MICROBIOLOGY
Bachelor of Science

Microbiology is the study of the smallest living organisms (bacteria, algae, fungi, and protozoa) and viruses. Because of their simplicity and rapid growth rates, microorganisms are readily amenable to study in the laboratory. Because their cellular processes closely resemble those of higher organisms, they are ideally suited for fundamental studies of biological structure, physiology, metabolism, genetics and development. The Microbiology department at the University of Washington works mainly in cutting edge research in Bacteriology and Virology.

The B.S. in Microbiology is complemented by the College of Arts and Sciences general educational requirements such as English Composition, Writing, Foreign Language, Quantitative & Symbolic Reasoning, Arts &Humanities, Social Science and Natural Science courses which provide a comprehensive liberal arts degree.

Most students are admitted to the major at the beginning of their junior year. For Admission, students must complete the following requirements:

1. A minimum of 75 credits applicable to graduation
2. A minimum cumulative GPA of 2.0 overall
3. A minimum cumulative GPA of 2.5 in prerequisite CHEM and BIOL courses listed in items 4-6 below.
4. Completion of BIOL 180, BIOL 200 (minimum grade 2.3), AND BIOL 220.
5. Completion of one of the following chemistry series:
    a. CHEM 142, CHEM 152, CHEM 162
    b. CHEM 143, CHEM 153
    c. CHEM 145, CHEM 155, CHEM 165
6. Completion of either CHEM 223, CHEM 237, or CHEM 335

All students are strongly encouraged to meet with the Microbiology Adviser before declaring and at least quarterly after acceptance to go over academic progress, academic goals, and department policies.

Counseling Services Coordinator Josey Overfield	Office: Health Sciences Building HSB E-421	Phone: 206-543-2572 Email: microadv@uw.edu

Grade Requirements:

1. All courses taken to fulfill requirements must be taken for a letter (numerical) grade unless the course is offered credit/no credit.
2. Students must maintain a cumulative GPA of 2.25 in all classes that count towards the Microbiology Major.
3. A minimum grade of 1.8 must be achieved in all required and elective courses (see below) for them to be used toward degree requirements for graduation.

Progress/Dismissal Policy:

A student is placed on departmental academic probation for one quarter, if the student's cumulative GPA in classes that count towards the Microbiology Major falls below 2.25. If at the end of the quarter the GPA has not improved to at least 2.25, the student is dropped from the major. Students who experience extraordinary circumstances may petition for one or more additional probationary quarters by contacting the academic adviser.

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Supporting Requirements (in addition to the prerequisite Biology and Chemistry Courses listed above):

BIOCHEMISTRY - Choose One Option:

1. **BIOC 405 (3), 406 (3)**
   Intro to Biochemistry I & II
2. **BIOC 440 (4), 441 (4), 442 (4)**
   Biochemistry I, II, III

Please note that CHEM 224, 238, and 239 may be needed, depending on which BIOC series you wish to pursue and your goals for post graduate work.

MATHEMATICS – Choose One Option:

1. **MATH 124 (5)**
   Calculus with Analytic Geometry I
2. **MATH 134 (5)**
   Accelerated [Honors] Calculus
3. **Q SCI 291 (5)**
   Analysis for Biologists I

Please note that calculus series is strongly recommended for students pursuing graduate work: MATH 124 (5), 125 (5), 126 (5) -OR- QSCI 291 (5), 292 (5), 381 (5)

PHYSICS – Choose One Option:

1. **PHYS 114 (4), 115 (4)**
   General Physics I & II
2. **PHYS 121 (5), 122 (5)**
   Mechanics, Electromagnetism
3. **PHYS 141 (5), 142 (5)**
   Honors Mechanics, Electromagnetism

STATISTICS – Choose One Option:

1. **BIOST 310 (4)**
   Biostatistics for the Health Sciences
2. **Q SCI 381 (5)**
   Introduction to Probability and Statistics
3. **STAT 220 (5)**
   Principles of Statistical Reasoning
4. **STAT 311 (5)**
   Elements of Statistical Methods

Freshman Year: Typically, students will complete Inorganic Chemistry and Math requirements along with other general education requirements.

Sophomore Year: Students should complete the Introductory Biology and Organic Chemistry requirements and continue general education courses.

Junior and Senior Years: Students will typically start Microbiology core and distribution courses, start Physics or Biochemistry, participate in research, and finish any remaining general education, graduate, or professional school requirements.

Please see the department website for the following:

- Departmental Honors (https://microbiology.washington.edu/undergrad/honors-program)
- Department Awards and Scholarships (https://microbiology.washington.edu/undergrad/awards)
- Faculty Research Areas (https://microbiology.washington.edu/research/research-areas)

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MICROBIOLOGY CORE COURSES: (must take all courses)

1. **MICROM 410 (4)** Fundamentals of Microbiology *Fall*
2. **MICROM 402 (3)** Fundamentals of General Microbiology Lab *Fall, Spring*
3. **MICROM 450 (3)** Molecular Biology of Viruses *Winter*

MICROBIOLOGY DISTRIBUTION

- Complete a total of 28 Credits from the following distribution groups **AND** electives. Each student is required to take electives.
- Two courses must have a lab component from the following list: MICROM 411, MICROM 431, MICROM 443

******MICROM 443:*** *graduating seniors and MLS students get priority for winter quarters. Best to plan ahead and take in a fall quarter.*

1. Medical Microbiology – **Choose two courses**:
   IMMUN 441 (4) Immunology *Fall*
   MICROM 442 (3) Medical Bacteriology Lecture *Winter*
   MICROM 443 (3) Medical Bacteriology Lab *Fall, Winter*
   MICROM 445 (3) Medical Virology *Spring*
   MICROM 460 (3) Medical Mycology and Parasitology Lecture *Spring*

2. Diversity and Ecology – **Choose two courses**:
   MICROM 412 (3) Prokaryotic Diversity *Spring*
   ENV H 409 (3) Microbiome & Environmental Health *Spring*
   FISH 406 (4) Parasite Ecology *Autumn*

3. Genetics and Molecular Biology – **Choose one option**:
   a. **MICROM 411 (4)** Bacterial Genetics w/ Lab *Winter*
   b. **MICROM 431 (3)** Prokaryotic Recombinant DNA Techniques Lab *Spring* and **GENOME 361 (3)** Fundamentals of Genetics and Genomics *all quarters*
   c. **MICROM 431 (3)** *Spring* and **GENOME 371 (5)** Introductory Genetics *Fall*

4. **After completing your choices of the courses above, you will need to take additional electives to reach the 28 credits needed. You can fulfill the remaining credits from the electives list or take additional courses from the list that will then count as electives**.

IT IS YOUR RESPONSIBILITY TO REGULARLY ASSESS YOUR DEGREE PROGRESS BY REFRESHING AND CHECKING YOUR DEGREE AUDIT. Should you have a question or notice a discrepancy, it is your responsibility to address this with a Department of Microbiology Adviser. This list is not a comprehensive handout of your requirements, you must consult your degree audit.

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ELECTIVES: Any of these credits may add up to your total 28 credits needed in combination with the distribution courses

- Electives also include any of the distribution courses not counted for distribution requirements.
- Check course pre-requisites. 500 level courses require instructor permission.
- Some courses may be restricted to majors only. Please check with the listed department.
- To obtain degree credit for a course not on this list, you must petition the Undergraduate Curriculum Committee *prior* to taking the class

BIOEN 454/G H 454	(1)	Bioeng Solutions to Improve the Health of Families Worldwide
BIOEM 498	(4)	Global Health Technology: Molecular Diagnostics
BIOL 401	(3)	Advanced Cell Biology
BIOL 419	(4)	Data Science for Biologists
BIOL 455	(4)	Human Immunology and pathology of infectious diseases
BIOL 466	(3)	Pathobiology of Emerging Diseases
BIOL 481	(5)	Experimental Evolutionary Ecology
CEE 462	(3)	Applied Limnology and Pollutant Effects on Freshwater
CEE 482	(3)	Wastewater Treatment and Re-Use
CHEM E 467/ BIOEN 467	(3)	Biochemical Engineering
ENV H 440 *Autumn*	(3)	Water, Wastewater, and Health
ENV H 441 *Autumn*	(3)	Food Protection
ENV H 442 *Spring*	(3)	Zoonotic Diseases and Their Control
ENV H 444 *Autumn*	(3)	Antibiotic Resistant Genes and Bacteria
ENV H 447 *Spring*	(3)	Environmental Change and Infectious Disease
ENV H 451 *Winter*	(3)	Ecology of Environmentally Transmitted Microbiological Hazards
ENV H 452 *Spring*	(3)	Detection & Control of Environmentally Transmitted Mbio Hazard
EPI 320 *Autumn/Winter/Spring*	(4)	Introduction to Epidemiology
EPI 527	(3)	Vaccines
ESRM 404	(5)	Plant Microbiology Lab
ESRM 422 *Winter*	(2)	Plant Microbiology Seminar
FISH 404	(5)	Diseases of Aquatic Animals
GENOME 372	(5)	Genomics and Proteomics
GENOME 373	(4)	Genomic Informatics
GENOME 414	(5)	Molecular Evolution
GH 401 *Autumn*	(1)	Introduction to Global Health
GH 402 *Winter*	(1)	Multidisciplinary Perspectives on Global Health
GH 410	(3)	Advanced Biologic Principles of Global Diseases
MICROM 482	(1-5)	Peer Teaching Assistants in Microbiology
MICROM 495	(var.)	Microbiology Undergraduate Research
MICROM 499	(var.)	Undergraduate Lab Research
MICROM 496	(var.)	Undergraduate Research Paper
MICROM 555	(2.5)	Advanced Clinical Microbiology
NUTR 446	(3)	Food Safety and Health
OCEAN 330	(3)	Marine Biogeochemical Cycles
OCEAN 431	(3)	Special Topics in Biological Oceanography
OCEAN 530	(3)	Marine Bacteria, Archaea, and Viruses
OCEAN 572	(1-3)	Marine Protist Ecology
PABIO 551	(4)	Biochemistry and Genetics of Pathogens and their Hosts
PABIO 552	(4)	Cell Biology of Human Pathogens and Disease