

MICROBIOLOGY, B.S. (CALs)

The smallest living things – including bacteria, viruses, and yeast—may not be visible to the human eye, but they have big effects on health, food, medicine, energy, and the environment. These tiny organisms, called microbes, were the first life forms on Earth and continue to influence the planet in significant ways. Microbiomes—communities of microbes—are increasingly studied by researchers focusing on human health, global warming, infectious disease, environmental remediation, bioenergy, and much more.

The microbiology major prepares students for modern research in microbiology, with a heavy emphasis on practical laboratory experiences. Students learn the cellular biology, genetics, ecology, evolution, and physiology of microbes. Through courses, students learn laboratory techniques—gaining the type of hands-on experiences with modern equipment that employers and graduate and professional schools seek. Additionally, students can conduct mentored and independent research projects in faculty laboratories where they will learn to critically evaluate scientific data, carry out laboratory experiments, and communicate scientific information.

Microbiology majors graduate prepared for careers in biotechnology, education, healthcare, information technology, and food safety. Many students pursue graduate and professional studies, including medical school, dental school and biological sciences PhD programs.

Learn through hands-on, real world experiences

With so many microbiologists on the faculty, students have numerous opportunities to conduct research in faculty labs. As one of the largest research buildings on campus, students have access to state-of-the-art facilities and are able to conduct cutting edge experiments using novel techniques that few other undergraduate programs allow. Through a senior-year capstone course, students conduct research under the direction of a professor or as part of class projects that have included culturing microbes from the gut of hibernating ground squirrels, comparing bacteria from the mouths of athletes and non-athletes, and culturing microbes found in deep sea vents. This kind of hands-on experience distinguishes microbiology majors from other graduates and enhances the real-world skills that are valued by post-secondary schools and employers.

Build community and networks

Through the Microbiology Club, students establish study groups, explore careers, and teach others on campus and in the community about microbiology. Through events like cheese, yogurt, and kombucha making, the club offers opportunities for community-building both within the program and with the broader university community. This student organization is the official American Society of Microbiology undergraduate chapter for the UW–Madison and provides annual travel and research awards to outstanding students.

Customize a path of study

Core courses focus on the diversity, genetics, biochemistry, and physiology of microorganisms. A variety of elective courses provide the opportunity to study environmental microbiology, food microbiology, microbial pathogenesis, immunology, virology, microbiomes, microbial biotechnology, and public health, as well as advanced topics in

microbial genetics and physiology. Students may also pursue Honors in Microbiology.

Make a strong start

All courses in the program, including entry level courses, are taught by faculty who specialize in teaching microbiology.

Gain global perspective

Majors can also choose from a variety of study abroad programs including short-term field experiences, summer research opportunities and semester-long exchange programs at top universities around the world. A study abroad program in Thailand specifically tailored for microbiology majors is frequently offered and led by microbiology faculty from UW–Madison. Students can explore studying abroad as a Microbiology major by utilizing the Microbiology Major Advising Page. Students work with their advisor and the CALs study abroad office to identify appropriate programs.