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| For Academic Affairs and Research Use Only |
| Proposal Number | SM04 |
| CIP Code:  |  |
| Degree Code: |  |

**Program Modification Form**

**[x] Undergraduate Curriculum Council**

**[ ] Graduate Council**

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| **Modification Type: [ ]Admissions, [x]Curricular Sequence, or [ ]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 | 11/29/2021 |

**Department Curriculum Committee Chair** |

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**COPE Chair (if applicable)** |
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| Stephen J. Mullin | 11/30/2021 |

**Department Chair**  |

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**Head of Unit (if applicable)**   |
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| John Hershberger | 1/21/2022 |

**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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| Lynn Boyd | 2/8/2022 |

**College Dean** |

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| Alan Utter | 3/14/2022 |

**Vice Chancellor for Academic Affairs** |
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**General Education Committee Chair (if applicable)**   |  |

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

**Andrew Sweet, asweet@astate.edu, 870-680-8489**

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

**Requiring BIO 3033 (4083 under proposed change): Evolution for students in the B.S. Biological Sciences, Pre-professional Studies emphasis.**

1. **Effective Date**

Fall 2022

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

**Evolution is a fundamental concept in the biological sciences. Every aspect of biology (genetics, anatomy and physiology, ecology, microbiology, medicine, etc.) should be viewed through an evolutionary lens (to quote biologist Theodosius Dobzhansky’s famous 1973 article: “Nothing in biology makes sense except in the light of evolution”). In essence, evolutionary biology is truly a nexus for all areas of biology. Because of the centrality of evolutionary theory and its broad applications, many biology programs at institutions of higher education require undergraduate students to take a course specifically focused on evolution. For example, Hendrix College, Southern Illinois University, Murray State University, and the University of Memphis (all institutions in the geographic vicinity of A-State) include an evolution course in their core requirements for Biology degrees. Yet, some emphases for the Biological Sciences degree at A-State do not require our Evolution course.**

**I propose to make the 3-credit Evolution course (BIO 3033; 4083 under a proposed change) a requirement for the B.S. Biological Sciences, Pre-professional Studies emphasis degree. Although some concepts in evolution are taught across other courses, it is crucial for students to take a course that focuses on the theory, concepts, and applications of evolution. This is especially true for pre-professional students, who often pursue careers in medicine or other areas of human health that rely on a solid background in evolutionary biology to understand diseases, disorders, and cutting-edge approaches for treatment. As a 4000-level course, Evolution will also act as a capstone-type requirement, enabling students to connect concepts from many of the other courses taken in previous semesters. Doing so will help our department, college, and university train well-rounded biology students, and will further enhance A-State’s reputation for graduating students who go on to be successful in graduate programs, professional practice, and any number of roles in technology and industry.**

**Adding Evolution as a required course does not cause major changes to the Pre-professional Studies degree plan. Students will be advised to take Evolution during the spring semester of their fourth years in place of a 3-credit elective.**

**In summary, requiring the Evolution course for the Pre-professional Studies emphasis is justifiable because 1) Evolution is a core area of biology, 2) the content is highly relevant for the career goals of students, 3) the course will function as a capstone-type course, 4) there is precedent from programs at similar universities, and 5) there will be minimal changes to the degree plan.**

**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.**  |

**Page 414:**

**Before:**

**Major in Biological Sciences**

**Bachelor of Science**

**Emphasis in Pre-professional Studies**

A complete 8-semester degree plan is available at https://www.astate.edu/info/academics/degrees/

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| **University Requirements:**  |
| See University General Requirements for Baccalaureate degrees (p. 47)  |
| **First Year Making Connections Course:**  | **Sem. Hrs.**  |
| BIO 1013, Making Connections - Biology  | **3**  |
| **General Education Requirements:**  | **Sem. Hrs.**  |
| See General Education Curriculum for Baccalaureate degrees (p. 84) **Students with this major must take the following:** *MATH 1023, College Algebra or MATH course that requires MATH 1023 as a prerequisite* *CHEM 1013* ***AND*** *1011, General Chemistry I and Laboratory* *BIO 2013* ***AND*** *2011, Biology of the Cell and Laboratory* *COMS 1203, Oral Communication (Required Departmental Gen. Ed. Option)*  | **35**  |
| **Language Requirement:**  | **Sem. Hrs.**  |
| *A student must complete the foreign language requirements before being considered a Biological Sciences Major. (Refer to Department of Biological Sciences Foreign Language Requirement).*  |
| **Major Requirements:**  | **Sem. Hrs.**  |
| BIO 1303 **AND** 1301, Biology of Animals and Laboratory  | 4  |
| BIO 1503 **AND** 1501, Biology of Plants and Laboratory  | 4  |
| BIO 3013 **AND** 3011, Genetics and Laboratory  | 4  |
| BIO 3023, Principles of Ecology  | 3  |
| BIO 4021, Biological Seminar  | 1  |
| CHEM 1023 **AND** 1021, General Chemistry II and Laboratory  | 4  |
| CHEM 3103 **AND** 3101, Organic Chemistry I and Laboratory  | 4  |
| CHEM 3113 **AND** 3111, Organic Chemistry II and Laboratory  | 4  |
| MATH 2194, Survey of Calculus **OR** MATH 2204, Calculus I  | 4  |
| PHYS 2054, General Physics I  | 4  |
| PHYS 2064, General Physics II  | 4  |
| **Sub-total**  | **40**  |
| **Emphasis Area (Pre-professional Studies):**  | **Sem. Hrs.**  |
| BIO 3302 **AND** 3312, Comparative Anatomy and Laboratory **AND** BIO 4443 **AND** 4441, Comparative Animal Physiology and Laboratory **OR** BIO 3223 **AND** 3221, Human Structure and Function I and Laboratory **AND** BIO 3233 **AND** 3231, Human Structure and Function II and Laboratory  | 8  |
| BIO 4104, Microbiology  | 4  |
| BIO 4133 **AND** 4131, Cell Biology and Laboratory **OR** CHEM 4243, Biochemistry  | 3-4 |

**After:**

**Major in Biological Sciences**

**Bachelor of Science**

**Emphasis in Pre-professional Studies**

A complete 8-semester degree plan is available at https://www.astate.edu/info/academics/degrees/

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| **University Requirements:**  |
| See University General Requirements for Baccalaureate degrees (p. 47)  |
| **First Year Making Connections Course:**  | **Sem. Hrs.**  |
| BIO 1013, Making Connections - Biology  | **3**  |
| **General Education Requirements:**  | **Sem. Hrs.**  |
| See General Education Curriculum for Baccalaureate degrees (p. 84) **Students with this major must take the following:** *MATH 1023, College Algebra or MATH course that requires MATH 1023 as a prerequisite* *CHEM 1013* ***AND*** *1011, General Chemistry I and Laboratory* *BIO 2013* ***AND*** *2011, Biology of the Cell and Laboratory* *COMS 1203, Oral Communication (Required Departmental Gen. Ed. Option)*  | **35**  |
| **Language Requirement:**  | **Sem. Hrs.**  |
| *A student must complete the foreign language requirements before being considered a Biological Sciences Major. (Refer to Department of Biological Sciences Foreign Language Requirement).*  |
| **Major Requirements:**  | **Sem. Hrs.**  |
| BIO 1303 **AND** 1301, Biology of Animals and Laboratory  | 4  |
| BIO 1503 **AND** 1501, Biology of Plants and Laboratory  | 4  |
| BIO 3013 **AND** 3011, Genetics and Laboratory  | 4  |
| BIO 3023, Principles of Ecology  | 3  |
| BIO 4021, Biological Seminar  | 1  |
| CHEM 1023 **AND** 1021, General Chemistry II and Laboratory  | 4  |
| CHEM 3103 **AND** 3101, Organic Chemistry I and Laboratory  | 4  |
| CHEM 3113 **AND** 3111, Organic Chemistry II and Laboratory  | 4  |
| MATH 2194, Survey of Calculus **OR** MATH 2204, Calculus I  | 4  |
| PHYS 2054, General Physics I  | 4  |
| PHYS 2064, General Physics II  | 4  |
| **Sub-total**  | **40**  |
| **Emphasis Area (Pre-professional Studies):**  | **Sem. Hrs.**  |
| BIO 3302 **AND** 3312, Comparative Anatomy and Laboratory **AND** BIO 4443 **AND** 4441, Comparative Animal Physiology and Laboratory **OR** BIO 3223 **AND** 3221, Human Structure and Function I and Laboratory **AND** BIO 3233 **AND** 3231, Human Structure and Function II and Laboratory  | 8  |
| BIO 4083, Evolution | 3 |
| BIO 4104, Microbiology  | 4  |
| BIO 4133 **AND** 4131, Cell Biology and Laboratory **OR** CHEM 4243, Biochemistry  | 3-4 |
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**Page 415:**

**Before:**

**Major in Biological Sciences (cont.)**

**Bachelor of Science**

**Emphasis in Pre-professional Studies**

A complete 8-semester degree plan is available at <https://www.astate.edu/info/academics/degrees/>

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| **Select three of the following:** BIO 3203, Pathophysiology BIO 4103, Virology BIO 4113 **AND** 4111, Immunology and Laboratory BIO 4123, Cell Signaling BIO 4133 **AND** 4131, Cell Biology and Laboratory BIO 4143, Pharmacology BIO 4363 **AND** 4361, Mammalian Neurobiology and Laboratory BIO 4213, Human Genetics BIO 4332 **AND** 4342, Animal Histology and Laboratory BIO 4343 **AND** 4341, Animal Embryology and Laboratory BIO 4552 **AND** 4551, Medical Mycology and Laboratory BIO 4623, Environmental Microbiology CHEM 3153, Survey of Physical Chemistry CHEM 4243, Biochemistry PHIL 3713, Ethics in the Health Professions STAT 3233, Applied Statistics I  | 9-12  |
| **Sub-total**  | **24-28**  |
| **Electives:**  | **Sem. Hrs.**  |
| Electives  | **14-18**  |
| **Total Required Hours:**  | **120**  |

**After:**

**Major in Biological Sciences (cont.)**

**Bachelor of Science**

**Emphasis in Pre-professional Studies**

A complete 8-semester degree plan is available at <https://www.astate.edu/info/academics/degrees/>

|  |  |
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| **Select three of the following:** BIO 3203, Pathophysiology BIO 4103, Virology BIO 4113 **AND** 4111, Immunology and Laboratory BIO 4123, Cell Signaling BIO 4133 **AND** 4131, Cell Biology and Laboratory BIO 4143, Pharmacology BIO 4363 **AND** 4361, Mammalian Neurobiology and Laboratory BIO 4213, Human Genetics BIO 4332 **AND** 4342, Animal Histology and Laboratory BIO 4343 **AND** 4341, Animal Embryology and Laboratory BIO 4552 **AND** 4551, Medical Mycology and Laboratory BIO 4623, Environmental Microbiology CHEM 3153, Survey of Physical Chemistry CHEM 4243, Biochemistry PHIL 3713, Ethics in the Health Professions STAT 3233, Applied Statistics I  | 9-12  |
| **Sub-total**  | **27-31**  |
| **Electives:**  | **Sem. Hrs.**  |
| Electives  | **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: Bachelor of Science****Major: Biological Sciences – Pre-professional Studies Emphasis****Year: 2022-2023** |
| 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** |
| BIO 1013 | Biology Making Connections | 3 |  |  | BIO 1503 | Biology of Plants | 3 |  |
| BIO 1303 | Biology of Animals | 3 |  |  | BIO 1501 | Biology of Plants Lab | 1 |  |
| BIO 1301 | Biology of Animals Lab | 1 |  |  | CHEM 1013 | General Chemistry I | 3 | X |
| ENG 1003 | Composition | 3 | X |  | CHEM 1011 | General Chemistry I Lab | 1 | X |
| MATH 1054 | Precalculus | 4 | X |  | ENG 1013 | Composition II | 3 | X |
|  |  |  |  |  | MATH 2194 | Survey of Calculus | 4 |  |
| **Total Hours** |  | 14 |  |  | **Total Hours** |  | 15 |  |
| **Year 2** |  | **Year 2** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
| BIO 2013 | Biology of the Cell | 3 | X |  | BIO 3023 | Principles of Ecology | 3 |  |
| BIO 2011 | Biology of the Cell Lab | 1 | X |  | CHEM 3103 | Organic Chemistry I | 3 |  |
| CHEM 1023 | General Chemistry II | 3 |  |  | CHEM 3101 | Organic Chemistry I Lab | 1 |  |
| CHEM 1021 | General Chemistry II Lab | 1 |  |  | PHYS 2064 | General Physics II | 4 |  |
| PHYS 2054 | General Physics I | 4 |  |  |  | Social Science | 3 | X |
|  | Social Science | 3 | X |  |  | Elective | 3 |  |
| **Total Hours** |  | 15 |  |  | **Total Hours** |  | 17 |  |
| **Year 3** |  | **Year 3** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
| BIO 3013 | Genetics | 3 |  |  | BIO 4104 | Microbiology | 4 |  |
| BIO 3011 | Genetics Lab | 1 |  |  | BIO 3233 | Human Structure and Function II | 3 |  |
| BIO 3223 | Human Structure and Function 1 | 3 |  |  | BIO 3231 | Human Structure and Function II Lab | 1 |  |
| BIO 3221 | Human Structure and Function I Lab |  |  |  | CHEM 4243 | Biochemistry |  |  |
| CHEM 3113 | Organic Chemistry II | 3 |  |  |  | Humanities | 3 | X |
| CHEM 3111 | Organic Chemistry II Lab | 1 |  |  |  |  |  |  |
|  | Fine Arts | 3 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  | X |  |  |  |  |  |
| **Total Hours** |  | 15 |  |  | **Total Hours** |  | 14 |  |
| **Year 4** |  | **Year 4** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
|  | Upper-Level Biology Elective | 3 |  |  | BIO 4021 | Biological Seminar | 1 |  |
|  | Upper-Level Biology Elective | 3 |  |  | *BIO 4083* | *Evolution* | *3* |  |
| BIO 4021 | Biological Seminar | 1 |  |  |  | Upper-Level Biology Elective | 3 |  |
| SCOM 1203 | Oral Communication | 3 | X |  |  | Upper-Level Elective | 3 |  |
|  | Elective | 3 |  |  |  | Elective | 3 |  |
|  | US History (to or since 1876) or American Government | 3 | X |  |  | Elective | 2 |  |
| **Total Hours** |  | 15 |  |  | **Total Hours** |  | 15 |  |
| **Total Jr/Sr Hours \_46\_\_ Total Degree Hours \_120\_\_** |
| **Graduation Requirements:** |