



UNIVERSITY OF COLORADO DENVER
DEPARTMENT OF INTEGRATIVE BIOLOGY



GRADUATE STUDENT HANDBOOK



2021-22 ACADEMIC YEAR

NOTE: This handbook is a supplement to the University of Colorado Denver | Anschutz Medical Campus Graduate School Student Handbook which can be found on the Graduate School's website. Students are responsible for knowing the procedures, policies, and requirements outlined here and in the Graduate School resources page: <https://graduateschool.ucdenver.edu>

INTRODUCTION

The graduate program in Biology is a research-based program designed for students with interests in any of a broad range of basic science subjects including molecular, cellular, behavioral, evolutionary, ecological, or wildlife population biology. The Program is administered by the Department of Integrative Biology and the Graduate School at the University of Colorado Denver and offers a Master's of Science (MS) program in Biology and a doctoral (PhD) program in Integrative and Systems Biology. The program consists of nearly 50 faculty members from 16 different departments and partnering organizations, and approximately 40 graduate students. Program inquiries should be directed to:

Graduate Programs in Biology
Department of Integrative Biology
University of Colorado Denver
Campus Box 171
P.O. Box 173364
Denver, CO 80217-3364

Web page: <http://clas.ucdenver.edu/biology/grad.html>

Graduate Program Coordinator: Molly O'Connor
molly.oconnor@ucdenver.edu
(303) 315-7603

Graduate Program Director: Dr. Brian Buma
brian.buma@ucdenver.edu

Program Goals & Philosophy

Graduate training in Biology at the University of Colorado Denver is intended to prepare students to become critical problem solvers who are qualified to address biology-related issues at national and international levels. The program philosophy recognizes science not as a collection of facts, but rather as a process designed to help make informed decisions about the nature of evidence; scientific methods are used to guide decisions about hypotheses. The program is designed to equip students with the background necessary to generate new ideas and to participate in scientific debates, both academically and publicly. Therefore, the goal is to provide advanced training in the current concepts, theories, debates, and methods for modern biology from a curriculum that emphasizes critical thinking and communication through a series of seminars and research-oriented courses that are specifically tailored to student research programs.

Nature of Programs

The graduate programs in Biology are research-based and provide an opportunity for instruction and mentorship from world-class faculty studying both basic and applied problems in biology. Faculty advisors for the Programs are from the Departments of Integrative Biology, Anthropology, Biochemistry, Biostatistics, Cell and Developmental Biology, Chemistry, Civil Engineering, Craniofacial Biology, Geography, Mathematics, Pharmacology, Physics, Physiology, and Psychology; additional faculty advisors are affiliated with the Denver Museum of Nature & Science and the Denver Botanic Gardens. There is a strong culture of mentorship shared by faculty in the Department of Integrative Biology. This provides the unique opportunity for close collaboration and for high quality individually directed mentoring by advisors and advisory committees. The Programs include a number of formal and informal activities designed to promote a strong sense of community among graduate students on campus.

Resources and Facilities

The campus is located in downtown Denver, one of America's most vibrant cities. The heart of downtown is the 16th Street Mall; a mile-long pedestrian zone lined with outdoor cafes, restaurants and retail shops. Shuttle buses provide free transportation on the mall, and the surrounding suburbs and Denver International Airport are linked by light rail. The Denver Performing Arts Complex and Theatres District is just across the street from campus and features live entertainment available nightly. LoDo, Denver's hip historic district, is also a short walk from campus and boasts more than 90 brew pubs, sports bars and music clubs. Denver is situated between the Great Plains and the Rocky Mountains; there are many opportunities for outdoor recreation and there are over 300 days of sunshine per year.

The Downtown and Anschutz Medical campuses at CU Denver provide a wide range of resources for research. Facilities for the Department of Integrative Biology were constructed in 2010 and include an AAALAC accredited animal holding facility, core molecular and ecological laboratories, two greenhouses, growth chamber rooms, a cold room, an imaging room, a dark room, a shared instrumentation room, as well as storage and access to cluster computing.

Facilities at the Anschutz Medical Campus in Aurora include core facilities for microscopy, imaging, biophysics, genetic sequencing, flow cytometry, histology, NMR, biochemistry, proteomics, and genomics computational facilities.

The greater Denver metro area is home to headquarters for a range of federal agencies including the U.S. Geological Survey, U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Land Management, Environmental Protection Agency, Bureau of Reclamation, and the U.S. Renewable Energy Laboratory. The state office for Colorado Parks and Wildlife is in Denver and local non-profits include the Denver Zoo, Denver Museum of Nature & Science, and the Denver Botanic Gardens. Denver is also becoming a hub for private biotechnology firms, and is home to several nationally ranked hospitals.

ADMISSIONS STANDARDS

Biology MS Program

- A BA/BS from an accredited institution awarded within the last 10 years (validation of current content may be required)
- Minimum undergraduate GPA: 3.0
- TOEFL: required for international applicants from countries in which English is not the official language
- 3 letters of recommendation
- Official transcripts from all attended institutions
- A letter of support from your identified faculty mentor. Students are required to contact faculty in advance. Prior to application, applicants must have identified and contacted an available Faculty Advisor (see list on page 14) to ensure availability of a position and appropriate research interests.
- GRE is optional and may be required by individual faculty mentors.

Prerequisite courses required:

- One year of general biology (lecture and laboratory)
- One year of any combination of chemistry, physics, or mathematics
- One course in applied or biological statistics (through regression and ANOVA)
- Additional prerequisite requirements may be set by individual faculty advisors

PhD Program in Integrative and Systems Biology

- A BA/BS or MS from an accredited institution awarded within the last 10 years (validation of current content may be required)
- Minimum undergraduate GPA: 3.0
- TOEFL: required for international applicants from countries in which English is not the official language
- 3 letters of recommendation
- Official transcripts from all attended institutions
- A letter of support from your identified faculty mentor. Students are required to contact faculty in advance. Prior to application, applicants must have identified and contacted an available Faculty Advisor (see list on page 14) to ensure availability of a position and appropriate research interests.
- GRE is optional and may be required by individual faculty mentors.

Prerequisite courses required:

- One year of general biology (lecture and laboratory)
- One year of any combination of chemistry, physics, or mathematics
- One course in applied or biological statistics (through regression and ANOVA)
- Additional prerequisite requirements may be set by individual faculty advisors

FINANCIAL SUPPORT

Student loans and other support can be applied for through the University of Colorado Financial Aid Office. However, financial support for graduate students in biology is usually from a combination of research grants, fellowships, and teaching appointments. Students from out of state may wish to apply for Colorado residency as soon as they arrive in the state. The process is fairly simple but requires a one-year domicile period, meaning students must be physically present in Colorado for 12 months and show intent of making Colorado one's permanent home.

The Department of Integrative Biology offers Graduate Teaching Assistantships (GTA) on a competitive basis. GTA are considered full-time student employment and provide a \$15,000 stipend for one academic year (9 months; 2 lab sections each semester). Any student on GTA (master's or doctoral) must enroll in BIOL 6002 (Pedagogy) during their first semester of teaching. Pedagogy is required for all doctoral students. Note: BIOL 6002 (Pedagogy) is only offered during the Fall semester of the academic year.

PhD students are eligible for institutional support in the form of a limited number of competitive Doctoral GTA Fellowships. The Doctoral GTA Fellowship includes up to 5 years of support, including a 9-month GTA appointment for \$15,000 and tuition (up to \$6,000/year). Support can be supplemented by grants and fellowships awarded to students and/or faculty advisors. It is the responsibility of the student to contact both the Graduate Program Coordinator (Molly O'Connor) and Program Assistant (Barbara Schmidt) to notify them of any grants and/or fellowships awarded.

The Department offers annual travel grants on a competitive basis. These grants can be used for travel to present research results at professional meetings. The maximum award amounts are typically around \$500 for domestic travel and \$750 for international travel (note: students may or may not receive the full award amount).

See departmental announcements for biannual Integrative Biology Travel Awards deadlines.

Applications should be submitted to the Graduate Program Coordinator -- Molly O'Connor (molly.oconnor@ucdenver.edu). Please contact for additional information, application and general application procedure.

The Graduate School and College of Liberal Arts and Sciences both also offer support for graduate student travel to national meetings to present their thesis or dissertation work and will provide up to \$500 per meeting, via a separate application process. Contact Graduate Program Coordinator for applications.

Important note: The Graduate School and College of Liberal Arts and Sciences will not award their travel support until students have received a departmental travel award. Apply to Department of Integrative Biology first, then apply for the Graduate School and College of Liberal Arts and Sciences awards.

Credit Loads and Program Residency Requirements

Graduate credits are classified as either coursework or dissertation/thesis. Independent study and directed research credits are considered coursework and count towards credit loads in both graduate degree programs. Pass/Fail courses and courses with less than B- do not count toward the credit load in either degree program. Graduate students are discouraged from auditing courses, but if choosing to audit, must seek consent of the instructor as appropriate.

Minimum Number of Credits

MS minimum is 24-27 coursework credits plus 3-6 thesis credits for the research program (30 total).
PhD minimum is 30 coursework credits plus 30 dissertation credits (60 total).

Masters Students Full-time Status—

- Full-time when enrolled in 5 or more credits per semester.
- Part-time when enrolled in 4 or less credits per semester.
- 1 credit/summer *if* needed for financial aid status or for defense eligibility.

Doctoral Students Full-time Status—

- Full time when enrolled in 5 or more credits per semester.
- Part time when enrolled in 4 or less credits per semester.
- After passing comprehensive exam, to remain full-time must enroll in a minimum of 5 credits of dissertation per term until reaching 30 dissertation credits.
- Once 30 dissertation credits completed, must enroll in 1 credit, each Fall and Spring semester, to be considered full-time and until a successful defense of the thesis.
- 1 credit/summer *if* needed for financial aid status or for examination/defense eligibility.

Important Note:

Students must be registered for the semester they plan to complete the preliminary examination, comprehensive examination, defend their proposals or thesis (MS degree), or defend final dissertation (PhD degree).

Minimum Duration of Residency in the Program

- MS requires minimum 2 semesters of full-time scholarship (5+ credits/semester).
- PhD requires minimum 4 semesters full time scholarship (5+ credits/semester) if student holds MS degree.
- PhD requires minimum 6 semesters full time scholarship (5+ credits/semester) without MS degree.

This information is a summary from the Graduate School Student Handbook (revision: July 2018). Be sure to check the Graduate School website for updated information:

Transfer credit refers to any credit earned at another accredited institution either in the USA or abroad, or credits earned as a non-degree student within the CU system. Graduate course credits earned while the student was enrolled in a Graduate Program anywhere in the CU System, or an institution with established Memoranda of Understanding with CU Denver | Anschutz Medical Campus, fall outside the limits for transfer credits.

The maximum amount of transfer work that may be applied toward a graduate degree at CU Denver is twelve (12) hours of coursework for Master's degree programs and thirty (30) hours of coursework for PhD degree programs.

For students who earned graduate course credits while they were enrolled in a Graduate Program at a University in the USA, or students who earned credits within the CU System as a non-degree student, the number of course credits that can be transferred to CU Denver will be determined by the graduate Program Director on a case-by-case basis (subject to the limits described at the bottom of this paragraph). In the case of students who performed coursework at institutions outside the USA, Graduate Program Directors shall provide a recommendation to the Graduate School listing the courses that they accept for transfer and will also provide documentation including an independent evaluation by the Office of International Affairs to support the recommendation. The Graduate School Dean will evaluate the recommendation of the Program Director regarding the transfer of credits from foreign institutions and will make a determination of acceptance on a case-by-case basis.

Coursework accepted for transfer credit must not have been applied towards an undergraduate degree or another graduate degree of the same level (e.g., MA to MS). Specifically, Master's courses applied to one completed Master's degree program may not be applied to another Master's degree program; however, graduate level coursework (5000 level or above) completed for a Master's degree may be applied toward a doctoral degree with Program approval. Likewise, coursework of a completed doctoral degree may be applied toward a concurrent or subsequent Master's degree with Program approval.

Credit cannot be transferred until the student has established a satisfactory record of at least one term of enrollment at the CU Denver and earned a minimum 3.00 GPA.

Transferred courses do not reduce the minimum duration of residency in the programs, but may reduce the workload required at CU Denver for the degree.

All courses accepted for transfer must:

- *Be graduate level (5000 or above)*
- *Have a "letter" grade (pass/fail not accepted)*
- *Have a grade of "B minus" or better*
- *Be validated by the Program Director if not taken within seven (7) years of the PhD comprehensive exam or the Master's final exam*
- *Be transferred prior to the semester in which the PhD comprehensive or Master's final examination is administered*

PROGRAMS OF STUDY

The Department of Integrative Biology offers a research-based program for the **MS** degree in Biology, and a research-based program for the **PhD** degree in Integrative and Systems Biology.

Students are required to maintain a minimum 3.0 GPA in each of the programs. Consequences for failing to meet this requirement are described in the Academic Probation section of the Graduate School Student Handbook; students with GPA < 3.0 are ineligible for employment by Integrative Biology as a GTA.

MS Degree The MS program requires a minimum of 30 credits. A maximum of 12 hours of graduate level courses may be transferred and counted toward the degree (see section on transfer credits). The MS program requires the student to form an advisory committee and to deliver and orally defend written work before the advisory committee; this defense constitutes the final for the program as required by the Graduate School.

MS Degree Program Requires

1. Writing coursework/curriculum plan*
2. Completing 30 credits including 3-6 thesis (BIOL 6950)
3. Meeting minimum academic residency requirements
4. Forming and meeting regularly with an advisory committee
5. Writing and defending research proposal*
6. Writing and defending research thesis (including 1 or more publishable units)*†

* paperwork required—see Program Coordinator

PhD Degree The PhD program consists of multiple phases. Students must complete a minimum of 60 credits. Up to 30 hours of graduate level courses from other graduate programs may be transferred and counted toward the degree. Students must also pass the Preliminary Exam, form an Advisory Committee and an Examination Committee, meet the academic residency requirements, pass the Comprehensive Exam, and write and orally defend a dissertation.

PhD Degree Program Requires

1. Writing coursework/curriculum plan*
2. Completing 60 credits including 30 of dissertation (BIOL 8990)
3. Meeting minimum academic residency requirements
4. Forming Advisory Committees by end of 2nd semester
5. Meeting annually with Advisory Committee
6. Passing the Preliminary Exam in the 2nd year (3rd semester)*
7. Writing and defending a research proposal (defense of the research proposal is considered part of the Comprehensive Exam) in the 2nd or 3rd year*
8. Writing and defending dissertation (2 or more publishable units)*†

* paperwork required—see Program Coordinator

† *Publishable units are expected to reflect original contributions, advancing knowledge in your field, and should be suitable for publication in peer reviewed ISI-ranked journals. Technical reports and literature reviews often help build a body of work that shows domain expertise; these efforts are in many cases encouraged. However, for the completion of a successful doctoral dissertation, these products should not substitute for manuscripts or dissertation chapters prepared for the primary peer-reviewed literature*

CURRICULUM

The graduate programs in biology share a minimum core curriculum, and required additional specializations for each program are as follows:

Minimum core curriculum required by all graduate programs

BIOL 6705 (4 credits total) Biological Research Workshop (taken in 2 different years)

BIOL 6655 (2 credits total) Seminar (take in 2 years)

BIOL 6764 (4 credits) Biological Data Analysis (take in year 1)

BIOL 6002 (2 credits) Biology Skill Sets—Pedagogy (GTAs must take this during their first semester of teaching, however, it is required for all doctoral students, regardless of a GTA appointment).

Additional minimum requirements for the research-based MS program

BIOL 6950 (1-2 credits) Master's Thesis in first spring/summer to write proposal

BIOL 6950 (2-4 credits) Master's Thesis in final semester to write thesis

Additional minimum requirements for the research-based PhD program

BIOL 7010 (3 credits) Integrative and Systems Biology (take in year 1)

BIOL 7050 (3-9 credits) Special Topics

BIOL 8990 (30 credits total) Doctoral Dissertation, after passing Comprehensive Exam

Recommended electives for all programs

BIOL 5840 (3-6 credits) Independent Study (background research and skill development)

BIOL 6880 (3-6 credits) Directed Research (data collection, model/analysis development)

ENGL 5175 (3 credits) Writing in the Sciences

Coursework Agreement is completed in the first semester with input from the faculty advisor.

ADVISORY AND EXAMINATION COMMITTEES (MS, PHD)

MS thesis advisor is the primary research mentor for MS students

Identified prior to admission by the student

MS thesis advisory committee advises research program, assesses proposal and thesis

Formed by student before start of second year

Minimum 3 faculty members, majority* Integrative Biology Faculty Chaired by thesis advisor

PhD dissertation advisor is the primary research mentor for PhD students

Identified prior to admission by the student

PhD dissertation advisory committee advises and monitors research progress

Formed by student by end of second semester

Minimum 3 members, majority* Integrative Biology Faculty Chaired by dissertation advisor

Assesses preliminary exam in third semester

PhD examination committee assesses comprehensive exam **and** defense of dissertation

Formed by student prior to comprehensive exam

Minimum 4 members; dissertation advisory committee (3) plus chair**

Can include members outside the department if minimum requirements are met.

* Majority is defined as $\geq 50\%$

** Exam committee chair may not also be on advisory committee, must be IB faculty

Formation of, and first meeting with, advisory committee should be done by the end of the second semester for both **MS** and **PhD** students. Additionally, the Graduate School requires PhD Advisory Committee meetings at least once per year after the student passes the Comprehensive Examination. The Graduate Program in Integrative and Systems Biology strongly encourages all MS and PhD students to schedule regular meetings (i.e. 1-2 times per year) with their full committee and/or with individual committee members for the remainder of their graduate program. These meetings must be registered with the Graduate Program Coordinator. It is the student's responsibility to schedule, run, and register the meetings. The importance of these meetings cannot be overstated; they protect the student and advisor from potentially disruptive misunderstandings that arise from lack of communication.

EXAMS AND OTHER MILESTONES (MS PROGRAM)

The MS Program includes the following milestones: writing MS thesis proposal and defending it during the MS Thesis Proposal Defense, writing an MS Thesis and defending it during the MS Thesis Defense

Students are encouraged to discuss particulars of each milestone with their Advisor, Exam Committee, and other faculty well in advance of the scheduled examination date.

MS Thesis Proposal Defense

- Must be completed by the end of the 3rd semester of the program, and cannot be done in the same semester as the thesis defense.
- The written research proposal must be submitted to the MS thesis advisory committee 2 weeks prior to oral defense.
- The student is expected to work with their advisory committee and research mentor in the preparation of the proposal.
- Assessment can result in pass, conditional pass, or failure (*form required—see Program Coordinator*).

Conditional Pass requirements must be satisfied within 4 months of the exam (including summer months).

Failure may lead to

- Committee offering a second attempt within 4 months
- Committee recommending transfer to coursework program
- Committee recommending dismissal from MS program
-

MS Thesis Defense

- Includes a written thesis submitted to the MS thesis committee 2 weeks prior to oral presentation.
- The format of the thesis is determined in consultation with the research mentor and advisory committee but generally follows author guidelines for publication in an appropriate peer-reviewed journal.
- The oral presentation of the thesis is open to the public and must be widely advertised.
- Presentation of the MS thesis is followed by a private defense before the MS thesis advisory committee.
- The defense can result in pass, conditional pass, or failure (*form required—see Program Coordinator*).

Conditional Pass requirements must be satisfied within 4 months of the exam (including summer months).

Failure may lead to:

- Committee offering a second attempt within 4 months
- Committee recommending dismissal from MS program

EXAMS AND OTHER MILESTONES (PHD PROGRAM)

The PhD Program includes the following milestones: completing the Preliminary Examination, writing a dissertation proposal and defending it during the Comprehensive Examination, writing the dissertation and defending it during the Final Examination.

Students are encouraged to discuss particulars of each milestone with their Research Mentor, Exam Committee, and other faculty well in advance of the scheduled examination date.

PhD Preliminary Examination

- Should be completed in year two, but must be completed prior to, or concurrently with, the Comprehensive Examination.
- Includes a written and oral component and is an opportunity to evaluate whether students are developing the qualities of a PhD, e.g., being self-directed, being able to ask and answer questions in their field of specialization and being able to contextualize questions in their field to broader concepts in biology.
- The PhD Dissertation Advisory Committee conducts the exam and determines its specific form, focus, and time frame.
- The assessment is not based on original work of the student to date, but rather is focused on critical literature review, contextualization of concepts, and the application of modern methods to address larger questions in biology.
- The student works with their Research Mentor and Advisory Committee to identify important literature in their specialized field. Ideally, these readings and analyses of the field could provide a foundation for the introductory chapter of the student's dissertation.
- The student will provide written responses to questions on the selected literature set by the Advisory Committee and Research Mentor, e.g. evaluating evidence underpinning established models, identifying knowledge gaps and proposing follow-up studies that would advance the field beyond the limitations of the paper(s).
- The Research Mentor will collect and distribute the response(s) to the committee at the end of the written portion of the exam.
- The student coordinates a date with the committee for the oral portion of the exam to follow completion of the written portion.
- The committee may choose to share feedback on the written exam prior to the oral exam.
- At the oral exam, the student will be asked to defend and elaborate on the written document based on committee feedback and questions.
- The Preliminary Examination results in pass, conditional pass, or failure. (*forms provided by the exam committee*).

Conditional pass requirements must be satisfied within 4 months of the exam (including summer months).

Failure may lead to:

- Committee recommending transfer to the MS program
- Committee recommending dismissal from all graduate programs

PhD Comprehensive Examination

- Must be completed before the end of the third year in the program.
- Includes both written and oral components and is designed to reveal the potential capacity for a student to contribute original discovery to the field.
- The written component consists of the dissertation research proposal, which should expose sufficient depth of background knowledge and feasibility of approach for the dissertation to impact the field via original discovery.
- The written proposal must be submitted to the PhD Examination Committee at least 2 weeks prior to the scheduled oral examination.
- The ~50 minute oral examination seminar must be advertised and open to the public.
- The public seminar is followed by a private defense before the Examination Committee, and results in pass, conditional pass, or failure.
- Committee is encouraged to ask questions that will probe the student's knowledge of the field of study highlighted by the research.
- Committee provides feedback and advice, collated by the chair.
- Students who pass the Comprehensive Exam automatically advance to PhD candidate status. (*multiple forms required in advance – see Program Coordinator*).

Conditional Pass requirements must be satisfied within 4 months of the exam (including summer months).

Failure may lead to:

- Committee recommending transfer to MS program
- Committee recommending dismissal from all graduate programs

PhD Final Examination

- Is the final exam of the PhD program with both written and oral components in defense of the completed dissertation.
- This final examination is a cumulative evaluation of the student's skills in research, communication, contextualization of their research program, development of research products, and elaboration on future directions in their field.
- The written component consists of the dissertation chapters, which should represent a minimum of 2 publishable units suitable for publication in the peer-reviewed ISI-ranked primary literature.
- The dissertation must be submitted to the PhD Examination Committee at least 2 weeks prior to scheduled oral examination.
- The oral examination seminar must be advertised and open to the public.
- The public seminar is followed by a private defense before the Examination Committee, and results in pass, conditional pass, or failure.
- Students who pass the Final Exam must submit their final dissertation to the Graduate School to be eligible for their doctoral degree (*multiple forms required in advance – see Program Coordinator*).

Conditional Pass requirements must be satisfied within 4 months of examination (including summer months).

Failure may lead to:

- Committee recommending transfer to MS program or
- Committee recommending dismissal from all graduate programs

FORMS AND PROCEDURES FOR GRADUATION (MS, PHD)

At start of the final term, be sure to:

1. Obtain and submit application for graduation with Graduate School
2. Obtain and submit application to candidacy (MS) with Graduate School
3. Complete thesis format review
4. Submit electronic thesis to the Graduate School by deadline
5. Schedule final exam/defense
6. File request for exam 2 weeks prior to exam
7. Submit Statement of Approval Form the Graduate School prior to final thesis
8. Submit final revised thesis to Graduate School prior to published deadline

APPENDIX A: Example paths through coursework and graduation requirements:

Example path through MS

<i>Year 1 Fall</i>	<i>Year 1 Spring</i>	<i>Year 2 Fall</i>	<i>Year 2 Spring</i>	<i>Year 3+</i>
BIOL 6705	BIOL 6764	BIOL 6705	BIOL 6950	BIOL 6950
BIOL 6002 (if GTA)	BIOL 6950	BIOL 6880	BIOL 6655	
BIOL 6655	ENGL 5175			
Coursework plan	Additional coursework to minimum of 30 credits			
Form thesis advisory committee		Meet with committee	Meet with committee	Meet with Committee
Defense of MS proposal			Publication of research and Defense of Thesis	

Example path through PhD

<i>Year 1 Fall</i>	<i>Year 1 Spring</i>	<i>Year 2 Fall</i>	<i>Year 2 Spring</i>	<i>Year 3 Fall</i>	<i>Year 3 Spring</i>
BIOL 6002 (if GTA)	BIOL 6705	ENGL 5175	BIOL 6655	BIOL 6880	BIOL 6880
BIOL 7010	BIOL 6764	BIOL 7050	BIOL 6705	BIOL 7050	
BIOL 6655					
Coursework plan	Additional coursework to minimum 30 course credits				
Form dissertation advisory committee		Meet with advisory committee		Meet with advisory committee	
		Preliminary exam Form examination committee Write research proposal		Comprehensive exam Defense of research proposal	

<i>Year 4 Fall</i>	<i>Year 4 Spring</i>	<i>Year 5 Fall</i>	<i>Year 5 Spring</i>	<i>Year 6+</i>
BIOL 8990	BIOL 8990	BIOL 8990	BIOL 8990	BIOL 8990
Take between 5-10 dissertation (BIOL 8990) credits each semester up to 30 total				
Advisory committee	Advisory committee	Advisory committee	Advisory committee	Advisory committee
Publication of research			Defense of Dissertation	

APPENDIX B: Reasonable Expectations for the Advisor/Student Relationship



Graduate Advisors

Graduate advisors are expected to communicate openly and honestly about the funding situation in their labs and about their mentoring philosophies as related to the student's goals for graduate school. The advisor is expected to identify benchmarks that would indicate satisfactory progress through the program, and to conduct an open discussion about expectations related to publication, authorship order, and applying for grants to help cover the costs of stipends, tuition, and research expenses. These discussions are expected to occur very early and often in the student program, ideally starting even before the student joins the lab.

Graduate advisors are expected to work with students to identify thesis topics that match student interests and that build on their strengths. Complementary to this, advisors are expected to guide the development of a program of study for the student, and to assist in managing (but not to determine or facilitate) the schedule of milestones and associated forms required for graduation.

Graduate advisor mentoring should result in students becoming independent scientists. To that end, graduate advisors are expected to mentor students in the design of projects, and in all aspects of the implementation and presentation of research. The advisor should encourage students to give frequent presentations on various stages of their research, including especially the proposal development stage. Advisors guide students to develop presentations intended for a range of audiences, from those in the research lab up to an audience at an internationally attended professional meeting. When possible, the advisor should attend professional meetings with the student and help the student establish connections with other scientists who might benefit some aspect of the student's research or future career. Advisors are expected especially to mentor students in scientific writing and in publishing their work in peer-reviewed journals as these activities form the basis for professional network development in the sciences.

Graduate Students

Graduate students are expected to communicate regularly with their advisor and their advisory committee about the progress and problems of their research programs. Students are expected to behave independently and to take responsibility for their own learning, including asking for help when required. Students are ultimately responsible for developing a defensible research proposal that will lead to eventual publication of results in a peer-reviewed outlet.

Students are expected to professionally represent the Graduate Program, the Department of Integrative Biology and their advisor at all times. Students should actively engage in their advisor's lab group and collaborate with other students in the graduate program as appropriate. Students are expected to network with other students and faculty in the Program and at other Universities by presenting their research at professional conferences. Students are expected to become aware of and pursue funding opportunities to enhance their research programs.

Students are expected to manage their time wisely so that they can meet deadlines established by their advisor, by their advisory committee, by course instructors, by the graduate program, or by the graduate school. Students are expected to understand Department, Program, and Graduate School policies as they relate to student conduct, requirements, and timelines. Students are ultimately responsible for understanding and adhering to all requirements for graduation, and (of course) are *expected to enjoy their time in graduate school*.

APPENDIX C: Policy Regarding Student Employee Work Hours



COLLEGE OF LIBERAL ARTS AND SCIENCES
Department of Integrative Biology
UNIVERSITY OF COLORADO DENVER

Title: Student Employee Work Hours
Prepared by: Assistant Vice Chancellor for Human Resources Effective
Date: July 1, 2015
Applies: Anschutz Medical Campus and Denver Campus

Introduction

The University of Colorado Denver | Anschutz Medical Campus has adopted certain requirements and guidelines for student employees. The University of Colorado, including the Anschutz, Boulder, Denver and Colorado Springs campuses as well as the CU system office is one employer for the purpose of counting student employee work hours. Additional information regarding student employment is available in the Student Employment Handbook located on the Student Employment website.

Policy Statement

- 1) Maximum work hours allowed.
 - a) Multiple positions.
 - i) All campuses and system administration of the University of Colorado and all departments, colleges, centers, divisions or other degree or non-degree units are considered one employer under Internal Revenue Service rules.
 - ii) Students working in more than one position at a University of Colorado campus and/or system administration of the University of Colorado are required to:
 - I. Disclose current CU Employment at the time of application for any subsequent CU jobs. Should the student employee be offered additional jobs, s/he must inform his or her other supervisor(s) and gain their approval prior to accepting any offer.
 - II. The first department currently employing a student is the primary department. The student's supervisor in this department will be considered the supervisor of record.
 - III. Additional disclosure to the supervisors is required any time the student employee changes positions.
 - b) The number of hours a student employee may work in all positions combined (the aggregate of a student employee's multiple positions in multiple departments for any University of Colorado employer) is limited as follows:
 - i) Fall and spring semesters: For the purpose of this policy, the fall semester is defined as August 15 through January 1 and the spring semester is defined as January 1 through May 15. The maximum number of hours a student employee may work during a fall or spring semester is 25 hours per week or 50 hours per bi-weekly payroll period, provided no single week in that period exceeds 40 work hours.
 - ii) Summer: For the purpose of this policy, summer is defined as May 15 through August 15. The maximum number of hours a student employee may work during the summer is 40 hours per week.
 - c) Student employees exceeding the work hour limits established above may become eligible for employee health benefits under the Affordable Care Act. Employee Services will notify the student and primary supervisor of such eligibility.
 - d) Exception: The employing department head(s) may determine that the department(s) business purposes or work objectives cannot be accomplished within the work hour limits established above.
- 2) Consequences
 - a) Supervisors are responsible for communicating this policy to their student employees and student employees are responsible for communicating with the supervisor(s) if they are no longer students or are scheduled to work more than the maximum total work hours allowed for all jobs.
 - b) In the event a student employee becomes eligible for employee health benefits under the Affordable Care Act, employer benefits contributions will be proportionately charged to the department(s) where the student was employed when the limits were exceeded, regardless of where the student is currently employed.

Departments may be also subject to additional administrative charges as violation of this policy subjects the University to additional exposure under the Affordable Care Act.

APPENDIX D: Department of Integrative Biology Graduate Program Associate & Affiliate Faculty Members

Graduate Program Associated Faculty

(Potential research advisors are listed in alphabetical order below, along with a brief description of their research interests. Students interested in pursuing an MS or PhD in a research topic aligned with a faculty member below should contact the faculty member directly using the provided email address.)

Branco, Sara – Assistant Professor

Department of Integrative Biology

Research Interests: Ecology and evolution of fungi, fungal diversity, adaptation to hostile environments

sara.branco@ucdenver.edu

Buma, Brian – Associate Professor

Department of Integrative Biology

Research Interests: Disturbance and landscape ecology, forest ecosystems, succession, and spatial ecology

brian.buma@ucdenver.edu

Charlesworth, Amanda – Associate Professor

Department of Integrative Biology

Research Interests: Molecular developmental biology, cell biology

amanda.charlesworth@ucdenver.edu

Greene, Michael – Professor

Department of Integrative Biology

Research Interests: Chemical ecology, behavioral ecology, physiology

michael.greene@ucdenver.edu

Hartley, Laurel – Associate Professor

Department of Integrative Biology

Research Interests: Pedagogy, community and ecosystem ecology

laurel.hartley@ucdenver.edu

Infante, Carlos—Assistant Professor

Department of Integrative Biology

Research Interests: Functional and comparative genomics, developmental biology and phylogenetics

carlos.infante@ucdenver.edu

Miller, Chris –Associate Professor

Department of Integrative Biology

Research Interests: Sequencing, microbial ecology

chris.miller@ucdenver.edu

Mosier, Annika – Assistant Professor

Department of Integrative Biology

Research Interests: Biogeochemistry, microbial ecology

annika.moiser@ucdenver.edu

Phiel, Christopher – Associate Professor

Department of Integrative Biology

Research Interests: Molecular biology, pathway signaling, biological chemistry

christopher.phiel@ucdenver.edu

Ragland, Greg – Associate Professor

Department of Integrative Biology

Research Interests: Seasonal adaptation, genomics

gregory.ragland@ucdenver.edu

Roane, Timberley – Associate Professor

Department of Integrative Biology

Research Interests: Microbial physiology, heavy metal contamination, microbial bioremediation

timberley.roane@ucdenver.edu

Stith, Brad –Professor

Department of Integrative Biology

Research Interests: Developmental biology, cell biology

brad.stith@ucdenver.edu

Swallow, John – Professor

Department of Integrative Biology

Research Interests: Experimental comparative physiology, evolutionary biology and animal behavior

john.swallow@ucdenver.edu

Tomback, Diana – Professor

Department of Integrative Biology

Research Interests: Evolution, ecology and succession, population biology

diana.tomback@ucdenver.edu

Vajda, Alan – Associate Professor

Department of Integrative Biology

Research Interests: Endocrine disruption, environmental toxicology, ecological developmental biology

alan.vajda@ucdenver.edu

Wunder, Mike –Associate Professor

Department of Integrative Biology

Research Interests: Behavior and dynamics of migratory animal populations

michael.wunder@ucdenver.edu

Associate Faculty

Bland, Sonda – Associate Professor

Department of Psychology

Research Interests: Behavioral neuropharmacology, behavioral neuroscience

sondra.bland@ucdenver.edu

Espinosa, Joaquin – Professor

Department of Pharmacology

Research Interests: Gene regulatory networks in human disease

joaquin.espinosa@ucdenver.edu

Greenwood, Benjamin – Associate Professor

Department of Psychology

Research Interests: Behavioral, neuroscience, exercise neuroscience

benjamin.greenwood@ucdenver.edu

Ren, Xiaojun– Associate Professor

Department of Chemistry

Research Interests: Stem cells, epigenetics, single-molecule imaging

xiaojun.ren@ucdenver.edu

Shaikh, Tamim —Associate Professor

Department of Pediatrics

Research Interests: Clinical genetics and metabolism

tamim.shaikh@ucdenver.edu

Affiliate Faculty

Cushing, Paula –PhD

Denver Museum of Nature & Science

Research Interests: Evolutionary biology, arachnology, biodiversity, taxonomy

paula.cushing@dmns.org

Hufft, Rebecca –PhD

Denver Botanic Gardens

Research Interests: Conservation biology, ecology and evolution, biodiversity, restoration.

rebecca.hufft@botanicgardens.org

Ramp Neale, Jennifer –PhD

Denver Botanic Gardens

Research Interests: Rare plant conservation, conservation genetics, biodiversity conservation

nealejr@botanicgardens.org

Wilson, Andrew –PhD

Denver Botanic Gardens

Research Interests: Mycology, taxonomy, systematics, evolution and ecology

andrew.wilson@botanicgardens.org

Please note: This list is not intended to be all-inclusive but rather a guideline of faculty that students can reach out to during their advisor search. If you know of others that should be added to the list, please contact the Graduate Program Coordinator, Molly O'Connor (molly.oconnor@ucdenver.edu) so they may be added.