

BS in Biophysics (285720) MAP Sheet

Life Sciences, Cell Biology and Physiology

For students entering the degree program during the 2023-2024 curricular year.



University Core and Graduation Requirements				Suggested Sequence of Courses			
University Core Requirements:				FRESHMAN YEAR			
Requirements	#Classes	Hours	Classes	1st Semester		JUNIOR YEAR	
Religion Cornerstones				5th Semester			
Teachings and Doctrine of The Book of Mormon	1	2.0	REL A 275	First-Year Writing or American Heritage	3.0	CELL 360	3.0
Jesus Christ and the Everlasting Gospel	1	2.0	REL A 250	CELL 120 (Biological Science)	3.0	CHEM 481	3.0
Foundations of the Restoration	1	2.0	REL C 225	CHEM 105	4.0	PHSCS 220	3.0
The Eternal Family	1	2.0	REL C 200	MATH 112 (Languages of Learning & Quantitative Reasoning)	4.0	PHSCS 225	2.0
The Individual and Society				Religion Cornerstone Course	2.0	Religion Elective	2.0
American Heritage	1-2	3-6.0	from approved list	Total Hours	16.0	Mentored Lab Experience (CELL 495R)	1-2.0
Global and Cultural Awareness	1	3.0	from approved list	2nd Semester		Total Hours	14-15.0
Skills				First-Year Writing or American Heritage	3.0	6th Semester	
First Year Writing	1	3.0	from approved list	BIO 250	2.0	CELL 362	3.0
Advanced Written and Oral Communications	1	3.0	WRTG 316 recommended	CHEM 106	3.0	CELL 363	1.0
Quantitative Reasoning	1	4.0	MATH 112*	CHEM 107	1.0	CHEM 468	3.0
Languages of Learning (Math or Language)	1	4.0	MATH 112*	MATH 113	4.0	Advanced Writing (WRTG 316 recommended)	3.0
Arts, Letters, and Sciences				Religion Cornerstone Course	2.0	Global & Cultural Awareness Elective	3.0
Civilization 1	1	3.0	from approved list	Total Hours	15.0	Religion Elective	2.0
Civilization 2	1	3.0	from approved list	SOPHOMORE YEAR		Total Hours	15.0
Arts	1	3.0	from approved list	3rd Semester		7th Semester	
Letters	1	3.0	from approved list	MMBIO 240	3.0	CELL 455R	0.5
Biological Science	1	3.0	CELL 120*	MMBIO 241	1.0	CELL 568	3.0
Physical Science	1	3.0	CHEM 105*, PHSCS 121*	CHEM 351	3.0	Mentored Lab Experience (CELL 495R or 498)	2.5-3.0
Social Science	1	3.0	from approved list	PHSCS 121	3.0	Arts or Letters Elective	3.0
Core Enrichment: Electives				Civilization 1 Elective	3.0	Social Science Elective	3.0
Religion Electives	3-4	6.0	from approved list	Religion Cornerstone Course	2.0	Religion Elective	2.0
Open Electives	Variable	Variable	personal choice	Total Hours	15.0	Total Hours	14-14.5
FOR GE QUESTIONS CONTACT THE ADVISEMENT CENTER. FOR PROGRAM QUESTIONS SEE YOUR MAJOR ADVISOR. *ASTERISKED CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS				4th Semester		8th Semester	
Graduation Requirements:				PWS 340	3.0	Arts of Letters Elective	3.0
Minimum residence hours required		30.0		CHEM 352	3.0	Major Electives	6.0
Minimum hours needed to graduate		120.0		CHEM 353	1.0	General Electives	6.0
				PHSCS 123	3.0	Complete Senior Survey/Exit Interview (See Department)	0.0
				Civilization 2 Elective	3.0	Pass ETS Biology Field Exam (See College Advisement Center)	0.0
				Religion Cornerstone Course	2.0	Total Hours	15.0
				Mentored Lab Experience (CELL 295R)	1-2.0		
				Total Hours	16-17.0		
				Note: The Senior Survey, Exit Interview, and ETS Biology Field Exam must be completed during the last semester. You will be contacted during the graduation clearance process.			
				Note: This degree program requires a minimum of 120.0 hours for graduation. Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.			

Requirement 1 — Complete 6 Courses*Life sciences core courses:*

BIO 250 - Evolutionary Medicine 2.0
 CELL 120 - Science of Biology 3.0
 CELL 360 - Cell Biology 3.0
 MMBIO 240 - Molecular Biology 3.0
 MMBIO 241 - Molecular & Cellular Bio Lab 1.0
 PWS 340 - Genetics 3.0

Requirement 2 — Complete 22 hours*Chemistry courses:*

CHEM 105 - Gen College Chem 1+Lab Integr 4.0
 CHEM 106 - General College Chemistry 2 3.0
 CHEM 107 - Gen Coll Chem Lab 1.0
 CHEM 351 - Organic Chemistry 1 3.0
 CHEM 352 - Organic Chemistry 2 3.0
 CHEM 353 - Organic Chem Lab-Nonmajors - Enroll for two credits 2.0v
 CHEM 468 - Biophysical Chemistry 3.0
 CHEM 481 - Biochemistry 3.0

Requirement 3 — Complete 6 Courses*Math and physics courses:*

MATH 112 - Calculus 1 4.0
 MATH 113 - Calculus 2 4.0
 PHSCS 121 - Intro to Newtonian Mechanics 3.0
 PHSCS 123 - Intro to Waves, Optics, Thermo 3.0
 PHSCS 220 - Intro Electricity & Magnetism 3.0
 PHSCS 225 - Intro to Experimental Physics 2.0

Requirement 4 — Complete 4 Courses*Major core courses:*

CELL 362 - Advanced Physiology 3.0
 CELL 363 - Adv Physiology Lab 1.0
 CELL 455R - Cell Bio & Physiology Seminar 0.5
 CELL 568 - Biophysics 3.0

Requirement 5 — Complete 10 hours

Complete 10 hours from the following. At least 4 hours must come from the mentored experience and at least 5 hours from electives.

Option 5.1 — Complete at least 4 hours up to 5 hours

A. Mentored laboratory experience (must be in an approved biophysics lab) (at least 4 hours required):

CELL 295R - Introductory Undergrad Research - *You may take up to 5.0 credit hours* 0.5-2.0
 CELL 495R - Adv Undergraduate Research - *You may take up to 5.0 credit hours* 0.5-4.0
 CELL 498 - Advanced Senior Research 3.0

Option 5.2 — Complete up to 6 hours*B. Electives (at least 5 hours required):*

CELL 365 - Pathophysiology 4.0
 CELL 450R - Readings in Cell Bio & Physiol 1.0-2.0
 CELL 498 - Advanced Senior Research 3.0
 CELL 561 - Physiology of Drug Mechanisms 3.0
 CELL 565 - Endocrinology 3.0
 CHEM 223 - Quant & Qual Analy 4.0
 CHEM 227 - Principles of Chem Analysis 4.0
 CHEM 482 - Mechanisms of Molecular Biol 3.0
 CHEM 489 - Structural Biochemistry 3.0
 CHEM 581 - Adv Biochemical Methodology 1 3.0
 CHEM 583 - Adv Biochemical Methodology 2 3.0
 CHEM 584 - Adv Biochemistry Methods 1 3.0
 CHEM 586 - Adv Biochemistry Methods 2 3.0
 EC EN 301 - Elements of Electrical Engr 3.0

MATH 302 - Math for Engr 1 4.0

MATH 303 - Math for Engineering 2 4.0

MMBIO 441 - Adv Molecular Biology 3.0

MMBIO 442 - Adv Molecular Biology Lab 2.0

NEURO 480 - Cellular Neuroscience 3.0

PHSCS 145 - Experimental Methods 1.0

PHSCS 230 - Computational Physics Lab 1.0

PHSCS 240 - Dsgn, Fabricatn, Sci Apparatus 2.0

STAT 121 - Principles of Statistics 3.0

THE DISCIPLINE:

Biophysics is the use of physics, chemistry, mathematics, and biology to investigate the physical basis of life. Upper-division courses require synthesis and integration of information from many areas of science to understand such processes as protein folding, ion channel functioning, and nerve cell signaling. The requirements of advanced chemistry, physics, and math courses set this major apart from other life science majors.

CAREER OPPORTUNITIES:

A major in Biophysics prepares students to pursue advanced professional or graduate degrees or to enter directly into employment. This major provides outstanding preparation for students seeking admittance into professional programs in medicine, dentistry, optometry, podiatry, chiropractic, or pharmacy. Students who have aspirations of doing health-related research, postsecondary life science teaching, or biotech innovation will find excellent preparation for entrance into graduate programs and beyond. Graduates will also have the academic and laboratory skills necessary for employment in medical, biotech, and pharmaceutical industries. This degree offer students pursuing advanced degrees in business, public management, or law the knowledge and training necessary for admission to professional schools and work in governmental agencies, health care and biotechnical industries, and patent or health care law.

STUDENT INVOLVEMENT IN RESEARCH:

Students majoring in Biophysics work closely with a faculty member doing research in biophysics (CELL 295R and CELL 495R). Faculty research interests are listed under the RESEARCH tab at cell.byu.edu. Current topics include biophysics of membrane structure and function, molecular and functional characterization of ligand-gated ion channels in the central nervous system, and molecular mechanisms of neurotransmitter release.

FINANCING:

Various private, federal, and university sources of scholarships, fellowships, and grants are available. Please see the Life Sciences Advisement Center (2060 LSB) for information regarding college-level and department-level scholarships. Advanced undergraduates may be hired as teaching assistants for CELL courses or research assistants in CELL labs.

MAP DISCLAIMER

While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

DEPARTMENT INFORMATION**Department of Cell Biology and Physiology**

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ADVISEMENT CENTER INFORMATION**Life Sciences Advisement**

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