

BS in MICROBIOLOGY (285120)
2016–2017

or courses not chosen previously:

| | | |
|-----------|-------------------------------|-----|
| MMBio 360 | Microbial Genetics | 4.0 |
| MMBio 363 | Microbial Ecology | 3.0 |
| MMBio 364 | Bacterial Pathogenesis | 4.0 |
| MMBio 461 | Advanced Bacterial Physiology | 3.0 |
| MMBio 463 | Immunology | 3.0 |
| MMBio 465 | Virology | 3.0 |

Successfully pass the Biology Major Field Exam.

Complete an exit interview

Recommended Courses:

Engl 316, Math 113, Phscs 107, 108.

Note: Students desiring a minor in chemistry must take Chem 223 and 2 hours of Chem 353.

Suggested Sequence of Courses:

FRESHMAN YEAR

1st Semester

| | |
|-----------------------------------|----------------|
| First-Year Writing or A Htg 100 | 3.0 |
| Rel A 275 | 2.0 |
| MMBio 121 or PDBio 120 or Bio 130 | 2–4.0 |
| Chem 105 | 4.0 |
| Total Hours | 11–13.0 |

2nd Semester

| | |
|---------------------------------|-------------|
| First-Year Writing or A Htg 100 | 3.0 |
| Rel A 250 | 2.0 |
| MMBio 151 | 4.0 |
| Chem 106 | 3.0 |
| Chem 107 | 1.0 |
| Arts or Letters elective | 3.0 |
| Total Hours | 16.0 |

SOPHOMORE YEAR

3rd Semester

| | |
|---------------------------------------|-------------|
| Rel C 225 | 2.0 |
| MMBio 240 | 3.0 |
| MMBio 241 | 1.0 |
| Phscs 105 (Physical Science elective) | 3.0 |
| Civilization I elective | 3.0 |
| Social Science elective | 3.0 |
| Total Hours | 15.0 |

4th Semester

| | |
|---------------------------------|----------------|
| Rel C 200 | 2.0 |
| MMBio 261 | 3.0 |
| Phscs 106 (if opted) | 3.0 |
| Civilization 2 elective | 3.0 |
| Stats 121, Math 112 or Math 119 | 3–4.0 |
| Total Hours | 14–15.0 |

JUNIOR YEAR

5th Semester

| | |
|----------------------------------|----------------|
| Religion elective | 2.0 |
| Chem 351 or Chem 285 | 3.0 |
| Stats 121, Math 112, or Math 119 | 3–4.0 |
| MMBio 360-465 choice | 4.0 |
| Micro elective | 3.0 |
| Total Hours | 15–16.0 |

6th Semester

| | |
|----------------------|-------------|
| Religion elective | 2.0 |
| MMBio 360-465 choice | 3.0 |
| Micro electives | 8.0 |
| General elective | 3.0 |
| Total Hours | 16.0 |

SENIOR YEAR

7th Semester

| | |
|-----------------------------------|-------------|
| Religion elective | 2.0 |
| Micro elective | 3.0 |
| MMBio 360-465 choice | 4.0 |
| Adv. Written & Oral Communication | 3.0 |
| Recommended: Engl 316 | |
| Arts or Letters elective | 3.0 |
| Total Hours | 15.0 |

8th Semester

| | |
|------------------------------|----------------|
| MMBio 360-465 choice | 3.0 |
| Micro elective | 4.0 |
| Global/Cultural Awareness | 3.0 |
| General electives, if needed | 2–6.0 |
| Total Hours | 12–16.0 |

THE DISCIPLINE:

Microbiology applies the tools of chemistry, molecular biology, mathematics, and physics to the study of the structure, biochemistry, genetics, immunology, physiology, and ecology of microorganisms (bacteria, viruses, fungi, protozoa).

This is an excellent degree for majors who desire an advanced degree in microbiology, virology, immunology, parasitology, cell biology, or epidemiology (master's or doctorate).

CAREERS:

Environmental microbiologists are concerned with microorganisms that cause pollution as well as those that can degrade pollutants in bioremediation processes.

Microbial ecologists work on land and in water studying how microbes recycle dead plants and animals and how they can be used to maintain environmental quality or correct environmental mishaps.

Industrial microbiologists fit into many categories. Food microbiologists seek better strains of organisms used to make products; some microbiologists work in pharmaceutical plants, in antibiotic development; others work on the production of solvents and other products from waste material.

Microbial geneticists and biotechnologists study microbial gene function, improve desirable microbial qualities and increase understanding of cell-regulation processes.

Microbial physiologists and biochemists study life processes that employ microbial systems and conduct basic research on microbial growth and development.

Clinical microbiologists are involved in diagnosis and identification of microbial infections and approaches to treatment.

Medical microbiologists study the biology of bacterial pathogens and the mechanisms they use to cause disease.

Virologists study the biology of viruses, the etiology and mechanisms of viral infections and diseases in biological species, and the use of viruses as molecular and biological tools.

Immunologists study the molecular and cellular biology of the immune system and its interactions with microorganisms.

Parasitologists study the biology, etiology, and epidemiology of parasites and the mechanisms by which they interact with their hosts.

Cell biologists study the molecular biology, signal transduction and cell signaling pathways involved in all aspects of biological function. This includes studies at the molecular level of diseases such as heart disease, cancer, diabetes, and AIDS, etc.

Epidemiologists study disease epidemics with an effort to track down the method and cause of the disease.

(See faculty advisor for additional career choices.)

RESEARCH EXPERIENCE:

Students are encouraged to participate in laboratory research. Faculty-directed research programs are available to undergraduates throughout the year.

FINANCING:

Students may be employed either as research or teaching assistants. Several endowed scholarships are available.

PROGRAM OBJECTIVES:

The objectives of the microbiology major program are to provide a conceptual knowledge base and critical thinking skills related to the following areas:

- Microbial cell biology
- Microbial genetics
- Interactions and impact of microorganisms and humans
- Interactions and impact of microorganisms in the environment
- Integrating themes (microbial evolution and diversity)
- Immunology
- Virology
- Parasitology
- Epidemiology
- Cell Biology

+Quantitative Reasoning - can be fulfilled by ACT Math subscore of 22 or higher

Note: Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.

Microbiology and Molecular Biology
4007 Life Sciences Building
Brigham Young University, Provo, UT 84602
Telephone: (801) 422-2889