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| For Academic Affairs and Research Use Only |
| Proposal Number | SM06  |
| CIP Code:  |  |
| Degree Code: |  |

**Program Modification Form**

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

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| **Modification Type: [ ]Admissions, [ ]Curricular Sequence, or [X]Other**  |

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

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| Virginie Rolland | 3/16/2023 |

**Department Curriculum Committee Chair** |

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**COPE Chair (if applicable)** |
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| Stephen J. Mullin | 3/16/2023 |

**Department Chair**  |

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**Head of Unit (if applicable)**   |
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| John Hershberger | 3/28/2023 |

**College Curriculum Committee Chair** |

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**Undergraduate Curriculum Council Chair** |
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**Director of Assessment** *(only for changes impacting assessment)* |

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**Graduate Curriculum Committee Chair** |
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| Jennifer L. Bouldin | 3/31/2023 |

**College Dean** |

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| Len Frey | 4/20/2023 |

**Vice Chancellor for Academic Affairs** |
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| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |

**General Education Committee Chair (if applicable)**   |  |

1. **Contact Person** (Name, Email Address, Phone Number)

Ronald Johnson, rlj@astate.edu 870.972.2638

1. **Proposed Change** (for undergraduate curricular changes please provide an 8-semester plan (appendix A), if applicable)

We propose updating the list of possible electives for the BS Biological Sciences, Emphasis in Pre-professional Studies, adding new options and removing courses that have not been offered in a long time. The degree program would still require three electives from the provided list, so these updates would not affect the program or suggested 8-semester graduation plan. Under the elective course options for the BS degree in Biological Sciences, Emphasis in Pre-professional studies, the following changes are demonstrated on the attached documents.

1. **Effective Date**

7/1/2023

1. **Justification –** *Please provide details as to why this change is necessary.*

Several courses were historically included as electives within the Pre-professional program, yet were never entered correctly into the undergraduate catalog. Some courses have also been renamed or removed, and these changes need to be reflected in the bulletin for this degree program. Some new courses have been created and can serve students in this degree path. Below are the specific changes needed with a brief explanation:

1. The deletion of BIO 4111 Immunology Laboratory. This course has been offered perhaps twice in the past 15 years and is not anticipated in being offered on a regular basis.
2. The change in prefix and numbering of BIO 4143 Pharmacology to CHEM 4343 Pharmacology. This course was previously co-taught between Biology and Chemistry faculty and was dual-numbered, but currently solely offered by the Chemistry department.
3. The addition of HP 3003 General Gross Anatomy, BIO 4324 Comparative Vertebrate Anatomy, BIO 4443 Comparative Animal Physiology AND BIO 4441 - Comparative Animal Physiology Laboratory, and BIO 4384 Parasitology. These courses are all relevant and valid electives to this degree and have a history of being accepted as electives.
4. The addition of BIO 4173 Molecular Biology. This course was recently developed and approved. It is appropriate for pre-professional students.
5. The addition of BIO 4383 Vertebrate Endocrinology and the deletion of BIO 4223 Human Endocrinology. The name and focus of the course was broadened. The change of BIO 4223 Human Endocrinology to BIO 4383 Vertebrate Endocrinology was never entered into the system.
6. The additions of: BIO 4011/4012 Microtechniques and Lab; BIO 4033 Bioinformatics and Applications; and BIO 4063 Biosafety and Ethics in Research. These options are appropriate for students seeking a career in medical research.

**Bulletin Changes**

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| **Instructions**  |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Please include a before (with changed areas highlighted) and after of all affected sections.** **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.**  |

**Before changes:**

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| **Biological Sciences, Emphasis in Pre-professional Studies, BS** |
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Return to {$returnto_text} Return to: [Catalog Search](https://catalog.astate.edu/search_advanced.php?catoid=3)A complete 8-semester degree plan is available at <https://www.astate.edu/info/academics/degrees/> |
| **UNIVERSITY REQUIREMENTS:**See [University General Requirements for Baccalaureate degrees](https://catalog.astate.edu/content.php?catoid=3&navoid=67#university-general-requirements-for-all-baccalaureate-degrees)**FIRST YEAR MAKING CONNECTIONS COURSE:*** [BIO 1013 - Making Connections Biology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**

**GENERAL EDUCATION REQUIREMENTS:**See [General Education Curriculum for Baccalaureate degrees](https://catalog.astate.edu/preview_program.php?catoid=3&poid=447) **Sem. Hrs: 35****Students with this major must take the following:*** [MATH 1023 - College Algebra](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** *or MATH course that requires*[*MATH 1023*](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search#tt5709)*as a prerequisite*
* [CHEM 1013 - General Chemistry I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 1011 - General Chemistry I Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [BIO 2013 - Biology of the Cell](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 2011 - Biology of the Cell Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [COMS 1203 - Oral Communication](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** *(Required Departmental Gen. Ed. Option)*

**LANGUAGE REQUIREMENT:***A student must complete the foreign language requirements before being considered a Biological Sciences Major. (Refer to Department of Biological Sciences*[*Foreign Language Requirement*](https://catalog.astate.edu/preview_entity.php?catoid=3&ent_oid=145#foreign-language-requirement)*).***MAJOR REQUIREMENTS:*** [BIO 1303 - Biology of Animals](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 1301 - Biology of Animals Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [BIO 1503 - Biology of Plants](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 1501 - Biology of Plants Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [BIO 3013 - Genetics](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 3011 - Genetics Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [BIO 3023 - Principles of Ecology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 4021 - Biological Seminar](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [CHEM 1023 - General Chemistry II](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 1021 - General Chemistry II Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [CHEM 3103 - Organic Chemistry I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 3101 - Organic Chemistry I Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [CHEM 3113 - Organic Chemistry II](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 3111 - Organic Chemistry II Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
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* [MATH 2194 - Survey of Calculus](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**
* ***OR***
* [MATH 2204 - Calculus I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**
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* [PHYS 2054 - General Physics I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**
* [PHYS 2064 - General Physics II](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**

**Sub-total: 40****EMPHASIS AREA (PRE-PROFESSIONAL STUDIES):*** [BIO 4324 - Comparative Vertebrate Anatomy](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**
* [BIO 4443 - Comparative Animal Physiology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 4441 - Comparative Animal Physiology Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* ***OR***
* [BIO 3223 - Human Structure and Function I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 3221 - Human Structure and Function I Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [BIO 3233 - Human Structure and Function II](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 3231 - Human Structure and Function II Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
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* [BIO 4083 - Evolution](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
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* [BIO 4104 - Microbiology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**
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* [BIO 4133 - Cell Biology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** ***AND***
* [BIO 4131 - Cell Biology Lab](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* ***OR***
* [CHEM 4243 - Biochemistry](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**

**Select three of the following:*** [BIO 3203 - Pathophysiology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 4103 - Virology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
*
* [BIO 4113 - Immunology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** ***AND***
* [~~BIO 4111 - Immunology Laboratory~~](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search)**~~Sem. Hrs:~~****~~1~~**
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* [BIO 4123 - Cell Signaling](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
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* [BIO 4133 - Cell Biology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** ***AND***
* [BIO 4131 - Cell Biology Lab](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
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* [BIO 4143 - Pharmacology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
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* [BIO 4213 - Human Genetics](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
*
* [BIO 4332 - Animal Histology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **2** ***AND***
* [BIO 4342 - Animal Histology Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **2**
*
* [BIO 4343 - Animal Embryology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** ***AND***
* [BIO 4341 - Animal Embryology Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
*
* [BIO 4552 - Medical Mycology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **2** ***AND***
* [BIO 4551 - Medical Mycology Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
*
* [BIO 4623 - Environmental Microbiology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 3153 - Survey of Physical Chemistry](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 4243 - Biochemistry](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [PHIL 3713 - Ethics in the Health Professions](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [STAT 3233 - Applied Statistics I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**

**Sub-total: 27-31****ELECTIVES:*** Electives **Sem. Hrs: 11-15**

**TOTAL REQUIRED HOURS: 120** |

**After changes:**

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| **Biological Sciences, Emphasis in Pre-professional Studies, BS** |
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| **UNIVERSITY REQUIREMENTS:**See [University General Requirements for Baccalaureate degrees](https://catalog.astate.edu/content.php?catoid=3&navoid=67#university-general-requirements-for-all-baccalaureate-degrees)**FIRST YEAR MAKING CONNECTIONS COURSE:*** [BIO 1013 - Making Connections Biology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**

**GENERAL EDUCATION REQUIREMENTS:**See [General Education Curriculum for Baccalaureate degrees](https://catalog.astate.edu/preview_program.php?catoid=3&poid=447) **Sem. Hrs: 35****Students with this major must take the following:*** [MATH 1023 - College Algebra](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** *or MATH course that requires*[*MATH 1023*](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search#tt5709)*as a prerequisite*
* [CHEM 1013 - General Chemistry I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 1011 - General Chemistry I Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [BIO 2013 - Biology of the Cell](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 2011 - Biology of the Cell Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [COMS 1203 - Oral Communication](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** *(Required Departmental Gen. Ed. Option)*

**LANGUAGE REQUIREMENT:***A student must complete the foreign language requirements before being considered a Biological Sciences Major. (Refer to Department of Biological Sciences*[*Foreign Language Requirement*](https://catalog.astate.edu/preview_entity.php?catoid=3&ent_oid=145#foreign-language-requirement)*).***MAJOR REQUIREMENTS:*** [BIO 1303 - Biology of Animals](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 1301 - Biology of Animals Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [BIO 1503 - Biology of Plants](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 1501 - Biology of Plants Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [BIO 3013 - Genetics](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 3011 - Genetics Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [BIO 3023 - Principles of Ecology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 4021 - Biological Seminar](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [CHEM 1023 - General Chemistry II](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 1021 - General Chemistry II Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [CHEM 3103 - Organic Chemistry I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 3101 - Organic Chemistry I Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [CHEM 3113 - Organic Chemistry II](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 3111 - Organic Chemistry II Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
*
* [MATH 2194 - Survey of Calculus](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**
* ***OR***
* [MATH 2204 - Calculus I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**
*
* [PHYS 2054 - General Physics I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**
* [PHYS 2064 - General Physics II](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**

**Sub-total: 40****EMPHASIS AREA (PRE-PROFESSIONAL STUDIES):*** [BIO 4324 - Comparative Vertebrate Anatomy](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**
* [BIO 4443 - Comparative Animal Physiology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 4441 - Comparative Animal Physiology Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* ***OR***
* [BIO 3223 - Human Structure and Function I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 3221 - Human Structure and Function I Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* [BIO 3233 - Human Structure and Function II](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 3231 - Human Structure and Function II Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
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* [BIO 4083 - Evolution](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
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* [BIO 4104 - Microbiology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **4**
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* [BIO 4133 - Cell Biology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** ***AND***
* [BIO 4131 - Cell Biology Lab](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
* ***OR***
* [CHEM 4243 - Biochemistry](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**

**Select three of the following:*** [BIO 3203 - Pathophysiology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* HP 3003 - General Gross Anatomy **Sem. Hrs.: 3**
* BIO 4011 - Microtechnique Lab **Sem. Hrs.: 1 *AND***
* BIO 4012 - Microtechnique **Sem. Hrs.: 2**
* BIO 4033 - Bioinformatics and Applications **Sem. Hrs.: 3**
* BIO 4063 - Biosafety and Ethics in Research **Sem. Hrs.: 3**
* [BIO 4103 - Virology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 4113 - Immunology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [BIO 4123 - Cell Signaling](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
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* [BIO 4133 - Cell Biology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** ***AND***
* [BIO 4131 - Cell Biology Lab](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
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* BIO 4173 - Molecular Biology **Sem. Hrs.: 3**
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* [BIO 4213 - Human Genetics](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
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* BIO 4324 - Comparative Vertebrate Anatomy **Sem. Hrs.: 4**
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* [BIO 4332 - Animal Histology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **2** ***AND***
* [BIO 4342 - Animal Histology Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **2**
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* [BIO 4343 - Animal Embryology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3** ***AND***
* [BIO 4341 - Animal Embryology Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
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* [CHEM 4343 - Pharmacology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* BIO 4383 Vertebrate Endocrinology **Sem. Hrs:** **3**
* BIO 4384 Parasitology **Sem. Hrs: 4**
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* BIO 4443 Comparative Animal Physiology **Sem. Hrs:** **3** ***AND***
* BIO 4441 - Comparative Animal Physiology Laboratory **Sem. Hrs:** **1**
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* [BIO 4552 - Medical Mycology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **2** ***AND***
* [BIO 4551 - Medical Mycology Laboratory](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **1**
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* [BIO 4623 - Environmental Microbiology](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 3153 - Survey of Physical Chemistry](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [CHEM 4243 - Biochemistry](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [PHIL 3713 - Ethics in the Health Professions](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**
* [STAT 3233 - Applied Statistics I](https://catalog.astate.edu/preview_program.php?catoid=3&poid=698&hl=biological+sciences&returnto=search) **Sem. Hrs:** **3**

**Sub-total: 27-31****ELECTIVES:*** Electives **Sem. Hrs: 11-15**

**TOTAL REQUIRED HOURS: 120** |

**Appendix A, 8-Semester Plan**

(**Referenced in #2** - **Undergraduate Proposals Only)**

*Instructions: Please identify new courses in italics*.

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| **Arkansas State University-Jonesboro****Degree:****Major:****Year:** |
| Students requiring developmental course work based on low entrance exam scores (ACT, SAT, ASSET, COMPASS) may not be able to complete this program of study in eight (8) semesters. Developmental courses do not count toward total degree hours. **Students having completed college level courses prior to enrollment will be assisted by their advisor in making appropriate substitutions. In most cases, general education courses may be interchanged between semesters.** A minimum of 45 hours of upper division credit (3000-4000 level) is required for this degree. |
| **Year 1** |  | **Year 1** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
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| **Total Hours** |  |  |  |  | **Total Hours** |  |  |  |
| **Year 2** |  | **Year 2** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
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| **Total Hours** |  |  |  |  | **Total Hours** |  |  |  |
| **Year 3** |  | **Year 3** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
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| **Total Hours** |  |  |  |  | **Total Hours** |  |  |  |
| **Year 4** |  | **Year 4** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
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| **Total Hours** |  |  |  |  | **Total Hours** |  |  |  |
| **Total Jr/Sr Hours \_\_\_ Total Degree Hours \_\_\_** |
| **Graduation Requirements:** |