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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.

<u>Most students are admitted to the major at the beginning of their junior year. For Admission, students</u> 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 <u>one</u> 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	Office: Health Sciences Building	Phone: 206-543-2572
Coordinator	K-Wing 343A	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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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.

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

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)

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.

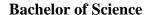
Sophomore Year: Students should complete the Introductory Biology and Organic Chemistry requirements and continue general education courses.

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

SCIENTIFIC WRITING COURSE: Choose one

- 1. MICROM 496 (3) Undergraduate Research all quarters
- 2. ENGL 199 (5) Interdisciplinary Writing/Natural Science (LINKED courses with BIOL 180 or 200)
- 3. ENGL 299 (5) Intermediate Interdisciplinary Writing Natural Sciences or Microbiology Spr

Note that MICROM 496 requires independent laboratory research (MICROM 499). See the departmental website for more information.

MICROBIOLOGY DISTRUBITUON

Complete a total of 28 Credits from the following distribution groups AND electives.

- Two courses must have a lab component from the following list: MICROM 411, MICROM 431, MICROM 443, MICROM 461
- 1. <u>Medical Microbiology Choose two courses:</u>

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

MICROM 461 (2) Medical Mycology and Parasitology Lab Spring

2. <u>Diversity and Ecology – Choose two courses:</u>

MICROM 412 (3) Prokaryotic Diversity Spring

MICROM 435 (3) Microbial Ecology Autumn

ENV H 409 (3) Microbiome & Environmental Health Spring

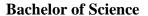
FISH 406 (4) Parasite Ecology Autumn

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 Winter and GENOME 361
 (3) Fundamentals of Genetics and Genomics all quarters
- c. MICROM 431 (3) Winter and GENOME 371 (5) Introductory Genetics Fall

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

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	(3)	Water, Wastewater, and Health	
ENV H 441	(3)	Food Protection	
ENV H 442	(3)	Zoonotic Diseases and Their Control	
ENV H 444	(3)	Antibiotic Resistant Genes and Bacteria	
ENV H 447	(3)	Environmental Change and Infectious Disease	
ENV H 451	(3)	Ecology of Environmentally Transmitted Microbiological Hazards	
ENV H 452	(3)	Detection & Control of Environmentally Transmitted Mbio Hazard	
EPI 320	(4)	Introduction to Epidemiology	
EPI 527	(3)	Vaccines	
ESRM 404	(5)	Plant Microbiology Lab	
ESRM 422	(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	(1)	Introduction to Global Health	
GH 402	(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 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	