Integrated Biology, Ph.D.

The Department of Biology's graduate programs in integrated biology emphasize original research and developing the skills essential for publishing and communicating research findings to the scientific community. Research programs in the department cover many areas of the biological sciences: cell biology, developmental biology, ecology, evolution, genetics, and neurobiology. Graduate study in the department provides students with a broad understanding of these basic areas.

When new graduate students are admitted, they are assigned a temporary advisor. Each student and the advisor discuss the student's educational background and formulate a first-semester study plan before the student registers for courses. The programs allow each student to tailor course work to the research interest of the student. Students may be advised to take specific course work in order to enhance their background in certain areas.

During the first year, students whose preparation in chemistry, genetics, mathematics, and physics does not meet the department's graduate entry requirements may need to remedy deficiencies by taking appropriate course work.

Minimum entry requirements are:

- two semesters of organic chemistry, or one semester of organic chemistry and one semester of biochemistry;
- one semester of calculus;
- two semesters of college physics; and
- 20 s.h. of course work in biology.

A student with a bachelor's degree outside the biological sciences may request modification of certain area requirements. The Graduate Affairs Committee decides whether portions of the requirements may be waived.

Requirements

The Doctor of Philosophy program in integrated biology requires a minimum of 72 s.h. of graduate credit.

New Ph.D. students will go through three laboratory rotations with different faculty during their first semester (August-December). Students consult with their temporary advisors and with prospective faculty research sponsors before identifying their preferences for research rotations. Based on their rotations, they choose a laboratory affiliation for their thesis. This is done late in the first semester.

During the first year (both semesters), students are required to enroll in BIOL:6298 Concepts, Models, and Systems in Biology (COSMOS) Seminar, which introduces them to multiple levels of biological analysis and provides them with significant opportunities to hone their skills in written and oral communication. At the end of the first year, students take a qualifying exam that consists of essay questions based on major themes in biology. Students must perform satisfactorily on this exam in order to continue in the program.

During the first two years, students must enroll in at least two advanced lecture courses (or courses approved by the Graduate Affairs Committee), one approved data informatics or statistics course, and one free elective (either another advanced lecture or informatics course). Prior to the comprehensive examination, students also take a seminar course (2 s.h.), that has a significant writing and oral presentation component, and BIOL:6188 Seminar: Writing in Natural Sciences.

The comprehensive examination is taken in the summer of the second year in residence. Students prepare a National Institutes of Health/National Science Foundation-style grant application on their planned thesis work and orally defend this work in front of a review committee. Students must demonstrate knowledge of biology fundamentals and the analytic and synthetic skills necessary to become creative, independent scientists. Once they complete the course work and proficiency requirements and pass the comprehensive examination, students may be admitted to full candidacy for the Ph.D.

Following comprehensive examinations, Ph.D. students must take at least two additional seminar courses (2 s.h. each). Seminar courses from other departments may be approved by the Graduate Affairs Committee in consultation with the faculty advisor to satisfy the requirement.

Ph.D. students must serve as teaching assistants for at least two semesters in order to develop and demonstrate teaching. The first teaching semester takes place during the spring of the student's first year and is preceded by extensive departmental training in effective teaching skills.

The department also offers career seminars that explore types of employment outside of academic research, including teaching careers and other topics.

The program culminates in students' preparation of a dissertation based on original independent research. Students must pass a final examination that covers the thesis and its specialized field before the Ph.D. is awarded.

Visit Integrated Biology Graduate Program for more detailed information about the Doctor of Philosophy program.

Admission

Application materials for the graduate program must be uploaded to the University's Office of Admissions website. These are reviewed by the Department of Biology Graduate Recruitment and Admissions Committee. For detailed instructions, visit iBio Application on the integrated biology graduate program website.

Applicants must hold a valid B.A. or B.S. from an accredited institution. Applicants should supply official transcripts from each undergraduate and graduate institution they have attended along with scores from the Graduate Record Examination (GRE) General Test (verbal, quantitative, and analytical writing). The GRE Subject Test in biology or biochemistry is optional but not required.

Applicants whose first language is not English must score at least 100 (Internet-based) on the Test of English as a Foreign Language (TOEFL) and have their score sent to the Office of Admissions. International applicants who received their degrees (either bachelor's or master's) from a U.S. institution are exempt from this requirement. All international students whose first language is not English are required to take the on-campus English Proficiency Evaluation before they first enroll for classes.

Successful applicants for graduate admission typically have a g.p.a. of at least 3.00 (on a 4.00 scale) and a Graduate Record Examination (GRE) General Test score above 1200 (combined verbal and quantitative) on the older GRE test.
or 308 (combined verbal and quantitative) on the revised GRE. The admissions committee also considers letters of recommendation, research experience, and other appropriate criteria.

Although most applicants have completed undergraduate programs in biology, the department also considers applicants with backgrounds in related sciences, providing they have taken the required course work.

Students with bachelor's degrees in other areas may need to register as nondegree students and complete the equivalent of the department's bachelor's degree program prior to consideration for admission. Nondegree students must complete chemistry, physics, and calculus requirements in addition to the biology courses listed in the undergraduate program. Nondegree students should consult the department's graduate program administrator before applying for admission.

Applications are due by January 1 (visit Integrated Biology Graduate Program for updated deadline information) and must include the applicant's GRE test scores. In order to meet the deadline, applicants must take the GRE in October or earlier. Late applications are considered as placement and funding permit.

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations of the Graduate College.

**Financial Support**

All graduate students making satisfactory progress toward the Ph.D. receive stipend and tuition support from non-University of Iowa fellowships and from teaching assistantships or research assistantships available through individual research grants administered by faculty members or by the University. First-year Ph.D. students are supported by department fellowships during the research rotation period and by teaching assistantships during the spring semester. Offers of admission include information about offers of financial support.

**Career Advancement**

The graduate program in integrated biology prepares students for careers in academic research, science education, industry, government, and a variety of other careers in which their scientific expertise can be used.

The Pomerantz Career Center offers multiple resources to help students find internships and jobs.