



BS in BIOPHYSICS (285720) MAP Sheet

Department of Physiology and Developmental Biology

For students entering the degree program during the 2016–2017 curricular year.

UNIVERSITY CORE AND GRADUATION REQUIREMENTS				PROGRAM REQUIREMENTS (71.5 total hours)			
UNIVERSITY CORE REQUIREMENTS				Complete the following life sciences core courses:			
<u>Requirements</u>	<u>#Classes</u>	<u>Hours</u>	<u>Classes</u>	Bio 420	Evolutionary Biology	2.0	
Religion Cornerstones				MMBio 240*	Molecular Biology	3.0	
Teachings & Doctrine, Book of Mormon	1	2.0	Rel A 275	MMBio 241	Molecular & Cellular Biology Lab	1.0	
Jesus Christ & the Everlasting Gospel	1	2.0	Rel A 250	PDBio 120*	Science of Biology	2.0	
Foundations of the Restoration	1	2.0	Rel C 225	PDBio 360	Cell Biology	3.0	
The Eternal Family	1	2.0	Rel C 200	PWS 340	Genetics	3.0	
The Individual and Society				Complete the following chemistry courses:			
Citizenship				Chem 105*	General College Chemistry	4.0	
American Heritage	1–2	3–6.0	from approved list	Chem 106	General College Chemistry	3.0	
Global & Cultural Awareness	1	3.0	from approved list	Chem 107	General College Chemistry Lab	1.0	
Skills				Chem 351	Organic Chemistry	3.0	
Effective Communication				Chem 352	Organic Chemistry	3.0	
First-Year Writing	1	3.0	from approved list	Chem 353	Organic Chemistry Lab-Nonmajor (1 hour required)	2.0V	
Adv Written & Oral Communication	1	3.0	Engl 316 recommended	Chem 468	Biophysical Chemistry	3.0	
Quantitative Reasoning	0–1	0–3.0	from approved list	Chem 481	Biochemistry	3.0	
Languages of Learning (Math or Language)	1–4	3–20.0	Math 112 recommended	Complete the following math and physics courses:			
Arts, Letters, and Sciences				Math 112	Calculus 1	4.0	
Civilization 1 and 2	2	6.0	from approved list	Math 113	Calculus 2	4.0	
Arts	1	3.0	from approved list	Phscs 121	Intro to Newtonian Mechanics	3.0	
Letters	1	3.0	from approved list	Phscs 123	Intro to Waves, Optics, & Thermodynamics	3.0	
Scientific Principles & Reasoning				Phscs 140	Electronics Lab	1.0	
Biological Science	2	5.0	MMBio 240* and PDBio 120*	Phscs 220	Intro to Electricity & Magnetism	3.0	
Physical Science	2	7.0	Chem 105*, Phscs 105* or 121*	Complete the following major core courses:			
Social Science	1	3.0	from approved list	PDBio 362	Advanced Physiology	3.0	
Core Enrichment: Electives				PDBio 363	Advanced Physiology Laboratory	1.0	
Religion Electives	3–4	6.0	from approved list	PDBio 455R	PDBio Seminar	0.5	
Open Electives	Variable	Variable	personal choice	PDBio 568	Cellular Electrophysiology & Bioph	3.0	
GRADUATION REQUIREMENTS:							
Minimum residence hours required		30.0					
Minimum hours needed to graduate		120.0					
				Complete 11 hours from the following.			
				At least 4 hours must come from the mentored experience and at least 5 hours from electives.			
				A. Mentored Laboratory Experience (must be in an approved biophysics lab):			
				PDBio 494R	Undergraduate Research in PDBio	4.0V	
				PDBio 495R	Adv Undergraduate Research in PDBio	4.0V	
				PDBio 498	Advanced Senior Research Project	3.0	
				B. Electives			
				Chem 223	Quantitative and Qualitative Analysis	4.0	
				Chem 227	Principles of Chemical Analysis	4.0	
				Chem 482	Mechanisms of Molecular Biology	3.0	
				Chem 489	Structural Biochemistry	3.0	
				Chem 581	Advanced Biochemical Methodology 1	3.0	
				Chem 583	Advanced Biochemical Methodology 2	3.0	
				Chem 584	Biochemistry Laboratory/Proteins	3.0	
				Chem 586	Biochemistry Laboratory/Nucleic Acids	3.0	
				ECEn 301	Elements of Electrical Engineering	3.0	
				Math 302	Mathematics for Engineering 1	4.0	
				Math 303	Mathematics for Engineering 2	4.0	
				MMBio 430	Advanced Cell Biology	3.0	
				MMBio 441	Advanced Molecular Biology	3.0	
				MMBio 442	Advanced Molecular Biology Lab	2.0	
				Neuro 480	Advanced Neuroscience	3.0	
				PDBio 365	Pathophysiology	4.0	
				PDBio 450R	Topics in PDBio	3.0V	
				PDBio 498	Advanced Senior Research Project	3.0	
				PDBio 561	Physiology of Drug Mechanisms	3.0	
				PDBio 565	Endocrinology	3.0	
				Phscs 145	Experimental Methods in Physics	1.0	
				Phscs 230	Computational Physics Lab 1	1.0	
				Phscs 240	Design Fabrication, and Use of Scientific Apparatus	2.0	
				Stat 121	Principles of Statistics	3.0	

FOR GE QUESTIONS CONTACT THE ADVISEMENT CENTER ◆ FOR PROGRAM QUESTIONS SEE YOUR FACULTY ADVISOR

*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (12 hours overlap)

BS in BIOPHYSICS (285720)
2016–2017

Suggested Sequence of Courses:

FRESHMAN YEAR

1st Semester

PDBio 120	2.0
Chem 105 (FWSpSu)	4.0
1 st Year Writing	3.0
Or A Htg 100	(3.0)
Religion Cornerstone course	2.0
Math 112	4.0
(Lang. of Learning or Quant. Reason.)	
Total Hours	15.0

2nd Semester

A Htg 100	3.0
or 1 st Year Writing	(3.0)
Math 113	4.0
Chem 106 (FWSpSu)	3.0
Chem 107 (FWSpSu)	1.0
Religion Cornerstone course	2.0
Arts or Letters elective	3.0
Total Hours	16.0

SOPHOMORE YEAR

3rd Semester

MMBio 240 (Biological Science)	3.0
MMBio 241	1.0
Civilization 1 elective	3.0
Chem 351 (FWSp)	3.0
Phscs 121 (Physical Science)	3.0
Religion Cornerstone course	2.0
Total Hours	15.0

4th Semester

PWS 340	3.0
Chem 352 (FWSpSu)	3.0
Chem 353 (FWSpSu)	1.0
Civilization 2 elective	3.0
Phscs 123	3.0
Religion Cornerstone course	2.0
Mentored Lab Experience	1–2.0
Total Hours	16–17.0

JUNIOR YEAR

5th Semester

PDBio 360	3.0
Chem 481	3.0
PDBio 494R	2.0
Phscs 140 (W, Sp)	1.0
Phscs 220	3.0
Religion elective	2.0
Mentored Lab Experience	1–2.0
Total Hours	15–16.0

6th Semester

PDBio 362	3.0
PDBio 363	1.0
Adv. Writing (Engl 316 recommended)	3.0
Global & Cultural Awareness	3.0
Religion elective	2.0
General electives	3.0
Total Hours	15.0

SENIOR YEAR

7th Semester

PDBio 455R	0.5
PDBio 495R or 498	2.5–3.0
PDBio 568 (F)	3.0
Arts or Letters elective	3.0
Religion elective (FWSpSu)	2.0
Social Science	3.0
Total Hours	14–14.5

8th Semester

Biol 420	2.0
Social Science	3.0
Major electives	6.0
General electives	3.0
Total Hours	14.0

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 allow understanding of such processes as protein folding, function of ion channels, and how the nervous system works.

CAREER OPPORTUNITIES:

A major in biophysics prepares students to pursue advanced degrees 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.

RESEARCH AREAS:

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:

- Molecular modeling and regulation of voltage-gated ion channels.
- 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.

MENTORED EXPERIENCE:

This involves working closely with a faculty member doing research in biophysics (PDBio 494R and 495R).

FINANCING:

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.

HONORARY SOCIETIES & 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.

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.

Department of Physiology and Developmental Biology
4005 Life Sciences Building
Brigham Young University, Provo, UT 84602
Telephone: (801) 422-2006