MOLECULAR & MEDICAL MICROBIOLOGY, BACHELOR OF ARTS

College of Biological Sciences

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

Molecular & Medical Microbiology A.B.

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 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>CHE 002A &amp; CHE 002B</td>
<td>General Chemistry and General Chemistry</td>
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<tr>
<td>CHE 004A &amp; CHE 004B</td>
<td>General Chemistry for the Physical Sciences &amp; Engineering and General Chemistry for the Physical Sciences &amp; Engineering</td>
<td>6-12</td>
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<tr>
<td>CHE 008A &amp; CHE 008B</td>
<td>Organic Chemistry: Brief Course and Organic Chemistry: Brief Course (Or )</td>
<td>6-12</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</td>
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Mathematics
Choose a series: 2

<table>
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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>MAT 017A &amp; MAT 017B</td>
<td>Calculus for Biology &amp; Medicine and Calculus for Biology &amp; Medicine</td>
<td>8</td>
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</table>
### Calculus and Calculus

**Physics**
- **PHY 001A**: Principles of Physics  
- **PHY 001B**: and Principles of Physics  

**OR**
- **PHY 007A**: General Physics  
- **PHY 007B**: and General Physics  
- **PHY 007C**: and General Physics  

Preparatory Subject Matter Subtotal: 45-57

### Biological Science
- **BIS 101**: Genes & Gene Expression  
- **BIS 105**: Biomolecules & Metabolism  
- **BIS 103**: Bioenergetics & Metabolism  
- **BIS 102**: and Structure & Function of Biomolecules  

### Microbiology
- **MIC 102**: Introductory Microbiology  
- **MIC 104L**: General Microbiology Laboratory  
- **MIC 105**: Microbial Diversity  
- **MIC 105L**: Microbial Diversity Laboratory  
- **MIC 111**: Human Microbiology  

### Areas of Study
Choose at least one course from each of the areas of study below: 6-7

#### 1. Microbial Genetics
- **MIC 115**: Recombinant DNA Cloning & Analysis  
- **MIC 150**: Genomes of Pathogenic Bacteria  
- **MIC 170**: Yeast Molecular Genetics  

#### 2. Virology or Immunology
- **MIC 162**: General Virology  
- **MMI 188A**: Human Immunology  
- **MMI 188B**: Human Immunology  
- **PMI 126**: Fundamentals of Immunology  
- **PMI 128**: Biology of Animal Viruses  

Choose additional course work from the list below, to achieve a total of 36 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  

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

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

<table>
<thead>
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<th>Depth Subject Matter Subtotal</th>
<th>36</th>
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<tr>
<td>Total Units</td>
<td>81-93</td>
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1. With BASC advisor approval, this combination also satisfies the Organic Chemistry requirement: CHE 118A-CHE 008B.  
2. With BASC advisor approval, this combination also satisfies the Mathematics requirement: MAT 021A-MAT 017B; MAT 017A-MAT 021B.