### Microbiology Undergraduate Program - Program of Study

**Degree: BS, Microbiology (Catalog: 2021-2022)**

#### I) ISU Requirements (Total of 13 credits)
- International Perspective (3) (see approved CALS list)
- US Diversity (3) (see approved CALS list)
- Communications
  - Engl 150 (3) and Engl 250 (3)
  - Lib 160 (1)

#### II) CALS Requirements (Total of 12 credits)
- Humanities (3) see CALS approved list
- Social Science (3) see CALS approved list
- Ethics (3) see CALS approved list

#### III) ISU or CALS & Microbiology (Total of 50 credits)

##### Scientific Communication (6 credits)
- 1) Speech 212 (3)
- 2) English 302, 309, 312, 314 (3) Choose 1

##### Math (10 Credits)
- 1) Stat 101 (4) or 104 (3)
- 2) Math 143 (4/pre-calc) or 145 (3/Trig) or Stat 301 (4) or Math 165 (4/Calculus 1)
- 3) Math 160 (4/Surv Calc) or 165 (4/Calculus 1) or Math 166 (4/Calculus 2)

##### Physical Science (23 Credits)
- 1) Chem 177/177L (5) and 178 (3) Inorganic
- 2) Phys 131/131L (5) and Phys 132/132L (5)
  - General Physics (recommended) OR Phys 115/115L (5) Phys for Life Sci. (only if not doing further schooling)
- 3) Chem 331/331L (4), and Chem 332 (3) Organic
- 4) BBMB 301 (3) or BBMB 316 (3) OR BBMB 404 (3) AND BBMB 405 (3)

##### Biological Sciences (15 credits)
- 1) Biol 211 (3) & Biol 211L (1) or Micro 115 (2/F)
- 2) Biol 212 (3) and Biol 212L (1)
- 3) Biol 313 (3) and Biol 313L (1) Genetics
- 4) Biol 314 (3/S) OR Biol 328 (3/F) Cell Biology

Minors to Consider: Pharmacology & Toxicology, Food Safety, Genetics, Global Health, etc.

(4) = 4 credits (3) = 3 credits (2) = 2 credits
F = offered fall semester S = offered spring semester,
No designation = offered Fall and Spring
Odd = odd years 2023, 2025, etc.
Even = even year 2022, 2024, etc
5) * Micro 430 & 456 & 477 can count as Micro requirement #5 OR #11, but not both

**updated 5/11/21**

#### IV) Microbiology (Total of 31 credits)

##### Core Microbiology Courses (16 credits)
- 1) MICRO 110 (1/F) Orientation
- 2) MICRO 302 (3) Biology of Microorganisms
- 3) MICRO 310 (3/F) Medical Microbiology
- 4) MICRO 320 (4/S) Molecular and Cellular Bact.
- 5) * MICRO 430 (3/S/odd) Micro Diversity & Ecology
  - Micro 456 (3/F) Mycology
  - Micro 477 (3/S/even) Bac-Plant Interactions
- 6) MICRO 450 (2/S) Capstone - Senior Seminar
- 7) MICRO 451 (R/F) Micro - Junior Survey

##### Core Laboratory Courses (6 Credits)
- 8) MICRO 302L (1) General Micro Lab
- 9) MICRO 310L (1/F) Medical Micro Lab
  - Or MICRO 475L (2/S) Immunology Lab
- 10) MICRO 440 (4) Lab in Microbial Physiology, Diversity & Genetics

##### Microbiology Electives – (9 credits)
- 11) Choose from the list below (Max 3 cr of lab)

**Common Clinical Electives**
- MICRO 353 (3/S) Intro Parasitology
- MICRO 374 (3/S) Insects & Our Health
- MICRO 374L (1/S/even) Insects/Health Lab
- MICRO 408 (3/F) Virology
- MICRO 428 (3/S) Principles of Epidemiology
- MICRO 475 (3/S) Immunology
- MICRO 475L (2/S) Immunology Lab
- MICRO 517 (3/F) Gut Microbiome
- MICRO 586 (4/F) Medical Bacteriology

**Common Environmental Electives**
- PLP 408 (3) Principles of Plant Pathology
- MICRO 456 * (3/F) Mycology
- MICRO 477 * (3/S/even) Bacteria-Plant interactions
- MICRO 487 (3/F) Microbial Ecology

**Common Physiology/Genetics Electives**
- MICRO 402 (3/F/evven) Microbial Genetics
- MICRO 408 (3/F) Virology
- MICRO 430 (3/S/odd) Micro Diversity & Ecology

**Common Food Microbiology Electives**
- MICRO 407 (3/S) Micro Food Safety
- MICRO 420 (3/F) Food Microbiology
- MICRO 421 (3/S) Food Microbiology Lab

**Maximum 490 credits applied toward Micro electives = 3**
- Micro 490A Research (1-3 credits)
- Micro 490B Literature review (1-3 credits)
- Micro 490C Lab Teaching Assistant (1 credit)

#### V) Electives (8-16 credits) Courses to obtain 128 total credit hours
- Micro 101 (3/F) Microbial World
- Micro 116 (2/S) Phage Genome Lab
- Micro 265X (2) Predicting the next epidemic

*updated 5/11/21*
<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>21-22 Catalog</th>
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<tbody>
<tr>
<td>Fall</td>
<td>Spring</td>
<td>21-22 Catalog</td>
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<tr>
<td>Chem 177/177L General Chemistry &amp; Lab</td>
<td>5 Chem 178 General Chemistry</td>
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<tr>
<td>Biol 211/211L Principles of Biology &amp; Lab (or Micro 115)</td>
<td>4/5 Biol 212/212L Principles of Biology &amp; Lab</td>
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<tr>
<td>Engl 250 or 150 Written Oral Visual and Electronic Comm</td>
<td>3 Stat 101 Statistics</td>
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<tr>
<td>Micro 101 Microbes in Society</td>
<td>3 Micro 302/302L Biology of Microorganisms &amp; Lab</td>
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<tr>
<td>Micro 110 Orientation in Microbiology</td>
<td>1 Micro 116 Bioinformatics</td>
<td>2</td>
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<tr>
<td>Lib 160 Library Instruction</td>
<td>1 Micro 116 Bioinformatics</td>
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<tr>
<td>(Learning team classes available)</td>
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<td>Fall</td>
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<tr>
<td>Chem 331/331L Organic Chemistry I &amp;Lab</td>
<td>4 Chem 332 Organic Chemistry II</td>
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<tr>
<td>Bio 313/313L Genetics &amp; Lab</td>
<td>4 Biol 314 or 328(F) Molecular Cell Biology (328 - Diseases)</td>
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<td>Micro 310/310L Medical Microbiology &amp; Lab</td>
<td>4 Math Math 143, 145 or 165</td>
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<tr>
<td>Sp. Cm 212 Fundamentals of Public Speaking</td>
<td>3 Micro Choice Environmental Micro (430, 477 or 456)</td>
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<td>(Learning team classes available)</td>
<td>15 Humanities Humanities (from list)</td>
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<td>Micro 451 Microbiology Survey</td>
<td>R BBMB 301 or 316 Biochemistry</td>
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<td>Phys 131/131L or Phys 115/115L General Physics I or Physics for Life Sci. with lab</td>
<td>5 Phys 132/132L General Physics II or electives</td>
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<td>Math Math 160 or 166 or Stat 301</td>
<td>4 Ethics Ethics (from list)</td>
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<td>English 302, 309, 312 or 314</td>
<td>3 Micro 320 Molecular &amp; Cellular Bacteriology</td>
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<td>Social Science Social Science elective</td>
<td>3 Micro 320 Molecular &amp; Cellular Bacteriology</td>
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<tr>
<td>Micro 440 Lab in Microbial Physio, Gen &amp; Diversity.</td>
<td>4 General Electives General Electives or Courses toward Minor</td>
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<td>General Electives General Electives or Courses toward Minor</td>
<td>6 US Diversity US Diversity (from list)</td>
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<td>Micro Choice Microbiology Elective</td>
<td>3 Micro Choices Microbiology Electives</td>
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<td>Int. Perspective International perspectives (from list)</td>
<td>3 Micro 450 Capstone Seminar</td>
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Courses that work well for summer or study-abroad

updated 3/22/21