BIOCHEMISTRY & MOLECULAR BIOLOGY, BACHELOR OF SCIENCE

The Biochemistry & Molecular Biology Major Program

The Biochemistry & Molecular Biology major introduces students to the chemistry of living organisms and the experimental techniques that are used to probe the structures and functions of biologically important molecules. Students who enjoy both chemistry and biology and who are comfortable with quantitative approaches to problem solving will find this major a rewarding field of study.

The Program

The upper division curriculum in the Biochemistry & Molecular Biology program begins with the three-course, upper-division common curriculum that introduces the principles of biochemistry and genetics. Majors then take a comprehensive and rigorous laboratory course to familiarize them with the most important aspects of biochemical research. Additional upper-division courses in biochemistry and molecular biology examine detailed aspects of these subjects. Students are also required to take courses in other biological sciences and a full year of physical chemistry.

Career Alternatives

The Biochemistry & Molecular Biology program provides a solid scientific background for students seeking a research, teaching, or service career in the life sciences. Positions are open to biochemists in bio-medical, biotechnological, pharmaceutical, agricultural research, and some chemical industries. Also, university-affiliated research laboratories, hospital laboratories, and government-sponsored research facilities provide employment opportunities. The major provides excellent preparation for advanced study in graduate or professional schools.

Graduate Study

See Biochemistry, Molecular, Cellular, & Developmental Biology (Graduate Group) (https://catalog.ucdavis.edu/departments-programs-degrees/biochemistry-molecular-cellular-developmental-biology/).

Faculty Advisor

David Wilson (dkwilson@UCDAVIS.EDU), Ph.D.

Advising

Biology Academic Success Center (BASC), CBS Dean’s Office Advising in 1023 Katherine Esau Science Hall (formerly Sciences Laboratory Building); 530-752-0410; csundergrads@ucdavis.edu.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>Preparatory Subject Matter</td>
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<tr>
<td>Biological Science</td>
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</table>
## Biochemistry & Molecular Biology, Bachelor of Science

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CHE 129A</td>
<td>Organic Chemistry Laboratory and Organic Chemistry Laboratory</td>
<td>3-6</td>
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<tr>
<td>CHE 129B</td>
<td></td>
<td>3-6</td>
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Choose the 107 or 110 series: 6-12

### CHE 107A
Physical Chemistry for the Life Sciences and Physical Chemistry for the Life Sciences

### CHE 110A

### MCB 120
Molecular Biology & Biochemistry Laboratory Associated Lecture

### MCB 120L
Molecular Biology & Biochemistry Laboratory

### MCB 121
Advanced Molecular Biology

### MCB 123
Behavior & Analysis of Enzyme & Receptor Systems

### MCB 124
Macromolecular Structure & Function

### or MCB 143
Cell & Molecular Biophysics

### Statistics

Choose STA 100 or 130A & 130B: 4-8

### STA 100
Applied Statistics for Biological Sciences

### or STA 130A
Mathematical Statistics: Brief Course

### & STA 130B
and Mathematical Statistics: Brief Course

### Restricted Electives

Choose at least 6 additional units (p. 2) 6

Depth Subject Matter Subtotal 53-65

**Total Units** 106-125

1. With BASC advisor approval, these combinations also satisfy the Chemistry requirement: CHE 004A-CHE 002A (3 units with no lab)-CHE 002B-CHE 002C, CHE 004A-CHE 004B-CHE 002C.

2. With BASC advisor approval, these combinations also satisfy the Mathematics requirement: MAT 021A-MAT 017B-MAT 017C, MAT 017A-MAT 021B.

3. With BASC advisor approval, these combinations also satisfy the Physics requirement: PHY 007A-PHY 009A-PHY 049*-PHY 007C, PHY 009A-PHY 009B-PHY 049*-PHY 007C. *PHY 049 requires approval from the PHY Department to enroll.


## Restricted Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>ANS 137</td>
<td>Techniques &amp; Practices of Avian Culture</td>
<td>3</td>
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<tr>
<td>ANT 151</td>
<td>Primate Evolution</td>
<td>4</td>
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<tr>
<td>ANT 152</td>
<td>Human Evolution</td>
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<tr>
<td>ANT 158</td>
<td>The Evolution of Sex: A Biological Perspective</td>
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BIS, any upper division 100-199, except 101, 101D, 102, 103, 105 (https://catalog.ucdavis.edu/courses-subject-code/bis/)

BIM 162
Introduction to the Biophysics of Molecules & Cells

BIT, any upper division 100-199, except tutoring 197T (https://catalog.ucdavis.edu/courses-subject-code/bit/)


EXB 106/CHA 101
Human Gross Anatomy

EXB 106/CHA 101L
Human Gross Anatomy Laboratory

ECH 140
Mathematical Methods in Biochemical & Chemical Engineering

ECH 142
Heat Transfer for Biochemical & Chemical Engineering

ECH 143
Mass Transfer for Biochemical & Chemical Engineering

ECH 152A
Chemical Engineering Thermodynamics

ECH 152B
Chemical Engineering Thermodynamics

ENT 100
General Entomology

ENT 102
Insect Physiology

ENT 153
Medical Entomology

ENT 158
Forensic Entomology

EXB 101
Exercise Physiology

EXB 117
Exercise & Aging in Health & Disease

EXB 124
Physiology of Maximal Human Performance

ETX 101
Principles of Environmental Toxicology

ETX/NUT 104
Environmental & Nutritional Factors in Cellular Regulation & Nutritional Toxicants

ETX 110
Toxic Tragedies & Their Impact on Society

ETX 120
Perspectives in Aquatic Toxicology

ETX/FST 128
Food Toxicology

ETX 130
Role & Applications of Toxicology in Modern Industry

EVE, any upper division 100-199, except tutoring 197T (https://catalog.ucdavis.edu/courses-subject-code/eve/)

FST 100A
Food Chemistry

FST 100B
Food Properties

FST 102A
Malting & Brewing Science

FST 102B
Practical Malting & Brewing

FST 104
Food Microbiology

FST 123
Introduction to Enzymology

FST/ETX 128
Food Toxicology

GDB 101
Epidemiology

GDB 103
Microbiome of People, Animals, & Plants

GEL 107
Earth History: Paleobiology

IDI 141
Infectious Diseases of Humans

MCB/PLB 126
Plant Biochemistry

MCB 140
Cell Biology Laboratory Associated Lecture

MCB 140L
Cell Biology Laboratory

MCB 142
Advanced Cell Biology: Contractile & Motile Systems
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<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>MCB 143</td>
<td>Cell &amp; Molecular Biophysics</td>
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<td>MCB 144</td>
<td>Mechanisms of Cell Division</td>
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<tr>
<td>MCB 145</td>
<td>Assembly &amp; Function of Cell Signaling Machinery</td>
<td>3</td>
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<td>MCB 160</td>
<td>Genetics Laboratory Associated Lecture</td>
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<td>MCB 160L</td>
<td>Principles of Genetics Laboratory</td>
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<td>MCB 162</td>
<td>Human Genetics &amp; Genomics</td>
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<tr>
<td>MCB 163</td>
<td>Developmental Genetics</td>
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<tr>
<td>MCB 164</td>
<td>Advanced Eukaryotic Genetics</td>
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<tr>
<td>MCB 182</td>
<td>Principles of Genomics</td>
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<td>MIC, any upper division 100-199, except tutoring 197T (<a href="https://catalog.ucdavis.edu/courses-subject-code/mic/">https://catalog.ucdavis.edu/courses-subject-code/mic/</a>)</td>
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<tr>
<td>MMI 188A</td>
<td>Human Immunology</td>
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<tr>
<td>or MMI 188B</td>
<td>Human Immunology</td>
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<td>NPB, any upper division 100-199, except 102 &amp; tutoring 197T (<a href="https://catalog.ucdavis.edu/courses-subject-code/npb/">https://catalog.ucdavis.edu/courses-subject-code/npb/</a>)</td>
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<td>NUT/ETX 104</td>
<td>Environmental &amp; Nutritional Factors in Cellular Regulation &amp; Nutritional Toxicants</td>
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<td>NUT 105</td>
<td>Nutrition through the Life Cycle</td>
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<td>NUT 111AY</td>
<td>Introduction to Nutrition &amp; Metabolism</td>
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<td>NUT 112</td>
<td>Nutritional Assessment</td>
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<tr>
<td>PHY 140B</td>
<td>Introduction to Solid State Physics</td>
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<td>PLB, any upper division 100-199, except tutoring 197T (<a href="https://catalog.ucdavis.edu/courses-subject-code/plb/">https://catalog.ucdavis.edu/courses-subject-code/plb/</a>)</td>
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<td>PLS 147</td>
<td>California Plant Communities</td>
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<td>PMI, any upper division 100-199, except tutoring 197T (<a href="https://catalog.ucdavis.edu/courses-subject-code/pmi/">https://catalog.ucdavis.edu/courses-subject-code/pmi/</a>)</td>
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<td>PSC 101</td>
<td>Introduction to Biological Psychology</td>
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<tr>
<td>STA 101</td>
<td>Advanced Applied Statistics for the Biological Sciences</td>
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<tr>
<td>STA 103</td>
<td>Applied Statistics for Business &amp; Economics</td>
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<tr>
<td>STA 104</td>
<td>Applied Statistical Methods: Nonparametric Statistics</td>
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<tr>
<td>STA 106</td>
<td>Applied Statistical Methods: Analysis of Variance</td>
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<tr>
<td>STA 108</td>
<td>Applied Statistical Methods: Regression Analysis</td>
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<tr>
<td>VMB 101V</td>
<td>Principles of Pharmacology &amp; Toxicology</td>
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<td>VMB 101Y</td>
<td>Principles of Pharmacology &amp; Toxicology (Up to 3 units of Research 192, 193, 199, 189, 190C, etc.)</td>
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<tr>
<td>Up to 3 units of Research 192, 193, 199, 189, 190C, etc.</td>
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<td>A small selection of other courses may work upon consultation with BMB master or BASC advisor.</td>
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