

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

13-36e.

LSC Use Only Proposal No:	UWUCC Use Only Proposal No: <u>12-137c</u>	
LSC Action-Date: <u>App-9/12/13</u>	UWUCC Action-Date: <u>App-11/19/13</u>	Senate Action Date: <u>App-12/3/13</u>

**Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee**

Contact Person(s) <b>Sandra Newell</b>	Email Address <b>sjnewell@iup.edu</b>
Proposing Department/Unit <b>Biology</b>	Phone <b>7-2352</b>

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: \_\_\_\_\_

Proposed course prefix, number and full title, if changing: \_\_\_\_\_

**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**  
**APR 29 2013**

**3. Other Designations, as appropriate**

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

**Liberal Studies**

**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 – Biology/Pre-Veterinary Track**

Proposed program name, if changing: \_\_\_\_\_

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)	<i>Sandra Newell</i>	30 Nov 2012
Department Chairperson(s)	<i>[Signature]</i>	Nov 30, 2012
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>	9/23/13
Director of Honors College (as needed)	<i>[Signature]</i>	
Provost (as needed)	<i>[Signature]</i>	5/2/13
Additional signature (with title) as appropriate		
UWUCC Co-Chairs	<i>Gail Sechrist</i>	11/19/13

## Part II. Description of Curriculum Change

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

### Bachelor of Science – Biology/Pre-Veterinary Track

<b>Liberal Studies:</b> As outlined in Liberal Studies section with the following specifications: <b>Mathematics:</b> MATH 121 <b>Natural Science:</b> CHEM 111-112 or CHEM 113-114 <b>Liberal Studies Electives:</b> 3cr, no courses with BIOL prefix	<b>45</b>
<b>Major:</b> <b>Required Core Courses:</b> BIOL 201 Principles of Ecology and Evolution 4cr BIOL 202 Principles of Cell and Molecular Biology 4cr BIOL 203 Principles of Genetics and Development 4cr <b>Required Biology Courses:</b> BIOL 220 General Zoology 3cr BIOL 242 Comparative Vertebrate Anatomy 3cr BIOL 250 Principles of Microbiology 3cr BIOL 331 Animal Developmental Biology 3cr BIOL 352 Comparative Animal Physiology 3cr <b>Controlled Biology Electives:</b> BIOL 210, 221, 261, 271, 272, 310, 323, 363, 364, 401, 402, 403, 405, 410, 455, 460, 466, 475, 477, 481, 482, 483, 484, 491, 493, 499, or other biology major courses by permission of advisor and department chairperson	<b>36</b>
<b>Other Science Requirements:</b> CHEM 231 Organic Chemistry I 4cr CHEM 232 Organic Chemistry II 4cr CHEM 351 Biochemistry 4cr PHYS 111 Physics I Lecture 3cr PHYS 121 Physics I Lab 1cr PHYS 112 Physics II Lecture 3cr PHYS 122 Physics II Lab 1 cr MATH 216 or 217 Probability and Statistics 3 cr	<b>23</b>
<b>Other Requirements:</b> Foreign Language Intermediate Level Exit survey for assessment purposes	<b>0-6</b> 0-6cr (3)
<b>Free Electives:</b>	<b>10-16</b>
<b>Total Degree Requirements:</b>	<b>120</b>

- (1) No more than 6cr total from Independent Study, Special Topics, or Internship applies to major; excess applied as free electives.
- (2) Other appropriate major courses at 200-level and above (excluding liberal studies courses) in the above departments may be substituted with permission of the advisor and the biology department chairperson in advance of taking the course.
- (3) a) Two courses in one language, including the placement course; or b) intermediate level. In lieu of a foreign language, students may elect to take a sequence of courses in either Computer Science, exclusive of COSC 101 (COSC 110 and 210 recommended), or Geography/Regional Planning (from the following: GEOG/RGPL 213, 314, 316, 415, 417)

## 2. Summary of changes:

1. CHEM 113-114 is added as a substitution for CHEM 111-112.
2. PSYC 101 is not specified as the Liberal Studies Elective.
3. The number of credits for the major was reduced from 38 to 36 cr.
4. 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 has been changed from a 3 credit course to 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.
5. BIOL 210 Botany was removed from the required courses and placed in the controlled electives. Also, the formatting of the Majors courses was made consistent with that of other tracks.
6. MATH 217 is added as a substitution for MATH 216.
7. The list of Controlled Biology Electives was expanded and updated.
8. The wording of the foreign language footnote was modified to be consistent with the B.S in Biology (no track). This constitutes a change in the foreign language requirement, allowing two computer science courses or two geography/regional planning courses to substitute for foreign language.
9. The requirement of an assessment survey was added.
10. Free elective credits have been increased by the reduction in the number of biology major credits.

Comparison of Old and New Programs:

Current:

Proposed:

<b>Bachelor of Science – Biology/ Pre-Veterinary Track</b>		<b>Bachelor of Science – Biology/ Pre-Veterinary Track</b>	
<b>Liberal Studies:</b> As outlined in Liberal Studies section with the following specifications:	<b>45</b>	<b>Liberal Studies:</b> As outlined in Liberal Studies section with the following specifications:	<b>45</b>
<b>Mathematics:</b> MATH 121		<b>Mathematics:</b> MATH 121	
<b>Natural Science:</b> CHEM 111-112		<b>Natural Science:</b> CHEM 111-112 or CHEM 113-114	
<b>Liberal Studies Electives:</b> 3cr, PSYC 101, no courses with BIOL prefix		<b>Liberal Studies Electives:</b> 3cr, no courses with BIOL prefix	
<b>Major: Required Courses:</b>	<b>38</b>	<b>Major:</b>	<b>36</b>
		<b>Required Core Courses:</b>	
<b>Biology Core Courses:</b>			
BIOL 111 Principles of Biology I	4cr		
BIOL 112 Principles of Biology II	4cr		
		BIOL 201 Principles of Ecology and Evolution	4cr
		BIOL 202 Principles of Cell and Molecular Biology	4cr
		BIOL 203 Principles of Genetics and Development	4cr
		<b>Required Biology Courses</b>	
BIOL 210 Botany	3cr		
BIOL 220 General Zoology	3cr	BIOL 220 General Zoology	3cr
BIOL 250 Principles of Microbiology	3cr	BIOL 242 Comparative Vertebrate Anatomy	3cr
BIOL 263 Genetics	3cr	BIOL 250 Principles of Microbiology	3cr
<b>Additional Required Biology Courses:</b>		BIOL 331 Animal Developmental Biology	3cr
BIOL 242 Comparative Vertebrate Anatomy	3cr	BIOL 352 Comparative Animal Physiology	3cr
BIOL 331 Animal Developmental Biology	3cr		
BIOL 352 Comparative Animal Physiology	3cr		
<b>Controlled Biology Electives:</b>		<b>Controlled Biology Electives: (1)</b>	
BIOL 151, 269, 271, 363, 364, 401, 405, 453, 466, 476, 477, 481, 482, 493	9cr (1)	BIOL 210, 221, 261, 271, 272, 310, 323, 363, 364, 401, 402, 405, 410, 455, 460, 466, 475, 477, 481, 482, 483, 484, 491, 493, 499, or other biology major courses by permission of advisor and	9cr

		department chairperson	
<b>Ancillary Science Requirements:</b>	<b>20</b>	<b>Ancillary Science Requirements:</b>	<b>23</b>
<b>Chemistry Sequence:</b>			
CHEM 231 Organic Chemistry I	4cr	CHEM 231 Organic Chemistry I	4cr
CHEM 232 Organic Chemistry II	4cr	CHEM 232 Organic Chemistry II	4cr
CHEM 351 Biochemistry	4cr	CHEM 351 Biochemistry	4cr
<b>Physics Sequence:</b>			
PHYS 111 Physics I Lecture	3cr	PHYS 111 Physics I Lecture	3cr
PHYS 121 Physics I Lab	1cr	PHYS 121 Physics I Lab	1cr
PHYS 112 Physics II Lecture	3cr	PHYS 112 Physics II Lecture	3cr
PHYS 122 Physics II Lab	1 cr	PHYS 122 Physics II Lab	1 cr
<b>Mathematics:</b>	<b>3</b>		
MATH 216 Probability and Statistics for Natural Sciences	3cr	MATH 216 or 217 Probability and Statistics	3cr
<b>Other Requirements:</b>	<b>0-6</b>	<b>Other Requirements: (2)</b>	<b>0-6</b>
Foreign Language Intermediate Level	0-6cr	Foreign Language Intermediate Level	0-6cr
		Exit survey for assessment purposes	
<b>Free Electives:</b>	<b>8-14</b>	<b>Free Electives:</b>	<b>10-16</b>
<b>Total Degree Requirements:</b>	<b>120</b>	<b>Total Degree Requirements:</b>	<b>120</b>
(1) No more than 6cr total from Independent Study, Special Topics, or Internship applies to major; excess applied as free electives.		(1) No more than 6cr total from Independent Study, Special Topics, or Internship applies to major; excess applied as free electives.	
		(2) a) Two courses in one language, including the placement course; or b) intermediate level. In lieu of a foreign language, students may elect to take a sequence of courses in either Computer Science, exclusive of COSC 101 (COSC 110 and 210 recommended), or Geography/Regional Planning (from the following: GEOG/RGPL 213, 314, 316, 415, 417)	

### 3. Rationale for changes:

1. 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.

2. The specification of PSYC 101 as a Liberal Studies Elective was an error in the catalog that we are correcting at this time.

3. The reduction in major credits was made to comply with the 60 cr maximum mandated by PASSHE.

4. 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.

5. BIOL 210 Botany is not required for preparation for veterinary school.

6. While a course in Probability and Statistics is essential, it does not need to be a calculus-based course. Either MATH 216 or 217 is acceptable.

7. The expanded and updated controlled biology electives list offers greater flexibility to the student in the completion of the track.

8. The current B.S. in Biology (no track) offers the substitution of computer science courses for foreign language. This option is being expanded to include the Pre-Veterinary Track since computer skills and geography skills are relevant to pre-veterinary training. All tracks within the program will have the same foreign language requirement. This will reduce confusion and facilitate students transferring between tracks.

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

10. Free elective credits were increased by reducing Biology major credits and Ancillary Science credits, to comply with the PASSHE mandate of 60 cr in the major and ancillary sciences.

### **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 from the list of required courses, the enrollment in this course will likely decrease and fewer sections will be necessary.

3. Are other resources adequate?

Other resources are adequate.

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 be surveyed, using the required exit survey, for feedback about the nature of their experiences in the various programs within the department. The biology minor is included in this review process.

**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**

Allied Health Professions: Clinical Laboratory Science

Biochemistry

Chemistry

Computer Science

Foreign Languages

Geography

Geosciences

Mathematics

Natural Science

Physics

Psychology