

Interested in This Major?

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What are Biological Sciences?

Biology is the study of life. Biologists analyze how systems function in organisms at the cellular and molecular levels using genetics, biochemistry and microscopy. They also study interactions of organisms with each other and the environment using behavior, morphology and genetics. These studies have applications across many areas, from agriculture to zoology.

Career Opportunities

There is broad demand for biologists in both the private and public sectors. People with degrees in biology are needed in areas as diverse as farming, food processing, and the environment, as well as in the biomedical and biotechnology fields. A degree in biology can also be used to prepare for professional schools like medicine, dentistry, pharmacy, and veterinary science, in addition to advanced study in any of the life sciences.

Are The Biological Sciences Right For Me?

Biological Sciences is the most popular science major at UWM and at most other universities. It appeals to students who think analytically and want the opportunity to prepare themselves for a wide variety of career options.

UWM's Programs

The department offers two majors, Biological Sciences and Microbiology. The Biological Sciences major has two options: the Standard option and the Cell and Molecular Biology option. Both majors and options are excellent preparation for a career in a life sciences. The Microbiology major allows students to focus on the

biology of microorganisms. The multiple offerings allow students a broad choice in their studies.

Biological Sciences Major

Most Biological Sciences majors earn a BS degree, although a BA degree is also available. Students should select and meet a departmental advisor early in their career for advice on course options to match their career goals.

Standard Option

A minimum of 34 credits, including the courses below, and a 2.5 GPA in all courses for the major are required.

- Bio Sci 150 and 152 – Foundations I and II
- Bio Sci 325 – Genetics
- Bio Sci 310 – Ecology OR Bio Sci 315 – Cell Biology and laboratory
- Four Bio Sci courses that include a laboratory
- One Capstone/Research course
- Chem 102 and 104 – Introductory Chemistry
- Either Chem 343, 344, and 345 (Organic Chemistry with laboratory) OR Chem 341, 342 (Survey of Organic Chemistry with laboratory)
- Physics 120, 122 (or equivalent), and a physics lab numbered 121 or higher
- Math 211 or 231 – Calculus

Cell and Molecular Biology Option

The requirements are basically the same as those for the Standard Option except that students must take Bio Sci 315 – Cell Biology and laboratory and must

select their other biology courses from an approved list of Cell and Molecular Biology courses.

Microbiology Major

The major in Microbiology requires a minimum of 35 credits and a 2.5 GPA in all courses in the major. The required elements include:

- Bio Sci 150 and 152 – Foundations I and II
- Bio Sci 315 Cell Biology OR Chem 501 Biochemistry
- Bio Sci 325 – Genetics
- Bio Sci 529 – Molecular Biology of Microorganisms
- Bio Sci 540 – Microbial Diversity and Physiology
- Bio Sci 580 – Experimental Microbiology OR Bio Sci 539 Laboratory Techniques in Molecular Biology
- Six additional Microbiology course credits selected from Bio Sci 316, 401, 402, 405, 425, 490, 495, 536, 539, 542, 544, 572, 573, 580, 595, 607, 667, 671, 698, 699; Chem 501, 601; BMS 534, 535, 539, 540, Honors 686, 687, 689
- One Capstone/Research course
- Chem 102 and 104 – Introductory Chemistry
- Chem 343, 344, and 345 – Organic Chemistry with laboratory
- Physics 120, 122, and 123 OR Physics 209 and 210 with laboratory
- Math 211 or 231 – Calculus

Research Opportunities

The research laboratories in the department provide an opportunity for undergraduates to gain real-life laboratory and field experience. As early as freshman year, students can work side-by-side with faculty members and graduate students on a broad range of current research projects. Students also have the opportunity to do research and receive Honors in the major.

Research Facilities

Students have access to modern research laboratories with the latest technology and equipment. UWM has state-of-the-art animal facilities and a modern research greenhouse. The Department has a wide range of molecular equipment in its Biotechnology facility as well as a microscopy facility with light and electron microscopes. The UWM Field Station in Saukville, Wisconsin, is home to natural communities including bogs, forests and a prairie. In addition, the Great Lakes WATER Institute is an aquatic and environmental research facility that includes a research vessel, the *R/V Neeskay*.

Scholarships

The UWM Office of Financial Aid and the College of Letters and Science Office of College Relations can provide information about campus and college-wide scholarships available to new students and transfers. The department also has a number of competitive scholarships and awards available to junior and senior students in the program.

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This sample four-year plan shows just one possible pathway to earning a degree with this major in four years. This plan **does not** replace the advice of your advisor, and students are cautioned to meet regularly with their advisor to create a personalized plan that matches their particular circumstances. This plan also follows the degree requirements for students who began their UWM education in Fall of 2013 or later. If you started at UWM prior to Fall of 2013, your degree requirements may be different.

Degree Requirements for a Bachelor of Science with a Biological Sciences major (brief summary):

(Biological Sciences is also available as a Bachelor of Arts degree with a different set of requirements than listed below.)

1. English Proficiency and UWM Oral and Written Communication (OWC) GER - English 102 (OWC-A); and OWC-B course.
2. Math and Formal Reasoning - Math 211, 221, or 231; an additional 200-level course from Math, Philos 212, or Letters and Science statistics course; and a QL-B course. (A single course may satisfy both formal reasoning and the QL-B GER.)
3. Foreign Language – 2 semesters of a single Foreign Language
4. L&S Humanities – 12 credits
5. L&S Social Sciences – 12 credits
6. L&S Natural Science – 12 credits including a laboratory course in three distinct natural science areas
7. L&S International – 9 credits usually accomplished in conjunction with Humanities and/or Social Science courses
8. UWM Arts GER – 3 credits
9. UWM Cultural Diversity GER – 3 credits usually accomplished in conjunction with a Humanities or Social Science course
10. 120 credits including 90 credits in L&S and with 36 of the 90 credits in L&S upper-level (numbered 300 and above) courses and 30 of those 36 in courses designated upper-level Natural Science
11. Complete the Bio Sci major requirements in either the General Bio Sci option or the Cell and Molecular Biology option, OR complete the requirements for the Microbiology major:
 - General Bio Sci option:
 - » 34 Bio Sci credits, including 26 numbered 300 or above, of which 15 must be completed at UWM
 - » All of Bio Sci 150, 152, and 325
 - » Bio Sci 310 or both Bio Sci 315 and 316
 - » One course from Bio Sci 611, 670, 671, 698, 699; CES 490; Honors 686, 687, 689
 - Cell and Molecular Biology option:
 - » Chem 102 and 104 AND one of the following sequences: Chem 343, 344, 345 OR Chem 341, 342
 - » All of Physics 120, 122 (or equivalent), and a Physics lab 121 or higher
 - » Bio Sci electives to build to 34 total credits, with 26 advanced credit and 4 lab courses
 - Microbiology Major:
 - » 35 credits, with at least 15 credits numbered 300 and above at UWM
 - » Both of Bio Sci 150 & 152
 - » One of Bio Sci 315 or Chem 501
 - » Bio Sci 325
 - » Bio Sci 383
 - » Bio Sci 529
 - » Bio Sci 540
 - » One of Bio Sci 580 or 539
 - » Six additional Microbiology course credits selected from Bio Sci 316, 401, 402, 405, 425, 490, 495, 536, 539, 542, 544, 572, 573, 580, 595, 607, 667, 671, 698, 699; Chem 501, 601; BMS 534, 535, 539, 540, Honors 686, 687, 689
 - » One Capstone/Research course
 - » All of Chem 102, 104, 343, 344, 345
 - » All of Physics 120, 122, 123 OR Physics 209, 210, 215

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Sample Four Year Plans:

There are hundreds of courses that satisfy various requirements (<http://www4.uwm.edu/lets/requirements/>), and courses in the major can be used. For example, Bio Sci 150 counts towards the major and as a natural science with lab. (This sample assumes no high school Foreign Language was taken and that the student placed into college-level Math and English.)

General Biological Sciences Option:

	Semester 1	Semester 2
Year 1	English 101	English 102 (OWC-A)
	Math 102, 105 or 108 (QL-A)	Math 211 (NS)
	1st semester Foreign Language	2nd semester Foreign Language
	Bio Sci 150 (NS+)	Bio Sci 152
Year 2	MthStat 215 (or other QL-B, formal reasoning)	Chem 104
	Chem 102 (NS+)	L&S Humanities/Cultural Diversity
	Elective	L&S Social Science/International
	Physics 120	Physics 122 (NS)
	Physics 121 (NS+)	Elective
Year 3	Bio Sci 310	Bio Sci 356 or other lab
	Bio Sci 325	Bio Sci advanced elective
	Chem 341	L&S Humanities/International
	Chem 342	Arts GER
	Elective	Elective
Year 4	Bio Sci advanced elective	Bio Sci advanced elective
	Bio Sci advanced elective	Bio Sci advanced elective
	L&S Social Science/International	Bio Sci research/capstone
	L&S Humanities	L&S Humanities
	L&S Social Science	L&S Social Science upper-level

Cell and Molecular Biology Option:

	Semester 1	Semester 2
Year 1	English 101	English 102 (OWC-A)
	Math 102, 105 or 108 (QL-A)	Math 211 (NS)
	1st semester Foreign Language	2nd semester Foreign Language
	Bio Sci 150 (NS+)	Bio Sci 152
Year 2	MthStat 215 (or other QL-B, formal reasoning)	Chem 104
	Chem 102 (NS+)	L&S Humanities/Cultural Diversity
	Elective	L&S Social Science/International
	Physics 120	Physics 122 (NS)
	L&S Humanities/International	Physics 123 (NS+)
	Arts GER	Elective
Year 3	Bio Sci 315	Bio Sci 356
	Bio Sci 316	Bio Sci 383
	Bio Sci 325	Chem 344
	Chem 343	Chem 345
	Social Science/International	Elective
Year 4	Bio Sci 401	Bio Sci 402
	Bio Sci advanced elective	Bio Sci 672 or 697
	L&S Humanities	Bio Sci elective
	L&S Social Science	L&S Humanities
	Elective	L&S Social Science upper-level
		Elective

(NS) Natural Science GER

(NS+) Natural Science GER with lab



Microbiology Option:

	Semester 1	Semester 2
Year 1	English 101	English 102 (OWC-A)
	Math 102,105 or 108# (QL-A)	Math 211 (NS)
	1st semester Foreign Language	2nd semester Foreign Language
	Bio Sci 150 (NS+)	Bio Sci 152
Year 2	MthStat 215 (or other QL-B, formal reasoning)	Chem 104
	Chem 102 (NS+)	L&S Humanities/ International
	L&S Social Science/ International	Arts GER
	Physics 120	Physics 122 (NS)
	Elective	Physics 123 (NS+)
	L&S Humanities/Cultural Diversity	
Year 3	Bio Sci 315	Bio Sci 383
	Bio Sci 325	Bio Sci advanced elective
	Bio Sci elective	Chem 344
	Chem 343	Chem 345
	Elective	Elective
Year 4	Bio Sci 529	Bio Sci 540
	Bio Sci 539 or 580	Bio Sci 671 or 698
	L&S Social Science/ International	Elective
	L&S Humanities	L&S Humanities
	L&S Social Science	L&S Social Science upper- level

(NS) Natural Science GER

(NS+) Natural Science GER with lab