UNDERGRADUATE PROGRAM CHANGE

Proposal for a Program Change

Department	Biological and Environmental Sciences	**Submission Date**	09/08/2015

Major ☐ **Minor** ☐ **Concentration** ☒

Semester of Implementation: Fall 2016

Retroactive? (If yes, please specify catalog year): No

I. Summary of Proposed Program Change:

	CURRENT	Check Box if no Change	PROPOSED CHANGE
Program Name	**BIOLOGY MAJOR, BS DEGREE** Teacher Preparation in Biology Concentration	X	
Credit Hours	130	X	
Course(s) to be Added			BIOL 120, 250, 251, 288, 301, 302, 305, 309, 315, 395, 455, 460, 465, 488, and 489; MATH 171, 261, and 301
Course(s) to be Removed			BIOL 121, 122, 292, 308, 400, 405, 410, 435, 441, and 443; CHEM 212 and CHEM 214
Indicate courses to be substituted for removed courses			On old catalogs, substitute BIOL 488 for 400; other substitutions will be approved individually, as needed
Course(s) to be Changed			BIOL 206, 207, 303, 304, 306, 324, 341, 342, 360, 361, 399, 404, 425, 426, 427, 430, 434, 445, 450, 470, 471, 474, 475
Other Changes			See catalog changes for modifications of major

requirement areas and the shift of some courses between these areas.

II. Proposed revision in catalog description of program.

Provide proposed revisions in catalog copy – use **bold** for new information, ~~strike through~~ for deletions, and *italicize* changes.

See catalog changes below

III. Rationale for proposed changes. *Attach extra sheet if necessary.*

This proposed program change is the result of several years of a curriculum mapping project. This effort began in 2009 and has been informed by two bodies of information: 1) assessment data collected annually by the faculty and archived in WEAVEonline and 2) national calls for curriculum reform in the life sciences, including *BIO2010*, the AAAS *Vision and Change* report, and the HHMI/AAMC *Preparing Future Physicians report*.

The curriculum review and revision process has involved all faculty in the program in critical discussions of teaching and learning. The collaborative effort started "with the end in mind" as faculty identified the knowledge, skills, and dispositions desired in all biology graduates. They then sought to map the development of knowledge and skills across the four-year student experience. The goal was to scaffold courses and student learning experiences so that knowledge and skills are progressively introduced, reinforced, mastered, and assessed. The proposed program changes are designed to achieve this goal.

The proposed changes to the Teacher Prep Concentration are needed to adjust the requirements and catalog copy to reflect the changes made in biology courses and the program change in the general biology major. Revisions to the Teacher Prep Concentration were designed to keep the curriculum as close to the general biology major as possible, while still meeting requirements for licensure and retaining the current total number of credits for this degree.

The SCED 490 requirement was removed from the Core Requirements section listing since it is already listed in the Secondary Education Licensure section.

The number of credits required for the Chemistry and Physics minors for endorsements have been corrected.

IV. Resource Assessment

A. Estimate any change in staff requirements that would result from this program change.

No additional staff will be required as a result of this program change.

B. Estimate the amount and cost of any extra equipment, library resources, computer hardware or software, or other resources that would be required to carry out this program change.

None

V. Affected Departments or Programs:

If the proposed program changes could have an impact on other departments or programs, the appropriate affected chairs or program directors should be notified of the proposed changes.

A. List other departments/programs that might be affected:

Math, Chemistry & Physics

B. Individuals contacted and date contacted:

David Shoenthal (Math) - 9/11/2015
Melissa Rhoten (Chemistry & Physics) - 9/12/2015

SIGNATURE PAGE
UNDERGRADUATE PROGRAM CHANGE

Department Biological and Environmental Sciences Program Name **BIOLOGY MAJOR, BS DEGREE** Teacher Preparation in Biology Concentration

VI. Approvals	Date Received	Date Approved	Signature
1. Department Curriculum Committee Chair	_____	_____	_____
2. Department Chair	_____	_____	_____

The Department Chairs, whose programs may be affected, have been notified:

Department __Math_____ Date Notified __9/11/2015__
Department _Chemistry & Physics_ Date Notified __9/12/2015__
Department _____ Date Notified _____

3. College Dean	_____	_____	_____
4. College Curriculum Committee	_____	_____	_____
5. Educational Policy Committee	_____	_____	_____
6. *Faculty Senate	_____	_____	_____
7. *VPAA	_____	_____	_____
8. *OAIR (notification only)	_____		_____

9. *BOV/SCHEV - VPAA will submit materials for approval

10. Date received by Registrar _____

*Substantive change (see definition and consult EPC chair prior to submitting materials)

All curriculum proposals/changes are processed in the date order received. In order to be included in the next academic year's catalog, all paperwork must be submitted no later than:

February 1st to the College Curriculum Committee
March 1st to the Educational Policy Committee (EPC)

Submission within the deadlines does not guarantee processing in time for the next academic year's catalog.

Revised June 2012, September 2014

Proposed Catalog Revisions

BIOLOGY MAJOR, BS DEGREE
Teacher Preparation in Biology Concentration

A. **General Education Core Requirement/37 credits**
MATH 171 is required for General Education Goal 5.
PHYS 103 is required for General Education Goal 6.
PHIL 315 or 316 is required for General Education Goal 12.
SCED 490 ~~is required for~~ **satisfies** General Education Goal 14.

B. Additional Degree Requirements/7 credits
MATH 261 or MATH 301/3 credits ~~Mathematics/Computer Science/3 credits~~
CHEM 111/4 credits

C. Major Requirements/~~**50 credits**~~ **49 credits**

1. **CORE REQUIREMENTS/26 credits** ~~Core Curriculum~~ ~~(required of all biology majors)~~

BIOL 120	**Integrative Biology/4 credits**
BIOL 250	**Introduction to Genetics and Cell Biology/4 credits**
BIOL 251	**Introduction to Ecology and Evolution/4 credits**
BIOL 288	**Sophomore Seminar/3 credits**
BIOL 488	**Senior Seminar/3 credits**
BIOL 489	**Senior Assessment/0 credits**
~~BIOL 121~~	~~The Unity of Life/4 credits~~
~~BIOL 122~~	~~The Diversity of Life/4 credits~~
~~BIOL 324~~	~~Genetics/4 credits~~
~~BIOL 341~~	~~Ecology/4 credits~~
~~BIOL 399~~	~~Evolution/3 credits~~
~~BIOL 400~~	~~Unifying Biological Principles/3 credits~~
~~SCED 490~~	~~Research Methods Science Education/1 cr satisfies Gen Education Goal 14~~
CHEM 112	Fundamentals of Chemistry II/4 credits
CHEM 211	Organic Chemistry I Lecture/3 credits
~~CHEM 212~~	~~Organic Chemistry II Lecture/3 credits~~
CHEM 213	Organic Chemistry Laboratory I/1 credit
~~CHEM 214~~	~~Organic Chemistry Laboratory II/1 credit~~
PHYS 103	Conceptual Physics I/4 credits (satisfied if taken for Gen Ed Goal 6)

2. **AREA REQUIREMENTS/12 credits**
All students must successfully complete at least one class from each area below.

CELL AND MOLECULAR AREA
BIOL 305: General Microbiology/4 credits
BIOL 324: Genetics/4 credits
BIOL 326: Cell Biology/4 credits
BIOL 360: Developmental Biology/4 credits

ECOLOGY AND EVOLUTION AREA
BIOL 330: Conservation Biology/4 credits
BIOL 341: Ecology/4 credits
BIOL 342: Biogeography /4 credits
BIOL 399: Evolution/4 credits

ORGANISMAL AREA
BIOL 301: Comprehensive Human Anatomy and Physiology/4 credits
BIOL 303: Vertebrate Morphology//4 credits
BIOL 309: Plant Biology/4 credits
BIOL 315: Invertebrate Zoology/4 credits

~~Biology electives – Choose 15 credits of biology electives from BIOL 206-498.~~

3. **BIOLOGY ELECTIVE REQUIREMENTS/11 credits**
   Students must complete at least 11 additional Biology elective credits from BIOL 206-498, with a minimum of 3 credits from BIOL 400 to BIOL 491. These biology electives may be selected from additional courses in the areas or from the elective courses offered on a rotating basis. However, to meet Virginia teaching licensure requirements, the Teacher Preparation in Biology Concentration requires that these electives, or the above area requirements, include a course in each of the following topics: botany (satisfied by BIOL 309 or BIOL 460 with a field botany focus), zoology (satisfied by BIOL 303, 306, or 315), and anatomy/physiology (satisfied by BIOL 206, 207, 301, or 302).

D. Secondary Education Licensure, Grades 6-12/~~36 credits~~ 37 credits

EASC 300	Dynamic Planet/3 credits
EDUC 245	Human Growth and Development/3 credits
EDUC 260	Introduction to the Teaching Profession/2 credits
EDUC 432	Content Area Literacy/3 credits
EDUC 473	Inquiry into the Classroom Community/3 credits
EDUC 487	Classroom Management & Systems/3 credits
SCED 152	Principles of Secondary Education in Science/1 credit
SCED 252	Practicum in Science Education I/2 credits
SCED 451	The Teaching of Secondary Science/2 credits
SCED 482	Directed Teaching in the Secondary School/9 credits
SCED 490	Research Methods in Science Education/3 credits (1 of these 3 credits satisfies General Education Goal 14)
SPED 489	Survey of Exceptional Children/3 credits

***For additional endorsement to teach Chemistry, Minor in Chemistry/~~24 credits~~ 23 credits**

***For additional endorsement to teach Physics, Minor in Physics/~~24 credits~~ 20 credits**

***Students seeking endorsement in these areas must meet criteria established by the State Department of Education.**

E. Total credits required for BS in Biology with Secondary science endorsement/130