

Curriculum Proposal Cover Sheet – form is available on-line as an interactive PDF

LSC Use Only Proposal No:	UWUCC Use Only Proposal No: 12-137a 13-36a	Senate Action Date:
LSC Action-Date: <u>App-9/12/13</u>	UWUCC Action-Date: <u>App-11/12/13</u>	<u>App-12/3/13</u>

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

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Proposing Department/Unit Biology	Phone 7-2359

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

1. Course Proposals (check all that apply)

New Course Course Prefix Change Course Deletion
 Course Revision Course Number and/or Title Change Catalog Description Change

Current course prefix, number and full title: _____

2. Liberal Studies Course Designations, as appropriate

This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)
 Learning Skills Knowledge Area Global and Multicultural Awareness Writing Intensive (include W cover sheet)
 Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)

Global Citizenship Information Literacy Oral Communication
 Quantitative Reasoning Scientific Literacy Technological Literacy

Received
NOV 5 2013
Liberal Studies
Received

3. Other Designations, as appropriate

Honors College Course Other: (e.g. Women's Studies, Pan African)

APR 29 2013

4. Program Proposals

Catalog Description Change Program Revision Program Title Change New Track
 New Degree Program New Minor Program Liberal Studies Requirement Changes Other

Current program name: **Bachelor of Science in Education- Biology**

Proposed program name, if changing: _____

Liberal Studies

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)	<i>[Signature]</i>	3/8/13
Department Chairperson(s)	<i>[Signature]</i>	3/8/13
College Curriculum Committee Chair	<i>[Signature]</i>	4/24/13
College Dean	<i>[Signature]</i>	4/29/13
Director of Liberal Studies (as needed)	<i>[Signature]</i>	9/13/13
Director of Honors College (as needed)	<i>[Signature]</i>	
Provost (as needed)	<i>[Signature]</i>	4/30/13
Additional signature (with title) as appropriate	<i>[Signature]</i>	10/28/13
UWUCC Co-Chairs	<i>[Signature]</i>	11/12/13

Part II. Description of Curriculum Change

1. Catalog description for the revised program in the appropriate form.

Bachelor of Science in Education – Biology (1)

Liberal Studies: As outlined in Liberal Studies section with the following specifications: **48**

Mathematics: MATH 110 (2)

Natural Science: CHEM 111-112 or CHEM 113-114

Social Science: PSYC 101

Liberal Studies Electives: 7cr, MATH 217, GEOS 201, no courses with BIOL prefix

College of Education: **31**

Preprofessional Education Sequence:

COMM 103 Digital Instructional Technology 3cr

EDSP 102 Educational Psychology 3cr

Professional Education Sequence:

EDEX 301 Education of Students with Disabilities in Inclusive Secondary Settings 2cr

EDEX 323 Instruction of English Language Learners in with Special Needs 2cr

EDSP 477 Assessment of Student Learning: Design and Interpretation of Educational Measures 3cr

EDUC 242 Pre-Student Teaching Clinical Experience I 1cr

EDUC 342 Pre-Student Teaching Clinical Experience II 1cr

EDUC 441 Student Teaching (1) 12cr

EDUC 442 School Law 1cr

EDUC 451 Teaching Science in the Secondary School 3cr

Major: **28**

Required Core Courses:

BIOL 201 Principles of Ecology & Evolution 4cr

BIOL 202 Principles of Cell & Molecular Biology 4cr

BIOL 203 Principles of Genetics & Development 4cr

Required Biology Courses:

BIOL 480 Biology Seminar 1cr

Controlled Biology Electives:

Biology electives (major courses only) (3) 15cr

Select one course from each area: Cell & Molecular Area, Ecology Area, Organismal Area (A list of courses in each area is available on the biology website or at the biology office.)

A minimum of 6 cr must be in courses at the 400-level.

At least one course must be a field biology course.

Other Science Requirements:		12
PHYS 151 Medical Physics Lecture	3cr	
PHYS 161 Medical Physics Lab	1cr	
CHEM: 231 Organic Chemistry I	4cr	
CHEM: 351 Biochemistry (4)	4cr	

Other Requirements:
Exit survey for assessment purposes

Free Electives: **1**

Total Degree Requirements (5): **120**

- (1) See requirements leading to teacher certification, titled “3-Step Process for Teacher Education,” in the College of Education and Educational Technology section of this catalogue.
- (2) MATH 121 may be substituted for MATH 110
- (3) No more than 3cr total from Independent Study, Special Topics, or Internship applies to major; excess applied as free electives.
- (4) The two-semester (6cr) sequence of BIOC 301-302 can be substituted for CHEM 351 to meet the biochemistry requirement.
- (5) See advisory paragraph “Timely Completion of Degree Requirements” in the section on Requirements for Graduation

2. Summary of changes:

1. The Liberal Studies mathematics course is specified as MATH 110 instead of MATH 110 or 121. MATH 121 is allowed as a substitution for MATH 110, as indicated in the new footnote #2. MATH 217 remains a Liberal Studies elective.
2. CHEM 113-114 is included as a possible substitution for CHEM 111-112.
3. GEOS 201 (4cr) is also now identified as a required Liberal Studies course in place of “one course with GEOS prefix (Option II) Nonlaboratory list” (3cr).
4. The number of credits for the major was reduced from 29cr to 28cr.
5. BIOL 111 Principles of Biology I, BIOL 112 Principles of Biology II, and BIOL 263 Genetics have been replaced by BIOL 201 Principles of Ecology & Evolution, BIOL 202 Principles of Cell & Molecular Biology, and BIOL 203 Principles of Genetics & Development. BIOL 263 Genetics, a 3 credit course, has been replaced by BIOL 203, a 4 credit course. These three courses, BIOL 201 Principles of Ecology & Evolution, BIOL 202 Principles of Cell & Molecular Biology, and BIOL 203 Principles of Genetics & Development constitute the biology core courses. The course proposals are attached.
6. BIOL 210 Botany, BIOL 220 General Zoology, and BIOL 250 Principles of Microbiology have been removed as required courses. The credits from these courses remain in the Major

requirements as controlled biology electives. These courses will count as controlled biology electives.

7. Stipulations have been placed upon the Controlled Biology Electives. Students must select one course from each of three areas: 1) Cell and Molecular Biology, 2) Organismal Biology, and 3) Ecology. Also, a minimum of 6 cr of the biology electives must be at the 400-level and one course must be a field biology course.

8. The requirement of an assessment survey was added.

9. All footnotes have been numbered rather than using a mixture of numbers and symbols. Footnote #3 is a revision of the old footnote #1, in which the number of credits that can be applied as biology electives is reduced from 6 cr to 3 cr.

Comparison of Old and New Programs:

Current:

Proposed:

Bachelor of Science in Education – Biology(*)		Bachelor of Science in Education – Biology (1)	
Liberal Studies as outlined in Liberal Studies section with the following specifications: Mathematics: MATH 110 or 121 Natural Sciences: CHEM 111-112 Social Science: PSYC 101 Liberal Studies Electives: 6cr, MATH 217, one course with GEOS prefix (Option II) Nonlaboratory list; no courses with BIOL prefix	47-48	Liberal Studies as outlined in Liberal Studies section with the following specifications: Mathematics: MATH 110 (2) Natural Sciences: CHEM 111-112 or CHEM 113-114 Social Science: PSYC 101 Liberal Studies Electives: 7 cr, MATH 217, GEOS 201, no courses with BIOL prefix	48
College of Education: Preprofessional Education Sequence: COMM 103 Digital Instructional Technology 3cr EDSP 102 Educational Psychology 3cr Professional Education Sequence: EDEX 301 Education of Students with Disabilities in Inclusive Secondary Settings 2cr EDEX 323 Instruction of English Language Learners with Special Needs 2cr EDSP 477 Assessment of Student Learning: Design and Interpretation of Educational Measures 3cr EDUC 242 Pre-Student Teaching Clinical Experience I 1cr EDUC 342 Pre-Student Teaching Clinical Experience II 1cr EDUC 441 Student Teaching 12cr EDUC 442 School Law 1cr EDUC 451 Teaching Science in the Secondary School 3cr	31	College of Education: Preprofessional Education Sequence: COMM 103 Digital Instructional Technology 3cr EDSP 102 Educational Psychology 3cr Professional Education Sequence: EDEX 301 Education of Students with Disabilities in Inclusive Secondary Settings 2cr EDEX 323 Instruction of English Language Learners with Special Needs 2cr EDSP 477 Assessment of Student Learning: Design and Interpretation of Educational Measures 3cr EDUC 242 Pre-Student Teaching Clinical Experience I 1cr EDUC 342 Pre-Student Teaching Clinical Experience II 1cr EDUC 441 Student Teaching 12cr EDUC 442 School Law 1cr EDUC 451 Teaching Science in the Secondary School 3cr	31
Major: Required Courses: BIOL 111 Principles of Biology I 4cr	29	Major: Required Core Courses: BIOL 201 Principles of Ecology & Evolution 4cr	28

BIOL 112 Principles of Biology II 4cr BIOL 210 Botany 3cr BIOL 220 General Zoology 3cr BIOL 250 Principles of Microbiology 3cr BIOL 263 Genetics 3cr BIOL 480 Biology Seminar 1cr Controlled Electives (2) Biology electives: (major courses only) 8cr		BIOL 202 Principles of Cell &Molecular Biology 4cr BIOL 203 Principles of Genetics & Development 4cr Required Biology Courses: BIOL 480 Biology Seminar 1cr Controlled Electives: 15cr Biology electives: (major courses only) (3) Select one course from each area: Cell & Molecular Area, Ecology Area, Organismal Area (A list of courses in each area is available on the biology website or at the biology office.) A minimum of 6 cr must be in courses at the 400-level. At least one course must be a field biology course.	
Other Requirements: Chemistry Sequence: CHEM 231 Organic Chem. I 4cr CHEM 351 Biochemistry (2) 4cr Controlled Electives: PHYS 151/161 Medical Physics lecture and Lab 4cr	12	Other Science Requirements: CHEM 231 Organic Chem. I 4cr CHEM 351 Biochemistry (4) 4cr PHYS 151/161 Medical Physics lecture and Lab 4cr	12
		Other Requirements: Exit survey for assessment purposes	
Free Electives:	0-1	Free Electives:	1
Total degree requirements (#)	120	Total degree requirements (5)	120
(*) See requirements leading to teacher certification, titled "3-Step Process for Teacher Education," in the College of Education and Educational Technology section of this catalog. (1) No more than 6cr from BIOL 482, 481, or 493 applies to major; excess applied as free electives. (2) The two-semester (6cr) sequence of BIOC 301-302 can be substituted for CHEM 351 to meet the biochemistry requirement. (#) See advisory paragraph "Timely Completion of Degree Requirements" in the section on Requirements for Graduation		(1) See requirements leading to teacher certification, titled "3-Step Process for Teacher Education," in the College of Education and Educational Technology section of this catalogue. (2) MATH 121 may be substituted for MATH 110 (3) No more than 3cr total from Independent Study, Special Topics, or Internship applies to major; excess applied as free electives. (4) The two-semester (6cr) sequence of BIOC 301-302 can be substituted for CHEM 351 to meet the biochemistry requirement. (5) See advisory paragraph "Timely Completion of Degree Requirements" in the section on Requirements for Graduation	

3. Rationale for changes:

1. The required math courses are now identified as MATH 110 (3cr) and MATH 217 (3cr) to fulfill the 6cr math requirement to meet PDE requirements. As noted in footnote #2, MATH 121 may still be substituted for MATH 110, but this is rarely used as an option for BSED students.

2. Students who are adequately prepared may take a higher level of freshman chemistry than CHEM 111-112. We are clarifying this option for students by including it here.
3. Previously, the BSED students followed the Liberal Studies guidelines to meet their Geoscience requirement, but at the recommendation of the Geoscience department, students will now be required to take GEOS 201. This will better prepare them for the content they will be certified to teach under current PA State Certification guidelines.
4. The reduction in major credit hours (from 29 cr to 28 cr) was made due to changes in the core Biology curriculum and to reduce major credits as much as possible. Because of the nature of state certification requirements, total science credits in Major Required Courses and Other Science Requirements are now at 40cr hours. An additional 31cr hours of College of Education courses are required to meet PDE requirements for PA certification.
5. The revision of the core courses is a complete restructuring of the Principles of Biology. We are revising our core curriculum to create three pillars of biology: BIOL 201 Principles of Ecology & Evolution, BIOL 202 Principles of Cell & Molecular Biology, and BIOL 203 Principles of Genetics & Development. The change in the core curriculum constitutes a shift in philosophy, moving away from a lengthy list of topics to a more integrated and focused cluster of courses. Also, we are shifting away from the old-fashioned botany-zoology dichotomy to a modern levels-of-organization approach.

BIOL 201 Principles of Ecology & Evolution is designed to be the first biology course for freshman biology majors. We have reversed the order of the material, placing the more familiar concepts of ecology and evolution in the first semester and moving the less familiar concepts of molecular and cellular biology into the second semester. BIOL 201 will replace BIOL 112 Principles of Biology II. BIOL 112 included evolution, ecology, and reproduction and development. The new course will focus only on ecology and evolution. As BIOL 201 Principles of Ecology & Evolution is proposed to be the first biology course for incoming students, the amount of content is being reduced to better serve the needs of students with diverse levels of preparation for college-level work.

BIOL 202 Principles of Cell & Molecular Biology will replace BIOL 111 Principles of Biology I. Placing the cell and molecular topics in the spring semester allows for the prerequisite of CHEM 111 or CHEM 113 to better prepare students for these topics.

BIOL 203 Principles of Genetics & Development will replace BIOL 263 Genetics. Modern developmental biology emphasizes cell, molecular, and genetic aspects of development, so development is being shifted to the third and final course in the core, linking it with genetics. The subject of genetics has expanded into a multidisciplinary science that covers material from population genetics to molecular genetics. The current system only allows two 50 minute lectures a week, which results in the elimination of a great deal of material from the course. A schedule with 3 lectures a week would allow for a more complete coverage for the student. In order to provide the level of rigor necessary, the course needs additional time in the lecture component.

The numbering system follows the model of the Geoscience department, in which majors courses begin at the 200-level and the 100-level courses are designated for nonmajors and liberal studies courses.

6. BIOL 210, 220 and 250 are not being deleted, simply removed from the general program as required courses. These courses are required by certain tracks within the biology program, and they will be electives for the B.S. in Biology Education. This will provide greater flexibility for students in developing their program, especially for students who are transferring credits from other institutions.

7. Students are required to take one course from each of three areas: 1) Cell and Molecular Biology, 2) Organismal Biology, and 3) Ecology. These three areas represent the broad spectrum of life sciences. At the undergraduate level, students who will be future teachers of Biology need to be exposed to the breadth of discipline, while maintaining the flexibility to focus in depth on an area of interest. Biology education students will be required to take at least one field course as part of their major requirements. This will ensure that they have some knowledge of plants and/or animals in order to effectively take their future students outside for instruction. With the current emphasis on programs such as No Child Left Inside, this will help our graduates obtain employment and be prepared for potential curriculum requirements that may come from state and federal education agencies.

8. The exit survey is added to insure compliance so that assessment data are complete and reliable.

9. Footnotes are now all numbered to improve clarity. The number of independent study, special topics or internship credits that apply as biology electives credits is being reduced because the proportion of the biology elective credits obtainable in this fashion was too high. This reduces the potential for excessive grade inflation and maintains strong content expectations.

Part III. Implementation

1. How will the proposed revision affect students in the existing program?

Students may elect to finish with the requirements of the catalog at the time of their matriculation, or students may choose to switch to the new requirements.

2. Are faculty resources adequate?

The overall credits in the major have been reduced by one credit, so faculty resources are adequate. By removing BIOL 210, 220, and 250 from the list of required courses, the enrollment in these courses will likely decrease and fewer sections of each will be necessary.

3. Are other resources adequate?

Other resources are adequate. Other than the change in BIOL 263 Genetics, the changes have no resource implications.

4. Do you expect an increase or decrease in the number of students as a result of these revisions?

We do not expect the revisions to affect the number of students in the program.

Part IV. Periodic Assessment

1. Describe the evaluation plan.

The Biology Department conducts a review of all programs every five years. Criteria include both quantitative and qualitative evaluation of the programs. In addition, every year the outgoing seniors will surveyed, using the required exit survey, for feedback about the nature of their experiences in the various programs within the department.

Part V. Course Proposals

BIOL 201 Principles of Ecology & Evolution – proposal attached

BIOL 202 Principles of Cell & Molecular Biology – proposal attached

BIOL 203 Principles of Genetics & Development – proposal attached

Part VI. Letters of Support or Acknowledgment

Geosciences

Mathematics

College of Education