The Integrative and Organismal Biology (IOB) option offers a home to students interested in basic organismal biology in all of its diverse aspects (physiology, neurobiology, behavior, cell biology, genetics, evolution, ecology, systematics, etc.), in both terrestrial and aquatic environments. Modern biology employs approaches and tools ranging from molecular to ecological levels to gain a deep understanding of organismal functions and adaptations. Students in IOB approach their studies with a focus on organisms, and apply whatever tools are necessary to answer thematic and specific questions. Students interested in combining hands-on biological projects with research on teaching and learning biology at the post-secondary level should choose this option. Students completing degrees in IOB will be prepared for a wide range of professional careers in animal and/or plant biology, whether in academia, government, research, or nonprofit organizations.

Requirements

Ph.D. Degree Requirements

Students work with their advisor and their Doctoral Guidance Committee to plan a program of study including the required core courses and competencies, and develop a viable research proposal. The Guidance Committee is normally established by the end of the first semester, and should meet by the end of the second semester. The student presents to the Guidance Committee a preliminary research proposal in which the soundness, originality, and feasibility of the planned research are clearly described. The Guidance Committee is responsible for approving the proposal, and also oversees the qualifying examination through which the student is admitted to doctoral candidacy. The Doctoral Dissertation Committee is established at this point. To earn the Ph.D. degree, students must complete an original dissertation project, present the results at a public seminar, pass an oral dissertation defense consisting of questions from members of the Dissertation Committee, and have the dissertation approved by the Dissertation Committee and accepted by the Graduate School.

Number of Credits Required

There is no specific credit requirement for the Ph.D., though students must take required core courses and meet competency requirements. The Biological Sciences Program specifies 2 credits’ worth of required coursework (BIOL 901 Introductory Graduate Seminar); most students use 6 more credits to satisfy the competency requirement in experimental design/analysis (BIOL 811 Experimental Design & Analysis or ANFS 933 Design, Analysis, and Interpretation of Experiments, 4 credits) and recommended coursework in writing/communication (BIOL 902 Writing and Publishing Science or BIOL 950 Scientific Communication, 2 credits). Other graduate coursework approved by the student’s committee can substitute for any of these courses except BIOL 901 Introductory Graduate Seminar.

Additional Information/Requirements

A summary of degree requirements is available at https://colsa.unh.edu/biological-sciences-integrative-and-organismal-biology, along with the program's graduate handbook, which includes expectations, guidelines, and detailed policies.

Student Learning Outcomes

- Students will demonstrate expertise in quantitative skills including (a) basic math and statistics; (b) spreadsheet software; (c) graphical presentation of quantitative data.
- Students will demonstrate writing skills that enable them to prepare a scientific research paper in standard format for their field.
- Students will demonstrate competency in experimental design, including the ability to articulate a testable hypothesis and design an appropriate experiment to test it.
• Students will demonstrate communication skills including the ability to clearly explain scientific information to both professional and general audiences.

• Students will demonstrate broad understanding of fundamental areas of biology, especially areas relevant to their research project.