

BIOCHEMISTRY AND BIOPHYSICS UNDERGRADUATE MAJOR (BS, HBS)

Administered by the Department of Biochemistry and Biophysics under the School of Life Sciences.

Accredited by the American Society for Biochemistry and Molecular Biology (<https://www.asbmb.org/Accreditation/Schools>).

The BS degree in Biochemistry and Biophysics provides a degree path centered on the chemistry and physics of life processes with training that integrates the principles of chemistry, physics, mathematics, biochemistry, genetics, and computer science. Biochemists explore the chemical structure of living matter and the chemical reactions occurring in living cells. Biophysicists use the methods of physical science to study the structure and functions of macromolecules. Biochemistry and Biophysics majors receive excellent training for careers in medicine and related health professions, biotechnology and pharmaceutical industries, or for graduate study in the biochemistry and biophysics. Training in biophysics is especially valuable for students who are interested in drug design.

Students majoring in Biochemistry and Biophysics cannot seek a dual or double major in Biochemistry and Molecular Biology, Biohealth Sciences, Biology, Microbiology or Zoology.

For further information, visit the Department of Biochemistry and Biophysics website (<https://biochem.science.oregonstate.edu>).

Total credits required for graduation is 180.

Course	Title	Hours
First Year		
BI 211 & BI 212 & BI 213	*PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY and *PRINCIPLES OF BIOLOGY	12
CH 231 & CH 261	GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 231	5
CH 232 & CH 262	GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232	5

CH 233 & CH 263	GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 233	5
HHS 231	*LIFETIME FITNESS FOR HEALTH	2
HHS 241	*LIFETIME FITNESS	1
MTH 251	*DIFFERENTIAL CALCULUS	4
MTH 252	INTEGRAL CALCULUS	4
MTH 254	VECTOR CALCULUS I	4
WR 121	*ENGLISH COMPOSITION	3
	Hours	45

Second Year

BB 317 or BI 317	*SCIENTIFIC THEORY AND PRACTICE or *SCIENTIFIC THEORY AND PRACTICE	3
BI 311	GENETICS	4
CH 334 & CH 335 & CH 336	ORGANIC CHEMISTRY and ORGANIC CHEMISTRY and ORGANIC CHEMISTRY	9
CH 361 & CH 362	EXPERIMENTAL CHEMISTRY I and EXPERIMENTAL CHEMISTRY I ¹	6
Select one of the following:		4
MTH 253	INFINITE SERIES AND SEQUENCES	
MTH 256	APPLIED DIFFERENTIAL EQUATIONS	
MTH 306	MATRIX AND POWER SERIES METHODS	

2 Biochemistry and Biophysics Undergraduate Major (BS, HBS)

PH 211 & PH 212 & PH 213	*GENERAL PHYSICS WITH CALCULUS and *GENERAL PHYSICS WITH CALCULUS and *GENERAL PHYSICS WITH CALCULUS	12
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Electives		8
	Hours	46

Third Year		
BB 314	CELL AND MOLECULAR BIOLOGY (Not required but strongly recommended)	4

BB 490	BIOCHEMISTRY 1: STRUCTURE AND FUNCTION	3
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BB 491	BIOCHEMISTRY 2: METABOLISM	3
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BB 492	BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY	3
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BB 493 & BB 497	BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1 and BASIC NUCLEIC ACID AND PROTEIN SEQUENCE ANALYSIS ¹	4
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BB 494 & BB 496	BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUE 2 and BIOCHEMISTRY LABORATORY MOLECULAR MODELING ¹	4
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CH 440 & CH 441 & CH 442	PHYSICAL CHEMISTRY and PHYSICAL CHEMISTRY and PHYSICAL CHEMISTRY	9
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Electives		18
	Hours	48

Fourth Year		
BB 481	MACROMOLECULAR STRUCTURE	3
BB 482	BIOPHYSICS	3

BB 483	ADVANCED BIOCHEMISTRY AND BIOPHYSICS CAPSTONE	3
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BB 498	ASBMB CERTIFICATION EXAM	0
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Select elective credits to reach 180		32
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	Hours	41
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	Total Hours	180
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¹ CH 361 EXPERIMENTAL CHEMISTRY I and CH 362 EXPERIMENTAL CHEMISTRY I can be taken in the junior year with BB 493 BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1, BB 494 BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 2, BB 496 BIOCHEMISTRY LABORATORY MOLECULAR MODELING, BB 497 BASIC NUCLEIC ACID AND PROTEIN SEQUENCE ANALYSIS being taken in the senior year.

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

Major Code: 506

Course	Title	Hours
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First Year		
Fall		
BI 211	*PRINCIPLES OF BIOLOGY	4

BB 111	INTRODUCTION TO BIOCHEMISTRY AND BIOPHYSICS RESEARCH	1
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CH 231	GENERAL CHEMISTRY	4
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CH 261	*LABORATORY FOR CHEMISTRY 231	1
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MTH 251	*DIFFERENTIAL CALCULUS	4
	Hours	14

Winter		
BI 212	*PRINCIPLES OF BIOLOGY	4

CH 232	GENERAL CHEMISTRY	4
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CH 262	*LABORATORY FOR CHEMISTRY 232	1
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MTH 252	INTEGRAL CALCULUS	4
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WR 121	*ENGLISH COMPOSITION	3
	Hours	16

Spring		
BI 213	*PRINCIPLES OF BIOLOGY	4

CH 233	GENERAL CHEMISTRY	4
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CH 263	*LABORATORY FOR CHEMISTRY 233	1
Select one of the following: 3		
COMM 111	*PUBLIC SPEAKING	
COMM 114	*ARGUMENT AND CRITICAL DISCOURSE	
COMM 218	*INTERPERSONAL COMMUNICATION	
MTH 254	VECTOR CALCULUS I	4
		Hours 16

Second Year

Fall		
BB 314	CELL AND MOLECULAR BIOLOGY	4
CH 334	ORGANIC CHEMISTRY	3
PH 211	*GENERAL PHYSICS WITH CALCULUS	4
Bacc Core Course		3
		Hours 14

Winter		
CH 335	ORGANIC CHEMISTRY	3
HHS 231	*LIFETIME FITNESS FOR HEALTH	2
PH 212	*GENERAL PHYSICS WITH CALCULUS	4
MTH 256	APPLIED DIFFERENTIAL EQUATIONS	4
Bacc Core Course		3
		Hours 16

Spring		
BB 317	*SCIENTIFIC THEORY AND PRACTICE	3
CH 336	ORGANIC CHEMISTRY	3
PH 213	*GENERAL PHYSICS WITH CALCULUS	4
Bacc Core Course		3
Elective		3
		Hours 16

Third Year

Fall		
BB 490	BIOCHEMISTRY 1: STRUCTURE AND FUNCTION	3

CH 361	EXPERIMENTAL CHEMISTRY I	3
CH 440	PHYSICAL CHEMISTRY	3
Bacc Core Course		3
Elective		3
		Hours 15

Winter		
BB 491	BIOCHEMISTRY 2: METABOLISM	3
CH 362	EXPERIMENTAL CHEMISTRY I	3
CH 441	PHYSICAL CHEMISTRY	3
Bacc Core Course		3
Elective		3
		Hours 15

Spring		
BB 492	BIOCHEMISTRY 3: GENETIC BIOCHEMISTRY	3
CH 441	PHYSICAL CHEMISTRY	3
Bacc Core Course		3
Elective		6
		Hours 15

Fourth Year

Fall		
BB 481	MACROMOLECULAR STRUCTURE	3
BB 493	BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1	3
BB 497	BASIC NUCLEIC ACID AND PROTEIN SEQUENCE ANALYSIS	1
Bacc Core Course		3
Elective		5
		Hours 15

Winter		
BB 482	BIOPHYSICS	3
BB 494	BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 2	3
BB 496	BIOCHEMISTRY LABORATORY MOLECULAR MODELING	1
Elective		8
		Hours 15

Spring		
BB 483	ADVANCED BIOCHEMISTRY AND BIOPHYSICS: CAPSTONE	3

4 *Biochemistry and Biophysics Undergraduate Major (BS, HBS)*

BB 498	ASBMB CERTIFICATI EXAM	0
Bacc Core Course		3
Elective		9
	Hours	15
	Total Hours	182

¹ CH 361 EXPERIMENTAL CHEMISTRY I and CH 362 EXPERIMENTAL CHEMISTRY I can be taken in the junior year with BB 493 BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 1, BB 494 BIOCHEMISTRY LABORATORY MOLECULAR TECHNIQUES 2, BB 496 BIOCHEMISTRY LABORATORY MOLECULAR MODELING, BB 497 BASIC NUCLEIC ACID AND PROTEIN SEQUENCE ANALYSIS being taken in the senior year.

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)