

BS in Biophysics (285720) MAP Sheet

Life Sciences, Cell Biology and Physiology

For students entering the degree program during the 2022-2023 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				First-Year Writing or American Heritage	3.0	5th Semester	
Teachings and Doctrine of The Book of Mormon	1	2.0	REL A 275	CELL 120 (Biological Science)	3.0	CELL 360	3.0
Jesus Christ and the Everlasting Gospel	1	2.0	REL A 250	CHEM 105	4.0	CHEM 481	3.0
Foundations of the Restoration	1	2.0	REL C 225	MATH 112 (Languages of Learning & Quantitative Reasoning)	4.0	PHSCS 220	3.0
The Eternal Family	1	2.0	REL C 200	Religion Cornerstone Course	2.0	PHSCS 225	2.0
The Individual and Society				Total Hours	16.0	Religion Elective	2.0
American Heritage	1-2	3-6.0	from approved list	2nd Semester		Mentored Lab Experience (CELL 495R)	1-2.0
Global and Cultural Awareness	1	3.0	from approved list	First-Year Writing or American Heritage	3.0	Total Hours	14-15.0
Skills				BIO 250	2.0	6th Semester	
First Year Writing	1	3.0	from approved list	CHEM 106	3.0	CELL 362	3.0
Advanced Written and Oral Communications	1	3.0	WRTG 316 recommended	CHEM 107	1.0	CELL 363	1.0
Quantitative Reasoning	1	4.0	MATH 112*	MATH 113	4.0	CHEM 468	3.0
Languages of Learning (Math or Language)	1	4.0	MATH 112*	Religion Cornerstone Course	2.0	Advanced Writing (WRTG 316 recommended)	3.0
Arts, Letters, and Sciences				Total Hours	15.0	Global & Cultural Awareness Elective	3.0
Civilization 1	1	3.0	from approved list	SOPHOMORE YEAR		Religion Elective	2.0
Civilization 2	1	3.0	from approved list	3rd Semester		Total Hours	15.0
Arts	1	3.0	from approved list	MMBIO 240	3.0	SENIOR YEAR	
Letters	1	3.0	from approved list	MMBIO 241	1.0	7th Semester	
Biological Science	1	3.0	CELL 120*	CHEM 351	3.0	CELL 455R	0.5
Physical Science	1	3.0	CHEM 105*, PHSCS 121*	PHSCS 121	3.0	CELL 568	3.0
Social Science	1	3.0	from approved list	Civilization 1 Elective	3.0	Mentored Lab Experience (CELL 495R or 498)	2.5-3.0
Core Enrichment: Electives				Religion Cornerstone Course	2.0	Arts or Letters Elective	3.0
Religion Electives	3-4	6.0	from approved list	Total Hours	15.0	Social Science Elective	3.0
Open Electives	Variable	Variable	personal choice	4th Semester		Religion Elective	2.0
FOR GE QUESTIONS CONTACT THE ADVISEMENT CENTER.				PWS 340	3.0	Total Hours	14-14.5
FOR PROGRAM QUESTIONS SEE YOUR MAJOR ADVISOR.				CHEM 352	3.0	8th Semester	
*ASTERISKED CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS				CHEM 353	1.0	Arts of Letters Elective	3.0
Graduation Requirements:				PHSCS 123	3.0	Major Electives	6.0
Minimum residence hours required		30.0		Civilization 2 Elective	3.0	General Electives	6.0
Minimum hours needed to graduate		120.0		Religion Cornerstone Course	2.0	Complete Senior Survey/Exit Interview (See Department)	0.0
				Religion Cornerstone Course	2.0	Pass ETS Biology Field Exam (See College Advisement Center)	0.0
				Mentored Lab Experience (CELL 295R)	1-2.0	Total Hours	15.0
				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.

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2022-2023 Program Requirements (72.5 - 73.5 Credit Hours)

<p>REQUIREMENT 1 Complete 6 courses</p> <p>LIFE SCIENCES CORE COURSES:</p> <p>BIO 250 - Evolutionary Medicine 2.0</p> <p>*CELL 120 - Science of Biology 3.0</p> <p>CELL 360 - Cell Biology 3.0</p> <p>MMBIO 240 - Molecular Biology 3.0</p> <p>MMBIO 241 - Molecular and Cellular Biology Laboratory 1.0</p> <p>PWS 340 - Genetics 3.0</p> <p>REQUIREMENT 2 Complete 22.0 hours from the following course(s)</p> <p>CHEMISTRY COURSES:</p> <p>*CHEM 105 - General College Chemistry 1 with Lab (Integrated) 4.0</p> <p>CHEM 106 - General College Chemistry 2 3.0</p> <p>CHEM 107 - General College Chemistry Laboratory 1.0</p> <p>CHEM 351 - Organic Chemistry 1 3.0</p> <p>CHEM 352 - Organic Chemistry 2 3.0</p> <p>CHEM 353 - Organic Chemistry Laboratory--Nonmajors 2.0v</p> <p>CHEM 468 - Biophysical Chemistry 3.0</p> <p>CHEM 481 - Biochemistry 3.0</p> <p>REQUIREMENT 3 Complete 6 courses</p> <p>MATH AND PHYSICS COURSES:</p> <p>*MATH 112 - Calculus 1 4.0</p> <p>MATH 113 - Calculus 2 4.0</p> <p>*PHSCS 121 - Introduction to Newtonian Mechanics 3.0</p> <p>PHSCS 123 - Introduction to Waves, Optics, and Thermodynamics 3.0</p> <p>PHSCS 220 - Introduction to Electricity and Magnetism 3.0</p> <p>PHSCS 225 - Introduction to Experimental Physics 2.0</p> <p>REQUIREMENT 4 Complete 4 courses</p> <p>MAJOR CORE COURSES:</p> <p>CELL 362 - Advanced Physiology 3.0</p> <p>CELL 363 - Advanced Physiology Laboratory 1.0</p> <p>CELL 455R - Cell Biology and Physiology Seminar 0.5</p> <p>CELL 568 - Cellular Electrophysiology and Biophysics 3.0</p> <p>REQUIREMENT 5 Complete 10.0 hours from the following option(s)</p> <p>COMPLETE 10 HOURS FROM THE FOLLOWING. AT LEAST 4 HOURS MUST COME FROM THE MENTORED EXPERIENCE AND AT LEAST 5 HOURS FROM ELECTIVES.</p> <p>OPTION 5.1 Complete up to 5.0 hours from the following course(s)</p> <p>A. MENTORED LABORATORY EXPERIENCE (MUST BE IN AN APPROVED BIOPHYSICS LAB) (AT LEAST 4 HOURS REQUIRED):</p> <p>CELL 295R - Introductory Undergraduate Research in Cell Biology and 2.0v</p>	<p style="text-align: center;"><i>You may take up to 5 credit hours.</i></p> <p>CELL 495R - Advanced Undergraduate Research in Cell Biology and Pf 4.0v</p> <p style="text-align: center;"><i>You may take up to 5 credit hours.</i></p> <p>CELL 498 - Advanced Senior Research Project 3.0</p> <p>OPTION 5.2 Complete up to 6.0 hours from the following course(s)</p> <p>B. ELECTIVES (AT LEAST 5 HOURS REQUIRED):</p> <p>CELL 365 - Pathophysiology 4.0</p> <p>CELL 450R - Readings and Discussion in Cell Biology and Physiology 2.0v</p> <p>CELL 498 - Advanced Senior Research Project 3.0</p> <p>CELL 561 - Physiology of Drug Mechanisms 3.0</p> <p>CELL 565 - Endocrinology 3.0</p> <p>CHEM 223 - (Not currently offered)</p> <p>CHEM 227 - Principles of Chemical Analysis 4.0</p> <p>CHEM 482 - Mechanisms of Molecular Biology 3.0</p> <p>CHEM 489 - Structural Biochemistry 3.0</p> <p>CHEM 581 - Advanced Biochemical Methodology 1 3.0</p> <p>CHEM 583 - Advanced Biochemical Methodology 2 3.0</p> <p>CHEM 584 - Advanced Biochemistry Methods 1 3.0</p> <p>CHEM 586 - Advanced Biochemistry Methods 2 3.0</p> <p>EC EN 301 - Elements of Electrical Engineering 3.0</p> <p>MATH 302 - Mathematics for Engineering 1 4.0</p> <p>MATH 303 - Mathematics for Engineering 2 4.0</p> <p>MMBIO 441 - Advanced Molecular Biology 3.0</p> <p>MMBIO 442 - Advanced Molecular Biology Laboratory 2.0</p> <p>NEURO 480 - Cellular Neuroscience 3.0</p> <p>PHSCS 145 - Experimental Methods in Physics 1.0</p> <p>PHSCS 230 - Computational Physics Lab 1 1.0</p> <p>PHSCS 240 - Design, Fabrication, and Use of Scientific Apparatus 2.0</p> <p>STAT 121 - Principles of Statistics 3.0</p> <p>THE DISCIPLINE:</p> <p>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 allow understanding of such processes as protein folding, function of ion channels, and how the nervous system works. The requirements of advanced chemistry, physics, and math courses set this major apart from other life science majors.</p> <p>CAREER OPPORTUNITIES:</p> <p>A major in biophysics prepares students to pursue advanced degrees in the biological sciences. This major also provides outstanding</p>	<p>preparation for students seeking admittance into professional programs. Graduates of this program will also have the academic and laboratory skills necessary for direct employment in medical, biotechnological, and pharmaceutical industries. Biophysicists whose primary interest is research often work in government agencies, such as the National Institutes of Health, NASA, and the Departments of Agriculture or Defense. Many new positions have been created in industry as a result of recent developments in molecular biophysics and molecular biology. Regardless of the setting, biophysicists generally work in groups with people with different backgrounds, interests, and abilities who collaborate to solve common problems.</p> <p>MENTORED RESEARCH OPPORTUNITIES:</p> <p>Students majoring in biophysics work closely with a faculty member doing research in biophysics (CELL 295R/495R). Faculty research interests are listed under the RESEARCH tab at cell.byu.edu. Current topics include:</p> <ul style="list-style-type: none"> • Biophysics of membrane structure and function. • Molecular and functional characterization of ligand-gated ion channels in the central nervous system. • Molecular mechanisms of neurotransmitter release. <p>FINANCING:</p> <p>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 to teach labs or help sections for CELL courses.</p> <p>MAP DISCLAIMER</p> <p>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.</p> <p>DEPARTMENT INFORMATION</p> <p>Department of Cell Biology and Physiology Brigham Young University 4005 Life Sciences Building</p>
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2022-2023

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ADVISEMENT CENTER INFORMATION

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