

# BACTERIOLOGY, MS

## REQUIREMENTS

### MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (<http://guide.wisc.edu/graduate/#policiesandrequirementstext>), in addition to the program requirements listed below.

### MAJOR REQUIREMENTS

#### MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	No

#### Mode of Instruction Definitions

**Accelerated:** Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

**Evening/Weekend:** Courses meet on the UW-Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

**Face-to-Face:** Courses typically meet during weekdays on the UW-Madison Campus.

**Hybrid:** These programs combine face-to-face and online learning formats. Contact the program for more specific information.

**Online:** These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

### CURRICULAR REQUIREMENTS

Requirement Detail	
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	21 credits
Minimum Graduate Coursework Requirement	15 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: <a href="https://policy.wisc.edu/library/UW-1244">https://policy.wisc.edu/library/UW-1244</a> ( <a href="https://policy.wisc.edu/library/UW-1244/">https://policy.wisc.edu/library/UW-1244/</a> ).
Overall Graduate GPA Requirement	3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: <a href="https://policy.wisc.edu/library/UW-1203">https://policy.wisc.edu/library/UW-1203</a> ( <a href="https://policy.wisc.edu/library/UW-1203/">https://policy.wisc.edu/library/UW-1203/</a> ).
Other Grade Requirements	n/a

Assessments and Examinations	<ul style="list-style-type: none"> <li>Research path: thesis is required;</li> <li>coursework path: writing assessment is required.</li> </ul>
Language Requirements	n/a

### REQUIRED COURSES

Students select one of the following pathways to complete the MS degree.

1. Coursework Pathway (<https://masters.bact.wisc.edu/coursework-track/>): This requires primarily formal coursework. There is no research requirement.
2. Research Pathway (<https://masters.bact.wisc.edu/research-track/>): This requires significant laboratory research with a formal written component describing and analyzing the work performed.

These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

#### Coursework Pathway

Code	Title	Credits
<b>Core</b>		
Students must complete the following courses.		
MICROBIO 303	Biology of Microorganisms	3
MICROBIO 526	Physiology of Microorganisms	3
MICROBIO 470	Microbial Genetics & Molecular Machines	3
BIOCHEM 501	Introduction to Biochemistry	3
<b>Masters Seminar</b>		
MICROBIO 875	Special Topics (Masters Degree Seminar and Ethics Workshop) <sup>1</sup>	1

<b>Electives</b>	<b>15</b>
Students must complete at least 15 credits of electives from the "Elective Coursework" table below.	

#### Research

Students may complete up to nine credits of Research (990). Special Problems (699, 999), and Independent Study (899) courses. These courses do not fulfill the 15-credit electives requirement.

<b>Additional Coursework</b>	<b>2</b>
Students must complete additional coursework chosen in consultation with program advisor to reach the 30-credit minimum requirement. Seminar credits and one-credit courses must be approved by the program advisor.	

<b>Total Credits</b>	<b>30</b>
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<sup>1</sup> The Ethics Workshop has the goal of fostering ethical and professional conduct. This workshop will be part of MICROBIO 875 Special Topics and will occur every year in the fall semester. This is a requirement for both pathway options.

**Research Pathway**

Code	Title	Credits
<b>Core</b>		
Students must complete the following courses. Students may use up to five credits from the core requirements towards the required ten credits of formal coursework if taken while enrolled in the MS program.		
MICROBIO 303	Biology of Microorganisms	3
MICROBIO 526	Physiology of Microorganisms	3
MICROBIO 470	Microbial Genetics & Molecular Machines	3
BIOCHEM 501	Introduction to Biochemistry	3
<b>Masters Seminar</b>		
MICROBIO 875	Special Topics (Masters Degree Seminar and Ethics Workshop) <sup>1</sup>	1
<b>Formal Coursework</b>		<b>10</b>
Students must complete at least 10 credits of formal coursework. This requirement may be fulfilled with electives chosen from the list below or coursework approved by the program advisor or research advisor. Seminar credits and one-credit courses must be approved by the program advisor.		
<b>Research</b>		<b>12</b>
Students must complete at least 12 credits of Research (990), Special Problems (699, 999), and Independent Study (899) courses chosen in consultation with research advisor. Students are strongly encouraged to enroll in additional credits.		
<b>Total Credits</b>		<b>30</b>

<sup>1</sup> The Ethics Workshop has the goal of fostering ethical and professional conduct. This workshop will be part of MICROBIO 875 Special Topics and will occur every year in the fall semester. This is a requirement for both pathway options.

**Elective Coursework**

Code	Title	Credits
MICROBIO 520	Planetary Microbiology: What Life Here Tells Us About Life Out There	3
MICROBIO/ SOIL SCI 523	Soil Microbiology and Biochemistry	3
MICROBIO 525	Field Studies of Planetary Microbiology and Life in the Universe	3
MICROBIO/ BIOCHEM/ GENETICS 612	Prokaryotic Molecular Biology	3
MICROBIO 626	Microbial and Cellular Metabolomics	3
MICROBIO 657	Bioinformatics for Microbiologists	3
MICROBIO/ BMOLCHEM 668	Microbiology at Atomic Resolution	3
MICROBIO 710	Microbial Symbiosis	3
M M & I/PATH- BIO 528	Immunology	3
M M & I 554	Emerging Infectious Diseases and Bioterrorism	2

M M & I/ BIOCHEM 575	Biology of Viruses	2
M M & I 704	Infectious Diseases of Human Beings	3
M M & I 740	Mechanisms of Microbial Pathogenesis	3
M M & I/PATH- BIO 750	Host-Parasite Relationships in Vertebrate Viral Disease	3
GENETICS/ MD GENET 565	Human Genetics	3
GENETICS/ AGRONOMY/ AN SCI/HORT 615	Genetic Mapping	3
GENETICS/ENTOM/ ZOOLOGY 624	Molecular Ecology	3
GENETICS/ CHEM 626	Genomic Science	2
GENETICS/ BIOCHEM 631	Plant Genetics and Development	3
GENETICS 633	Population Genetics	3
GENETICS/ MD GENET/ POP HLTH 636	Public Health Genomics	1
GENETICS/ BOTANY/M M & I/ PL PATH 655	Biology and Genetics of Fungi	3
GENETICS/ BOTANY/ENTOM/ ZOOLOGY 820	Foundations of Evolution	2
GENETICS 885	Advanced Genomic and Proteomic Analysis	3
GENETICS/B M E/ B M I/BIOCHEM/ CBE/COMP SCI 915	Computation and Informatics in Biology and Medicine	1
BIOCHEM/ NUTR SCI 510	Nutritional Biochemistry and Metabolism	3
BIOCHEM 570	Computational Modeling of Biological Systems	3
BIOCHEM 601	Protein and Enzyme Structure and Function	2
BIOCHEM/B M I/ BMOLCHEM/ MATH 609	Mathematical Methods for Systems Biology	3
BIOCHEM/ NUTR SCI 619	Advanced Nutrition: Intermediary Metabolism of Macronutrients	3
BIOCHEM/ GENETICS/ MD GENET 620	Eukaryotic Molecular Biology	3
BIOCHEM/ BOTANY 621	Plant Biochemistry	3
BIOCHEM 924	Membrane Protein Structure and Function	1
CHEM 665	Biophysical Chemistry	3
PUBLHLTH 710	Introduction to Global Health: History, Current Issues, and Health Statistics	2

PUBLHLTH 711	Global Public Health and Healthcare Systems: Organizations, Governance, Financing, and Workforce	2
BOTANY/ANTHRO/ ZOOLOGY 410	Evolutionary Biology	3
BOTANY/ENTOM/ PL PATH 505	Plant-Microbe Interactions: Molecular and Ecological Aspects	3
ONCOLOGY/ M M & I/ PL PATH 640	General Virology-Multiplication of Viruses	3
ONCOLOGY 675	Advanced or Special Topics in Cancer Research	1-3
STAT/F&W ECOL/ HORT 571	Statistical Methods for Bioscience I	4