

MICROBIOLOGY GRADUATE MAJOR (MS, PHD)

This program is available at the following location:

- Corvallis

Administered by the Department of Microbiology under the School of Life Sciences in the College of Science

The Department of Microbiology offers graduate degrees leading to the Doctor of Philosophy, Master of Science (thesis) and Master of Science (non-thesis) degrees. Major fields of study are diverse, and include Basic and Applied Virology, Bacteriology and Immunology; Pathogenic Microbiology; Aquatic, Ecological and Environmental Microbiology; Microbial Evolution; and Microbiome Sciences. Students may minor in a variety of related disciplines in the Life Sciences, such as Biological Data Sciences, Biochemistry and Biophysics, Chemistry, or obtain certificates in areas such as College and University Teaching (CERT). The principal objective of the Doctoral Program in Microbiology is the completion of a comprehensive research project and preparation of a dissertation. Student programs and research projects are developed with the major professor and are subject to approval by a committee of graduate faculty members. Example of research areas may include, but are not limited to, Human Gut Microbiome/Gut-Brain Axis, Bioinformatics Applied to Microbiome Data, Microbial Interactions, Microbial Drug Resistance and Food Safety, and Aquatic Microbiology. Microbiology research facilities are excellent, well-equipped, well-funded and employ state of the art technology. The Masters Program in Microbiology can be pursued as a thesis track or through two non-thesis tracks, Microbiome Analytics or BioHealth Sciences.

Major Code: 5700

Upon successful completion of the program, students will meet the following learning outcomes:

MA

- Conduct research or produce some other form of creative work.
- Demonstrate mastery of subject material.
- Conduct scholarly or professional activities in an ethical manner.

MS

- Conduct research or produce some other form of creative work.
- Demonstrate mastery of subject material.
- Conduct scholarly or professional activities in an ethical manner.
- Acquire skills and experience in communication. This is considered a valuable experience and an integral part of training towards a higher degree.

PhD

- Produce and defend an original significant contribution to knowledge.
- Demonstrate mastery of subject material.
- Conduct scholarly activities in an ethical manner.
- Communicate research findings to a scientific audience.
- Exhibit basic skills in teaching microbiology to undergraduate students.

The Department of Microbiology offers the following graduate degrees:

- Ph.D.
- M.S. (thesis)
- M.S. (non-thesis)

The Ph.D. and M.S. (thesis) degrees contain a rigorous research component, in addition to coursework. The M.S. (non-thesis) degree is comprised of coursework and allows specialization through two tracks:

1. Microbiome Analytics
2. BioHealth Sciences

All students in the Microbiology Graduate Program are required to take the following seven credit core sequence of four courses during their first year of enrollment in the program:

Code	Title	Credits
GRAD 520	RESPONSIBLE CONDUCT OF RESEARCH	2
MB 511	SCIENTIFIC SKILLS	1
MB 512	HIGHLIGHTS OF MICROBIOLOGY	1
MB 513	MICROBIAL SYSTEMS	3
Total Credits		7

In addition to the seven credit core sequence of four courses, the requirements for each degree are as follows:

PhD

- 108 total graduate credits consisting of at least 27 coursework credits and at least 36 thesis credits.
- A comprehensive preliminary examination consisting of a written non-thesis proposal and an oral exam.
- An initial program of study meeting and subsequent annual progress meetings with a graduate committee.
- An overall GPA of 3.0 at the graduate level, and a 3.0 GPA in program of study courses.
- Completion of one term as a graduate teaching assistant.
- A written Doctoral thesis that is orally defended at the end of the degree program.
- Two public presentations of their original research, including the final oral defense.

MS (Thesis)

- 45 total graduate credits consisting of at least 24 coursework credits and 6 to 12 thesis credits.
- An initial program of study meeting and subsequent annual progress meetings with a graduate committee.
- An overall GPA of 3.0 at the graduate level, and a 3.0 GPA in program of study courses.
- Completion of one term as a graduate teaching assistant.
- A written Masters thesis that is orally defended at the end of the degree program.

MS (Non-thesis)

- 45 total graduate course credits.
- An initial program of study meeting and subsequent annual progress meetings with a graduate committee.
- An overall GPA of 3.0 at the graduate level, and a 3.0 GPA in program of study courses.

2 Microbiology Graduate Major (MS, PhD)

- Completion of an additional 13 core credits to replace the thesis credits:

Code	Title	Credits
MB 520	MICROBIAL GENOME EVOLUTION AND BIODIVERSITY	3
MB 534	VIROLOGY	3
MB 556	MICROBIAL BIOTECHNOLOGY	3
MB 506	SPECIAL PROJECTS (Capstone/Professional Skills)	3
MB 507	SEMINAR	1

- Completion of an additional 25 credits of course electives specific to either the Microbiome Analytics or BioHealth Sciences non-thesis track:

Code	Title	Credits
Microbiome Analytics (Non-thesis Track)		
MB 599	SELECTED TOPICS (Quantitative Genomics)	4
MB 599	SELECTED TOPICS (Collaborative Problem Solving in Biological Data Sciences)	3
MB 668	MICROBIAL BIOINFORMATICS AND GENOME EVOLUTION	4
BDS 599	SPECIAL TOPICS (Metagenomics, Intro to UNIX, LINUX, PYTHON)	3-4
ST 511	METHODS OF DATA ANALYSIS	4
ST 512	METHODS OF DATA ANALYSIS	4
ST 513	METHODS OF DATA ANALYSIS	4
ST 591	INTRODUCTION TO QUANTITATIVE GENOMICS	3
ST 592	STATISTICAL METHODS FOR GENOMICS RESEARCH	3
BioHealth Sciences (Non-thesis Track)		
MB 516	IMMUNOLOGY	3
MB 517	IMMUNOLOGY LABORATORY	2
MB 530	BACTERIAL PATHOGENESIS	3
MB 580	GENERAL PARASITOLOGY	3
MB 599	SELECTED TOPICS (Mechanisms of Disease)	3
PHL 544	BIOMEDICAL ETHICS	4
ST 511	METHODS OF DATA ANALYSIS	4
ST 512	METHODS OF DATA ANALYSIS	4
ST 513	METHODS OF DATA ANALYSIS	4
H 511	COMMUNITY, CULTURE, AND GLOBAL HEALTH	3
H 520	HEALTH DISPARITIES	3
H 524	INTRODUCTION TO BIostatISTICS	4
H 535	INTERPRETING EPIDEMIOLOGIC EVIDENCE	3
H 540	WATER AND HUMAN HEALTH	3
H 543	EXPOSURE SCIENCE I	4
H 564	COMPUTING TOOLS AND HEALTH DATA ANALYSIS	3
VMB 523	ZOOSES	3
VMB 621	GENERAL PATHOLOGY	4
VMB 651	SELECTED TOPICS IN VETERINARY MEDICINE	3
VMB 674	VACCINES AND NEW THERAPIES	3

Major Code: 5700