Microbiology

Department Information

- **Department Location:** Van Es Hall
- **Department Phone:** 701-231-7667
- **Department Web Site:** www.ndsu.edu/micro/
- **Credential Offered:** B.S.
- **Plan Of Study Sample:** bulletin.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 specific by the university.
4. A minimum institutional GPA of 2.00 based on work taken at NDSU.
5. At least 36 credits presented for graduation must be in courses number 300 or higher.
6. Transfer Students: Must earn a minimum of 60 credits from a baccalaureate-degree granting or professional institution.
   a. Of these 60, at least 36 must be NDSU resident credits as defined in #7.
   b. Within the 36 resident credits, a minimum of 15 must be in courses numbered 300 or higher and 15 credits in the major field of study.
7. At least 36 credits must be NDSU resident credits. Residence credits include credits registered and paid for at NDSU.

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

**University General Education Requirements**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>College Composition I</td>
<td></td>
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<tr>
<td>ENGL 120</td>
<td>College Composition II</td>
<td></td>
</tr>
<tr>
<td>COMM 110</td>
<td>Fundamentals of Public Speaking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper Division Writing †</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Quantitative Reasoning (R) †</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Science and Technology (S) †</strong></td>
<td>10</td>
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<tr>
<td></td>
<td><strong>Humanities and Fine Arts (A) †</strong></td>
<td>6</td>
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<tr>
<td></td>
<td><strong>Social and Behavioral Sciences (B) †</strong></td>
<td>6</td>
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<tr>
<td></td>
<td><strong>Wellness (W) †</strong></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Cultural Diversity (D) ††</strong></td>
<td></td>
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<tr>
<td></td>
<td><strong>Global Perspectives (G) ††</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 39

* May be satisfied by completing 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.
• A list of university approved general education courses and administrative policies are available here (http://bulletin.ndsu.edu/academic-policies/undergraduate-policies/general-education/#gencedcourses).  

**Major Requirements**

A grade of ‘C’ or better is required for the microbiology core and elective requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required Courses for Microbiology Major</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICR 350 &amp; 350L</td>
<td>General Microbiology and General Microbiology Lab</td>
<td>5</td>
</tr>
<tr>
<td>MICR 352 &amp; 352L</td>
<td>General Microbiology II and General Microbiology Lab II</td>
<td>5</td>
</tr>
<tr>
<td>MICR 452</td>
<td>Microbial Ecology</td>
<td>3</td>
</tr>
<tr>
<td>MICR 470</td>
<td>Basic Immunology</td>
<td>3</td>
</tr>
<tr>
<td>MICR 475</td>
<td>Virology</td>
<td>3</td>
</tr>
<tr>
<td>MICR 480</td>
<td>Bacterial Physiology</td>
<td>3</td>
</tr>
<tr>
<td>MICR 482</td>
<td>Bacterial Genetics &amp; Phage</td>
<td>3</td>
</tr>
<tr>
<td>MICR 485</td>
<td>Capstone Experience in Microbiology - Experimental Design</td>
<td>1</td>
</tr>
<tr>
<td>MICR 486</td>
<td>Capstone Experience in Microbiology - Research Project</td>
<td>2</td>
</tr>
<tr>
<td><strong>Elective Courses for Microbiology Major</strong></td>
<td><strong>Select a minimum of 12 credits from the following:</strong></td>
<td>12</td>
</tr>
<tr>
<td>No more than 3 credits may come from courses numbered 371-399 or 491-499 to fulfill this requirement.</td>
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<tr>
<td>MICR 379</td>
<td>Study Tour Abroad</td>
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<tr>
<td>or MICR 492</td>
<td>Study Abroad</td>
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<tr>
<td>MICR 394</td>
<td>Food Microbiology</td>
<td></td>
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<tr>
<td>MICR 453</td>
<td>Pathogenic Microbiology</td>
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<tr>
<td>MICR 460</td>
<td>Clinical Parasitology</td>
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<tr>
<td>MICR 463</td>
<td>Microbial Genomics with Computational Laboratory</td>
<td></td>
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<tr>
<td>MICR 481</td>
<td>Seminar</td>
<td></td>
</tr>
<tr>
<td>MICR 491</td>
<td>Study Tour Abroad and General Microbiology Lab</td>
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<tr>
<td><strong>Laboratory courses - select one of the following:</strong></td>
<td>2-3</td>
<td></td>
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<tr>
<td>BIOC 483</td>
<td>Methods of Recombinant DNA Technology</td>
<td></td>
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<tr>
<td>BIOC 487</td>
<td>Animal Cell Culture Techniques</td>
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<td>BIOC 487</td>
<td>Molecular Biology of Gene Expression</td>
<td></td>
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<tr>
<td>BIOL 359</td>
<td>Evolution</td>
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<tr>
<td>MLS 435</td>
<td>Hematology</td>
<td></td>
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<tr>
<td>PH 474</td>
<td>Epidemiology</td>
<td></td>
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<tr>
<td>PLSC 431</td>
<td>Intermediate Genetics</td>
<td></td>
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<tr>
<td>SOIL 351</td>
<td>Soil Ecology</td>
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<tr>
<td>ZOO 370</td>
<td>Cell Biology</td>
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<tr>
<td><strong>Related Requirements for the Microbiology Major</strong></td>
<td>1</td>
<td></td>
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<tr>
<td>MICR 189</td>
<td>1</td>
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<tr>
<td>PHIL 111</td>
<td>Professional Responsibility and Ethics</td>
<td>3</td>
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<tr>
<td>BIOL 150</td>
<td>General Biology I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 150L</td>
<td>and General Biology I Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIOL 151</td>
<td>General Biology II</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 151L</td>
<td>and General Biology II Laboratory</td>
<td></td>
</tr>
<tr>
<td>CHEM 121</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 121L</td>
<td>and General Chemistry I Laboratory (May satisfy general education category S)</td>
<td></td>
</tr>
</tbody>
</table>
CHEM 122 & 122L
General Chemistry II
and General Chemistry II Laboratory (May satisfy general education category S)

CHEM 341 & 341L
Organic Chemistry I
and Organic Chemistry I Laboratory

CHEM 342
Organic Chemistry II

BIOC 460 & 460L
Foundations of Biochemistry and Molecular Biology I
and Foundations of Biochemistry I Laboratory

BIOC 461
Foundations of Biochemistry and Molecular Biology II

PHYS 211 & 211L
College Physics I
and College Physics I Laboratory (May satisfy general education category S)

PHYS 212 & 212L
College Physics II
and College Physics II Laboratory (or higher (May satisfy general education category S)

PLSC 315 & 315L
Genetics
and Genetics Laboratory (May satisfy general education category S)

STAT 330
Introductory Statistics (May satisfy general education category R)

Select one of the following or higher level math:

- MATH 105 Trigonometry
- MATH 107 Precalculus
- MATH 146 Applied Calculus I

Total Credits: 94-95

MICR 189 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 MICR189.

Degree Requirements and Notes

- A cumulative 2.50 GPA is required for graduation.

Minor Requirements

Microbiology Minor

Required Credits: 16

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
</table>
| MICR 350 & 350L | General Microbiology
and General Microbiology Lab | 5       |

Elective Courses: Select 11 credits from the following:

No more than 3 credits may come from courses numbered 491-499 to fulfill this requirement.

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>MICR 352</td>
<td>General Microbiology II</td>
</tr>
<tr>
<td>MICR 352L</td>
<td>General Microbiology Lab II</td>
</tr>
<tr>
<td>MICR 379</td>
<td>Study Tour Abroad</td>
</tr>
<tr>
<td>MICR 445</td>
<td>Animal Cell Culture Techniques</td>
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<tr>
<td>MICR 452</td>
<td>Microbial Ecology</td>
</tr>
<tr>
<td>MICR 453</td>
<td>Food Microbiology</td>
</tr>
<tr>
<td>MICR 460</td>
<td>Pathogenic Microbiology</td>
</tr>
<tr>
<td>or MICR 450</td>
<td>Infectious Disease Pathogenesis</td>
</tr>
<tr>
<td>MICR 460L</td>
<td>Pathogenic Microbiology Laboratory</td>
</tr>
<tr>
<td>or MICR 450L</td>
<td>Infectious Disease Pathogenesis Laboratory</td>
</tr>
<tr>
<td>MICR 463</td>
<td>Clinical Parasitology</td>
</tr>
<tr>
<td>MICR 470</td>
<td>Basic Immunology</td>
</tr>
<tr>
<td>MICR 471</td>
<td>Immunology and Serology Laboratory</td>
</tr>
<tr>
<td>MICR 472</td>
<td>Clinical Immunology</td>
</tr>
<tr>
<td>MICR 474</td>
<td>Epidemiology (see SAFE)</td>
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</tbody>
</table>
### Minor Requirements and Notes

- A minimum of 8 credits must be taken at NDSU.
- Students must earn a 2.50 minimum GPA for the minor with a grade of 'C' or better in the courses used to satisfy the minor requirements.