BIOLOGICAL SCIENCES, MS

The Department of Biological Sciences offers graduate programs in biology with areas of concentration in botany; microbiology; cellular and molecular biology; genetics; physiology and morphology of plants and animals; terrestrial and aquatic ecology; behavioral biology; conservation biology; and evolution.

Both a thesis and non-thesis track are offered within the MS degree. The thesis track is a research-based degree and is intended for students pursuing careers in formal research or planning to continue study towards the PhD degree. The non-thesis track is a coursework-intensive MS degree designed for students desiring a graduate education to enhance employment opportunities or prior to obtaining a professional degree. Students may switch from the non-thesis track to the thesis track if all requirements are met and with written approval of the student's advisor and the Graduate Program Director.

Admission Requirements

Application Deadlines

Application deadlines vary by program, please review the application deadline chart (http://uwm.edu/graduateschool/program-deadlines/) for specific programs. Other important dates and deadlines can be found by using the One Stop calendars (https://uwm.edu/onestop/dates-and-deadlines/).

Fall Semester

- 12/01 - MS Thesis Track
- 05/01 - MS Non-Thesis Track

Spring Semester

- 10/01 - MS Non-Thesis Track

Thesis Track

Students are required to maintain full-time status and develop a formal thesis to earn the degree. Admission is during the fall semester only. When applying for admission, applicants should describe in their personal statement as completely as possible their specific research interests within biological sciences. Applicants are strongly encouraged to establish contact, before or during the application process, with Biological Sciences faculty members whose research interests are closest to their own, regarding the likelihood of one serving as the student's major professor. To assist the applicant in this process, a Biological Sciences Graduate Program brochure is available, which describes the research activities of the faculty. The brochure can be obtained by contacting the departmental office.

Non-Thesis Track

Students may enroll part-time and complete the degree at a slower pace or enroll full time to earn the degree faster. Students may be admitted during the fall or spring semesters. The accelerated degree is especially well suited for those students seeking to improve their academic record prior to applying to professional schools such as medical school, veterinary school, pharmacy school, dental school, etc. The course requirements for the program are highly adaptable to meet the student's goals such as completion of admission requirements, exploring a secondary area of interest, or gaining hands-on laboratory research experience. When applying for admission, applicants should describe their career goals in their personal statement as completely as possible to ensure assignment of the appropriate advisor.

Additional Admission Requirements

An applicant must meet Graduate School requirements (http://uwm.edu/graduateschool/admission/) plus these departmental requirements to be considered for admission to the Biological Sciences Master's program. Track-specific requirements are also noted:

1. Undergraduate coursework equivalent to the Biological Sciences major at UWM, including coursework in the following areas of plant or animal science: cellular and molecular biology or genetics; organismal biology; ecology. Additional coursework in chemistry through organic or biochemistry; mathematical preparation including at least one course in calculus, statistics, or biometry; and a year of physics are strongly encouraged.
2. Submission of official scores:
   a. **Thesis Track**: Optional submission of official scores from the General Test of the Graduate Record Examination (GRE) (http://uwm.edu/graduateschool/admission/#gre).
   b. **Non-Thesis Track**: Optional submission of official scores from the General Test of the Graduate Record Examination (GRE) (http://uwm.edu/graduateschool/admission/#gre), Medical College Admission Test (MCAT), Dental Admission Test (DAT), Pharmacy College Admission Test (PCAT), or Praxis test. Submitted test scores may be used as additional evidence of academic ability.
3. Reasons Statement:
   a. **Thesis Track, please describe:**
      i. your academic and scientific background
      ii. reason for pursuing graduate studies
      iii. specific research area
      iv. why you decided to apply to the program
      v. the names of faculty members with whom you would like to study. Browse our research page to find a list of faculty and their research interests. Prior to listing them on your application, please contact the faculty members of interest via email to see if they are accepting new students.
   b. **Non-Thesis Track, please describe:**
      i. your academic background
      ii. reason for pursuing graduate studies
      iii. your career goals
      iv. why you decided to apply to the program
4. At least two letters of recommendation from persons familiar with the applicant's scholarship.
5. **Thesis Track:** Submission of a resume/CV.
6. International students must meet the minimum department requirements for English proficiency:
   a. **Thesis Track**:
      i. Completion of a baccalaureate or higher degree within the last two years from an institution where English is the sole language of instruction with a minimum of two years attendance; or
      ii. A minimum required TOEFL score of 79 overall with a minimum required score of 24 on the Speaking portion; or
      iii. A minimum required IELTS score of 6.5 overall with a minimum required score of 7.0 on the Speaking portion; or
      iv. A minimum required CAE score of C1 overall with a minimum required score of 185 on the Speaking portion; or
      v. A minimum required Duolingo score of 120 overall with a minimum required score of 125 on the Conversation and Production sections.

b. **Non-Thesis Track**:
   i. Completion of a baccalaureate or higher degree within the last two years from an institution where English is the sole language of instruction with a minimum of two years attendance; or
   ii. A minimum required TOEFL score of 79 overall with a minimum recommended sub-score of 18 in each skill; or
   iii. A minimum required IELTS score of 6.5 overall with a minimum recommended sub-score of 6.0 on each skill; or
   iv. A minimum required CAE score of C1 overall with a minimum recommended sub-score of 170 on any given language skill test; or
   v. A minimum required Duolingo score of 120 overall.

Credits and Courses

Thesis Track

Minimum degree requirement is 30 graduate credits, at least 24 of which must be in biological sciences and up to 6 of which may be in related courses. Of the 30 graduate credits, 15 must be taken at the graduate-only course level. Of the 24 biological sciences credits, at least 12 must be course or seminar credits. The student must take at least two seminars during the course of the student's program up to a maximum of 4 credits counting toward the degree; and enroll in Biology Colloquium (BIO SCI 900) each semester with a maximum of 4 colloquium credits counting toward the degree. The student must enroll in a minimum of 12 credits in research (BIO SCI 990). The student plans a program of studies in consultation with the major professor. If desired, a special area of concentration (botany, microbiology, physiology) may be declared. A cumulative GPA of a 3.0 or higher on a 4.0 scale is required to receive the MS degree.

Non-Thesis Track

Minimum degree requirement is 30 graduate credits, at least 20 of which must be in courses offered by the Department of Biological Sciences. Of the 30 graduate credits, 15 must be taken at the graduate-only course level.

Code	Title	Credits
Biological Science Requirements		
Select at least one laboratory course		
Select two of the following seminars that require a presentation (up to a maximum of 4 credits):		
BIO SCI 925	Graduate Seminar in Biological Sciences	
BIO SCI 929	Special Topics in Ecology, Evolution and Behavior	
BIO SCI 931	Seminar in Systematic Biology and Evolution:	
BIO SCI 933	Seminar in Neuroscience	
BIO SCI 934	Research Advances in Cell and Molecular Biology	
BIO SCI 935	Research Advances in Ecology, Evolution and Behavior	
BIO SCI 936	Research Advances in Microbiology	
Select up to 6 credits of the following:		
BIO SCI 899	Advanced Independent Studies	
Select up to 2 credits of the following:		
BIO SCI 900	Biology Colloquium	
Additional Requirements		
Select additional graduate credits to fulfill the required total of 30 credits [1]		

[1] Any remaining course work may be completed in other departments within UWM with the approval of the student's advisor and the Graduate Program Director.

A cumulative GPA of a 3.0 or higher on a 4.0 scale is required to receive the MS degree.

Additional Graduation Requirements

All students must submit three examples of any of the following projects that have been completed and graded during their graduate studies: paper, poster or presentation. These projects must demonstrate the student's ability to read and understand current scientific literature in the biological sciences and apply this acquired knowledge. At least one of these must be from a laboratory course or experience. These documents must be submitted to the Graduate Program Director and will be used as a portfolio to demonstrate the student's analytic and scientific writing abilities.

Additional Requirements

Thesis Track

MS Graduate Advisory Committee

The MS Graduate Advisory Committee is selected by the major professor in consultation with the student, by the end of the first year of enrollment. The MS Advisory Committee consists of the major professor and two other graduate faculty members. The Committee must meet at least once a year to monitor and formally report on the student's academic and research progress.

Oral Examination

The student must pass an MS oral examination. The examination should be taken by the end of the first year of enrollment and must be taken no later than the end of the second year of enrollment. The student's MS Advisory Committee administers the oral examination.

Thesis

Students must prepare and defend a formal thesis reporting the results of their research. During the final year of study, students must present a seminar on their research, with prior public announcement. Submission of the final thesis to the Graduate School is required to complete the MS degree.

Major Professor as Advisor

The student must have a major professor to advise and supervise the student's studies as specified in Graduate School regulations. The Graduate Committee assigns a faculty advisor as a necessary prerequisite to admission.

Time Limit

Student must complete all degree requirements within five years of initial enrollment.

Non Thesis Track

MS Graduate Advisor

Upon admission to the program, the student will be assigned an advisor whose research background is similar to the student's stated area of interest and career goals. Students may request a specific advisor from the faculty list; however, requesting an advisor does not guarantee

availability. During the first semester of study the student and advisor must complete and submit a Plan of Study to the Graduate Program Director. The Plan of Study will detail the coursework to be taken for completion of the degree and can be modified at any time during the program.

Time Limit

Student must complete all degree requirements within three years of initial enrollment.

Biological Sciences MS Learning Outcomes

Students graduating from the Biological Sciences MS Program will be able to:

- **Summarize**, **synthesize**, and **critique** the relevant literature, theories, and methodologies for the student's specific research topic.
- **Identify** unanswered questions, **generate** hypotheses and **design experiments** to address those questions.
- Develop a **command** of the broader literature in relation to the student's specific research topic.
- **Design** and **conduct** original research that is publishable in peer-reviewed journals that constitutes the student's thesis to be defended.
- Effectively **communicate** research findings in **oral** and **written** forms; e.g., in presentations at national research conferences.
- MS students are **encouraged** to publish their thesis research in peer-reviewed journals (as first authors or co-authors).

Accelerated Program Option

This program is offered as part of an accelerated graduate program. For more information, see Accelerated Graduate Degrees (https://catalog.uwm.edu/opportunities-resources/accelerated-graduate-degrees/).