INTEGRATIVE AND SYSTEMS BIOLOGY, PHD

Introduction

Please click here (https://catalog.ucdenver.edu/cu-denver/graduate/schools-colleges-departments/college-liberal-arts-sciences/integrative-biology/) to see Integrative Biology department information.

The PhD program in Integrative and Systems Biology at the University of Colorado Denver is a multidisciplinary, dual campus program that offers students opportunities to address complex questions in biology using computational, laboratory and field approaches. Program advising faculty are from the departments of Integrative Biology, Chemistry, and Psychology at CU Denver as well as from the Denver Museum of Nature and Science and the Denver Botanic Gardens. A strong culture of mentorship, shared by all students and faculty, provides a unique opportunity for close collaboration and for high-quality individually-directed research mentoring by advisors and advisory committees.

The PhD program is research-based. Applicants to the program must have a declared area of specialization that aligns with the research focus of a program graduate faculty member. Faculty expertise can be found undergraduate faculty profiles on the Department of Integrative Biology website (clas.ucdenver.edu/biology/). Students must contact prospective faculty advisors to determine if openings are available within the faculty member's research group.

Graduate Program Director: Michael Wunder (grad.biology@ucdenver.edu)
Website: https://clas.ucdenver.edu/integrative-biology/academics/graduate-programs

Graduate Education Policies and Procedures apply to this program.

Program Requirements

1. The PhD degree requirements comprise six phases. First, students must complete a minimum of 60 credits, including 30 dissertation credits. Up to 30 hours of graduate level courses from other programs may be transferred and counted toward the degree.
2. Students must also form an Advisory Committee and an Examination Committee, pass the Preliminary Exam, meet the academic residency requirement, pass the comprehensive exam, and write and orally defend a dissertation.
3. Students must earn a minimum grade of B- (2.7) in all courses that apply to the degree and must achieve a minimum cumulative GPA of 3.0. Courses taken using P+/P/F or S/U grading cannot apply to degree. requirements

Research-based PhD degree program **requires**:

1. Completing 60 credits including 30 of dissertation
2. Meeting minimum academic residency requirements
3. Forming Advisory and Examination committees
4. Passing the Preliminary Exam
5. Writing and defending research proposal
6. Passing the Comprehensive Exam
7. Writing and defending dissertation (including >one publishable unit)

Code	Title	Hours
Complete all of the following required courses:		**18**
BIOL 6002	Biology Skills Sets - Pedagogy (taken in the first year; only required for students supported by a Graduate Teaching Assistantship)	
BIOL 6655	Seminar (taken two different times in the student's career)	
BIOL 6705	Biological Research Workshop (taken two different times in the student's career)	
BIOL 6764	Biological Data Analysis (taken in the first year)	
BIOL 7010	Integrative and Systems Biology (taken in the first year)	
BIOL 7050	Special Topics (a minimum of 3 credits must be completed, but students may take up to 9 credits)	
Students should complete a minimum of 12 elective credit hours from graduate level Biology coursework. [1]		**12**
Complete dissertation after passing the Comprehensive Exam.		**30**
BIOL 8990	Doctoral Dissertation	
Total Hours		**60**

[1] Master's Thesis (BIOL 6950) credits will not apply to the PhD.

1. Specialized knowledge and skills within sub-discipline
   a. development of hands-on skills
   b. integration of background research (concepts/methods)
   c. appreciation/application of foundational work
2. Apply the process of science to original work
   a. articulates logical argument for original work using conceptual models etc.
   b. uses hypothesis vetting (articulates and evaluates set of all possible outcomes)
   c. seeks critical feedback from peers and supervisors
   d. justifies the methods to address question/hypothesis
   e. develops, manages and curates publishable datasets (journal requirements)
   f. models and visualizes hypotheses with data
   g. interprets model results in light of uncertainties
3. Communicate and professional engagement
   a. writes scientifically
   b. crafts and delivers a scientific presentation
   c. tailors communication to different/appropriate audiences (why care about this work)
4. Context of Science in Society, Recognition of Diversity
   a. explains how academic disciplinary culture influence what is studied, how it is studied, and how results are interpreted and applied/used
   b. explains how societal/civic culture influence what is studied, how it is studied, and how results are interpreted and applied/used