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.

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<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>&amp; BIS 002B</td>
<td>and Introduction to Biology: Principles of Ecology &amp; Evolution</td>
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<tr>
<td>&amp; BIS 002C</td>
<td>and Introduction to Biology: Biodiversity &amp; the Tree of Life</td>
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<tr>
<td>&amp; BIS 002D</td>
<td>and Introduction to Biology: Principles of Cell Biology &amp; Physiology</td>
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Chemistry: 21-27

Choose the 002 series or 004 series: 1

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<tr>
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<tbody>
<tr>
<td>CHE 002A</td>
<td>General Chemistry</td>
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<tr>
<td>&amp; CHE 002B</td>
<td>and General Chemistry</td>
</tr>
<tr>
<td>&amp; CHE 002C</td>
<td>and General Chemistry</td>
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CHE 004A    | General Chemistry for the Physical Sciences & Engineering    |

CHE 004B    | and General Chemistry for the Physical Sciences & Engineering|

CHE 004C    | and General Chemistry for the Physical Sciences & Engineering|

Choose the 008 series or 118 series: 2

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<th>Code</th>
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<tr>
<td>CHE 008A</td>
<td>Organic Chemistry: Brief Course</td>
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<tr>
<td>&amp; CHE 008B</td>
<td>and Organic Chemistry: Brief Course</td>
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CHE 118A    | Organic Chemistry for Health & Life Sciences                  |

CHE 118B    | and Organic Chemistry for Health & Life Sciences              |

CHE 118C    | and Organic Chemistry for Health & Life Sciences              |

Mathematics: 8-12

Choose the 017 series or 021 series: 3
MAT 017A & MAT 017B & MAT 017C  
Calculus for Biology & Medicine

OR

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

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

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

Subtotal 60-70

Depth Subject Matter

Biological Science

BIS 101  
Genes & Gene Expression 4

BIS 105 or BIS 102 & BIS 103  
Biomolecules & Metabolism and Structure & Function of Biomolecules and Bioenergetics & Metabolism 3-6

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 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

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.