

# M.S. IN BIOLOGY

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## Overview

The Department of Biology aims to train graduate students in integrative research, with a curriculum that exposes students to the major sub-disciplines of biology and a program that allows enough flexibility to develop interdisciplinary work. Our major strengths include developmental biology, global change biology, neuroscience, and species interactions.

## Application for Admission

**Applications are due December 1.**

In applying for admission, applicants must select either the *Master's* or the *Ph.D.* track.

Students with an appropriate B.S. degree may seek direct entry to either the M.S. track or the Ph.D. track.

Applicants who were admitted on the Master's track, but wish to change to a Ph.D. track without completing the Master's may apply for admission to the Ph.D. program before the end of their second semester. Letters of support from three UM Biology faculty, including a major advisor, should be added to the applicant's file. The file must be current. Such applicants will be judged by the same criteria that are applied to other Ph.D. applicants.

Applicants to the Ph.D. track who were admitted on the Master's track and wish to complete the M.S. degree, should follow the same procedures as all other applicants, but they must include letters of support from three UM Biology faculty. Such applicants will be judged by the same criteria that are applied to other Ph.D. applicants.

Applicants must:

1. Apply online (<https://applygrad.miami.edu/apply/>) at the UM Graduate School. Application fee of \$85.
2. Send hardcopies of the following to the Coordinator of Graduate Studies in Biology, Department of Biology, 1301 Memorial Drive, Coral Gables, FL 33146 USA.
  - a. Originals of all undergraduate and graduate official transcripts (photocopies are not accepted)
  - b. International applicants whose native language is not English must additionally submit the TOEFL (Test of English as a Foreign Language) official scores (photocopies of scores are not accepted)
3. Send digital copies of the following to the Coordinator of Graduate Studies in Biology ([bio.gradcoord@miami.edu](mailto:bio.gradcoord@miami.edu))
  - a. A cover letter that identifies interests, suggests possible research projects, states career goals and identifies a UM Biology faculty sponsor
  - b. Copies of any research papers (e.g., publications, manuscripts, senior reports, etc.)
4. Letters of recommendation from **three** science instructors/ supervisors that address: nature and duration of relationship to applicant; motivation; ability to conceptualize and deal quantitatively with biological problems, and research potential should be sent by email to the Coordinator of Graduate Studies in Biology at [bio.gradcoord@miami.edu](mailto:bio.gradcoord@miami.edu)
5. Request UM Biology faculty sponsor submit a memo of support by email to the Coordinator of Graduate Studies in Biology ([bio.gradcoord@miami.edu](mailto:bio.gradcoord@miami.edu)). Applicants **MUST** secure the sponsorship of a faculty member as a condition for admission; the research interests of the applicant and the faculty sponsor should be well-matched; the sponsor will be the major advisor

A limited number of applicants to the Ph.D. program may be invited to interview at departmental expense in early January of the year of admission.

*Materials submitted in support of an application cannot be released for other purposes or returned to the applicant.*

## Degree Requirements

All students are required to satisfy **the general requirements** for the appropriate degree that are listed in the **Graduate Studies Bulletin**, whether or not they are listed among the Biology requirements.

## Implementation

All Graduate students will be reviewed each spring semester by GAAC.

1. The advisor will review the student's progress to date.
2. The student will provide updates for a student progress database every February.
3. The student will provide written evidence that the advisor and committee have reviewed her/his progress and plans.
4. Each student will receive a letter summarizing the results of the discussion concerning his/her progress.
5. All graduate students shall have the right to respond to GAAC, and, if necessary, the graduate faculty in matters pertaining to the review.
6. Possible outcomes of the review:

- a. Student making satisfactory progress
- b. Student not making satisfactory progress; recommendations for improvement
- c. Student not making satisfactory progress; his/her tenure terminated.

## Financial Support

1. The Department intends to support all doctoral students in good standing for up to 10 semesters. Support beyond 10 semesters is contingent upon GAAC approval.
2. Master's degree students usually are not eligible for departmental stipends or tuition remission.
3. Students who do not provide annual updates for the student progress database will not be eligible for continued funding. Students who will be off-campus are still responsible for making sure that GAAC receives the data. Students who choose not to present at the annual departmental graduate student symposium may be considered as not in good standing.
  - a. Students holding full fellowships or research assistantships will not normally be given teaching assignments, nor will students be permitted to hold fellowships and research assistantships simultaneously. Exceptions require GAAC approval.

## Curriculum Requirements

### M.S. in Biology with Thesis (Three-Year Program)

Code	Title	Credit Hours
<b>Required Graduate Core Modules</b>		
BIL 612	Graduate Core I	3
BIL 613	Graduate Core II	3
<b>BIL Courses</b>		<b>15</b>
Graduate Statistics Course		3
BIL 810	Master's Thesis	6
<b>Total Credit Hours</b>		<b>30</b>

1. Credit hours: a total of 30 credit hours are required:
  - 24 course credit hours, including the two semester departmental core courses for graduate students and at least one graduate course in statistics. Students are encouraged to take courses from more than one conceptual area; they are encouraged to select courses and independent studies that will prepare them for research, as listed under the Ph.D. requirements. No more than 9 credit hours from the independent study series may be used to fulfill the 24 course credit hours.:

Code	Title	Credit Hours
BIL 675	Advanced Study in Plant or Animal Sciences	1-6
BIL 678	Current Topics in Biological Research - DVP	1

At times these course numbers are used by professors to teach a new course or a special topics course, in which case the corresponding credit hours can be counted as a non-independent study credit hour. Course selection requires committee approval.

- 6 research credit hours (BIL 810); no more than 6 M.S. research credit hours are allowed.
  - The minimum acceptable grade average in all coursework towards the degree is a "B (3.0)" and no grade may be below a "C."
2. Research Proposal: public presentation and successful defense to the committee of a written research proposal. The public presentation must be given during regular sessions of the Fall or Spring semesters, not during summer sessions, intersessions, reading days or finals weeks.
  3. Thesis: A well-written and successfully defended thesis of publishable quality; a defense is successful if all members of the committee sign the grad school form and the signature page of the dissertation.
  4. Other requirements described under "The Master's Degree," including but not limited to:
    - a total of at least 30 credit hours (course credit hours plus research credit hours). The Graduate School and the Department concur in requiring at least 24 course credit hours and exactly 6 research credit hours (BIL 810) for a thesis M.S.
    - once a student has completed all required credit hours, she/he must enroll in "Research in Residence" (BIL 820) status until the degree is granted. This course carries 1 credit hour, but is considered full-time enrollment. Even though no credit is earned, a tuition charge equivalent to 1 course credit hour normally applies to this course.
  5. About the committee:
    - A single committee will combine the responsibilities of the supervisory and thesis committees.
    - The supervisory committee will be determined by the student in consultation with his or her advisor. The committee will consist of a minimum of three faculty, one of whom must be from outside the department, and one of whom must be a member of the graduate faculty. There is no sub-disciplinary representation requirement.
    - The thesis committee is formed officially when the student is admitted to candidacy. It may comprise the same individuals as the supervisory committee, or it may be formed anew. The student in consultation with the advisor suggests the membership of the committee to the graduate

school. The committee will consist of a minimum of three faculty, one of whom must be from outside the department, and one of whom must be a member of the graduate faculty. There is no sub-disciplinary representation requirement.

- The thesis committee is nominated by the department, but it must be approved and appointed by the Dean of the Graduate School. There is a special form that must be filed with the graduate school.
  - Committee meetings are required at least once a year (recommended at least once a semester); the student is responsible for arranging meetings; the student should consult with the committee about major changes in research goals and about problems. Memos summarizing each meeting should be in the student's file and emailed to the Coordinator of Graduate Studies in Biology (bio.gradcoord@miami.edu).
6. About the time table:
- A **written thesis proposal** is due no later than the **middle of the second semester. Please take note of this deadline. The scope of the M.S. thesis should be in line with the timetable.**
  - Analysis of data and a **polished draft of the thesis** should be completed and in the hands of the committee by the **middle of the sixth semester. Please take note of this deadline. The scope of the M.S. thesis should be in line with the timetable.**
  - **Defense of the thesis and its submission to the Graduate School** must meet or precede the deadline for graduation immediately **following the sixth semester** unless an extension has been approved by the Graduate Admissions and Advisement Committee (GAAC) upon recommendation of the thesis committee. Notice of the defense must be submitted on a special form to the graduate school in advance of the defense and must be posted publicly in the department.
  - The oral defense of the thesis **must** be given during regular sessions of the Fall or Spring semesters, not during summer sessions, intersessions, reading days or finals weeks.
  - **No student may receive the degree in the same semester in which she/he is admitted to candidacy.**
  - The indicated dates form **firm deadlines**. A student's committee, however, may submit a written petition to GAAC for an extension of time detailing reasons for the request. **An extension will be granted only under extraordinary circumstances and will be effective upon written approval by GAAC.**
  - Proposals to change the schedule for any reason should be preceded by a study of the **graduate bulletin** sections on **leaves of absence, full time student status** and **recency of credit hour** and explicitly address how the proposed change of schedule relates to these matters. The memo requesting the change also should address the **proposed financial support**.
7. Completed SACSCOC evaluation forms are required at two points during the course of study. One following the research proposal defense and the final following defense of the thesis. The student is responsible for providing blank forms to the committee at each milestone. The graduate advisor is responsible for forwarding completed forms to the Graduate Director. The student is responsible for ensuring the Graduate Director receives these forms.

## M.S. in Biology without Thesis (Two-Year Program)

Code	Title	Credit Hours
<b>Required Graduate Core Modules</b>		
BIL 612	Graduate Core I	3
BIL 613	Graduate Core II	3
<b>BIL Courses</b>		<b>21</b>
Graduate Statistics Course		3
<b>Total Credit Hours</b>		<b>30</b>

1. Credit hours: a total of 30 credit hours are required:
- A total of 30 course credit hours are required by the Biology Department, including the two semester departmental core courses for graduate students and at least one graduate course in statistics. Students are encouraged to take courses from more than one conceptual area, listed under the Ph.D. requirements. No more than 9 credit hours from the independent study series may be used to fulfill the 30 course credit hours.:

Code	Title	Credit Hours
BIL 675	Advanced Study in Plant or Animal Sciences	1-6
BIL 678	Current Topics in Biological Research - DVP	1

At times these course numbers are used by professors to teach a new course or a special topics course, in which case the corresponding credit hours can be counted as a non-independent study credit hour. Course selection requires committee approval.

- The minimum acceptable grade average in all coursework towards the degree is a "B (3.0)" and no grade may be below a "C."
2. Passing a written comprehensive exam given by the committee.
3. About the committee:
- A single committee will combine the responsibilities of the initial supervisory and the comprehensive examination committees. The committee will be determined by the student in consultation with her/his advisor. The committee will consist of a minimum of three faculty, one of whom must be from outside the department, and one of whom must be a member of the graduate faculty. There is no sub-disciplinary representation requirement.
  - The examination committee is formed officially when the student is admitted to candidacy. It may comprise the same individuals as the supervisory committee, or it may be formed anew. The student in consultation with the advisor suggests the membership of the committee

to the graduate school. The committee will consist of a minimum of three faculty including the student's advisor, one of whom must be from outside the department, and one of whom must be a member of the graduate faculty. There is no sub-disciplinary representation requirement.

- The examination committee is nominated by the department, but it must be approved and appointed by the Dean of the Graduate School. There is a special form that must be filed with the graduate school.
  - Committee meetings are required at least once a year (recommended at least once a semester); the student is responsible for arranging meetings; the student should keep the committee advised of major changes in the graduate program plan; memos summarizing each meeting should be in the student's file.
4. About the time table:
- The **comprehensive exam** must be passed by the **end of the fourth semester**.
  - **No student may receive the degree in the same semester in which she/he is admitted to candidacy.**
  - The indicated dates form **firm deadlines**. A student's committee, however, may submit a written petition to GAAC for an extension of time detailing reasons for the request. **An extension will be granted only under extraordinary circumstances and will be effective upon written approval by GAAC.**
  - Proposals to change the schedule for any reason should be preceded by a study of the **graduate bulletin** sections on **leaves of absence, full time student status** and **recency of credit hour** and explicitly address how the proposed change of schedule relates to these matters. The memo requesting the change also should address the **proposed financial support**.
5. Completed SACSCOC evaluation forms are required following the comprehensive exam. The student is responsible for providing blank forms to the committee. The graduate advisor is responsible for forwarding completed forms to the Graduate Director. The student is responsible for ensuring the Graduate Director receives these forms.

## Suggested Plan of Study

### Masters with Thesis Program Timeline - Including Program Requirements and Suggested Goals

Disclaimer: This Masters with Thesis Program Timeline does not replace the "Procedures for Graduate Students in Biology".

<b>Year One</b>		
<b>Fall</b>		<b>Credit Hours</b>
BIL 612	Graduate Core I	3
BIL courses or other relevant courses with advisor approval		6
Form initial committee		
Meet with Committee to plan first year of study.		
Suggested Goals: (1) Sometime in you first year, start contributing to a project in your group that will yield co-authorship on an article in year 1 or 2. (2) Start your personal Endnote (or equivalent) library and start delving into the primary literature to inform your work. (3) Take Professional Skills Course.		
<b>Credit Hours</b>		<b>9</b>
<b>Spring</b>		
BIL 613	Graduate Core II	3
BIL courses or other relevant courses with advisor approval		6
By the end of the first year you must have met your Committee.		
A written thesis proposal is due no later than the end of the second semester.		
Suggested Goals: (1) By the end of your first year, you should have completed the departmental Core course. (2) Establish 30 minutes per day dedicated to writing.		
<b>Credit Hours</b>		<b>9</b>
<b>Year Two</b>		
<b>Fall</b>		
BIL 810	Master's Thesis	1-6
BIL courses or other relevant courses with advisor approval		0-3
Meet with Committee.		
Suggested Goals: Attend a local conference and present your proposed research at the Annual Biology Graduate Student Symposium.		
<b>Credit Hours</b>		<b>4</b>
<b>Spring</b>		
BIL 810 or 820	Master's Thesis or Research in Residence - Master's Thesis	1-6
BIL courses or other relevant courses with advisor approval		0-3
Meet with Committee.		

Suggested Goals: (1) By the end of the fourth semester you should have completed all of your required coursework including a graduate-level course in statistics. (2) Network to explore options for jobs after your Masters degree. (3) Set up summer internship. (4) Start to apply for positions after Masters.	
<b>Credit Hours</b>	<b>4</b>
<b>Year Three</b>	
<b>Fall</b>	
BIL 820	Research in Residence - Master's Thesis
BIL courses or other relevant courses with advisor approval	1-2
Meet with Committee.	
Suggested Goals: (1) Work with your mentor on completing a draft of your thesis. (2) Present your work at a national meeting. (3) Apply for positions after Masters.	
<b>Credit Hours</b>	<b>3</b>
<b>Spring</b>	
BIL 820	Research in Residence - Master's Thesis
Analysis of data and a polished draft of the thesis should be completed and in the hands of the committee by the middle of this semester.	
Publicly defend you Masters thesis.	
Suggested Goals: (1) Set-up next stage of professional development.	
<b>Credit Hours</b>	<b>1</b>
<b>Total Credit Hours</b>	<b>30</b>

**Masters Program Timeline Notes:**

1. The timeline for the suggested goals will vary some across labs and disciplines. The important things to capture from the list of suggested goals are (1) the importance of publishing, (2) the value of publishing early and steadily, and (3) the importance of building your professional network by attending and presenting your work at meetings. Use the suggested timeline to facilitate setting your professional goals and discussing your goals with your advisor and members of your committee.
2. Contributing to research projects outside your main research project can be a valuable way to gain lab/field skills and skills in data analysis, presentation and writing. Thus, it is suggested that sometime in your 1st year you should start contributing to a project in your group that will yield co-authorship on a publication in Year 1 or 2.
3. Because of the compressed timeline of the masters with thesis, meeting with your committee once each semester is a program requirement.
4. TOTAL CREDITS must at least 30 at time of graduation.
5. One credit of an 800-level course qualifies as full-time enrollment. Thus, in your final years, enrolling in one credit of BIL820 is sufficient.
6. Proposal and dissertation defenses must be advertised and scheduled at a time that does not conflict with departmental events including seminars, workshops and faculty meetings. *Absolutely no defense should be scheduled to conflict with Monday Seminars (12:20-1:30), Wednesday Faculty Meetings (12:20-1:30), or to conflict with Friday Seminars (12:20-1:30; please note that scheduling defenses for presentation as part of the Friday Seminar Series is encouraged).* Defenses must be scheduled during regular term times, consult your program requirements for details.

**M.S. in Biology without Thesis (Two-Year Program)**

**Disclaimer: This Masters without Thesis Program Timeline does not replace the "Procedures for Graduate Students in Biology".**

<b>Year One</b>	
<b>Fall</b>	
BIL 612	Graduate Core I
BIL courses or other relevant courses with advisor approval	6
Form initial committee	
Suggested Goals: Take Professional Skills course.	
<b>Credit Hours</b>	<b>9</b>
<b>Spring</b>	
BIL 613	Graduate Core II
BIL courses or other relevant courses with advisor approval	6
Suggested Goals: (1) By the end of your first year, you should have completed the departmental Core course. (2) Consider taking a graduate-level statistics course. (3) Set up summer internship. (4) Explore career options for after Masters Degree.	
<b>Credit Hours</b>	<b>9</b>

<b>Year Two</b>	
<b>Fall</b>	
BIL courses or other relevant courses with advisor approval	9
Meet with Committee.	
Suggested Goals: Apply for positions after Masters.	
<b>Credit Hours</b>	<b>9</b>
<b>Spring</b>	
BIL courses or other relevant courses with advisor approval	3
Complete Comprehensive exam	
By the end of the fourth semester you should have completed all of your required coursework including a graduate-level course in statistics.	
Suggested Goals: Network to explore options for jobs after your Masters degree.	
<b>Credit Hours</b>	<b>3</b>
<b>Total Credit Hours</b>	<b>30</b>

**Coursework Masters without Thesis Program Timeline Notes:**

1. The timeline for the suggested goals will vary some across labs and disciplines. The important things to capture from the list of suggested goals are (1) the importance of presentation skills, (2) the value of learning to write compelling arguments. Use the suggested timeline to facilitate setting your professional goals and discussing your goals with your advisor and members of your committee.
2. Because of the compressed timeline of the masters without thesis, meeting with your committee once each semester is a program requirement.
3. TOTAL CREDITS must at least 30 at time of graduation.

## Mission

The purpose of the Biology M.S. program is to engender the knowledge of biological concepts as well as the critical thinking and presentation skills that are central to professional careers in teaching, laboratory employment and non-governmental organizations.

## Student Learning Outcomes

- Students will demonstrate a deep knowledge of a biological area.
- Students will demonstrate the ability to critically evaluate peer-reviewed publications in Biology.
- Students will demonstrate the presentation skills necessary for presenting their work at professional meetings.