

# CELL BIOLOGY, BACHELOR OF SCIENCE

## College of Biological Sciences

The Cell Biology major provides students with a comprehensive understanding of the cell, the basic structural and functional unit of all living organisms.

## The Program

To understand living organisms, the biologist must understand the cell. Hence, cell biology lies at the core of the biological sciences. Students taking this major gain a solid foundation in biological principles. The major emphasizes how cellular organization and function contribute to the development, maintenance, and reproduction of adult organisms. The major illustrates the ways in which principles derived from the physical sciences, genetics, biochemistry, molecular biology, and physiology are integrated in the study of living cells and emphasizes the experimental nature of the study of cell biology.

## Career Alternatives

The major provides an excellent background for students wishing to enter postgraduate and professional programs in biological, health sciences or veterinary sciences; for students pursuing careers involving teaching or research in the biological sciences; for students interested in careers in the biotechnological or pharmaceutical industries; or for students interested in careers related to the administrative, legal, or commercial aspects of biomedical science.

## Faculty Advisor

F.J. McNally (fjmcnally@ucdavis.edu), Ph.D.

## Advising

Biology Academic Success Center (BASC) in 1023 Katherine Esau Science Hall (formerly Sciences Laboratory Building); 530-752-0410, cbsundergrads@ucdavis.edu.

## Graduate Study

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

The major requirements below are in addition to meeting University Degree Requirements (<https://catalog.ucdavis.edu/undergraduate-education/university-degree-requirements/>) & College Degree Requirements (<https://catalog.ucdavis.edu/undergraduate-education/college-degree-requirements/>); unless otherwise noted. The minimum number of units required for the Cell Biology Bachelor of Science is 106.

Code	Title	Units
<b>Preparatory Subject Matter</b>		
	<i>Biological Science</i>	18

BIS 002A & BIS 002B & BIS 002C & BIS 002D	Introduction to Biology: Essentials of Life on Earth and Introduction to Biology: Principles of Ecology & Evolution and Introduction to Biology: Biodiversity & the Tree of Life and Introduction to Biology: Principles of Cell Biology & Physiology
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<i>Chemistry</i>		
Choose the 002 or 004 series: <sup>1</sup>		15
CHE 002A & CHE 002B & CHE 002C	General Chemistry and General Chemistry and General Chemistry	
<b>OR</b>		
CHE 004A & CHE 004B & CHE 004C	General Chemistry for the Physical Sciences & Engineering and General Chemistry for the Physical Sciences & Engineering and General Chemistry for the Physical Sciences & Engineering	
Choose the 008 series or 118 series or 128 series & 129A-B: <sup>2</sup>		6-13
CHE 008A & CHE 008B	Organic Chemistry: Brief Course and Organic Chemistry: Brief Course	
<b>OR</b>		
CHE 118A & CHE 118B & CHE 118C	Organic Chemistry for Health & Life Sciences and Organic Chemistry for Health & Life Sciences and Organic Chemistry for Health & Life Sciences	
<b>OR</b>		
CHE 128A & CHE 128B & CHE 128C & CHE 129A & CHE 129B	Organic Chemistry and Organic Chemistry and Organic Chemistry and Organic Chemistry Laboratory and Organic Chemistry Laboratory	
<i>Mathematics</i>		
Choose the 017 or 021 series: <sup>3</sup>		8-12
MAT 017A & MAT 017B & MAT 017C	Calculus for Biology & Medicine and Calculus for Biology & Medicine and Calculus for Biology & Medicine	
<b>OR</b>		
MAT 021A & MAT 021B & MAT 021C	Calculus and Calculus and Calculus (Recommended)	
<i>Physics</i>		
Choose the 007 or 009 series: <sup>4</sup>		12-15
PHY 007A & PHY 007B & PHY 007C	General Physics and General Physics and General Physics	
<b>OR</b>		
PHY 009A & PHY 009B & PHY 009C	Classical Physics and Classical Physics and Classical Physics	
Preparatory Subject Matter Subtotal		59-73
<b>Depth Subject Matter</b>		
<i>Biological Science</i>		

BIS 101	Genes & Gene Expression	4	or MIC 103L DIS
or BIS 101V	Genes & Gene Expression		MMG 170 Yeast Molecular Genetics
BIS 102	Structure & Function of Biomolecules	3	or MIC 170 DISCONTINUED FOR FALL 2025 **
or BIS 102V	Structure & Function of Biomolecules		MMG 172 Host-Parasite Interactions
BIS 103	Bioenergetics & Metabolism	3	or MIC 175 DISC
BIS 104	Cell Biology	3	MMG 175 Cancer Biology
<i>Statistics</i>			or MIC 175 DISCONTINUED FOR FALL 2025 **
Choose STA 100 or 130A & 130B:		4-8	NPB 100 Neurobiology
STA 100	Applied Statistics for Biological Sciences		NPB 101 Systemic Physiology
or STA 130A & STA 130B	Mathematical Statistics: Brief Course and Mathematical Statistics: Brief Course		PMI 126 Fundamentals of Immunology
<i>Molecular &amp; Cellular Biology</i>			PMI 126L Immunology Laboratory
MCB 121	Advanced Molecular Biology	3	PMI 128 Biology of Animal Viruses
MCB 140L	Cell Biology Laboratory	5	PLB 111 Plant Physiology
Choose two:		6	PLB 111D Problems in Plant Physiology
MCB 143	Cell & Molecular Biophysics		PLB 113 Molecular & Cellular Biology of Plants
MCB 144	Mechanisms of Cell Division		PLB 113D Problems in Molecular & Cellular Biology of Plants
MCB 145	Assembly & Function of Cell Signaling Machinery		MMI 188A Human Immunology 3-4
MCB 150	Developmental Biology	3-4	or MMI 188B Human Immunology
or MCB 163	Developmental Genetics		No more than 4 units of research (193, 194H, 199) may be used for credit in this category.
Choose at least 10 units:		10	Depth Subject Matter Subtotal 47-53
CHE 107A	Physical Chemistry for the Life Sciences		<b>Total Units 106-126</b>
CHE 107B	Physical Chemistry for the Life Sciences		1
EVE 100	Introduction to Evolution		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.
MIC 101	(Discontinued for spring 2024) **		2
MCB 120	Molecular Biology & Biochemistry Laboratory Associated Lecture		With BASC advisor approval, these combinations also satisfy the Organic Chemistry requirement: CHE 118A-CHE 008B; CHE 128A-CHE 128B-CHE 008B; CHE 128A-CHE 118B-CHE 118C; CHE 128A-CHE 128B-CHE 129A-CHE 118C; CHE 118A-CHE 128B-CHE 128C-CHE 129A-CHE 129B; CHE 118A-CHE 118B-CHE 128C-CHE 129B.
MCB 120L	Molecular Biology & Biochemistry Laboratory		3
MCB 123	Behavior & Analysis of Enzyme & Receptor Systems		With BASC advisor approval, these combinations also satisfy the Mathematics requirement: MAT 021A-MAT 017B-MAT 017C; MAT 017A-MAT 021B.
MCB 124	Macromolecular Structure & Function		4
MCB/PLB 126	Plant Biochemistry		With BASC advisor approval, these combinations also satisfy the Physics requirement: PHY 007A ( <a href="https://catalog.ucdavis.edu/search/?P=PHY%20007A">https://catalog.ucdavis.edu/search/?P=PHY%20007A</a> )-PHY 007C ( <a href="https://catalog.ucdavis.edu/search/?P=PHY%20007C">https://catalog.ucdavis.edu/search/?P=PHY%20007C</a> )-PHY 009A ( <a href="https://catalog.ucdavis.edu/search/?P=PHY%20009A">https://catalog.ucdavis.edu/search/?P=PHY%20009A</a> )-PHY 049 ( <a href="https://catalog.ucdavis.edu/search/?P=PHY%200049">https://catalog.ucdavis.edu/search/?P=PHY%200049</a> )*; PHY 009A ( <a href="https://catalog.ucdavis.edu/search/?P=PHY%20009A">https://catalog.ucdavis.edu/search/?P=PHY%20009A</a> )-PHY 009B ( <a href="https://catalog.ucdavis.edu/search/?P=PHY%20009B">https://catalog.ucdavis.edu/search/?P=PHY%20009B</a> )-PHY 049 ( <a href="https://catalog.ucdavis.edu/search/?P=PHY%200049">https://catalog.ucdavis.edu/search/?P=PHY%200049</a> )*. *PHY 049 ( <a href="https://catalog.ucdavis.edu/search/?P=PHY%200049">https://catalog.ucdavis.edu/search/?P=PHY%200049</a> ) requires approval from the Physics Department to enroll.
MCB 138	Undergraduate Seminar in Biochemistry		**
MCB 139	Undergraduate Seminar in Biochemistry		Course(s) discontinued; see your advisor for course options.
MCB 143	Cell & Molecular Biophysics		
MCB 144	Mechanisms of Cell Division		
MCB 145	Assembly & Function of Cell Signaling Machinery		
MCB 148	Undergraduate Seminar in Cell Biology		
MCB 150	Developmental Biology		
MCB 160L	Principles of Genetics Laboratory		
MCB 162	Human Genetics & Genomics		
MCB 163	Developmental Genetics		
MCB 164	(Discontinued for spring 2025) **		
MCB 178	Undergraduate Seminar in Molecular Genetics		
MCB 182	Principles of Genomics		
MCB 191	Introduction to Research		
MMG 102			
or MIC 102 DISCONTINUED FOR FALL 2026 **			
MIC 103L	Introductory Microbiology Laboratory		