### UNIVERSITY CORE AND GRADUATION REQUIREMENTS

#### UNIVERSITY CORE REQUIREMENTS

<table>
<thead>
<tr>
<th>Requirements</th>
<th>#Classes</th>
<th>Hours</th>
<th>Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doctrinal Foundation</strong></td>
<td></td>
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<tr>
<td>Book of Mormon</td>
<td>2</td>
<td>4.0</td>
<td>Rel A 121 and 122</td>
</tr>
<tr>
<td>New Testament</td>
<td>1</td>
<td>2.0</td>
<td>Rel A 211 or 212</td>
</tr>
<tr>
<td>Doctrine and Covenants</td>
<td>1</td>
<td>2.0</td>
<td>Rel C 324 or 325</td>
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<tr>
<td><strong>The Individual and Society</strong></td>
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<tr>
<td>Citizenship</td>
<td>1-2</td>
<td>3-6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Global &amp; Cultural Awareness</td>
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<td>3.0</td>
<td>from approved list</td>
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<tr>
<td><strong>Skills</strong></td>
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<tr>
<td>Effective Communication</td>
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<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>First-Year Writing</td>
<td>1</td>
<td>3.0</td>
<td>Engl 316 recommended</td>
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<tr>
<td>Quantitative Reasoning</td>
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<td>0-3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Languages of Learning</td>
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<td>3-20.0</td>
<td>Math 112 or Stat 121</td>
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<tr>
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<td>recommended</td>
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<tr>
<td><strong>Arts, Letters, and Sciences</strong></td>
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<tr>
<td>Civilization 1 and 2</td>
<td>2</td>
<td>6.0</td>
<td>from approved list</td>
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<tr>
<td>Arts</td>
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<td>3.0</td>
<td>from approved list</td>
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<tr>
<td>Letters</td>
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<tr>
<td>Scientific Principles &amp; Reasoning</td>
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<tr>
<td>Biological Science</td>
<td>2</td>
<td>5.0</td>
<td>MMBio 240* and PDBio 120*</td>
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<tr>
<td>Physical Science</td>
<td>2</td>
<td>7.0</td>
<td>Chem 105*, Phscs 105*</td>
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<tr>
<td>Social Science</td>
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<td>3.0</td>
<td>from approved list</td>
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<tr>
<td><strong>Core Enrichment: Electives</strong></td>
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<tr>
<td>Religion Electives</td>
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<td>6.0</td>
<td>from approved list</td>
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<tr>
<td>Open Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
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</tbody>
</table>

#### GRADUATION REQUIREMENTS:

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

### PROGRAM REQUIREMENTS (66-67 total hours)

**Complete the following life sciences core courses:**

- Bio 420 Evolutionary Biology 2.0
- MMBio 240* Molecular Biology 3.0
- MMBio 241 Molecular & Cellular Biology Lab 1.0
- PDBio 120* Science of Biology 2.0
- PDBio 360 Cell Biology 3.0
- PWS 340 Genetics 3.0

**Complete the following chemistry and physics courses:**

- Chem 105* General College Chemistry 4.0
- Chem 106 General College Chemistry 3.0
- Chem 107 General College Chemistry Lab 1.0
- Chem 351 Organic Chemistry 3.0
- Chem 352 Organic Chemistry 3.0
- Chem 481 Biochemistry 3.0
- Phscs 105 General Physics 1 3.0
- Phscs 106 General Physics 2 3.0

**Complete the following major core courses:**

- PDBio 325 Tissue Biology (with lab) 3.0
- PDBio 362 Advanced Physiology 3.0
- PDBio 363 Advanced Physiology Laboratory 1.0
- PDBio 455R PDBio Seminar 0.5
- PDBio 482 Developmental Biology 3.0

**Complete one course from the following:**

- PDBio 210 Human Anatomy (with virtual lab) 3.0
- PDBio 220 Human Anatomy (without lab) 3.0

**Complete one course from the following:**

- PDBio 365 Pathophysiology 4.0
- PDBio 484 Human Embryology 3.0

**Complete one course from the following advanced molecular courses:**

- Bio 468 (Bio-MMBio-PWS) Genomics 3.0
- Chem 482 Mechanisms of Molecular Biology 3.0
- Chem 489 Structural Biochemistry 3.0
- MMBio 430 Advanced Cell Biology 3.0
- MMBio 441 Advanced Molecular Biology 3.0
- MMBio 442 Advanced Molecular Biology Lab 2.0
- NDFS 200 Nutrient Metabolism 3.0
- Neuro 480 Advanced Neuroscience 3.0
- PDBio 320 Dissection Techniques in Human Anat 1.0
- PDBio 365 Pathophysiology 4.0
- PDBio 455R Topics in PDBio 3.0
- PDBio 455R PDBio Seminar 0.5
- PDBio 484 Human Embryology 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/Biophys 3.0
- PDBio 582 Developmental Genetics 3.0

**Total 6.5 hours from the following courses:**

- Bio 468 (Bio-MMBio-PWS) Genomics 3.0
- Chem 581 Advanced Biochemical Methodology 1 3.0
- Chem 583 Advanced Biochemical Methodology 2 3.0
- Chem 594 Biochemistry Lab / Proteins 3.0
- Chem 598 Biochemistry Lab / Nucleic Acids 3.0
- MMBio 442 Adv Molecular Biology Lab 2.0
- PDBio 399R Academic Internship; PDBio 9.0
- PDBio 495R Adv Undergraduate Research in PDBio 4.0

**Elective courses**

- Courses used to fill any requirements listed above cannot count for this requirement.
- Bio 350 Ecology 3.0
- Bio 370 Bioethics 2.0
- Bio 421 Evolutionary Biology Lab 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
- 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 Lab / Proteins 3.0
- Chem 586 Biochemistry Lab / Nucleic Acids 3.0
- ExSc 463 Exercise Physiology 3.0
- ExSc 464 Exercise Physiology Lab 0.5
- MMBio 261 Infection and Immunity 3.0
- MMBio 417 Medical Parasitology 3.0
- MMBio 430 Advanced Cell Biology 3.0
- MMBio 441 Advanced Molecular Biology 3.0
- MMBio 442 Advanced Molecular Biology Lab 2.0
- NDFS 200 Nutrient Metabolism 3.0
- Neuro 480 Advanced Neuroscience 3.0
- PDBio 320 Dissection Techniques in Human Anat 1.0
- PDBio 365 Pathophysiology 4.0
- PDBio 455R Topics in PDBio 3.0
- PDBio 455R PDBio Seminar 0.5
- PDBio 484 Human Embryology 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/Biophys 3.0
- PDBio 582 Developmental Genetics 3.0

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

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*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (12 hours overlap)*
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 voltage-gated 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.
- 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.

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).

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.

Grades 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.

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.

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.