Doctor of Philosophy in Biology

Goals and Program Description

The Ph.D. program in Biology is designed to prepare graduates for careers in the biological sciences, working in academia, industry, and government research labs.

General Admission and Course Requirements

The Doctor of Philosophy is a research degree granted for proven ability, independent investigation, and scholarly contribution in a specialized field. It is not granted solely on the completion of a certain number of credits. Dissertation research must involve original and creative work. Credits for the dissertation and research on which it is based should comprise a substantial portion of the Program of Study. In addition to the departmental graduate program core course requirements, students in the Ph.D. program in Biology are expected to have knowledge of cell & molecular biology, organismal biology, and ecology & evolution, through coursework or directed readings. For applicants who hold only a bachelor's degree in biology or a related discipline, entrance requirements will be closely followed. Students will normally be required to satisfy deficiencies of any courses typically required for the bachelor's degree in biology or a related field. For applicants who hold an M.S. degree in Biology or a related discipline, entrance requirements may be more flexible (contact program director for details).

Incoming Ph.D. students are required to take a diagnostic examination to assess the breadth of his or her background in biological science and to help plan the Program of Study. The diagnostic exam must be completed in the student's first semester (as part of BIOL 6690), is conducted by an exam committee appointed by the Chair of the Graduate Committee, and results in a diagnostic exam report. See the Biology Graduate Program website for guidelines and other information.

An advisory committee will guide each student in establishing his or her Program of Study based upon the student's diagnostic exam report, background, and research interests. Formation of the advisory committee will occur in the student's first semester. Typically, a full-time Ph.D. student on a departmental assistantship or fellowship will take 9 credit hours in fall and spring semesters and 1 credit hour in summer semesters, for a total of 75 credit hours for 4 years of study, including:

Code	Title	Credits
Courses required of all biology graduate students		6
BIOL 6690	Introduction to Graduate Studies	1
BIOL 6691	Seminar	1
BIOL 6605	Biometry	4
BIOL 6648	Graduate Problems	4 or more
BIOL 6692	Seminar	1
BIOL 8850	Doctoral Dissertation	1-12

Remaining credit hours will come from coursework at the graduate level (55xx or 66xx), the majority of which must be earned from the ISU Department of Biological Sciences. Courses, seminars, special projects, or readings assigned by the student's advisory committee will provide mastery in appropriate core conceptual areas in the biological sciences (including genetics and evolution; anatomy and physiology of animals or plants; cell biology, biochemistry, & molecular biology; and ecology).

A Ph.D. student is encouraged to develop a minor that complements the student's area of research. Minors must include 9 credits of coursework reflecting a common theme (e.g., biometry, microscopy, or a related field outside the biological sciences, such as geology, engineering, economics, or computer science). Ph.D. students who develop a minor in Biological Education will leverage the Doctor of Arts in Biology curriculum: The Biological Education minor consists of 4 credits of seminars (BIOL 6693 (http://coursecat.isu.edu/search/?P=BIOL%206693) and/or BIOL 6694 (http://coursecat.isu.edu/search/?P=BIOL%206694)) and 5 credits of Supervised Teaching Internships (BIOL 7700 (http://coursecat.isu.edu/search/?P=BIOL%207700)). Students who pursue the minor in Biological Education are eligible for D.A. Fellowship support.

Research Requirements

A dissertation proposal defense must be completed no later than the student's third semester (typically fall); a written proposal will be given to the advisory committee 1 week prior to a proposal seminar (presented to the department as part of BIOL 6691 (http://coursecat.isu.edu/search/?P=BIOL%206691)), to be followed by an oral proposal defense. The successful proposal defense will result in the development and submission of the final Program of Study to the graduate program director. Once the student has successfully defended the research proposal and completed a Program of Study, the student is advanced to candidacy and may sign up for BIOL 8850 (http://coursecat.isu.edu/search/?P=BIOL%208850) (Doctor's Dissertation).

By the end of the sixth semester (or whenever coursework described in the Program of Study is complete), a Ph.D. candidate must sit for a Comprehensive Exam, consisting of a written and an oral portion. The exam will reflect the student's areas of research and other specific knowledge the student's advisory committee determines is necessary to successfully address the student's dissertation research.

A substantial, original research project is required, culminating in a written dissertation describing the research. The dissertation must demonstrate the student's ability in independent investigation and must be a contribution to scientific knowledge. It must display mastery of the literature of the subject field and must demonstrate an organized, coherent development of ideas, with a clear exposition of results and a creative discussion of the conclusions. The dissertation examination requires a public presentation at a Biological Sciences department seminar, followed by a satisfactory oral defense to the advisory committee.

Additional details regarding the graduate timeline are available on the ISU Department of Biological Sciences website (https://www.isu.edu/bios/).