

# Microbiology, B.S.

## Requirements

The Bachelor of Science with a major in microbiology requires a minimum of 120 s.h., including 60–64 s.h. of work for the major, depending on the track. Students must maintain a grade-point average of at least 2.00 in all courses for the major and in all UI courses for the major. Courses for the major may not be taken pass/nonpass. Students also must complete the College of Liberal Arts and Sciences GE CLAS Core.

Students must complete at least 12 s.h. of the required 18–19 s.h. in Department of Microbiology and Immunology courses at the University of Iowa.

The major in microbiology can be pursued on either a pre-medicine or a scholar track.

Students in the pre-medicine track complete admission requirements for the Carver College of Medicine and for most colleges of medicine as an integral part of the completion of their major requirements. This track is recommended for pre-medical, pre-dental, and pre-pharmacy students.

Students in the scholar track pursue a curriculum with streamlined organic chemistry and physics requirements and expanded microbiology and immunology courses, including advanced laboratory and global health studies coursework. The scholar track is recommended for students interested in pursuing graduate training or in developing a career as a microbiologist.

Students may shift from one track to the other during their program of study.

The B.S. with a major in microbiology in the pre-medicine or the scholar track requires the following coursework.

## Pre-Medicine Track

Students in the pre-medicine track complete the following coursework.

| Code               | Title                               | Hours        |
|--------------------|-------------------------------------|--------------|
|                    | Supporting Coursework               | 42-43        |
|                    | Microbiology and Immunology Courses | 18           |
|                    | Advanced Elective Coursework        | 3            |
| <b>Total Hours</b> |                                     | <b>63-64</b> |

## Pre-Medicine Track: Supporting Coursework

| Code                     | Title   | Hours |
|--------------------------|---|-------|
| All of these:            |   |       |
| BIOL:1411-<br>BIOL:1412  | Foundations of Biology<br>- Diversity of Form and<br>Function | 8     |
| BMB:3120 &<br>BMB:3130   | Biochemistry and Molecular<br>Biology I-II                    | 6     |
| CHEM:1110 &<br>CHEM:1120 | Principles of Chemistry I-II                                  | 8     |
| CHEM:2210 &<br>CHEM:2220 | Organic Chemistry I-II  | 6     |
| CHEM:2410                | Organic Chemistry<br>Laboratory                               | 3     |

One of these:

|                         |  |   |
|-------------------------|--|---|
| BIOS:4120               | Introduction to Biostatistics                          | 3 |
| MATH:1460               | Calculus for the Biological<br>Sciences                | 4 |
| MATH:1550               | Engineering Mathematics I:<br>Single Variable Calculus | 4 |
| MATH:1850               | Calculus I   | 4 |
| STAT:3510/<br>IGPI:3510 | Biostatistics  | 3 |
| One of these sequences: |  |   |
| PHYS:1511-<br>PHYS:1512 | College Physics I-II                                   | 8 |
| PHYS:1611-<br>PHYS:1612 | Introductory Physics I-II                              | 8 |

## Pre-Medicine Track: Microbiology and Immunology Courses

Students earn a minimum of 18 s.h. in Department of Microbiology and Immunology courses from the following.

| Code      | Title   | Hours |
|-----------|---|-------|
| MICR:2157 | General Microbiology<br>(required with a grade of C<br>or higher)                     | 3     |
| MICR:2158 | General Microbiology<br>Laboratory (required with a<br>grade of C or higher)          | 2     |
| MICR:3145 | Honors in Microbiology<br>Thesis Preparation (required<br>for honors in microbiology) | 1     |

Additional microbiology and immunology courses (prefix MICR) numbered MICR:3147 or above, excluding MICR:3164; students select from the following:

|           |  |      |
|-----------|--|------|
| MICR:3147 | Immunology and Human<br>Disease                          | 3    |
| MICR:3150 | Eukaryotic Pathogens and<br>Human Disease                | 2    |
| MICR:3159 | Bacteria and Human Disease                               | 3    |
| MICR:3165 | Genetics of Bacterial<br>Pathogens Lab and<br>Discussion | 3    |
| MICR:3168 | Viruses and Human Disease                                | 3    |
| MICR:3170 | Microbial Genetics and<br>Physiology                     | 3    |
| MICR:3177 | Virology Discussion                                      | 2    |
| MICR:3178 | Virology Laboratory                                      | 2    |
| MICR:4161 | Undergraduate Research in<br>Microbiology                | arr. |
| MICR:4171 | Honors Undergraduate<br>Research in Microbiology         | arr. |
| MICR:5218 | Microscopy for Biomedical<br>Research                    | arr. |
| MICR:5264 | Directed Study in<br>Microbiology                        | arr. |

A maximum of 4 s.h. earned in either MICR:4161 Undergraduate Research in Microbiology or MICR:4171 Honors Undergraduate Research in Microbiology may be counted toward the major. However, students earning honors in the major must complete 6 s.h. in MICR:4171 Honors Undergraduate Research in Microbiology; see Honors [p. ] in this section of the catalog.

## Pre-Medicine Track: Advanced Elective Coursework

| Code   | Title   | Hours |
|--|---|-------|
| Up to 3 s.h. from these:   |   |       |
| BIOL:2723  | Cell Biology  | 3     |
| BIOL:3212/<br>IGPI:3212  | Bioinformatics for Beginners  | 3     |
| BIOL:3314/<br>IGPI:3314  | Genomics  | 3     |
| BIOL:4213/<br>GENE:4213/<br>IGPI:4213  | Bioinformatics  | 2,4   |
| BMB:3310/<br>CBIO:3310/<br>MMED:3310   | Practical Data Science and Bioinformatics   | 3     |
| CPH:2230   | Finding Patient Zero: The Exploration of Infectious Disease Transmission and Pandemic Threats | 3     |
| GHS:2000/<br>ANTH:2103   | Introduction to Global Health Studies   | 3     |
| GHS:2320/<br>ANTH:2320   | Origins of Human Infectious Disease   | 3     |
| Additional microbiology and immunology course (prefix MICR) numbered MICR:3147 or above, excluding MICR:3164 |   | 3     |

## Scholar Track

Students in the scholar track complete the following coursework.

| Code                                | Title | Hours        |
|-------------------------------------|-------|--------------|
| Supporting Coursework               |       | 35-36        |
| Microbiology and Immunology Courses |       | 19           |
| Advanced Elective Coursework        |       | 6            |
| <b>Total Hours</b>                  |       | <b>60-61</b> |

## Scholar Track: Supporting Coursework

| Code                     | Title   | Hours |
|--------------------------|---|-------|
| All of these:            |   |       |
| BIOL:1411-<br>BIOL:1412  | Foundations of Biology - Diversity of Form and Function | 8     |
| BMB:3120 &<br>BMB:3130   | Biochemistry and Molecular Biology I-II                 | 6     |
| CHEM:1110 &<br>CHEM:1120 | Principles of Chemistry I-II                            | 8     |
| CHEM:2210                | Organic Chemistry I                                     | 3     |
| PHYS:1400                | Basic Physics   | 4     |
| One of these:            |   |       |
| BIOS:4120                | Introduction to Biostatistics                           | 3     |
| MATH:1460                | Calculus for the Biological Sciences                    | 4     |
| MATH:1550                | Engineering Mathematics I: Single Variable Calculus     | 4     |
| MATH:1850                | Calculus I  | 4     |
| STAT:3510/<br>IGPI:3510  | Biostatistics   | 3     |
| One of these:            |   |       |

|  |  |   |
|--|--|---|
| GHS:2000/<br>ANTH:2103   | Introduction to Global Health Studies    | 3 |
| GHS:2320/<br>ANTH:2320   | Origins of Human Infectious Disease      | 3 |
| In addition, this course may be recommended for some students: |  |   |
| CNW:2680   | The Art and Craft of Creative Nonfiction | 3 |

## Scholar Track: Microbiology and Immunology Courses

Students earn a minimum of 19 s.h. in Department of Microbiology and Immunology courses from the following.

| Code          | Title   | Hours |
|---------------|---|-------|
| MICR:2157     | General Microbiology (required with a grade of C or higher)                       | 3     |
| MICR:2158     | General Microbiology Laboratory (required with a grade of C or higher)            | 2     |
| MICR:3145     | Honors in Microbiology Thesis Preparation (required for honors in microbiology)   | 1     |
| One of these: |   |       |
| MICR:3165     | Genetics of Bacterial Pathogens Lab and Discussion                                | 3     |
| MICR:3178     | Virology Laboratory   | 2     |
| MICR:4161     | Undergraduate Research in Microbiology (must be taken for at least 2 s.h.)        | arr.  |
| MICR:4171     | Honors Undergraduate Research in Microbiology (must be taken for at least 2 s.h.) | arr.  |

Additional microbiology and immunology courses (prefix MICR) numbered MICR:3147 or above, excluding MICR:3164; students select from the following:

|           |  |      |
|-----------|--|------|
| MICR:3147 | Immunology and Human Disease                       | 3    |
| MICR:3150 | Eukaryotic Pathogens and Human Disease             | 2    |
| MICR:3159 | Bacteria and Human Disease                         | 3    |
| MICR:3165 | Genetics of Bacterial Pathogens Lab and Discussion | 3    |
| MICR:3168 | Viruses and Human Disease                          | 3    |
| MICR:3170 | Microbial Genetics and Physiology                  | 3    |
| MICR:3177 | Virology Discussion                                | 2    |
| MICR:3178 | Virology Laboratory                                | 2    |
| MICR:4161 | Undergraduate Research in Microbiology             | arr. |
| MICR:4171 | Honors Undergraduate Research in Microbiology      | arr. |
| MICR:5218 | Microscopy for Biomedical Research                 | arr. |
| MICR:5264 | Directed Study in Microbiology                     | arr. |

A maximum of 4 s.h. earned in either MICR:4161 Undergraduate Research in Microbiology or MICR:4171 Honors Undergraduate Research in Microbiology may be counted toward the major. However, students earning honors in the major must complete 6 s.h. in MICR:4171 Honors Undergraduate Research in Microbiology; see Honors [p. ] in this section of the catalog.

## Scholar Track: Advanced Elective Coursework

| Code   | Title   | Hours |
|--|---|-------|
| Up to 6 s.h. from these:   |   |       |
| BIOL:3172  | Evolution   | 4     |
| BIOL:3212/<br>IGPI:3212  | Bioinformatics for Beginners  | 3     |
| BIOL:3314/<br>IGPI:3314  | Genomics  | 3     |
| BIOL:4213/<br>GENE:4213/<br>IGPI:4213  | Bioinformatics  | 2,4   |
| BMB:3310/<br>CBIO:3310/<br>MMED:3310   | Practical Data Science and Bioinformatics   | 3     |
| PCOL:3101  | Pharmacology I: A Drug's Fantastic Journey  | 3     |
| Additional microbiology and immunology course (prefix MICR) numbered MICR:3147 or above, excluding MICR:3164 |   | 3     |
| May include one of these:  |   |       |
| BIOL:2512  | Fundamental Genetics  | 4     |
| BIOL:2723  | Cell Biology  | 3     |
| CPH:2230   | Finding Patient Zero: The Exploration of Infectious Disease Transmission and Pandemic Threats | 3     |
| GHS:2000/<br>ANTH:2103   | Introduction to Global Health Studies (if not taken as supporting coursework option)          | 3     |
| GHS:2320/<br>ANTH:2320   | Origins of Human Infectious Disease (if not taken as supporting coursework option)            | 3     |