

# BS in Biophysics (285720) MAP Sheet

Life Sciences, Physiology and Developmental Biology

For students entering the degree program during the 2018-2019 curricular year.



University Core and Graduation Requirements				Suggested Sequence of Courses			
<b>University Core Requirements:</b>				<b>FRESHMAN YEAR</b>			
<b>Requirements</b>	<b>#Classes</b>	<b>Hours</b>	<b>Classes</b>	<b>1st Semester</b>		<b>JUNIOR YEAR</b>	
<b>Religion Cornerstones</b>				First-year Writing or American Heritage	3.0	<b>5th Semester</b>	
Teachings and Doctrine of The Book of Mormon	1	2.0	REL A 275	PDBIO 120	3.0	PDBIO 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	Religion Cornerstone course	2.0	PDBIO 494R	2.0
The Eternal Family	1	2.0	REL C 200	MATH 112 (Lang. of Learning or Quant. Reasoning)	4.0	PHSCS 140	1.0
<b>The Individual and Society</b>				<b>Total Hours</b>	<b>16.0</b>	PHSCS 220	3.0
American Heritage	1-2	3-6.0	from approved list	<b>2nd Semester</b>		Religion elective	2.0
Global and Cultural Awareness	1	3.0	from approved list	First-year Writing or American Heritage	3.0	Mentored Lab Experience	1-2.0
<b>Skills</b>				MATH 113	4.0	<b>Total Hours</b>	<b>15-16.0</b>
First Year Writing	1	3.0	from approved list	CHEM 106	3.0	<b>6th Semester</b>	
Advanced Written and Oral Communications	1	3.0	ENGL 316 recommended	CHEM 107	1.0	PDBIO 362	3.0
Quantitative Reasoning	1	4.0	MATH 112*	Religion Cornerstone course	2.0	PDBIO 363	1.0
Languages of Learning (Math or Language)	1	4.0	MATH 112*	Arts or Letters elective	3.0	Adv. Written & Oral Communication (ENGL 316 recommended)	3.0
<b>Arts, Letters, and Sciences</b>				<b>Total Hours</b>	<b>16.0</b>	Global & Cultural Awareness	3.0
Civilization 1	1	3.0	from approved list	<b>SOPHOMORE YEAR</b>		Religion elective	2.0
Civilization 2	1	3.0	from approved list	<b>3rd Semester</b>		CHEM 468	3.0
Arts	1	3.0	from approved list	MMBIO 240	3.0	<b>Total Hours</b>	<b>15.0</b>
Letters	1	3.0	from approved list	MMBIO 241	1.0	<b>SENIOR YEAR</b>	
Biological Science	1	3.0	PDBIO 120*	Civilization 1 elective	3.0	<b>7th Semester</b>	
Physical Science	1	3.0	CHEM 105*, PHSCS 105* or 121*	CHEM 351	3.0	PDBIO 455R	0.5
Social Science	1	3.0	from approved list	PHSCS 121	3.0	PDBIO 495R or 498	2.5-3.0
<b>Core Enrichment: Electives</b>				Religion cornerstone course	2.0	PDBIO 568	3.0
Religion Electives	3-4	6.0	from approved list	<b>Total Hours</b>	<b>15.0</b>	Arts or Letters elective	3.0
Open Electives	Variable	Variable	personal choice	<b>4th Semester</b>		Religion Elective	2.0
FOR GE QUESTIONS CONTACT THE ADVISEMENT CENTER – FOR PROGRAM QUESTIONS SEE YOUR FACULTY ADVISOR				PWS 340	3.0	Social Science	3.0
*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (12 hours overlap)				CHEM 352	3.0	<b>Total Hours</b>	<b>14-14.5</b>
<b>Graduation Requirements:</b>				CHEM 353	1.0	<b>8th Semester</b>	
Minimum residence hours required		30.0		Civilization 2 elective	3.0	BIO 250	2.0
Minimum hours needed to graduate		120.0		PHSCS 123	3.0	Social Science	3.0
				Religion cornerstone course	2.0	Major electives	6.0
				Mentored Lab Experience	1-2.0	General electives	3.0
				<b>Total Hours</b>	<b>16-17.0</b>	<b>Total Hours</b>	<b>14.0</b>
				<b>Note:</b> The Senior Survey and Exit Interview must be completed during the last semester. You will be contacted during the graduation clearance process.			
				<b>Note:</b> 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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### 2018-2019 Program Requirements (70.5 Credit Hours)

<p><b>REQUIREMENT 1</b> Complete 6 courses</p> <p><b>LIFE SCIENCES CORE COURSES:</b></p> <p>BIO 250 - Evolutionary Medicine 2.0</p> <p>MMBIO 240 - Molecular Biology 3.0</p> <p>MMBIO 241 - Molecular and Cellular Biology Laboratory 1.0</p> <p>*PDBIO 120 - Science of Biology 3.0</p> <p>PDBIO 360 - Cell Biology 3.0</p> <p>PWS 340 - Genetics 3.0</p> <p><b>REQUIREMENT 2</b> Complete 8 courses</p> <p><b>CHEMISTRY COURSES:</b></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><b>REQUIREMENT 3</b> Complete 6 courses</p> <p><b>MATH AND PHYSICS COURSES:</b></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 140 - Electronics Lab 1.0</p> <p>PHSCS 220 - Introduction to Electricity and Magnetism 3.0</p> <p><b>REQUIREMENT 4</b> Complete 4 courses</p> <p><b>MAJOR CORE COURSES:</b></p> <p>PDBIO 362 - Advanced Physiology 3.0</p> <p>PDBIO 363 - Advanced Physiology Laboratory 1.0</p> <p>PDBIO 455R - Physiology and Developmental Biology Seminar 0.5</p> <p><i>You may take this course up to 1 time.</i></p> <p>PDBIO 568 - Cellular Electrophysiology and Biophysics 3.0</p> <p><b>REQUIREMENT 5</b> Complete 11.0 hours from the following option(s)</p> <p><b>COMPLETE 11 HOURS FROM THE FOLLOWING. AT LEAST 4 HOURS MUST COME FROM THE MENTORED EXPERIENCE AND AT LEAST 5 HOURS FROM ELECTIVES.</b></p> <p><b>OPTION 5.1</b> Complete up to 6.0 hours from the following course(s)</p> <p><b>A. MENTORED LABORATORY EXPERIENCE (MUST BE IN AN APPROVED BIOPHYSICS LAB) (AT LEAST 4 HOURS REQUIRED):</b></p>	<p>PDBIO 295R - Introductory Undergraduate Research in Physiology ar 2.0v</p> <p><i>You may take up to 6 credit hours.</i></p> <p>PDBIO 494R - (Not currently offered)</p> <p>PDBIO 495R - Advanced Undergraduate Research in Physiology and I 4.0v</p> <p><i>You may take up to 6 credit hours.</i></p> <p>PDBIO 498 - Advanced Senior Research Project 3.0</p> <p><b>OPTION 5.2</b> Complete up to 7.0 hours from the following course(s)</p> <p><b>B. ELECTIVES (AT LEAST 5 HOURS REQUIRED):</b></p> <p>CHEM 223 - Quantitative and Qualitative Analysis 4.0</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 - Advanced Neuroscience 3.0</p> <p>PDBIO 365 - Pathophysiology 4.0</p> <p>PDBIO 450R - Readings and Discussion in Physiology and Developme 2.0v</p> <p><i>You may take this course up to 1 time.</i></p> <p>PDBIO 498 - Advanced Senior Research Project 3.0</p> <p>PDBIO 561 - Physiology of Drug Mechanisms 3.0</p> <p>PDBIO 565 - Endocrinology 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><b>THE DISCIPLINE:</b></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.</p> <p><b>CAREER OPPORTUNITIES:</b></p> <p>A major in biophysics prepares students to pursue advanced degrees</p>	<p>in the biological sciences. This major also provides outstanding 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><b>RESEARCH OPPORTUNITIES:</b></p> <p>Students majoring in biophysics have the opportunity to become involved in laboratory research with the faculty. Funding for this research comes from such sources as the National Institutes of Health, and National Science Foundation. Research topics such as the following are being investigated:</p> <ul style="list-style-type: none"> <li>• Molecular modeling and regulation of voltage-gated ion channels.</li> <li>• Biophysics of membrane structure and function.</li> <li>• Molecular and functional characterization of ligand-gated ion channels in the central nervous system.</li> <li>• Molecular mechanisms of neurotransmitter release.</li> </ul> <p><b>MENTORED EXPERIENCE:</b></p> <p>A mentored experience involves working closely with a faculty member doing research in biophysics (PDBio 494R and 495R).</p> <p><b>FINANCING:</b></p> <p>Various private, federal, and university sources of scholarships, fellowships, and grants are available. Advanced undergraduates may be hired to teach labs or help sections for PDBio courses.</p> <p>Please see the Life Sciences Advisement Center (2060 LSB) for information regarding College and Department Scholarship Requests.</p>
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## **BS in Biophysics (285720)**

**2018-2019**

### **HONORARY SOCIETIES AND CLUBS:**

Membership in the Premedical or Pre dental Clubs, as well as service on the Student Council of the College of Life Sciences, promotes fellowship among students and develops professionalism.

### **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 Physiology and Developmental Biology**

Brigham Young University  
4005 Life Sciences Building  
Provo, UT 84602  
Telephone: (801) 422-2006

### **ADVISEMENT CENTER INFORMATION**

#### **Life Sciences Advisement**

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