### University Core and Graduation Requirements

#### University Core Requirements:

- **Religion Cornerstones**
  - Teachings and Doctrine of The Book of Mormon: 1, 2.0, REL A 275
  - Jesus Christ and the Everlasting Gospel: 1, 2.0, REL A 250
  - Foundations of the Restoration: 1, 2.0, REL C 225
  - The Eternal Family: 1, 2.0, REL C 200

- **The Individual and Society**
  - American Heritage: 1-2, 3-6.0, from approved list
  - Global and Cultural Awareness: 1, 3.0, from approved list

- **Skills**
  - First Year Writing: 1, 3.0, from approved list
  - Advanced Written and Oral Communications: 1, 3.0, ENGL 316 recommended
  - Quantitative Reasoning: 0–1, 0–3.0, from approved list
  - Languages of Learning (Math or Language): 1-4, 3–20.0, MATH 112 or STAT 121 recommended

- **Arts, Letters, and Sciences**
  - Civilization 1: 1, 3.0, from approved list
  - Civilization 2: 1, 3.0, from approved list
  - Arts: 1, 3.0, from approved list
  - Letters: 1, 3.0, from approved list
  - Biological Science: 1, 3.0, PDBIO 120*
  - Physical Science: 2, 7.0, CHEM 105*, PHSCS 105*
  - Social Science: 1, 3.0, from approved list

- **Core Enrichment: Electives**
  - Religion Electives: 3-4, 6.0, from approved list
  - Open Electives: Variable

**FOR GE QUESTIONS CONTACT THE ADVISEMENT CENTER — FOR PROGRAM QUESTIONS SEE YOUR MAJOR ADVISOR**

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

#### Graduation Requirements:

- Minimum residence hours required: 30.0
- Minimum hours needed to graduate: 120.0

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### Suggested Sequence of Courses

#### FRESHMAN YEAR

**1st Semester**
- PDBIO 120 (Biological Science) 3.0
- CHEM 105 4.0
- Religion Cornerstone course 2.0
- Quantitative Reasoning (if needed) 0–3.0
- Global & Cultural Awareness elective 3.0
**Total Hours 15-18.0**

**2nd Semester**
- 1st Year Writing or A HTG 100 3.0
- PDBIO 220 3.0
- CHEM 106 3.0
- CHEM 107 1.0
- Religion Cornerstone course 2.0
- Languages of Learning elective 3–4.0
**Total Hours 15–16.0**

#### SOPHOMORE YEAR

**3rd Semester**
- MMBIO 240 3.0
- MMBIO 241 1.0
- CHEM 351 3.0
- Civilization 1 elective 3.0
- PHSCS 105 (Physical Science) 3.0
- Religion Cornerstone course 2.0
- PDBIO Experiential Learning (i.e. PDBIO 295R) 1-2.0
**Total Hours 15–16.0**

**4th Semester**
- PDBIO Experiential Learning (i.e. PDBIO 295R) 1-2.0
- PWS 340 3.0
- CHEM 481 3.0
- Religion elective (FWSpSu) 2.0
**Total Hours 15–17.0**

#### JUNIOR YEAR

**5th Semester**
- PDBIO 360 3.0
- CHEM 352 3.0
- PHSCS 106 3.0
- PDBIO 325 3.0
- Religion Cornerstone course 2.0
- General electives 2.0–3.0
**Total Hours 15–17.0**

**6th Semester**
- PDBIO Experiential Learning (i.e. PDBIO 295R) 1-3.0
- Major Elective or PDBIO Capstone 5–7.0
- Social Sciences elective 3.0
- General Electives 5.0
**Total Hours 15–17.0**

#### SENIOR YEAR

**7th Semester**
- PDBIO 295R 1-3.0
- Major Elective or PDBIO Capstone 5–7.0
- Arts or Letters elective 3.0
- General Electives 5.0
**Total Hours 14.5–17.0**

**8th Semester**
- Complete Senior Survey/Exit Interview (See Department) 0.0
**Total Hours 15–17.0**

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.
BS in Physiology & Developmental Biology (285721)
2017-2018 Program Requirements (65.5 Credit Hours)

REQUIREMENT 1 Complete 6 courses
BIOLOGY CORE COURSES:
BIO 420 - Evolutionary Biology 2.0
MMBIO 240 - Molecular Biology 3.0
MMBIO 241 - Molecular and Cellular Biology Laboratory 1.0
*PDBIO 120 - Science of Biology 3.0
PDBIO 360 - Cell Biology 3.0
PWS 340 - Genetics 3.0

REQUIREMENT 2 Complete 8 courses
CHEMISTRY AND PHYSICS COURSES:
PDBIO 445
PDBIO 444
PDBIO 399R - Academic Internship: Physiology and Developmental Biology
PDBIO 349R - Physiology and Developmental Biology Teaching Experience
PDBIO 295R - Introductory Undergraduate Research in Physiology and Developmental Biology
LFSCI 199R - Nonresearch Academic Internship
PDBIO 382
PDBIO 363
PDBIO 325
PDBIO 220

*PHSCS 105
CHEM 481
CHEM 352
CHEM 106
CHEM 351 - Organic Chemistry 1
CHEM 352 - Organic Chemistry 2
CHEM 481 - Biochemistry
CHEM 305 - General College Chemistry Laboratory
CHEM 205 - General College Chemistry 2
CHEM 105 - General College Chemistry 1 with Lab (Integrated)
CHEM 104 - General College Chemistry 1 with Lab (Integrated)

REQUIREMENT 3 Complete 6 courses
MAJOR CORE COURSES: (NOTE: PDBIO 210 CAN BE SUBSTITUTED FOR PDBIO 220 UPON REQUEST.)
PDBIO 220 - Human Anatomy (with lab) 3.0
PDBIO 325 - Tissue Biology (with lab) 3.0
PDBIO 362 - Advanced Physiology 3.0
PDBIO 363 - Advanced Physiology Laboratory 1.0
PDBIO 382 - Developmental Biology 3.0
PDBIO 455R - Physiology and Developmental Biology Seminar 0.5

You may take this course up to 1 time.

REQUIREMENT 4 Complete 3.0 hours from the following course(s)
EXPERIENTIAL LEARNING OPTIONS - MUST BE FROM AT LEAST TWO DIFFERENT COURSES (EXPERIENCES SHOULD BE SOUGHT EARLY IN YOUR ACADEMIC CAREER):
LFSCI 199R - Nonreasearch Academic Internship 3.0v
You may take up to 1 credit hour.
PDBIO 295R - Introductory Undergraduate Research in Physiology and Development 3.0v
PDBIO 349R - Physiology and Developmental Biology Teaching Experirner 3.0v
PDBIO 399R - Academic Internship: Physiology and Developmental Biology 9.0v
PDBIO 444 - BIO-Innovation and -Entrepreneurship 1 2.0
PDBIO 445 - BIO-Innovation and -Entrepreneurship 2 2.0
PDBIO 455R - Readings and Discussion in Physiology and Developmental Biology 2.0v

PDBIO 494R - (Not currently offered)
PDBIO 495R - Advanced Undergraduate Research in Physiology and Developmental Biology 4.0v

REQUIREMENT 5 Complete 1 course
CAPSTONE COURSES:
NEURO 480 - Advanced Neuroscience 3.0
PDBIO 498 - Advanced Senior Research Project 3.0
PDBIO 561 - Physiology of Drug Mechanisms 3.0
PDBIO 562 - Reproductive Physiology 3.0
PDBIO 565 - Endocrinology 3.0
PDBIO 568 - Cellular Electrophysiology and Biophysics 3.0
PDBIO 582 - Developmental Genetics 3.0

REQUIREMENT 6 Complete 9.0 hours from the following course(s)
ELECTIVE COURSES (AT LEAST 3 HOURS MUST BE PDBIO):
BIO 370 - Bioethics 2.0
BIO 421 - Evolutionary Biology Laboratory 1.0
BIO 463 - Genetics of Human Disease 3.0
BIO 468 - Bio-MMBio-PWS Genomics 3.0
BIO 475 - Plant Developmental Biology 3.0
CHEM 482 - Mechanisms of Molecular Biology 3.0
EXSC 463 - Exercise Physiology 3.0
EXSC 464 - Exercise Physiology Lab 0.5
MMBIO 261 - Infection and Immunity 3.0
MMBIO 442 - Advanced Molecular Biology 3.0
MMBIO 442 - Advanced Molecular Biology Laboratory 2.0
MMBIO 463 - Immunology 3.0
NEURO 480 - Advanced Neuroscience 3.0
PDBIO 320 - Dissection Techniques in Human Anatomy 1.0
PDBIO 365 - Pathophysiology 4.0
PDBIO 455R - Physiology and Developmental Biology Seminar 0.5
PDBIO 484 - Human Embryology 3.0
PDBIO 498 - Advanced Senior Research Project 3.0
PDBIO 520R - Advanced Topics in Clinical Human Anatomy 2.0v
You may take up to 3 credit hours.
PDBIO 550R - Advanced Topics in Physiology and Developmental Biology 4.0v
You may take up to 3 credit hours.
PDBIO 550R - Advanced Topics in Physiology and Developmental Biology 4.0v
PDBIO 551 - Physiology of Drug Mechanisms 3.0
PDBIO 562 - Reproductive Physiology 3.0
PDBIO 565 - Endocrinology 3.0

THE DISCIPLINE:
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.

CAREER OPPORTUNITIES:
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 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.

RESEARCH AREAS:
Students majoring in physiology and developmental biology have the opportunity to become involved in laboratory research with the faculty (PDBio 495R). Funding for this research comes from such sources as the National Institutes of Health, National Science Foundation, American Heart Association, and U.S. Department of Agriculture. Research topics such as the following are being investigated: • Molecular modeling and regulation of voltagegated ion channels. • Biophysics of membrane structure and function. • Role of cytokines in regulation of the adrenal gland. • Interaction between the nervous system and hormones in blood pressure regulation. • Hereditary connective tissue disorders. • Targeting of muscle AMP-activated protein kinase for prevention and treatment of type 2 diabetes. • Control of sexual differentiation of the brain. • Molecular mechanisms of control of embryonic development of the nervous system. • Effects of phytoestrogens on gene expression in the brain. • Molecular and functional characterization of ligandgated ion channels in the central nervous system. • Molecular mechanisms of neurotransmitter release.

MENTORED EXPERIENCE:
This involves working closely with a faculty member in teaching (PDBio 349R), laboratory research (PDBio 494R), or research in current literature (PDBio 550R).

FINANCING:
Various private, federal, and university sources of scholarships, fellowships, and grants are available. Most faculty attract grant funds to hire undergraduates to help with their research. Advanced undergraduates may be hired to teach labs or help sections for PDBio courses.

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.

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