



Biology

UNIVERSITY OF COLORADO
COLORADO SPRINGS

Program Information Handbook

For Students & Faculty

Master of Sciences in Biology

MSc Biology

University of Colorado Colorado Springs

College of Letters, Arts, and Sciences

Department of Biology

1420 Austin Bluffs Parkway, Colorado Springs

Colorado 80918

Phone: (719) 255-3266 or 255-7552

Fax: (719) 255-3047

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Biology

UNIVERSITY OF COLORADO
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Welcome to the Department of Biology

This handbook has been prepared as a resource for graduate students and faculty in the Department of Biology at the University of Colorado Colorado Springs. This handbook identifies and describes the major processes, rules and regulations, and policies of the Department of Biology in one comprehensive document.*

All graduate students in the Department of Biology are required to read this document prior to initiating coursework. Further, all students are responsible for knowing the information contained in this document. Knowledgeable, empowered students will understand how to meet the demands of the graduate program as well as advocate for themselves when appropriate. If a student has questions about any of the content, it is recommended that the student meet with his or her faculty advisor, in a timely and proactive manner, or contact the MSc advisor directly.

Your suggestions, on the part of all who use this document, are encouraged. Please send your comments directly to the Department of Biology MSc advisor.

Sincerely,

Thomas Wolkow, Ph.D
Chair, Department of Biology
Osborne Center for Science & Engineering, B339
College of Letters, Arts, and Sciences
1420 Austin Bluffs Parkway
University of Colorado Colorado Springs
Colorado Springs, CO 80918
twolkow@uccs.edu, 719-255-3663

*NOTE: The faculty of the Department of Biology reserve the right to make changes to this handbook whenever necessary and without prior notice.

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Table of Contents

General Information	4
Discipline Options	4
MSc Faculty Advisors	5
Duration and Scope of the Program	6
Applying to the MSc program	6
Requirements for Regular Admission	6
Provisional Admission	6
Transfer Credit	6
Required Application Materials	7
Financial Aid	7
Completing the Degree	8
Timeline of important events	8
Faculty Advisor	8
Graduate Committee	9
Course Requirements for the Thesis Option	9
Course Requirements for the Capstone Option	10
Thesis Proposal	11
Written Thesis	11
Thesis Defense	12
Safety and Compliance	12
Leave of Absence	13

General Information

The Department of Biology offers a program leading to the degree of Master of Sciences (MSc) with options in Molecular & Cellular Biology, and Ecology & Evolution. Graduate students must take at least one course from another science discipline (e.g., physics, chemistry, mathematics, geography), providing students with a diverse curriculum and an understanding of how various science disciplines relate to each other.

This interdisciplinary program offers students a broad science education with few restrictive requirements compared to traditional graduate science programs. It allows for development of a plan based on individual needs.

The MSc degree is designed for students intending to become professional biologists. The standard MSc degree plan requires a research-based thesis and is appropriate for those seeking advanced graduate work or those seeking employment in biology-related fields.

MSc Discipline Options

In consultation with the Faculty Advisor, students may choose to focus their graduate studies in one of the following options:

- Ecology and Evolution
- Molecular and Cellular Biology

MSc Advisors

Dr. Jeremy Bono evolution and ecology

(719) 255-3668; jbono@uccs.edu

Dr. Lisa Hines epidemiology

(719) 255-3192; lhines@uccs.edu

Dr. Meghan Lybecker microbial pathogenesis

(719) 255-4101; mlybecke@uccs.edu

Dr. Emily Mooney ecology

(719) 255-3616; emooney@uccs.edu

Dr. Olesnicky Killian neurobiology

(719) 255-3727; eolesnic@uccs.edu

Dr. Thomas Wolkow yeast molecular and cellular biology

(719) 255-3663; twolkow@uccs.edu

Dr. Amy Klocko plant genetics

(719) 255-4907; aklocko2@uccs.edu

Dr. Aaron Corcoran ecophysiology

(719) 255-4504; acorcora@uccs.edu

The **MSc Program Director** is the primary point of contact for additional information:

Dr. Jeremy Bono

OSCE B347; (719) 255-3668; jbono@uccs.edu

Duration and scope of the program

The MSc Program in Biology usually requires 2-3 years to complete, but is dependent on student progress. The degree must be completed within six years. In addition to coursework, students must complete a research-based thesis to earn the MSc. degree. Research requires dedication, time, and flexibility. Students should be prepared to devote considerable time and effort to their research. This may involve working long hours in the lab or field, potentially including evenings and weekends in order to finish within the 2-3 year timeframe. **It is important that students discuss research expectations with their Faculty Advisor before starting the program.** Students who plan on continuing their education by applying to a professional school (e.g., veterinary, medical and dental school) or to graduate school (towards a Ph.D.) should be aware that many of these schools do not accept students until they have completed the MSc.

Applying to the MSc program in Biology

- New students start the MSc program the fall semester of each academic year.
- Applications are reviewed annually and all materials are due by December 15.
- Applicants are evaluated based on their past achievements and statement of interests and future goals. **An applicant will only be accepted into the program if a faculty member agrees to serve as the Faculty Advisor during the application review process.** Applicants are strongly encouraged to review the research interests of Biology faculty and contact potential research advisors before beginning the application process.

Requirements for regular admission

- A Bachelor's degree from an accredited College or University
- An undergraduate GPA of 3.0 or higher
- Completion of at least 20 hours of coursework in Biology or a closely related discipline
 - Applicants not meeting this requirement may alternatively demonstrate proficiency in Biology by scoring >49th percentile on GRE Biology Subject Test
- The GRE General Test and GRE Biology Subject Test are not required, but applicants may submit scores if they feel it strengthens their application
- All applicants whose native language is not English must meet a minimum standard of English proficiency. It is expected that students understand to read, write and communicate effectively in English to be successful in the Graduate Biology Program
 - Applicants will be considered to have the required English language proficiency if they meet one of the following criteria:
 - Hold a post-secondary degree from a U.S. accredited institution or in a program where English is the language of instruction
 - OR
 - Test of English Foreign Language (TOEFL) score that meets the minimum requirement of 85
 - OR

- International English Language Testing System (IELTS) score that meets the minimum requirement of 6.5
- OR
- Successful Completion of an UCCS approved English language training program

Provisional admission

- Under certain circumstances, applicants not meeting the criteria for admission as a regular degree student may be recommended by the faculty for admission as a 'provisional admission' student. The department may assign course work and/or examinations that must be taken to make up deficiencies. When the conditions for regular status are met, the Program Advisor will reclassify the student to regular status.

Transfer credits

- **University of Colorado System:** Up to 12 credit hours of appropriate upper-level course work with a grade of B or better that are not counted toward a degree and earned at any CU campus may be requested for transfer into the MSc program. Double counting of undergraduate and graduate courses is not allowed. These credit hours are computed into the students' graduate GPA but the undergraduate transcripts remain unchanged (i.e., there is no physical movement of courses on the transcripts).
- **Outside Institutions:** Up to 9 credit hours of appropriate upper-level course work with a grade of B or better that are not counted toward a degree and completed at an institution other than the University of Colorado may be requested for transfer into the MSc program. These credit hours are not computed into the students' graduate GPA.

Required application materials

- All applications should be submitted using the online graduate application:
<http://www.uccs.edu/graduateschool/prospective-students/admissions.html>
- The application requires:
 - Resume or curriculum vitae
 - One copy of official transcripts from all institutions of higher education attended.
 - Three letters of recommendation. The names of those recommending the applicant are included in the online application. Once the application has been submitted, they will be contacted by UCCS for their recommendation letter.
 - Original GRE test scores
 - Statement of past accomplishments and goals

Financial Aid

- The Biology department offers Graduate Teaching Assistantship (GTA) positions to a limited number of qualified students each year.

- Awards total \$15,000 per academic year, which includes \$8000 for teaching four laboratory sections (two each semester), and \$7000 in tuition remission (\$3500 per semester).
- Students are responsible for paying any remaining tuition beyond the \$7000 awarded per year.
- GTAs must be enrolled as a full-time student (at least 5 credit hours) during semesters in which the GTA is awarded and they must make satisfactory progress on their research thesis.
- Students may work no more than 25 hours on-campus during the academic year (fall and spring semesters). Each course section taught by GTAs is considered 4.5 work hours, which counts toward the 25 hour maximum.
- GTA positions are typically awarded for two years, but under special circumstances this may be altered.
- Some Faculty Advisors may be able to support a graduate student with grant money, but all students are expected to be actively engaged in research regardless. Prospective students should discuss funding and the time commitment for research with potential Faculty Advisors.
- Students are encouraged to explore additional sources of financial aid and scholarships summarized on the UCCS Graduate School website:
<https://www.uccs.edu/graduateschool/uccs-finances/finance-resources>
 - Students wishing to be nominated for the Graduate Research Fellowship must inform the Biology Graduate Program Director as soon as possible following notification of acceptance into the MSc program in Biology.

Completing the MSc in Biology degree

Timeline of important events

- Before the start of the first semester (or soon after), the student should meet with his/her Faculty Advisor to:
 - Plan a research project
 - Select a graduate committee to advise the student during his/her tenure as a graduate student
 - Determine the coursework appropriate for his/her plan of study, including plans for enrollment in Biol 5010
- No later than the end of the second semester of enrollment in the program the student must give his/her thesis oral proposal presentation (see below)
- In the final semester:
 - The student must enroll in Biol 9990, Candidate for Degree, the semester he/she defends the thesis or project *if not enrolled in any other course*. If the student has previously defended the thesis or project, and all coursework has been completed, then enrollment in Biol 9990 is not required.
 - Complete all paperwork required by the graduate school. The Schedule of Deadlines can be found here: <https://www.uccs.edu/graduateschool/current-students/graduating-this-semester.html>

- Note, the online Admission to Candidacy form is completed by the student and emailed to the Biology MSc Advisor. After approving the form, the MSc Advisor will submit it to the Graduate School for final approval.
- Any problems found by the Graduate School must be addressed and corrected before the student can graduate.

Faculty Advisor

The Faculty Advisor is the faculty member on the Graduate Faculty who agrees to function as a research mentor to the student during his/her tenure as a graduate student. Faculty advisors will have individual expectations and policies for students working in their research labs. Students should communicate with their Faculty Advisor on a regular basis to ensure timely completion of degree requirements.

Changing Faculty Advisors

During the first year in the MSc program the student may determine that he/she wishes to change his/her project, and therefore his/her Faculty Advisor. Students should be aware that changing projects/advisors may lead to a longer time-frame for completing the MSc degree.

- The student must meet with his/her Faculty Advisor to discuss the change.
- An alternative faculty member must agree to function as the new Faculty Advisor.
- If there is no alternative faculty member the student may decide to withdraw from the MSc program. The student must then give written notification to the MSc Program Advisor.

Graduate Committee

The Graduate Committee consists of 3-4 members including the Faculty Advisor and at least one other faculty member from the Department of Biology. The Faculty Advisor will often suggest possible faculty members appropriate for the committee.

- Students should meet individually with possible committee members to introduce themselves and determine if the faculty member would be interested, and have time, to be on the committee.
- Any committee members from outside the Department of Biology must be a member of the Graduate Faculty.
 - Members from outside the Department of Biology may include individuals with special expertise (e.g., Colorado Parks & Wildlife staff, physicians, genetic counselors) or non-UCCS faculty (e.g., USAFA, Colorado College, other CU campuses) as well.
 - The MSc Program Advisor will request a special appointment from the Graduate School for non-UCCS members to participate on the MSc committee.
- The committee will work with the Faculty Advisor to conduct examination periods following the proposal presentation and thesis defense and to assign grades for Biol 5010.
- Committee meetings must be scheduled at least once a year so the committee can review the student's progress and continue to advise the student.

Course Requirements for the Thesis Option

- A total of 30 hours of upper-level coursework is required. To be considered full-time, students must enroll in at least five credit hours during a given semester.
 - Biol 5010, Graduate Seminar, must be taken three times. Students are required to give an oral presentation each time they enroll in the course. One of the three times the student will present his/her thesis proposal. **The thesis proposal must be given no later than the end of the second semester of enrollment in the graduate program.** The final presentation is reserved for the thesis defense. The Faculty Advisor determines the subject of the other presentation (e.g. a paper from the primary literature or a research progress update).
 - The student must enroll in exactly 6 hours of Master's Thesis (Biol 7000) over the course of the program.
 - A maximum of 7 hours of Independent Study, Research Practicum, or Externships will count toward the degree.
- A minimum of 24 hours of 5000-level courses is required.
 - The 6 thesis hours are counted toward this requirement.
 - The student must enroll in the 5000-level of any course offered at both 4000-level and 5000-level to receive credit.
 - Courses taken pass/fail will not count toward the degree.
 - All courses must be taught by faculty appointed to the Graduate Faculty.
- At least one course must be taken from another department participating in the MSc program (e.g., chemistry, physics, geography, health sciences, mathematics).
- A 3.0 GPA or higher must be maintained.
 - Any course in which the student receives a grade of C (C+, C-, or lower in courses where + and – are used) will not be counted toward the degree.
 - The student will be allowed to retake any one course in which he/she receives a C or lower; if a B- or above is not achieved on the retake, the student will be dismissed from the program.
 - Two consecutive grades of C (C+, C, C-) or lower will be cause for dismissal from the program.
- After three consecutive semesters of not enrolling in any credits, students are administratively removed from the program and must reapply. There is no guarantee that the student will be accepted into the program during the reapplication process.

Course requirements for the Capstone option

In certain circumstances, the student may elect the Capstone option. For example, if the student determines they cannot dedicate the required time to complete a research thesis. This decision must be made in consultation with the Faculty Advisor.

- The coursework requirements for the Capstone and Thesis are the same except Capstone students do not enroll in Biol 7000 Master's Thesis (6 credits). Instead, capstone students enroll in Biol 6050, Biology Master's Capstone Project (3 credits). The student will need to take additional coursework to reach 30 credits required for completion of the program.

- The committee will establish requirements for completion of the project.
- The student will present his/her project work to the committee; the committee will assign a grade for Biol 6050.
- A thesis will not be written and any paper required by the committee will not be submitted to the Graduate School.
- The transcript will state that the student has received a MSc degree in Biology.

Thesis proposal

The student must present his/her thesis proposal as part of Biol 5010 no later than the end of second semester of enrollment in the graduate program.

- The proposal presentation will include an oral seminar (approximately 30 minutes) that is open to the academic community. At the discretion of the Faculty Advisor, the proposal may also involve a written component.
 - Seminar attendees will be given an opportunity to ask questions following the presentation
 - Following the public presentation and question period, the committee will meet with the student for an additional question and answer period/discussion until all committee members are satisfied with the presentation. This meeting is officiated by the Faculty Advisor.
 - The committee will grade the student; this will be the student's grade for Biol 5010.
 - If the committee is not satisfied or fails the student, the student will receive a grade of Incomplete and will be required to repeat the process by the end of the next semester.
- If the student fails to meet the Biol 5010 milestones, the student must communicate with the MSc Program Advisor a timeline to fulfill these requirements before the last day of the second semester or he/she will be dismissed from the program.
- The process may be repeated only once. If the student fails a second time, he/she will be dismissed from the program.
- A copy of the IBC and/or IRB approval form(s) and protocol number(s) must be submitted to the MSc Program Advisor to be placed in the student's file. These are required by the graduate school.

Written Thesis

- The 'Thesis and Dissertation Manual' and information on all forms that need to be submitted can be found at: <http://www.uccs.edu/graduateschool/current-students/graduating-this-semester.html#ThesisDissertationForms>
- The candidate will provide a draft of the thesis, approved by the Faculty Advisor, to the committee members at least two weeks prior to the scheduled defense.
- The candidate will complete any changes or revisions to the thesis as required by the committee.
- Submission of the thesis to the Graduate School must be completed and approved by the Graduate School by the deadlines set by the Graduate School. The Graduate School requires

up to one week to complete the review and approval process. Therefore the student should submit the thesis for approval at least one week before the Graduate School deadline.

Thesis defense

- All students in the MSc Biology program are required to present their thesis work to the academic community in an oral seminar of approximately 45 minutes followed by a defense examination with the student's committee. Students must be enrolled in Biol 5010 the semester he/she defends the thesis.
- The candidate will consult committee members and schedule the thesis defense for a time prior to the deadline set by the Graduate School. The presentation time will typically coincide with the Biol 5010 meeting time, unless other arrangements must be made to accommodate the committee. If the defense will be held outside of the Biol 5010 scheduled time, it is the candidate's responsibility to set a new time and reserve a room for the presentation.
- The candidate will inform the Program Advisor of the defense schedule. The Graduate School will announce the seminar to the campus community.
- The candidate will post announcements of the seminar in the Osborne Science & Engineering building at least one week prior to the scheduled defense.
- Following the public presentation and question period, the committee will meet with the student for an additional question and answer period until all committee members are satisfied with the examination. This meeting is officiated by the Faculty Advisor.
- The committee will assign a grade for Biol 7000, Masters Thesis.
- Following the defense, the committee members will:
 - Complete the 'Master Defense Exam Report' form and return it to the Program Advisor: <https://www.uccs.edu/Documents/graduateschool/Master%20Final%20Exam%20form%202015.pdf>
 - Complete the departmental 'Thesis Evaluation' form and the 'Thesis Oral Presentation Evaluation' form.
 - These forms should be returned to the Biology MSc Program Advisor after the defense and/or when revisions have been accepted by the committee.

Safety and Compliance

- All students conducting research in the laboratory or field must complete the required safety training. Contact Cynthia Norton (cnorton@uccs.edu) at 719-255-3212 for further information.
- Safety training must be completed prior to initiation of the research.
- Most biological research requires IBC authorization prior to initiation of the research.
- **The Institutional Biosafety Committee (IBC)** is responsible for reviewing all University research protocols involving any biological agents, infected animals or tissues (including field work), recombinant DNA, Select Agents & Toxins, and work with human blood, bodily fluids, tissues or cells in culture.
- <https://www.uccs.edu/pusafety/environmental/hazardous-materials/biosafety.html>
- **The Institutional Review Board (IRB)** is responsible for reviewing all University research protocols involving human subjects.

- Most research using human subjects requires IRB authorization prior to initiation of the research.
- It often requires several months to get IRB approval so students planning on using human subjects should discuss this with the Major Advisor as soon as possible.
- If the research will involve both biohazards and human subjects (e.g., bodily fluids), IBC approval should be obtained prior to applying for IRB approval.
- <https://www.uccs.edu/osp/research-compliance/research-involving-human-subject-irb.html>

Leave of absence

Under extraordinary circumstances a student may request one leave of absence of up to one year from the program. Any student that does not plan to enroll in credits for more than one semester must apply for a leave of absence. A leave of absence does not reset the six year time limit on completing the degree.

- This request must be in writing and have the approval of the Faculty Advisor and the Program Advisor.
- At the end of this term, the student must inform the MSc Program Advisor in writing if he/she wishes to return to, or withdraw from, the program.
- Upon return, the student must reapply to the program before enrolling in courses.
- The student will be admitted back to work with the same Faculty Advisor unless the student enters into a verbal or other agreement with another mentor and completes a new student-mentor form.
- If the student wishes to change Faculty Advisors upon his/her return, and a new advisor cannot be found, the application will be treated as a new admission with the understanding the individual may not be readmitted.
- If the student fails to notify the MSc Program Advisor of his/her plans within 13 months of the beginning of the leave of absence, the student will be dismissed from the program.