

LS → 10/06/03

Never received department revisions

LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
		03-20e	AP-1/20/04	

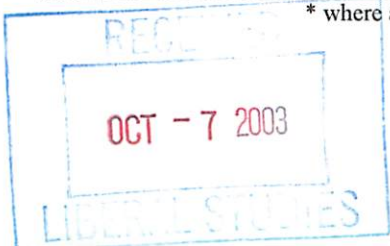
Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

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

1. Course Proposals (check all that apply) <input type="checkbox"/> New Course <input type="checkbox"/> Course Prefix Change <input type="checkbox"/> Course Deletion <input type="checkbox"/> Course Revision <input type="checkbox"/> Course Number and/or Title Change <input type="checkbox"/> Catalog Description Change	
<hr/>	
<u>Current</u> Course prefix, number and full title	<u>Proposed</u> course prefix, number and full title, if changing
2. Additional Course Designations: check if appropriate <input type="checkbox"/> This course is also proposed as a Liberal Studies Course. <input type="checkbox"/> Other: (e.g., Women's Studies, Pan-African) <input type="checkbox"/> This course is also proposed as an Honors College Course.	
3. Program Proposals <input type="checkbox"/> New Degree Program <input type="checkbox"/> Program Title Change <input type="checkbox"/> Other <input type="checkbox"/> New Minor Program <input checked="" type="checkbox"/> New Track <input type="checkbox"/> Catalog Description Change <input type="checkbox"/> Program Revision	
<hr/>	
<u>Current</u> program name	<u>Proposed</u> program name, if changing
B.A. in Biology	B. A. in Biology – Environmental Biology Track
4. Approvals	
Department Curriculum Committee Chair(s)	<i>Arthur C. Huls</i> 3-04-03
Department Chair(s)	<i>[Signature]</i> 3/14/03
College Curriculum Committee Chair	<i>[Signature]</i> 10/06/03
College Dean	<i>John D. Ed</i> 10/06/03
Director of Liberal Studies *	
Director of Honors College *	
Provost *	
Additional signatures as appropriate: (include title)	
UWUCC Co-Chairs	<i>Gail Sechrist</i> 1/20/04

* where applicable



1. Complete Catalog Description for New Track

Bachelor of Arts in Biology: Environmental Biology Track

The Environmental Biology track includes all the core Biology courses and a selection of related courses that focuses on ecological and environmental sciences. In order to achieve an environmental focus, the student must complete broad training in the sciences and the social sciences. Breadth of study is achieved by careful choice in complementary fields. This track prepares students for employment in areas related to environmental biology such as conservation and environmental advocacy.

Bachelor of Arts in Biology: Environmental Biology Track

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

Mathematics (3 sh): MATH 217

Natural Sciences (8 sh): CHEM 111-112

Liberal Studies Electives (3 sh): PHYS 111

Majors: **32 sh**

Required: (23 sh)

BIOL 111	Principles of Biology I	4 sh
BIOL 112	Principles of Biology II	4 sh
BIOL 210	Botany	3 sh
BIOL 220	General Zoology	3 sh
BIOL 250	Principles of Microbiology	3 sh
BIOL 263	Genetics	3 sh
BIOL 362	Ecology	3 sh

Controlled Biology Electives⁽¹⁾ (minimum 9 sh)

BIOL 251, 252, 261, 262, 269, 271, 272, 310, 323, 401, 425, 450, 463, 471, 475, 477, 480, 481, 482, 490, 493
MRSC xxx

Other Requirements⁽²⁾: **9 sh**

Geoscience Sequence

GEOS 121	Physical Geology	3 sh
GEOS 122	Physical Geology Lab	1 sh
GEOS 131	Historical Geology	3 sh
GEOS 132	Historical Geology Lab	1 sh

Physics

PHYS 121	Physics I Lab	1 sh
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Foreign Language **0-6sh**

(Two courses beyond placement or intermediate level.)

Humanities

Recommended for philosophy requirement:
PHIL 101, 222

Social Sciences (Must include one non-western course)

Restricted to choose among the following:

ECON 101 or 121
GEOG 101 or 102 or 104
PLSC 101 or 111
PSYC 101
SOC 151

Planned Program in Complementary Field⁽²⁾**18 sh**

(Advisor approval required with at least 6sh in 300/400 level courses. Courses should be selected from the following complementary fields: anthropology, biochemistry, chemistry, communications media, computer science (excluding COSC/IFMG/BTED 101), economics, English, geography/regional planning, geoscience, information management/business, mathematics, physics, political science, sociology. Other fields may be elected in consultation with the students advisor.

Free Electives**7-13 sh****Total Degree Requirements:****120 sh**

⁽¹⁾ No more than 6sh total from Independent Study, Special Topics or Internship applies to major; excess applied as free electives. Other biology courses may be applied to requirement for controlled biology electives with permission of advisor.

⁽²⁾ A course used to fulfill the requirement in ancillary sciences cannot also be used to fulfill the requirement for complementary field.

2. Detailed Description of the Environmental Biology Track (B. A.)

Rationale and Justification for an Environmental Biology Track (B. A.)

The purpose of this track is to allow students who are interested in environmental biology to focus their studies, making their college education relevant to a specific career goal. In the B. A. program this track will provide the breadth of study in natural and social sciences that is required for employment in various aspects of environmental science. Students will develop skills in both laboratory and field biology. Students who choose this track may combine biology with one of many complementary fields, including but not limited to computer science, economics, English, geography and political science.

The Ecological Society of America recommends that students get a broad background in the life and natural sciences, including geology, chemistry and physics. The society also recommends that students have "a working knowledge of mathematics, statistics, and computers". In addition to the natural sciences, the Ecological Society of America recommends that students develop communication skills and have background in relevant social sciences, such as economics, geography, and political science.

The job market in environmental biology is diverse and includes jobs at all levels of experience and education. Scanning the listings in ecojobs.com provides an overview of this market. The Environmental Biology track (B. A.) is designed specifically for students who intend to enter the job market in conservation, environmental advocacy, and environmental policy. The complementary fields have been chosen to make our students attractive to consulting agencies, environmental foundations, and federal, state and local governments. Such agencies seek students with skills in computers and database management, public speaking and media presentations, writing of grant proposals, cartography and Geographic Information Systems (GIS). The proposed track will allow students to make more choices in their coursework while providing guidance toward a specific career goal. By identifying a specific job market and targeting a specific career goal, this track represents a valuable recruitment tool for attracting students to IUP.

Credit Requirements for Environmental Biology Track (B. A.)

Overview: The Environmental Biology Track includes the requirements of the B.A. in Biology in the majors courses and the ancillary sciences. One additional biology course (BIOL 362 Ecology) is required. The liberal studies requirements also have the same number of semester hours as the B.A. in Biology. For this track the liberal studies mathematics, natural sciences, and elective courses are specified. The foreign language requirement matches that of the B.S. in Biology. There are recommended courses for the philosophy requirement and for the social sciences requirement. Complementary fields are used to focus the track on relevant coursework outside of biology. Free electives range from 7-13 sh depending on the choice of foreign language credits. The total degree requirement is 120 sh.

Required Majors Courses: Courses required for the B.A. in Biology are also required in this track. Additionally, BIOL 362 Ecology is required. The relevant biology courses are specified as controlled biology electives. This provides the necessary depth in life sciences.

Ancillary Natural Sciences: In this track the number of required credits in ancillary sciences is the same as the B.A. in Biology. Required ancillary sciences include chemistry (two courses), geoscience (two courses), mathematics (one course) and physics (one course). Geoscience is an essential addition to the ancillary sciences in environmental biology and provides background necessary for field biologists. The existing physics sequence (PHYS 111/121 & 112/122) does not focus on biologically relevant topics and does not meet the needs of our students. A one-semester interdisciplinary course in physics for biologists would be ideal. Lacking that, PHYS 111/121 is the best substitute. This provides breadth in ancillary sciences.

Controlled Electives: There are controlled biology electives which focus the student's studies on courses relevant to ecology/environmental science. Also, there are 18 sh in the complementary fields that help to meet the

recommendations of the Ecological Society of America for relevant coursework in humanities, social and natural sciences. The list of these courses is quite extensive.

Specification of Liberal Studies Courses: In the liberal studies the mathematics requirement is met with MATH 217 Probability and Statistics, the natural sciences requirement with CHEM 111-112 General Chemistry I & II, and the elective requirement with PHYS 111. Students are recommended to select PHIL 101 Informal Logic or PHIL 222 Ethics to fulfill the humanities/philosophy requirement. The social sciences courses are restricted to a list of nine courses that are relevant to environmental science (i.e., two courses in economics, three in geography, two in political science, one in psychology and one in sociology). This list includes two non-western courses.

Sequencing of Environmental Biology Track

B.A. in Biology (Environmental Biology Track)
(Feb. 2003)

First Semester			Second Semester		
BIOL 111	Principles of Biology I	4	BIOL 112	Principles of Biology II	4
CHEM 111	Gen. Chem. I	4	CHEM 112	Gen. Chem. II	4
HPED 143/			HIST 195	The Modern Era	3
FDNT 143	Hlth. & Wellness ¹	3	Choice of only <u>one</u> from:		
ENGL 101	College Writing or	<u>4</u>	ARHI 101	Intro. to Art or	<u>3</u>
			MUHI 101	Intro. to Music or	
			THTR 101	Intro. to Theater or	
			THTR 102	Intro. to Dance	
Total Credits		15	Total Credits		14
Third Semester			Fourth Semester		
BIOL ____	Botany or Zoo or Micro	3	BIOL ____	Botany or Zoo or Micro	3
GEOS 121	Physical Geology	3	GEOS 131	Historical Geology	3
GEOS 122	Physical Geology Lab	1	GEOS 132	Historical Geology Lab	1
____	Controlled Elective ⁴	3	MATH 217	Prob. & Stat.	3
____	Foreign Language ³	3-4	____	Foreign Lang.	3-4
____	Social Science Elective	<u>3</u>	____	Free Elective	<u>3</u>
Total Credits		16-17	Total Credits		16-17
Fifth Semester			Sixth Semester		
BIOL ____	Botany or Zoo or Micro	3	BIOL ____	Biology Elective	3
BIOL 263	Genetics (W)	3	____	Controlled Elective	3
BIOL ____	Biology Elective	3	____	Controlled Elective	3
ENGL 202	Research Writing	3	____	Social Science Elective	3
____	Controlled Elective	<u>3</u>	____	Free Elective	<u>3</u>
Total Credits		15	Total Credits		15
Seventh Semester			Eighth Semester		
BIOL 362	Ecology (W)	3	LBST 499	Synthesis	3
BIOL ____	Biology Elective	3	____	Controlled Elective	3
PHYS 111	Physics I	3	____	Social Science Elective	3
PHYS 121	Physics I Lab	1	____	Hum: Phil./RS	3
____	Humanities: Lit	3	____	Free Elective	<u>1</u>
____	Controlled Elective	<u>3</u>	Total Credits		13
Total Credits		16	Total Credits		13

¹ MLSC 101 and 102 (World and Amer. Mil. Hist.) may be substituted for the Health & Wellness course.

² One of these should be a non-western culture course.

³ Intermediate level (or two courses beyond placement) Intermediate = Spanish 201; French 201,202; German 251,252; Latin 201. Intermediate-level foreign language may be included in Liberal Studies electives.

⁴ A course used to fulfill the requirement in ancillary sciences cannot also be used to fulfill the requirement for complementary field.

Restrictions

There are no restrictions beyond the prerequisites for individual courses.

Part III. Implementation of the Environmental Biology Track

1. How will the proposed new track affect students already in the existing program?

The proposed track will provide expanded opportunities for existing students, allowing those who are interested in environmental biology to focus their program of study. We can identify no detrimental effect.

2. Are faculty resources adequate?

Teaching loads within the biology department will remain the same. The track is based on existing courses, which are already in the rotation schedule for course offerings in the department. Requirements are similar to existing requirements in the biology department. No additional seats are needed.

3. Are other resources adequate?

Again, the track is based on existing courses, which are being offered with the existing resources. Current space use is adequate for this track. Equipment and supplies will be for existing courses. Budgeting for these courses will be based upon the biology department's standard budgeting procedures. No travel funds are involved; any field labs will use the biology department vans according to standard procedures for scheduling vans. Library resources are minimal and will be supplemented with personal journal collections and access to Penn State's Library.

4. Do you expect an increase or decrease in the number of students as a result of these revisions? If so, how will the department adjust?

By providing clear guidelines to careers in environmental biology, we hope to recruit high-quality students. We don't expect large increases (or decreases) in the number of students in biology. Modest increases in number can be accommodated with existing resources.

The track may have some impact on other departments. Geoscience Department may see additional students in both Physical Geology and Historical Geology (GEOS 121, 122, 131, 132) since these are required of students in this track. Chemistry Department may see a small decrease in the number of students in Organic Chemistry I (CHEM 231) and Biochemistry (CHEM 351) as these are no longer required. Students may still select them as part of a complementary field or as free electives. Mathematics Department may see an increase in MATH 217 Probability and Statistics and a decrease in MATH 216 Probability and Statistics. This change was made, substituting a 3 credit course for a 4 credit course, in order to fit the number of credits into the 48 sh of liberal studies. Physics Department may see a small increase in Physics I lecture and lab (PHYS 111, 121) since the existing B. A. does not require this course. The departments with courses in the complementary fields will see an occasional biology student in their upper level classes. Each student will take six courses. We expect that students are most likely to choose computer science, economics, geography, geoscience, and political science as complementary fields in a B. A. degree program.

5. Intended Implementation Date

We plan to implement the track in Fall 2004.

Part IV. Periodic Assessment

We plan a two-pronged method of evaluation of the program. This will involve a survey of graduating seniors as well as a five-year evaluation of the program by the Department of Biology. Upon submission of their graduation application to their advisors students will be given a Senior Survey that they will be required to complete and return to their advisor in a sealed envelope bearing the letter head of the Department of Biology. These sealed envelopes will be given to the department secretary and not opened until after graduation (either Fall or Spring). The department secretary will then transcribe the results and distribute the results to the entire faculty of the Department of Biology. If students so chose they may identify themselves on the survey form for follow-up interviews by phone or e-mail. At the end of the first five years of the program and every five years after that the Undergraduate Curriculum Committee of the Department of Biology will evaluate all of the Senior Surveys for the last five years. In addition enrollment trends during each five year period will be examined and included in the evaluation. All faculty within the Department of Biology will also be asked to submit their individual evaluations regarding the success of the program.

Part V. Course Proposals

No new or revised courses are proposed as part of this curriculum.

Part VI. Letters of Support from Affected Departments

Anthropology
Biochemistry
Chemistry
Communications Media
Computer Science
Economics
English
Geography and Regional Planning
Geoscience
Information Management
Mathematics
Physics
Political Science
Sociology