates), and an exit exam (thesis defense for Ph.D. and Plan A M.S.). Additional coursework depends on the area of specialization and is determined with input from the faculty mentor and student's advisory committee and the training program. The training programs include Environmental and Evolutionary Biology (EEB), Molecular, Cellular and Developmental Biology (MCDB), and Tailored Training (TT).

Environmental and Evolutionary Biology Training Program

The Environmental and Evolutionary Biology group supports education and research on the interactions between organisms and their environment from an evolutionary perspective. This includes the study of micro- and macro-evolutionary processes; the physiological, developmental, and behavioral adaptations of individual organisms; predator-prey, mutualistic, and competitive interactions; and community and ecosystem relationships. Faculty members conduct research exploring both basic underlying principles and specific applied consequences of ecological interactions. The group's core philosophy is that major advances in understanding how organisms evolve and function in changing ecological systems are achieved in an interactive, interdisciplinary research environment involving diverse conceptual and methodological approaches. Students achieve this through coursework, topical seminars, weekly research seminars, and research projects guided by their major advisor and thesis committee.

Molecular, Cellular and Developmental Biology Training Program

Molecular, Cellular and Developmental Biology (MCDB) training focuses on fundamental cellular and developmental processes such as gene expression, cell proliferation, cell signaling, development, neural function, aging, and behavior. We apply biochemical, genetic, physiological, and molecular techniques to resolve outstanding issues in biology and use a diverse set of experimental organisms (e.g. fungi, cultured cells, and complex animals ranging from the fruit fly to mouse). Entering MCDB students rotate through two different laboratories before selecting a research mentor near the end of the first year of study. Students participate in weekly research and literature seminars and are guided in the selection of other formal course work in order to best prepare for their thesis/dissertation studies. The faculty and students in the MCDB group interact closely with each other, with colleagues elsewhere on our campus, and with scientists worldwide to achieve a stimulating research atmosphere. Our program successfully prepares students for scientific research careers in academic, industrial and governmental settings.

Tailored Training

The Tailored Training program provides great curricular flexibility. The principal difference between Tailored Training and training in the MCDB and EEB programs is that there are no set course requirements, other than the minimum requirements set by the Biology Graduate Program. The mentor and advisory committee work together with the student to customize a curriculum that best suits the needs, interests, and goals of the student. This may be particularly advantageous for students whose primary interests encompass areas outside of or across the other training programs. The curriculum is unique to each student, but not isolating. The student is encouraged to participate in relevant seminars, journal clubs, or other activities attended by students in the MCDB and EEB training programs or in other University graduate training programs. Students admitted through the Tailored Training option enter the Biology Graduate Program directly into the lab of their research mentor. Applicants interested in admission through this mechanism should contact the faculty member with whom they wish to train and also indicate their lab of choice in the Biology application. Faculty members offering Tailored Training will indicate this option on their web pages.

Financial Support

Full financial support is offered to all Ph.D. and Plan A M.S. students accepted for graduate admission; no financial aid application is required. Support may include teaching assistantships and fellowships provided by the university and department, research assistantships offered by faculty mentors, interdisciplinary traineeships and fellowships or extramural research fellowships to individual students.

Admission Requirements

Anyone with a bachelor's degree from an accredited college or university may apply for admission to the Biology Graduate Program at either the MS or Ph.D. levels. Applicants are generally expected to have an undergraduate grade point average of at least 3.0 (out of 4.0), a combined verbal and quantitative Graduate Record Examination score of at least 1100 (old scoring system) or 300 (new scoring system) and, for non-native English speakers, a TOEFL score of at least 550 on paper based test or 213 on the computer-based test (CBT) or 79 on internet-based test (IBT). Our GRE institution code is 1837 and Department Code is 0206. We encourage completed applications by January 1 although applications will continue to be reviewed until all positions are filled.

Prerequisite college-level coursework includes one year of physics, two years of chemistry, one semester of calculus, one year of general biology, and upper-level courses providing a working knowledge of contemporary biology. Every student entering the Biology Graduate Program is presented with the Graduate School Bulletin at orientation to familiarize the students with UK Graduate School policy. In addition, each student is provided with a copy of the Rules, Regulations & Policies for the Biology Graduate Program which describes the Departmental rules governing the Biology Graduate Program.

The Biology Graduate Program application is available online. This application and additional information about the Biology Graduate Program can be found at the Program website: <http://bio.as.uky.edu/grad-program>.

Graduate Courses

A&S 500	Special Topics Course (Animal Senses; Stem Cells & Tissue, Engineering; Homeostasis)	(1-4)
Bio 401g	Special Topics In Biology:Elementary, Middle School & High School Teachers	(1-4)
Bio 430g	Plant Physiology	(3)
Bio 452g	Laboratory In Ecology	(2)
Bio 494g	Immunobiology (Same As Mi 494g)	(3)
Bio 502	Principles Of Systems, Cellular & Molecular Physiology (Same As Pgy 502)	(5)
Bio 507	Biology Of Sleep And Circadian Rhythms	(3)
Bio 508	Evolution	(3)

Bio 510	Recombinant Dna Techniques Laboratory	(4)
Bio 520	Bioinformatics (Same As Inf 520)	(3)
Bio 529	Developmental Biology	(3)
Bio 530	Biogeography And Conservation (Same As Geo 530)	(3)
Bio 535	Comparative Neurobiology And Behavior (Same As Pgy 535)	(3)
Bio 542	Histology	(5)
Bio 550	Comparative Physiology	(3)
Bio 551	Life Cycle Ecology Of Flowering Plants	(4)
Bio 555	Vertebrate Zoology	(5)
Bio 559	Ornithology	(4)
Bio 560	Environmental Physiology And Toxicology (Same As Tox 560)	(4)
Bio 561	Insects Affecting Human And Animal Health (Same As Ent 561)	(3)
Bio 563	Parasitology (Same As Ent 563)	(4)
Bio 564	Insect Taxonomy (Same As Ent 564)	(4)
Bio 568	Insect Behavior (Same As Ent 568)	(3)
Bio 570	Invertebrate Zoology	(4)
Bio 575	Plant Anatomy And Morphology	(4)
Bio 601	Special Topics In Molecular And Cellular Genetics (Bch/Mi/Pls/Ppa 601)	(1)
Bio 606	Conceptual Methods In Ecology And Evolution (Same As Ent/For 606)	(3)
Bio 607	Advanced Evolution (Same As Ent/For 607)	(2)
Bio 608	Behavioral Ecology And Life Histories (Same As Ent/For 608)	(2)
Bio 609	Population And Community Ecology (Same As Ent/For 609)	(2)
Bio 612	Biology Of Aging (Same As Ana/Grn/Pgy 612)	(3)
Bio 615	Molecular Biology (Same As Mi/Bch 615)	(3)
Bio 620	Plant Molecular Biology (Same As Pls 620)	(3)
Bio 621	Topics In Modern Biology (Advanced Genetics; Population Biology; Biometry; Membrane Biophysics)	(1-3)
Bio 622	Physiology Of Plants I (Same As Pls/For 622)	(3)
Bio 623	Physiology Of Plants II (Same As Pls/For 623)	(3)
Bio 625	Insect-Plant Relationships (Same As Ent 625)	(3)
Bio 635	Insect Physiology And Internal Morphology (Same As Ent 635)	(4)
Bio 638	Developmental Neurobiology (Same As Ana/Pgy/Psy 638)	(3)
Bio 650	Animal Physiology Laboratory (Same As Pgy 650)	(2)
Bio 665	Insect Ecology (Same As Ent 665)	(3)
Bio 684	Phylogenetic Systematics (Same As Ent 684)	(3)
Bio 685	Advanced Immunobiology (Same As Mi 685)	(3)
Bio 707	Contemporary Topics In Immunology	(2)
Bio 720	Microbial Structure And Function (Same As Mi/Obi 720)	(4)
Bio 740	Mammalian Radiation Biology (Same As Rm 740)	(2)
Bio 748	Master's Thesis Research	(0)
Bio 749	Dissertation Research	(0)
Bio 767	Dissertation Residency Credit	(2)
Bio 768	Residence Credit For Master's Degree	(1-6)
Bio 769	Residence Credit For Doctor's Degree	(0-12)
Bio 770	Seminar In Biology (Subtitle Required)	(1)
Bio 772	Seminar In Microbiology (Same As Mi 772)	(0-1)
Bio 773	Seminar In Plant Physiology (Same As Pls 773)	(1)
Bio 782	Advanced Virology (Same As Vs 782)	(3)
Bio 790	Mentoring Undergraduate Research In Biology	(1)
Bio 795	Research In Biology	(1-9)