MOLECULAR & MEDICAL MICROBIOLOGY, BACHELOR OF SCIENCE

College of Biological Sciences

The department of Microbiology & Molecular Genetics offers the major in Molecular & Medical Microbiology.

Molecular & Medical Microbiology B.S.
The Major Program
Microbiology is the branch of biology that deals with bacteria, yeasts and other fungi, algae, protozoa, and viruses. These microorganisms are ubiquitous in nature and play a crucial role in areas such as agriculture, biotechnology, ecology, medicine, and veterinary science. The field of microbiology contributes to areas of fundamental inquiry such as biochemistry, cell biology, evolution, genetics, molecular biology, pathogenesis, and physiology. The ease and power of simultaneous genetic and biochemical analysis of microbes led to the emergence of the new disciplines of molecular biology & molecular genetics, and spawned the new industry of biotechnology.

The Program
The Molecular & Medical Microbiology Undergraduate Program offers Bachelor of Science and Bachelor of Arts degrees in the College of Biological Sciences. Both degrees are designed to provide students with quantitative skills and knowledge across the breadth of Biological Sciences, while maintaining a focus on the biology of microorganisms. The B.S. degree offers more training in mathematics, biochemistry and laboratory methodology; the A.B. degree incorporates more exposure to the liberal arts. The choice of a major program and its suitability for particular career options should be discussed with a Biology Academic Success Center (BASC) advisor.

Career Alternatives
A bachelor's degree in Molecular & Medical Microbiology serves as the foundation for advanced study in microbiology, entry into the professional schools of all health sciences, or immediate employment in biotechnology, health care and food science industries.

Graduate Study
The Graduate Group in Microbiology offers programs of study and research leading to M.S. and Ph.D. degrees.

Strong preference is given to doctoral applicants. The group offers study in general microbiology, microbial physiology, microbial genetics, molecular mechanisms of microbial regulation, molecular mechanisms of microbial pathogenesis, immunology, virology, and recombinant DNA technology. For information on the graduate study and undergraduate preparation for the program contact a graduate advisor or the Chairperson of the Group.

Related Courses

Faculty of the Department of Microbiology & Molecular Genetics also teach or participate in the following courses: BIS 002A, BIS 101, BIS 104 and BIS 181.

Faculty Advisor
Rebecca Parales, Ph.D.

Honors & Honors Program
Rebecca Parales, Ph.D.

Teaching Credential Subject Representative
Rebecca Parales, Ph.D.; see the Teaching Credential/M.A. Program (https://education.ucdavis.edu/teaching-credentialma/).

Advising
Biology Academic Success Center (BASC) (https://basc.biology.ucdavis.edu/) in 1023 Katherine Esau Science Hall (formerly Sciences Laboratory Building); 530-752-0410.

Please Note: MIC courses are in the process of transitioning to MMG courses within the year.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>BIS 002A</td>
<td>Introduction to Biology: Essentials of Life on Earth</td>
<td>18</td>
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<tr>
<td>CHE 002A &amp; CHE 002B &amp; CHE 002C</td>
<td>General Chemistry and General Chemistry and General Chemistry</td>
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<tr>
<td>CHE 004A &amp; CHE 004B &amp; CHE 004C</td>
<td>General Chemistry for the Physical Sciences &amp; Engineering and General Chemistry for the Physical Sciences &amp; Engineering and General Chemistry for the Physical Sciences &amp; Engineering</td>
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<tr>
<td>CHE 008A &amp; CHE 008B</td>
<td>Organic Chemistry: Brief Course and Organic Chemistry: Brief Course</td>
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<tr>
<td>CHE 118A &amp; CHE 118B &amp; CHE 118C</td>
<td>Organic Chemistry for Health &amp; Life Sciences and Organic Chemistry for Health &amp; Life Sciences and Organic Chemistry for Health &amp; Life Sciences</td>
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<tr>
<td>Mathematics</td>
<td>8-12</td>
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<tr>
<td>Choose the 017 series or 021 series:</td>
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1. Choose the 002 series or 004 series:
2. Choose the 008 series or 118 series:
3. Choose the 017 series or 021 series:
MAT 017A  Calculus for Biology & Medicine
& MAT 017B  and Calculus for Biology & Medicine
& MAT 017C  and Calculus for Biology & Medicine

OR

MAT 021A  Calculus
& MAT 021B  and Calculus
& MAT 021C  and Calculus (Recommended)

Physics 12

PHY 007A  General Physics
& PHY 007B  and General Physics
& PHY 007C  and General Physics

Microbiology 1

MIC 091  Introduction to Research
or MIC 191  Introduction to Research for Advanced Undergraduates

Subtotal 60-70

Depth Subject Matter

Biological Science

BIS 101  Genes & Gene Expression  4
BIS 105  Biomolecules & Metabolism  3-6
or BIS 102  Structure & Function of Biomolecules
& BIS 103  and Bioenergetics & Metabolism

Statistics

STA 100  Applied Statistics for Biological Sciences  4

Microbiology

MIC 102  Introductory Microbiology  3
MIC 104L  General Microbiology Laboratory  3
MIC 105  Microbial Diversity  3
MIC 105L  Microbial Diversity Laboratory  3
MIC 111  Human Microbiology  3

Areas of Study

Choose at least one course from each of the areas of study below: 9-10

1. Molecular Microbiology
   MIC 115  Recombinant DNA Cloning & Analysis
   MIC 150  Genomes of Pathogenic Bacteria
   MIC 170  Yeast Molecular Genetics

2. Virology
   MIC 162  General Virology
   PMI 128  Biology of Animal Viruses

3. Immunology
   MMI 188A  Human Immunology
   or MMI 188B  Human Immunology
   PMI 126  Fundamentals of Immunology

Choose additional course work from the list below, to achieve a total of 45 or more units. Upper division Microbiology courses not used in satisfaction of any other requirement; or:

BIS 181  Comparative Genomics
BIS 183  Functional Genomics
FST 104  Food Microbiology
MCB 121  Advanced Molecular Biology
MCB 182  Principles of Genomics
MIC 117  Analysis of Molecular Genetic Circuits
(Discontinued)

MIC 120  Microbial Ecology
MIC 172  Host-Parasite Interactions
MIC 175  Cancer Biology
PLP 130  Fungal Biology & Disease
SSC 111  Soil Microbiology

Upper division courses in related fields, relevant to the student's interest and chosen in consultation with the advisor.

No more than 3 units of variable-unit courses (numbered 192,
198, or 199) may be used for credit in this category.

Note: Although a course may be listed in more than one category,
that course may satisfy only one requirement in the entire major.

Depth Subject Matter Subtotal 45

Total Units 105-115

1 With BASC advisor approval, these combination also satisfies the General Chemistry requirement: CHE 004A-CHE 002A (3 units w/no lab)-CHE 002B-CHE 002C or CHE 004A-CHE 004B-CHE 002C.

2 With BASC advisor approval, this combination also satisfies the Organic Chemistry requirement: CHE 118A-CHE 008B.

3 With BASC advisor approval, this combination also satisfies the Mathematics requirement: MAT 021A-MAT 017B-MAT 017C; MAT 017A-MAT 021B.