

Microbiology Master's

Department Information

- **Program Information:**
ndsu.edu/programs/graduate/microbiology (<http://ndsu.edu/programs/graduate/microbiology/>)
- **Department Web Site:**
ndsu.edu/microbiology/ (<http://ndsu.edu/microbiology/>)
- **Application Deadline:**
January 15- fall
- **Credential Offered:**
M.S.
- **English Proficiency Requirements:**
TOEFL iBT 81 (Speaking 23, Writing 21); IELTS 7 (Speaking 6, Writing 6); Duolingo 115

Apply Now (https://ndsugrad.my.site.com/Application/TX_SiteLogin/?startURL=/Application/TargetX_Portal__PB)

The program seeks to help students develop their foundation of knowledge in microbiology, master techniques in microbiology and immunology, critically analyze results from their own research and the work of others, write high-quality technical documents, present their work, and to meet all professional and ethical standards of the field.

Program Options

Plan A (Thesis-based) MS degree, including an Accelerated BS to MS (4+1) Program

30 credits are required in total; 16 of which should be didactic, including required coursework in Structure & Function of Cells, Microbial Systems, and Analytical Skill & Technology. Students are expected to craft their plan of study based on their career goals and under advisement from their committee. Two credits for presentation in MICR 790 (Graduate Seminar) are required for the thesis masters. After the required courses, the remaining credits must consist of graduate-level elective coursework as featured on a Plan of Study approved by the student's thesis committee.

Plan A Outcomes

1. Adhere to ethical and professional standards in Microbiology.
2. Demonstrate foundational knowledge in Microbiology.
3. Participates in scholarly inquiry relevant the field of study.
4. Collect and document reproducible and publishable quality data through completion of experiments using at least one technique.
5. Critically analyze, write high-quality technical documents, and communicate scientific content to a chosen audience. Contribute significantly (co-authorship) to scientific journal articles.
6. Participates in collaboration in ways that enhance the output of the project.
7. Display professional skills in personal effectiveness, including managing individual projects and being ready for the workplace.
8. Participate in activities that promote leadership, citizenship, and inclusiveness.

Plan B (Master's paper-based)

30 credits are required in total. Students must complete a minimum of 21 didactic credits towards this degree, including required coursework in Structure & Function of Cells, Microbial Systems, and Analytical Skill & Technology as required for a plan A MS degree. At least one credit for presentation in MICR 790 (Graduate Seminar) and between two and four credits in MICR 797 (MS Paper) will count towards degree requirements. Attendance at program seminars is expected as is adherence to professional standards in microbiology.

Plan B Outcomes

1. Adhere to ethical and professional standards in Microbiology.
2. Demonstrate foundational knowledge in Microbiology.
3. Participates in scholarly inquiry relevant to the field of study.
4. Critically analyze and write quality technical documents and communicate scientific content to a chosen audience.
5. Participates in collaboration to successfully complete a project.
6. Display professional skills in personal effectiveness, including managing individual projects and being ready for the workplace

Students in either Masters plan must complete the following courses

Code	Title	Credits
MICR 701	Introduction to Graduate Research	1-3
MICR 720	Scientific Integrity	1
MICR 790	2 required for Thesis MS	1-2
MICR 793	Masters Portfolio	1
MICR 797		2-4
or		
MICR 798		6-10

Students in either Masters plan must complete one course from each of three core areas of study:

Structure and Functional of Cells (select one of the following options):

Code	Title	Credits
MICR 675	Virology	3
MICR 680	Microbial Physiology	3
MICR 682	Microbial Genetics	3
BIOL 820	Advanced Cell Biology	3

Microbial Systems (select one of the following options):

Code	Title	Credits
MICR 652	Microbial Ecology	3
MICR 653	Food Microbiology	3
MICR 660	Microbial Pathogenesis	3
MICR 670	Basic Immunology	3

Analytical Skills & Technology (select one of the following options):

Code	Title	Credits
CSCI 732	Introduction to Bioinformatics	3
MICR 671	Immunology and Serology Laboratory	2
and		
MICR 645	Animal Cell Culture Techniques	2
MICR 681	Microbial Genomics with Computational Laboratory	3
STAT 669	Introduction to Biostatistics	3

Admission and Application Requirements

Graduate School admission and application requirements are found on the Admission Information (<https://catalog.ndsu.edu/past-bulletin-archive/2025-2026/graduate/admission-information/>) page. In addition to these requirements, the following are required:

- Evidence of a strong academic record in the biological sciences.
- The statement of purpose should address each of the following:
 - The degree you are seeking (Comprehensive study-based M.S., Thesis-based M.S., or PhD).
 - An explanation of how obtaining a graduate degree in our program fits your career goals.
 - A description of the qualities you possess that will contribute to your success.
 - A description of any relevant experiences you have had. If you have had research experience, it is important to include a letter of recommendation from your research adviser. (Particularly important for Thesis-based M.S. and Ph.D. applicants).
 - A list of the areas of research in the department that interest you and identifying specific researchers is helpful. (Particularly important for Thesis-based M.S. and Ph.D. applicants)
 - The Department of Microbiological Sciences at North Dakota State University is committed to fostering a welcoming and dynamic learning environment that prepares students for academic and professional success. Graduate education benefits from a wide range of perspectives, experiences, and problem-solving approaches. Please provide a statement describing any experiences, challenges, or perspectives that have shaped your journey and how they will contribute to your graduate studies and the broader learning community.

Admission Standards

Applicants are evaluated in each of five dimensions that are expected to impact performance as a graduate student:

1. Academic preparation
 - a. Prior courses/degrees
 - b. Communication
 - c. English Proficiency - if applicable
2. Scholarly Potential
 - a. Motivation for graduate study
 - b. Prior Experience
3. Socio-Emotional Competencies
 - a. Self-Appraisal
 - b. Long term Goals/Accomplishments
4. Alignment with Program
 - a. Alignment with Faculty research
 - b. Alignment with program training
5. Alignment with Values of the department

Please see the Microbiology website (<https://www.ndsu.edu/agriculture/academics/academic-units/microbiological-sciences/>) for more details on the admissions process and Frequently Asked Questions.