Microbiology

Department Information

- **Department Web Site:**
  www.ndsu.edu/microbiology/ (http://www.ndsu.edu/microbiology/)
- **Credential Offered:**
  B.S.; Minor
- **Sample Program Guide:**
  catalog.ndsu.edu/programs-study/undergraduate/microbiology/#planofstudytext (http://catalog.ndsu.edu/programs-study/undergraduate/microbiology/#planofstudytext)

Major Requirements

Major: Microbiology

Degree Type: B.S.
Minimum Degree Credits to Graduate: 120

University Degree Requirements

1. Satisfactory completion of all requirements of the curriculum in which one is enrolled.
2. Earn a minimum total of 120 credits in approved coursework. Some academic programs exceed this minimum.
3. Satisfactory completion of the general education requirements as specified by the university.
4. A minimum institutional GPA of 2.00 based on work taken at NDSU.
5. At least 30 credits must be NDSU resident credits. Resident credits include credits registered and paid for at NDSU.
6. At least 36 credits presented for graduation must be in courses numbered 300 or higher.
7. Students presenting transfer credit must meet the NDSU residence credits and the minimum upper level credit. Of the 30 credits earned in residence, a minimum of 15 semester credits must be in courses numbered 300 or above, and 15 semester credits must be in the student's curricula for their declared major.

For complete information, please refer to the Degree and Graduation Requirements (http://catalog.ndsu.edu/past-bulletin-archive/2024-25/academic-policies/undergraduate-policies/degree-and-graduation/) section of this Bulletin.

University General Education Requirements

A list of university approved general education courses and administrative policies are available here (http://catalog.ndsu.edu/past-bulletin-archive/2024-25/academic-policies/undergraduate-policies/general-education/#genedcoursestext).

Code	Title	Credits
Category C: Communication		**12**
ENGL 110	College Composition I	
ENGL 120	College Composition II	
COMM 110	Fundamentals of Public Speaking	
Upper Division Writing †		
Category R: Quantitative Reasoning †		**3**
Category S: Science and Technology †		**10**
Category A: Humanities and Fine Arts †		**6**
Category B: Social and Behavioral Sciences †		**6**
Category W: Wellness †		**2**
Category D: Cultural Diversity *†		
Category G: Global Perspectives *†		
Total Credits		**39**

*
Courses for category D & G are satisfied by completing D & G designated courses in another general education category.

†
General education courses may be used to satisfy requirements for both general education and the major, minor, and program emphases, where applicable. Students should carefully review major requirements to determine if specific courses can also satisfy these general education categories.

Major Requirements

Code	Title	Credits
Microbiology Core Courses		
MICR 189	Skills for Academic Success [1, 2]	1
MICR 350 & 350L	General Microbiology and General Microbiology Lab [2]	5
MICR 352 & 352L	Critical Skills in Microbiology and Critical Skills in Microbiology Laboratory Research [2]	5
MICR 452	Microbial Ecology [2,3]	3
MICR 470	Basic Immunology [2,3]	3
MICR 475	Virology [2,3]	3
MICR 480	Microbial Physiology [2,3]	3
MICR 482	Microbial Genetics [2,3]	3
MICR 485	Capstone Experience I: Reflecting and Planning [2]	1
MICR 486	Capstone Experience II: Reflection and Dissemination [2]	1
Laboratory Course [3]		
Select one from the following:		2-3
BIOC 474	Methods of Recombinant DNA Technology [2,3]	
MICR 445	Animal Cell Culture Techniques [2,3]	
MICR 460L	Microbial Pathogenesis Laboratory [2,3]	
MICR 471	Immunology and Serology Laboratory [2,3]	
Capstone Experience [3]		
Capstone Experience must include a minimum of 2 credits from the following:		2
MICR 493	Undergraduate Research	
MICR 496	Field Experience	
MICR 497	FE/Coop Ed/Internship	
Microbiology Electives [2,3]		
Select from the following:		8
MICR 379	Global Seminar (No more than 3 credits) [2]	
or MICR 492	Global Practicum: Study Abroad	
MICR 394	Individual Study (No more than 3 credits) [2]	
MICR 453	Food Microbiology [2,3]	
MICR 453L	Food Microbiology Laboratory [2]	
MICR 455	Microbial Biotechnology [2,3]	
MICR 460	Microbial Pathogenesis [2,3]	
MICR 463	Clinical Parasitology [2,3]	
MICR 481	Microbial Genomics with Computational Laboratory [2,3]	
MICR 491	Seminar (No more than 3 credits) [2]	
ANSC 475	One Health [2,3]	
BIOC 483	Cellular Signal Transduction Processes and Metabolic Regulations [2,3]	
BIOC 487	Molecular Biology of Gene Expression [2,3]	
BIOL 359	Evolution [2,3]	
BIOL 370	Cell Biology [2,3]	
BIOL 401	Science Communication [2,3]	
BIOL 483	Cellular Mechanisms of Diseases [2,3]	
MLS 435	Hematology [2,3]	
PH 474	Epidemiology [2,3]	
PLSC 307	History and Evolution of Wine in America [2,3]	
PLSC 431	Intermediate Genetics [2,3]	

PPTH 454	Diseases Of Field and Forage Crops [2,3]	
PPTH 460	Fungal Biology [2,3]	
SOIL 351	Soil Ecology [2,3]	
BIOC 461	Foundations of Biochemistry and Molecular Biology II	3
BIOC 460	Foundations of Biochemistry and Molecular Biology I	3
BIOL 150 & 150L	General Biology I and General Biology I Laboratory	4
BIOL 151 & 151L	General Biology II and General Biology II Laboratory	4
CHEM 121 & 121L	General Chemistry I and General Chemistry I Laboratory	4
CHEM 122 & 122L	General Chemistry II and General Chemistry II Laboratory	4
CHEM 341 & 341L	Organic Chemistry I and Organic Chemistry I Laboratory	4
CHEM 342	Organic Chemistry II	3
PHYS 211 & 211L	College Physics I and College Physics I Laboratory	4
PHYS 212 & 212L	College Physics II and College Physics II Laboratory	4
PLSC 315 & 315L	Genetics and Genetics Laboratory	4
STAT 330	Introductory Statistics	3
Select one philosophy course from the following:		3
PHIL 111	Professional Responsibility and Ethics	
PHIL 210	Ethics	
PHIL 215	Contemporary Moral Issues	
PHIL 216	Business Ethics	
PHIL 225	Environmental Ethics	
PHIL 327	Ethics, Engineering, and Technology	
Select one math course from the following:		3-4
MATH 105	Trigonometry	
MATH 107	Precalculus	
MATH 146	Applied Calculus I	
MATH 165	Calculus I	
Total Credits		**90-91**

1

MICR189 is only required for first-time, first-year students - A first-time, first-year student is defined as a student who has not yet completed a college course as a college student. Students that are not first-time, first-year students that either transfer into the university or change their major are not required to take MICR 189.

2

Course requires a grade of C or better.

3

Courses offered at the 600 level can be used in the B.S./M.S. accelerated program. The 600 level courses have additional outcomes/requirements for graduate level students. When students complete and submit the Accelerated Declaration form, the courses must be identified and no more than 15 credits of graduate coursework can be counted toward the B.S. degree.

Accelerated Undergraduate to Master's Degree Programs

- Students may participate in an accelerated program in the following areas:
  - B.S. Microbiology to Master of Science in Microbiology
  - B.S. Microbiology to Master of Public Health
- A 3.0 GPA is required for the B.S./M.S. accelerated programs
- Instructions to apply are found here (https://www.ndsu.edu/onestop/accelerated-degrees-undergraduate-graduate-programs/).

- A sample 5-year plan for interested students can be found on the department website (https://www.ndsu.edu/agriculture/academics/academic-units/microbiological-sciences/undergraduate-programs/pathways-success/).
- Students may complete a thesis-based or comprehensive study-based masters program. Outcomes of these master's programs can be found here (https://catalog.ndsu.edu/programs-study/graduate/microbiology/#degreerequirementstext).