

BS in Physiology & Developmental Biology (285721) 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			
University Core Requirements:				FRESHMAN YEAR			
Requirements	#Classes	Hours	Classes	1st Semester		JUNIOR YEAR	
Religion Cornerstones				<u>1st Semester</u>		<u>5th Semester</u>	
Teachings and Doctrine of The Book of Mormon	1	2.0	REL A 275	PDBIO 120 (Biological Science)	3.0	PWS 340	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	1st Year Writing or A HTG 100	3.0	PDBIO Experiential Learning	1-3.0
The Eternal Family	1	2.0	REL C 200	Religion Cornerstone course	2.0	PDBIO 362	3.0
The Individual and Society				Quantitative Reasoning (if needed)	0-3.0	PDBIO 363	1.0
American Heritage	1-2	3-6.0	from approved list	Global & Cultural Awareness elective	3.0	General elective	2.0
Global and Cultural Awareness	1	3.0	from approved list	Total Hours	15-18.0	Religion elective (FWSpSu)	2.0
Skills				<u>2nd Semester</u>		Total Hours	15-17.0
First Year Writing	1	3.0	from approved list	1st Year Writing or A HTG 100	3.0	<u>6th Semester</u>	
Advanced Written and Oral Communications	1	3.0	ENGL 316 recommended	PDBIO 220	3.0	PDBIO 382	3.0
Quantitative Reasoning	0-1	0-3.0	from approved list	CHEM 106	3.0	PDBIO 455R	0.5
Languages of Learning (Math or Language)	1-4	3-20.0	MATH 112 or STAT 121 recommended	CHEM 107	1.0	Advanced Writing (ENGL 316 recommended)	3.0
Arts, Letters, and Sciences				Religion Cornerstone course	2.0	Arts or Letter elective	3.0
Civilization 1	1	3.0	from approved list	Languages of Learning elective	3-4.0	Religion elective (FWSpSu)	2.0
Civilization 2	1	3.0	from approved list	Total Hours	15-16.0	Major electives	3-5.5
Arts	1	3.0	from approved list	SOPHOMORE YEAR		Total Hours	14.5-17
Letters	1	3.0	from approved list	<u>3rd Semester</u>		SENIOR YEAR	
Biological Science	1	3.0	PDBIO 120*	MMBIO 240	3.0	<u>7th Semester</u>	
Physical Science	2	7.0	CHEM 105*, PHSCS 105*	MMBIO 241	1.0	Major Elective or PDBIO Capstone	5-7.0
Social Science	1	3.0	from approved list	CHEM 351	3.0	Civilization 2 elective	3.0
Core Enrichment: Electives				Civilization 1 elective	3.0	Religion elective (FWSpSu)	2.0
Religion Electives	3-4	6.0	from approved list	PHSCS 105 (Physical Science)	3.0	General electives	5.0
Open Electives	Variable	Variable	personal choice	Religion Cornerstone course	2.0	Total Hours	15-17.0
FOR GE QUESTIONS CONTACT THE ADVISEMENT CENTER — FOR PROGRAM QUESTIONS SEE YOUR MAJOR ADVISOR				PDBIO Experiential Learning (i.e. PDBIO 295R)	1-2.0	<u>8th Semester</u>	
*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (12 hours overlap)				Total Hours	16-17.0	Major Elective or PDBIO Capstone	2-5.0
Graduation Requirements:				<u>4th Semester</u>		Arts or Letters elective	3.0
Minimum residence hours required		30.0		PDBIO 360	3.0	Social Sciences elective	3.0
Minimum hours needed to graduate		120.0		CHEM 352	3.0	BIO 250	2.0
				PHSCS 106	3.0	General electives	5.0
				PDBIO 325	3.0	Complete Senior Survey/Exit Interview (See Department)	0.0
				Religion Cornerstone course	2.0	Total Hours	15-17.0
				General electives	2.0-3.0		
				Total Hours	16-17.0		
				Note: The Senior Survey and Exit Interview 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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2018-2019 Program Requirements (65.5 Credit Hours)

<p>REQUIREMENT 1 Complete 6 courses</p> <p>BIOLOGY CORE COURSES:</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>REQUIREMENT 2 Complete 8 courses</p> <p>CHEMISTRY AND PHYSICS 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 481 - Biochemistry 3.0</p> <p>*PHSCS 105 - General Physics 1 3.0</p> <p>PHSCS 106 - General Physics 2 3.0</p> <p>REQUIREMENT 3 Complete 6 courses</p> <p>MAJOR CORE COURSES: (NOTE: PDBIO 210 CAN BE SUBSTITUTED FOR PDBIO 220 UPON REQUEST.)</p> <p>PDBIO 220 - Human Anatomy (with lab) 3.0</p> <p>PDBIO 325 - Tissue Biology (with lab) 3.0</p> <p>PDBIO 362 - Advanced Physiology 3.0</p> <p>PDBIO 363 - Advanced Physiology Laboratory 1.0</p> <p>PDBIO 382 - Developmental Biology 3.0</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>REQUIREMENT 4 Complete 3.0 hours from the following course(s)</p> <p>EXPERIENTIAL LEARNING OPTIONS - MUST BE FROM AT LEAST TWO DIFFERENT COURSES (EXPERIENCES SHOULD BE SOUGHT EARLY IN YOUR ACADEMIC CAREER):</p> <p>LFSCI 199R - Nonresearch Academic Internship 3.0v</p> <p><i>You may take up to 1 credit hour.</i></p> <p>PDBIO 295R - Introductory Undergraduate Research in Physiology and I 2.0v</p> <p>PDBIO 349R - Physiology and Developmental Biology Teaching Experier 3.0v</p> <p>PDBIO 399R - Academic Internship: Physiology and Developmental Biol 9.0v</p> <p>PDBIO 444 - BIO-Innovation and -Entrepreneurship 1 2.0</p> <p>PDBIO 445 - BIO-Innovation and -Entrepreneurship 2 2.0</p> <p>PDBIO 450R - Readings and Discussion in Physiology and Development: 2.0v</p>	<p>PDBIO 494R - (Not currently offered)</p> <p>PDBIO 495R - Advanced Undergraduate Research in Physiology and Dev 4.0v</p> <p><i>You may take up to 2 credit hours.</i></p> <p>REQUIREMENT 5 Complete 1 course</p> <p>CAPSTONE COURSES:</p> <p>NEURO 480 - Advanced Neuroscience 3.0</p> <p>PDBIO 498 - Advanced Senior Research Project 3.0</p> <p>PDBIO 561 - Physiology of Drug Mechanisms 3.0</p> <p>PDBIO 562 - Reproductive Physiology 3.0</p> <p>PDBIO 565 - Endocrinology 3.0</p> <p>PDBIO 568 - Cellular Electrophysiology and Biophysics 3.0</p> <p>PDBIO 582 - Developmental Genetics 3.0</p> <p>REQUIREMENT 6 Complete 9.0 hours from the following course(s)</p> <p>ELECTIVE COURSES (AT LEAST 3 HOURS MUST BE PDBIO):</p> <p>BIO 370 - Bioethics 2.0</p> <p>BIO 421 - (Not currently offered)</p> <p>BIO 463 - Genetics of Human Disease 3.0</p> <p>BIO 468 - (Bio-MMBio-PWS) Genomics 3.0</p> <p>BIO 475 - Plant Developmental Biology 3.0</p> <p>CHEM 482 - Mechanisms of Molecular Biology 3.0</p> <p>EXSC 463 - Exercise Physiology 3.0</p> <p>EXSC 464 - Exercise Physiology Lab 0.5</p> <p>MMBIO 261 - Infection and Immunity 3.0</p> <p>MMBIO 441 - Advanced Molecular Biology 3.0</p> <p>MMBIO 442 - Advanced Molecular Biology Laboratory 2.0</p> <p>MMBIO 463 - Immunology 3.0</p> <p>NEURO 480 - Advanced Neuroscience 3.0</p> <p>PDBIO 320 - Dissection Techniques in Human Anatomy 1.0</p> <p>PDBIO 365 - Pathophysiology 4.0</p> <p>PDBIO 455R - Physiology and Developmental Biology Seminar 0.5</p> <p><i>You may take up to 3 credit hours.</i></p> <p>PDBIO 484 - Human Embryology 3.0</p> <p>PDBIO 498 - Advanced Senior Research Project 3.0</p> <p>PDBIO 520R - Advanced Topics in Clinical Human Anatomy 2.0v</p> <p><i>You may take up to 3 credit hours.</i></p> <p>PDBIO 550R - Advanced Topics in Physiology and Developmental Biolog 4.0v</p> <p><i>You may take up to 3 credit hours.</i></p> <p>PDBIO 550R - Advanced Topics in Physiology and Developmental Biolog 4.0v</p> <p>PDBIO 561 - Physiology of Drug Mechanisms 3.0</p> <p>PDBIO 562 - Reproductive Physiology 3.0</p>	<p>PDBIO 565 - Endocrinology 3.0</p> <p>PDBIO 568 - Cellular Electrophysiology and Biophysics 3.0</p> <p>PDBIO 582 - Developmental Genetics 3.0</p> <p>Professional schools and graduate programs may require additional courses not required for this major, such as Phscs 107, 108, chemistry, calculus, or statistics. Contact the programs to which you may apply to determine the specific courses required.</p> <p>Students considering professional or graduate degrees should take at least two semesters of mathematical courses. The recommended sequences are:</p> <p>1. Math 119, Stat 221 for students who want exposure to calculus and statistics.</p> <p>2. Math 112, 113 for students who want a firm foundation in calculus.</p> <p>3. Math 112, 113, Stat 221 for students who want a firm foundation in both calculus and statistics.</p> <p>THE DISCIPLINE:</p> <p>Physiology is the study of the functions of the body systems. Developmental biology is the study of how genes govern differentiation of cells, tissues, and organs with unique structures and functions. Both disciplines require a foundation of mathematics, chemistry, physics, and cellular biology. Upper-division courses require synthesis and integration of information from many areas of science to allow understanding of such remarkable processes of how the heart pumps blood, how neurons communicate with one another, how insulin regulates blood sugar, or how specific gene products determine the morphology and functional capacity of the nervous system. Knowledge in these areas is expanding rapidly due to application of new techniques in molecular biology. Hence, significant exposure to concepts and techniques of molecular biology is an important component of the major.</p> <p>CAREER OPPORTUNITIES:</p> <p>A major in physiology and developmental biology prepares students to pursue advanced degrees in the biological sciences and non-biological fields or to directly enter into employment. This major provides outstanding preparation for students seeking admittance into professional programs in medicine, dentistry, optometry, podiatry, chiropractics, and pharmacy. For students who have aspirations of doing health-related research, this major will provide a challenging, thorough preparation for entrance into graduate programs and beyond. Graduates of this program will also have the academic and laboratory skills</p>
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2018-2019

necessary for employment in medical, biotechnological, and pharmaceutical industries. This degree provides students pursuing advanced degrees in business, public management, or law the knowledge and training necessary to be admitted into professional schools and work in governmental agencies, health care and biotechnical industries, and patent or health care law.

For additional information and statistics on careers that PDBio graduates have pursued in the past please refer to <https://careers.byu.edu/channels/physiology-developmental-biology/>

RESEARCH AREAS:

Students majoring in physiology and developmental biology have the opportunity to become involved in mentored laboratory research with the faculty (PDBio 295R and 495R). Those that become highly engaged in research and generate sufficient data to participate with faculty in writing a peer-reviewed primary research article reporting their results can fulfill their capstone requirement (PDBio 495R in requirement 5 of the MAP). Explore faculty research interests under the RESEARCH tab at pdbio.byu.edu.

EXPERIENTIAL LEARNING

Completion of the Physiology and Developmental Biology major requires experiential learning over multiple semesters. Experiential learning can occur in several ways including: 1) Working closely with faculty as teaching assistants (PDBio 349R), 2) as mentored laboratory researchers (PDBio 295R/495R), 3) in research internships (PDBio 399R), 4) in exploring current research by directed literature readings (PDBio 450R), or 5) in the BIO-Innovation and Entrepreneurship (BIO-I&E) Program (PDBio 444 and 445).

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.

Please see the Life Sciences Advisement Center (2060 LSB) for information regarding College and Department Scholarship Requests.

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

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ADVISEMENT CENTER INFORMATION

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