**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>
<td></td>
<td></td>
</tr>
<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>
</tr>
<tr>
<td><strong>The Individual and Society</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective Communication</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>First-Year Writing</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Adv Written &amp; Oral Communication</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>0-1</td>
<td>0-3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Languages of Learning (Math or Language)</td>
<td>1-4</td>
<td>3-20.0</td>
<td>Math 112 or Stat 121 recommended</td>
</tr>
<tr>
<td><strong>Arts, Letters, and Sciences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civilization 1 and 2</td>
<td>2</td>
<td>6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Arts</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Letters</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Scientific Principles &amp; Reasoning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological Science</td>
<td>2</td>
<td>5.0</td>
<td>MMBio 240* and PDBio 120*</td>
</tr>
<tr>
<td>Physical Science</td>
<td>2</td>
<td>7.0</td>
<td>Chem 105*, Phscs 105*</td>
</tr>
<tr>
<td>Social Science</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td><strong>Core Enrichment: Electives</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion Electives</td>
<td>3-4</td>
<td>6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Open Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
</tr>
</tbody>
</table>

### GRADUATION REQUIREMENTS:

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

---

**PROGRAM REQUIREMENTS (65-66.0 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 2.0

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 Intro Applied Physics 3.0
- Phscs 106 Intro Applied Physics 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 (with lab) 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
- 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

Complete one course from the following 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/Biophysics 3.0
- PDBio 582 Developmental Genetics 3.0

Complete 6.5 hours from the following courses, including at least 1 hour from the mentored experience list and at least 2 hours from the advanced laboratory requirement list.

A. Mentored experience:
- PDBio 349R PDBio Teaching Seminar 3.0V
- PDBio 494R Undergraduate Research in PDBio 4.0V
- PDBio 555R Advanced Topics in PDBio 4.0V

B. Advanced laboratory experience (courses used to fill any requirements listed above cannot count for this requirement):
- Bio 458 (Bio-MMBio-PWS) Genomics 3.0
- Chem 581 Advanced Biochemical Methodology 1 3.0
- Chem 583 Advanced Biochemical methodolgy 2 3.0
- Chem 584 Biochemistry Lab / Proteins 3.0
- Chem 586 Biochemistry Lab / Nucleic Acids 3.0
- MMBio 442 Adv Molecular Biology Lab 2.0

C. 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
- 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 361 Infection and Immunity 4.0
- 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 365 Dissection Techniques in Human Anat 1.0
- PDBio 365 Dissection Techniques in Human Anat 1.0
- PDBio 455R PDBio Seminar 0.5
- PDBio 484 Human Embryology 3.0
- PDBio 498 Advanced Senior Research Project 0.5
- PDBio 561 Physiology of Drug Mechanisms 3.0
- PDBio 562 Reproductive Physiology 3.0
- PDBio 565 Endocrinology 3.0
- PDBio 568 Cellular Electrophysiology / Biophysics 3.0
- PDBio 582 Developmental Genetics 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 (12.0 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:

- 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.
- Development of the nervous system.
- Effects of phytoestrogens on gene expression in the brain.
- Molecular and functional characterization of ligand-gated ion channels in the central nervous system.
- Molecular mechanisms of neurotransmitter release.

Suggested Sequence of Courses:

FRESHMEN YEAR
1st Semester
- PDBio 120 2.0
- Chem 105 4.0
- 1st Year Writing 3.0
- or A Htg 100 (3.0)
- Rel A 121 (FWSpSu) 2.0
- Quantitative Reasoning (if needed) 0–3.0
- Global & Cultural Awareness elective 3.0
Total Hours 14–16.0

2nd Semester
- A Htg 100 3.0
- or 1st Year Writing (3.0)
- PDBio 210 or 220 3.0
- Chem 106 3.0
- Chem 107 1.0
- Rel A 122 (FWSpSu) 2.0
- Languages of Learning elective 3–4.0
Total Hours 15–16.0

SENIOR YEAR
7th Semester
- PDBio 365 or 484 or PDBio Capstone 3–4.0
- PDBio 455R 0.5
- PDBio Elective 2.0
- Advanced Molecular requirement 3.0
- Religion elective (FWSpSu) 2.0
- General electives 5.0
Total Hours 15.5–16.5

8th Semester
- PDBio 365 or 484 or PDBio Capstone 3–4.0
- Arts or Letters elective 3.0
- Social Sciences elective 3.0
- Biol 420 2.0
- General electives 3.0
Total Hours 14–15.0

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.

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.

RESEARCH AREAS:
- 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.
- Molecular and functional characterization of ligand-gated ion channels in the central nervous system.
- Molecular mechanisms of neurotransmitter release.

Responsible for the accuracy of the data contained within.

For more information, contact the Department of Physiology and Developmental Biology at (801) 422-2006.