

Microbiology and Immunology, B.S.

Microbiology and immunology are well-established disciplines within the life sciences. Microbiology addresses the biology of bacteria, viruses, and unicellular eukaryotes such as fungi and protozoa. Studies of microorganisms reveal basic information about processes in evolution, genetics, biochemistry, molecular biology, cell biology, structural biology, and ecology. Many bacteria, viruses, and protozoa cause disease in plants and animals. Hence, major areas of medicine and public health focus on these microorganisms.

Immunology encompasses efforts to understand how multicellular organisms have evolved to survive a variety of challenges to health and survival, including threats by pathogens and cancer cells. Basic questions of how immunity functions are entwined with a fundamental understanding of the consequences of microbial infection. Immunology also refers to the study of autoimmunity, the attack of the host by its own immune system.

The study of viruses (virology) is an important branch of microbiology that has contributed to our understanding of most of the fundamental processes in eukaryotic molecular biology, including the discovery of oncogenes. Viruses provide an excellent tool for the study of disease, cancer, and mechanisms of gene control. With the growing threat of emerging diseases and the potential for viral-based biological weapons, the study of virology was recently intensified and gained new perspectives.

The major is designed primarily for students who are serious about pursuing careers in microbiology and immunology and is intended to provide its graduates with the appropriate tools and training to successfully pursue professional and graduate degrees emphasizing these disciplines. These include Ph.D., M.D., and combined M.D./Ph.D. programs. Majoring in Microbiology and Immunology will also provide resources for serious students wishing to use a solid background in these disciplines for career goals in business, law, public and environmental policy, education, and other pursuits.

Application Process to Declare the Major: The major in Microbiology and Immunology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Microbiology and Immunology Faculty Board is completed during the summer. Information can also be found at the UCI Change of Major Criteria website (<http://www.changeofmajor.uci.edu/>). Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

All students must meet the University Requirements (<http://catalogue.uci.edu/informationforadmittedstudents/requirementsforabachelorsdegree/>).

All students must meet the School Requirements (<http://catalogue.uci.edu/schoolofbiologicalsciences/#schoolrequirementstext>).

Major Requirements for Microbiology and Immunology

A. Required Major Courses:

BIO SCI M121	Immunology with Hematology
BIO SCI M122	General Microbiology
BIO SCI M124A	Virology

B. Upper-Division Laboratories:

BIO SCI M116L	Molecular Biology Laboratory
and either	
BIO SCI M118L or BIO SCI M121L	Experimental Microbiology Laboratory Advanced Immunology Laboratory

C. Upper-Division Biology Electives:

Select at least four from the following:

BIO SCI E124	Infectious Disease Dynamics
BIO SCI M119	Advanced Topics in Immunology
BIO SCI M120	Signal Transduction in Mammalian Cells
BIO SCI M124B	Viral Pathogenesis and Immunity
BIO SCI M125	Molecular Biology of Cancer
BIO SCI M131	Innate Immunity, Infection, and Pathogenesis
BIO SCI M137	Microbial Genetics
BIO SCI M143	Human Parasitology
BIO SCI M180	Biotechnological Applications of Energy and Environmental Research
MOL BIO 205	Molecular Virology

and two can be selected from the following:

BIO SCI D103	Cell Biology
BIO SCI D137	Eukaryotic and Human Genetics
BIO SCI M114	Advanced Biochemistry

BIO SCI M116

Advanced Molecular Biology

BIO SCI M144

Cell Organelles and Membranes

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Freshman**Fall**

BIO SCI 93

CHEM 1A

Lower-Division Writing¹

General Education

BIO SCI 2A

Winter

BIO SCI 94

CHEM 1B

Lower-Division Writing¹

General Education

Spring

MATH 2A or 5A

CHEM 1C- 1LC

Lower-Division Writing¹**Sophomore****Fall**

BIO SCI 97

CHEM 51A

CHEM 1LD

MATH 2B or 5B

BIO SCI 194S

Winter

BIO SCI 98

CHEM 51B- 51LB

General Education

Spring

BIO SCI 99

CHEM 51C- 51LC

General Education

STATS 7, 8, MATH 2D, or MATH 3A

Junior**Fall**

PHYSICS 3A

BIO SCI M124A

BIO SCI 100

BIO SCI 199

Winter

PHYSICS 3B- 3LB

U-D Bio Elective

BIO SCI M121

BIO SCI 199

Spring

PHYSICS 3C- 3LC

BIO SCI M122

General Education or U-D Lab

BIO SCI 199

Senior**Fall**

U-D Biology Elective

BIO SCI M116L

BIO SCI 199

Winter

U-D Biology Elective

U-D Biology Elective

BIO SCI 199

Spring

U-D Biology Elective

U-D Biology Elective

BIO SCI 199

¹ Students have the option of taking HUMAN 1AS, HUMAN 1BS, HUMAN 1CS or WRITING 39A, WRITING 39B, WRITING 39C in order to fulfill the lower-division writing requirement.