

THE FIELD

Microbiology, central to the study of basic life sciences, has a close connection to medical fields and a direct role in biotechnology. The program of study for microbiology majors offers broad training both for students who plan to enroll in graduate or medical/dental/veterinary school, and for those who will seek positions in biotechnology research or with hospital, university, or government laboratories upon graduation.

Because it focuses on the study of viruses, bacteria, and the immune system, microbiology has a long history of close contact with medicine and other health professions. The recent explosive growth of biotechnology depends heavily on using microorganisms to produce biomedical and industrial products, and so has created a large demand for correspondingly trained personnel at both the bachelor's degree and more advanced levels. The revolutionary advances in understanding the molecular mechanisms of basic biological phenomena have been largely accomplished using microorganisms such as viruses and bacteria. This has drawn microbiology to the center of such basic life science fields as molecular genetics and cell biology, as the principles and approaches developed using microorganisms prove applicable to all levels of biology.

A minor in microbiology is available.

THE MAJOR

Microbiology majors are required to complete a minimum of 35 credits within the microbiology department with at least a 2.0 GPA. In addition, MICROBIO 311 and 312 must be completed with a grade of C or higher to progress to upper-level microbiology requirements. Students also take one semester each of biochemistry, calculus, and statistics, as well as two semesters each of general chemistry, introductory biology, introductory physics, and organic chemistry. Major requirements also include general microbiology, microbiology laboratory, infectious disease and defense, microbial genetics, microbial physiology, and writing, as well as electives.

HONORS

Students may pursue honors opportunities within the major. Contact the honors program director, Dr. Kristen DeAngelis (413-577-4669, deangelis@microbio.umass.edu), for more information.

STUDY ABROAD

Majors are encouraged to study abroad if it supports their academic and career goals. Students should contact the International Programs Office (413-545-2710, umass.edu/ipo) and work closely with their academic advisor to choose the appropriate courses in preparation.

CAREER OPPORTUNITIES

Microbiology is one of the most rapidly developing sciences. With progress in both basic and applied aspects of the field, employment opportunities at the BS level continue to increase in number. Major future developments in microbiology will likely be in the areas of basic research, health, environment, and in the application of biotechnology to agriculture and to the pharmaceutical and food industries. The need for microbiologists at various levels of the educational and governmental systems will parallel developments in these areas. Successful completion of the major is also an excellent preparatory route for admission into an MS or PhD program, as well as the professional schools of medicine, dentistry, and veterinary medicine.

COLLEGE OF NATURAL SCIENCES

The College of Natural Sciences unites the life, environmental, computational, and physical sciences on campus. Students take advantage of a range of inquiry-based classroom and laboratory experiences, hands-on undergraduate research opportunities, multidisciplinary and cross-departmental education and research initiatives, and a variety of science student organizations. In addition, they are encouraged to develop strong written and oral communication skills, as well as leadership and problem-solving abilities.

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