LSC Use Only:
Number: _____
Submission Date: _____
Action Date: _____

MAR 28 2001 LIBERAL STUDIES

UWUCC Use Only: 01-19b
Number: ~~00-645~~
Submission Date: _____
Action Date: App 2/5/02
Senate App 2/26/02

CURRICULUM PROPOSAL COVER SHEET
University-Wide Undergraduate Curriculum Committee

I. CONTACT

Contact Person Keith Putirka Phone x5627
Department Geoscience

II. PROPOSAL TYPE (Check All Appropriate Lines)

_____ **COURSE** _____
Suggested 20 character title

_____ New Course* _____
Course Number and Full Title

Rev

_____ Course Revision _____
Course Number and Full Title

RECEIVED 3 0 2002 LIBERAL STUDIES

_____ Liberal Studies Approval for new or existing course _____
Course Number and Full Title

_____ Course Deletion _____
Course Number and Full Title

_____ Number and/or Title Change _____
Old Number and/or Full Old Title

_____
New Number and/or Full New Title

_____ Course or Catalog Description Change _____
Course Number and Full Title

X PROGRAM: X Major _____ Minor _____ Track

_____ New Program* _____
Program Name

X Program Revision BS—Geology
Program Name

_____ Program Deletion* _____
Program Name

_____ Title Change BS Geology
Old Program Name

BS—Geology/Geology Track, Environmental Track
New Program Name

III. Approvals (signatures and date)

Darlene Richard
Department Curriculum Committee

Darlene Richard 3-15-01
Department Chair

3/29/01
College Curriculum Committee

3/27/01
College Dean

Director of Liberal Studies (where applicable)

3/29/01
*Provost (where applicable)

Geoscience Department: Program Revision

Part II. Description of Curriculum Change

1. Catalog Description

The catalog will be revised to read as follows:

Geology is a far-ranging science and encompasses various aspects of the Earth system, including the oceans, the atmosphere as well as the solid Earth. Professional geologists are thus engaged in a wide range of activities, depending upon their interests. The problems with which geologists are faced include the evolution of life, the origin of volcanic activity, the assessment of volcanic and earthquake hazards, the evolution of our planetary neighbors, and perhaps most importantly, the human impact on our environment.

The department offers a degree in Geology that is divided into two tracks: Geology, and Environmental. Either track gives students the necessary foundation to pursue a wide variety of career goals. In addition, we offer degrees in secondary education for those students who are interested in teaching. The degrees and courses in our program emphasize hands-on learning, including outdoor instruction and student-oriented research. In addition to on-campus instruction and class-related field trips, the department offers several regional geology field courses, which take place in Newfoundland, the Yellowstone region, the Bahamas, and the American Southwest. In addition, there are coursework and research opportunities at the Marine Science Consortium at Wallops Island, Virginia.

Our B.S. in Geology/Geology Track is designed for students who are interested in pursuing any of the various sub-disciplines in Geology, including Oceanography/Marine Geology, Climate Change, Volcanology, Paleontology, Meteorology and Geophysics. There is also considerable overlap between geology and astronomy; it is primarily geologists who explore the evolution of other planetary bodies, such as the Moon, Mars and Venus. Our curriculum reflects various interdisciplinary links and provides the foundation needed to pursue a wide variety of career goals. Career options include teaching, graduate school/research, and employment as a professional geologist (associated with a private business, an environmental firm, or as a consultant for a federal or state agency).

The B.S. in Geology/Environmental Track is designed for students who wish to pursue a career in the environmental field. In spite of our brief residence time our presence has had a significant, and in some cases negative, impact upon our environment. Geologists play a key role in dealing with environmental issues, and our Environmental Track prepares students to address various environmental problems. Graduates from this track will be prepared for direct entry into jobs with federal or state agencies and private environmental consulting firms, as well as postgraduate studies.

The Minor in Geology is designed for students who desire some background in Geology, in conjunction with a degree in Business, or one of the social or physical sciences. The department also serves public education by preparing qualified and certified teachers in the field of Earth and Space Sciences and General Science Education.

2. Summary of Changes

2 (a) New Program:

Bachelor of Science—Geology/Geology Track

Liberal Studies: As outlined in Liberal Studies section, with the following specifications: **Mathematics:** MATH 121 or 123 **Natural Science:** CHEM 111-112 or CHEM 113-114 **Liberal Studies Electives:** MATH 122 or 124, no courses with GEOS prefix			**56**
Major:			**29**
Geoscience Core:			
GEOS 121	Physical Geology	3sh	
GEOS 122	Physical Geology Laboratory	1sh	
GEOS 131	Historical Geology	3sh	
GEOS 132	Historical Geology Laboratory	1sh	
GEOS 220	Mineralogy	3sh	
GEOS 320	Igneous and Metamorphic Petrology	3sh	
GEOS 325	Structural Geology	3sh	
GEOS 326	Field Geology	3sh	
GEOS 380	Research Techniques in Geoscience	2sh	
GEOS 411	Sedimentary Petrology	3sh	
GEOS 412	Stratigraphy	3sh	
GEOS 480	Geoscience Seminar	1sh	
Requirements for the Geology Track			**23-24**
PHYS111-121	Physics I Lecture/Lab	4sh	
PHYS112-122	Physics II Lecture/Lab	4sh	
GEOS330	Paleontology	3sh	
GEOS362	Plate Tectonics	3sh	
Controlled Electives: Choose three courses from among the following: MATH 216, MATH 241, GEOG 316, GEOG 415, GEOS courses 300 or above (1)		9-10	
Other Requirements:			**0-6**
Foreign Language Intermediate-Level (2, 3)		0-6sh	
Free Electives:			**9-16**
Total Degree Requirements:			**124**

(1) Up to 3 credits of a summer field camp, internship or independent study, all of which must be approved by the department, may be applied to controlled electives.
(2) Intermediate-level foreign language may be included in liberal studies electives
(3) Six credits of computer language may substitute for the foreign language requirement: COSC110 and 310 (recommended), or other higher-level COSC courses with department permission in consultation with the Computer

Science Department.

Bachelor of Science—Geology/Environmental Track

Liberal Studies: As outlined in Liberal Studies section, with the following specifications: **56**
Mathematics: MATH 121 or 123
Natural Science: CHEM 111-112 or CHEM 113-114
Liberal Studies Electives: MATH 122 or 124, PHYS 111, no course with GEOS prefix

Major: **29**

Geoscience Core:

GEOS 121	Physical Geology	3sh
GEOS 122	Physical Geology Laboratory	1sh
GEOS 131	Historical Geology	3sh
GEOS 132	Historical Geology Laboratory	1sh
GEOS 220	Mineralogy	3sh
GEOS 320	Igneous and Metamorphic Petrology	3sh
GEOS 325	Structural Geology	3sh
GEOS 326	Field Geology	3sh
GEOS 380	Research Techniques in Geoscience	2sh
GEOS 411	Sedimentary Petrology	3sh
GEOS 412	Stratigraphy	3sh
GEOS 480	Geoscience Seminar	1sh

Requirements for the Environmental Track **25-26**

PHYS 121	Physics I Lab	1sh
BIOL 111	Principles of Biology I	4sh
GEOS 310	Environmental Geology	3sh
GEOS 331	Hydrogeology	3sh
GEOS 332	Geochemistry	3sh

Controlled Electives (1, 2): 11-12
Select three courses (3)

Biology Electives

BIOL 112	Principles of Biology II	4sh
BIOL 250	Principles of Microbiology	3sh
BIOL 321	Environmental Protection I	3sh
BIOL 322	Environmental Protection II	3sh
BIOL 362	Ecology	3sh

Chemistry Electives

CHEM 231	Organic Chemistry I	4sh
CHEM 233	Organic Chemistry II	4sh
CHEM 322	Instrumental Analysis	4sh
CHEM 323	Analytical Methods	4sh
CHEM 341	Physical Chemistry I	4sh

Allied Fields

GEOS courses 300 or above (4)		3sh
COSC 250	Introduction of Numerical Methods	3sh
GEOG 316	Introduction to Geographic	

	Information Systems	3sh
GEOG 415	Remote Sensing	3sh
MATH 216	Probability and Statistics for Natural Sciences	4sh
PHYS 112-122	Physics II Lecture/Lab	4sh
SAFE 101	Introduction to Occupational Safety and Health	3sh

Other Requirements: **0-6**

Foreign Language Intermediate-Level (5, 6) 0-6sh

Free Electives: **7-14**

Total Degree Requirements: **124**

(1) Some courses have prerequisites that may be taken as free electives
(2) Students who plan to pursue graduate-level studies are encouraged to enroll in PHYS112-122.
(3) Select one each from the Biology and Chemistry Electives lists, and a third from any of the three elective lists.
(4) Up to 3 credits of a summer field camp, internship or independent study, all of which must be approved by the department, may be applied to controlled electives.
(5) Intermediate-level foreign language may be included in liberal studies electives
(6) Six credits of computer language may substitute for the foreign language requirement: COSC110 and 310 (recommended), or other higher-level COSC courses with department permission and in consultation with the Computer Science Department.

2 (b). Comparisons of current and proposed programs

Bachelor of Science—Geology
(Current)

Liberal Studies: As outlined in Liberal Studies 56-57 section with the following specifications: **Mathematics:** MATH121 or 123 **Natural Science:** CHEM111-112 or CHEM113-114 **Liberal Studies Electives:** MATH122 or MATH124, no courses with GEOS prefix	**56-57**
Major:	**44**
Required courses	
GEOS121 Physical Geology	3sh
GEOS122 Physical Geology Laboratory	1sh
GEOS131 Historical Geology	3sh
GEOS132 Historical Geology Laboratory	1sh
GEOS320 Igneous and Metamorphic Petrology	3sh
GEOS321 Mineralogy	3sh
GEOS325 Structural Geology	3sh
GEOS326 Field Geology or summer field course (offered by other universities) (1,2)	3sh
GEOS330 Paleontology	3sh
GEOS362 Plate Tectonics	3sh
GEOS380 Research Techniques in Geoscience	2sh
GEOS411 Sedimentary Petrology	3sh
GEOS412 Stratigraphy or GEOS 327 Geomorphology	3sh
GEOS480 Geoscience Seminar	1sh
Controlled Electives: GEOS courses 300 or above	9sh
Other requirements	**8-14**
Additional Science:	
PHYS111-112 Physics I Lecture/Lab	4sh
PHYS 111-112 Physics II Lecture/Lab	4sh
Foreign Language Intermediate-Level (3, 4)	0-6sh
Free Electives	**9-16**
Total Degree Requirements:	**124**

(1) Summer field camp in Geology (5-9sh) is strongly recommended.
(2) A maximum of 6 sh from approved summer field camp may apply to a required core and controlled electives.
(3) Intermediate-level Foreign Language may be included in Liberal Studies electives.
(4) 6 sh of computer languages substitute for the foreign language requirement: COSC110 and COSC310 (recommended), or other higher-level

Bachelor of Science—Geology/Geology Track
(Proposed)

Liberal Studies: As outlined in Liberal Studies section, with the following specifications: **Mathematics:** MATH121 or 123 **Natural Science:** CHEM111-112 or CHEM113-114 **Liberal Studies Electives:** MATH122 or 124, no courses with GEOS prefix	**56**
Major:	**29**
Geoscience core	
GEOS121 Physical Geology	3sh
GEOS122 Physical Geology Laboratory	1sh
GEOS131 Historical Geology	3sh
GEOS132 Historical Geology Laboratory	1sh
GEOS220 Mineralogy	3sh
GEOS320 Igneous and Metamorphic Petrology	3sh
GEOS325 Structural Geology	3sh
GEOS326 Field Geology	3sh
GEOS380 Research Techniques in Geoscience	2sh
GEOS411 Sedimentary Petrology	3sh
GEOS412 Stratigraphy	3sh
GEOS480 Geoscience Seminar	1sh
Requirements for the Geology track	**23-24**
PHYS 111-121 Physics I Lecture/Lab	4sh
PHYS 111-121 Physics II Lecture/Lab	4sh
GEOS330 Paleontology	3sh
GEOS362 Plate Tectonics	3sh
Controlled Electives: Choose three courses from among the following: MATH216, GEOG 316, GEOS courses 300 or above (1)	9-10sh
Other requirements	**0-6**
Foreign Language Intermediate-Level (2,3)	0-6sh
Free Electives	**9-16**
Total Degree Requirements:	**124**

(1) Up to 3 credits of a summer field camp, internship or independent study, all of which must be approved by the department, may be applied to controlled electives.
(2) Intermediate-level foreign language may be included in liberal studies electives
(3) Six credits of computer language may substitute for the foreign language requirement: COSC110 and 310 (recommended), or other higher-level COSC courses with department permission in consultation

COSC courses with department permission in consultation with the Computer Science Department.

Bachelor of Science—Environmental Geoscience

Liberal Studies: As outlined in Liberal Studies section with the following specifications: **Mathematics:** MATH121 or 123 **Natural Science:** CHEM111-112 or CH113-114 **Liberal Studies Electives:** MATH122 or 124, no courses with GEOS prefix	**56-57**
Major:	**29**
Required Courses:	
GEOS121 Physical Geology	3sh
GEOS122 Physical Geology Laboratory	1sh
GEOS131 Historical Geology	3sh
GEOS132 Historical Geology Laboratory	1sh
GEOS310 Environmental Geology	3sh
GEOS320 Igneous and Metamorphic Petrology	3sh
GEOS321 Mineralogy	3sh
GEOS325 Structural Geology	3sh
GEOS331 Hydrogeology	3sh
GEOS332 Geochemistry	3sh
GEOS380 Research Techniques in Geoscience	2sh
GEOS480 Geoscience Seminar	1sh
Other requirements:	**23-30**
Biology Sequence:	
BIOL111 Principles of Biology I	4sh
BIOL250 Principles of Microbiology	3sh
Chemistry Sequence:	
CHEM231 Organic Chemistry I	4sh
CHEM323 Analytical Methods	4sh
Controlled Electives:	8-9

Bachelor of Science—Geology/Environmental Track

Liberal Studies: As outlined in Liberal Studies section with the following specifications: **Mathematics:** MATH121 or 123 **Natural Science:** CHEM111-112 or CHEM113-114 **Liberal Studies Electives:** MATH122 or 124, PHYS 111, no courses with GEOS prefix	**56**
Major:	**29**
Geoscience Core:	
GEOS121 Physical Geology	3sh
GEOS122 Physical Geology Laboratory	1sh
GEOS131 Historical Geology	3sh
GEOS132 Historical Geology Laboratory	1sh
GEOS220 Mineralogy	3sh
GEOS320 Igneous and Metamorphic Petrology	3sh
GEOS325 Structural Geology	3sh
GEOS326 Field Geology	3sh
GEOS380 Research Techniques in Geoscience	2sh
GEOS411 Sedimentary Petrology	3sh
GEOS412 Stratigraphy	3sh
GEOS480 Geoscience Seminar	1sh
Requirements for the Environmental Track	**25-26**
PHYS 121 Physics I Lab	1sh
BIOL111 Principles of Biology I	4sh
GEOS310 Environmental Geology	3sh
GEOS331 Hydrogeology	3sh
GEOS332 Geochemistry	3sh
Controlled Electives (1, 2):	11-12sh
Select three courses (3)	
Biology Electives	
BIOL112 Principles of Biology II	4sh
BIOL250 Principles of Microbiology	3sh
BIOL321 Environmental Protection I	3sh
BIOL322 Environmental Protection II	3sh
BIOL362 Ecology	3sh

BIOL112 Principles of Biology II	4sh
BIOL272 Conservation of Plant and Animal Resources	3sh
BIOL321 Environmental Protection I	3sh
BIOL362 Ecology	3sh
CHEM322 Instrumental Analysis	4sh
CHEM341 Physical Chemistry I	4sh
COSC110 Problem Solving and Structured Programming	3sh
COSC250 Introduction of Numerical Methods	3sh
COSC310 Data Structures	3sh
GEOG314 Map and Photograph Interpretation	3sh
GEOG343 Geography of Fresh Water Resources	3sh
GEOG415 Remote Sensing	3sh
GEOG417 Technical Issues in GIS	3sh
GEOS326 Field Geology	3sh
GEOS327 Geomorphology	3sh
GEOS411 Sedimentary Petrology	3sh
GEOS412 Stratigraphy	3sh
GEOS432 Coal Geology	3sh
GEOS440 Subsurface Geology	3sh
PHYS111-121 Physics I Lecture/Lab (5)	4sh
PHYS112-122 Physics II Lecture/Lab (5)	4sh
One summer field course:	3sh
GEOS336 Geology of the Northern Rockies	3sh
GEOS337 Geology of Newfoundland	3sh
GEOS338 Geology of the American Southwest	3sh
GEOS441 Carbonate Geology—Florida (GEOS 441 incorrectly reads as 'GEOS 331' in current catalog)	3sh
Foreign Language Intermediate Level (2,3)	0-6sh
Free Electives	**8-16**
Total Degree Requirements:	**124**

(1) Students who plan to pursue and advanced degree in environmental geoscience are strongly advised to take the physics sequence as their controlled electives.
(2) Intermediate-level foreign languages may be included in Liberal Studies electives (3 sh).
(3) 6 sh of computer language may substitute for the foreign language requirement: COSC110 and

Chemistry Electives

CHEM231	Organic Chemistry I	4sh
CHEM233	Organic Chemistry II	4sh
CHEM323	Analytical Methods	4sh
CHEM341	Physical Chemistry I	4sh
CHEM322	Instrumental Analysis	4sh

Allied Fields

GEOS courses 300 or above (4)	3sh
COSC250 Introduction of Numerical Methods	3sh
GEOG316 Introduction to Geographic Information Systems	3sh
GEOG415 Remote Sensing	3sh
MATH216 Probability and Statistics for Natural Sciences	4sh
SAFE101 Introduction to Occupational Safety and Health	3sh
PHYS112-122 Physics II Lecture/Lab	4sh
Other requirements:	**0-6**
Foreign Language Intermediate-Level (5,6)	0-6sh
Free Electives	**7-14**
Total Degree Requirements:	**124**

(1) Some courses have prerequisites that may be taken as free electives
(2) Students who plan to pursue graduate-level studies are encouraged to take PHYS112-122.
(3) Select one each from the Biology and Chemistry electives lists, and a third from any of the three elective lists.
(4) Up to 3 credits of a summer field camp, internship

COSC310 (recommended), or other higher-level COSC courses with department permission in consultation with the Computer Science Department.

or independent study, all of which must be approved by the department, may be applied to controlled electives.
(5) Intermediate-level foreign language may be applied to Liberal Studies Electives (3 sh).
(6) Six credits of computer language may substitute for the foreign language requirement: COSC110 and 310 (recommended), or other higher-level COSC courses with department permission in consultation with the Computer Science Department.

2 (b). Highlights of program changes

Current Program	Proposed Program
1. BS—Geology and BS—Environmental Geoscience	BS-Geology— Geology Track and Environmental Track • We have combined our two Geology degrees into a single degree program with different tracks. This strategy emphasizes the similarities between the two programs, and adds flexibility (facilitates future potential program changes, i.e., the addition of other tracks, as faculty interests and professional needs change).
2. BS—Geology, Geology Track - changes in the program	• Compared to our existing program, BS—Geology, the proposed changes are relatively few. • We now require Field geology, since this gives students needed field experience in east coast Geology, which is crucial for students who will largely be working on the east coast following graduation. • MATH 216 (Prob. and Stats.) and GEOG 316 (Intro. dot GIS) have been added as controlled electives. Data analysis and GIS skills are rapidly becoming essential tools for geologists. Students now earn credit toward the degree for enrollment in such coursework.
3a. BS—Geology, Environmental Track - changes in the program	• The new Environmental Track offers some significant and substantial improvements over the existing the BS-Environmental Geoscience. • In brief, we have added coursework that is crucial for success in graduate school, which is increasingly becoming essential for advancement in the Environmental field. Presently students are missing essential components of the Geology GREs, and those students attending graduate school are finding it necessary to make up GOS coursework that most other universities have added to their Environmental Geoscience Programs. This essential coursework is added to the new track as a Geoscience Core.

This core summarizes the essential coursework needed to practice Environmental Geoscience, and/or to meet with success in a graduate-level Geoscience program.
• Since the Environmental field has grown and diversified, we have also modified and augmented our controlled electives section, with the added intent of requiring students to sample various related (no-GEOS) disciplines of interest.

3b. Hi-lights of changes in the Environmental Program:

Geoscience Core
• We have added Stratigraphy, Sedimentary Petrology as required courses in the new Environmental Track.
• This move is in response to professional needs in the Environmental field. Environmental geology involves the reconstruction of paleoenvironments and paleogeography. An understanding of sedimentary rocks, landforms and stratigraphic principles is thus central to geo-environmental analysis. Employers (and graduate schools) are looking for students with such a foundation in geology. To remain competitive in the modern geoscience job market it is crucial that students obtain this geologic background.
•GEOS 326 has been added to the program. Field geology is involves the hands-on application of geoscience principles taught within the program. Employers need broadly trained scientists that have the ability to identify and interpret geologic outcrops and GEOS 326 provides this crucial experience.

Other requirements:

Biology Sequence:
BIOL111 Principles of Biology I
BIOL250 Principles of Microbiology
Chemistry Sequence:
CHEM231 Organic Chemistry I
CHEM323 Analytical Methods

Other requirements:
Foreign Language Intermediate-Level (1,2)

• We maintain BIOL 111 as a required course for the track. All other BIOL and CHEM courses are moved from 'Other requirements' to controlled electives. In the new program, students are required to select at least one course from the BIOL and CHEM electives list. Many employers are also looking for breadth in other disciplines, and in many cases prefer candidates with exposure to GIS or Safety science. In the revised program we enforce breadth by requiring students to select courses from several disciplines. Our new program allows more flexibility and student choice, and will thus allow students to build on a foundation in the geosciences and explore associated fields of interest.

Controlled Electives BIOL 272 Conservation of Plant and Animal Resources	**Controlled Electives** •BIOL 250 and 322 replace BIOL 272 as controlled electives. BIOL 250 and 322 are more appropriate than BIOL 272 for environmental geoscience majors.
COSC110 Problem Solving and Structured Programming COSC250 Introduction to Numerical Methods COSC310 Data structures	• COSC250 is retained as a controlled elective. COSC 110 and 310 are part of our language option listed under 'other requirements' - footnotes
GEOS 316, 327, 411	• These have been moved into the required course section, as noted above.
GEOS432 Coal Geology	• This course is inactive
GEOS336, 337, 338, 440, 441	• These are retained as controlled electives (subsumed under "GEOS courses 300 or above")
	• SAFE 101 has been added to the list of controlled electives. A growing employment trend in the environmental sciences is to seek out students with a geoscience/safety science background. Addition of SAFE 101 allows students to explore this option.
	•MATH216 has been added as a controlled elective. The geosciences are a quantitative science, and MATH 216 will be extremely valuable to students who will perform data analysis.
	•Summary: The revised program gives students more choice and flexibility. The program offers a solid geoscience foundation and students can build on this foundation to design a program that more closely prepares them to meet their career goals. In addition, the added flexibility will allow students to respond to ever-changing employment trends

3. Rationale for changes

It has been several years since the Geoscience department has visited the issue of curriculum. With the addition of several new faculty, and the ever-changing field of environmental geology, we desire to make needed changes to our program. Our proposed changes are important, and urgently needed, especially in regard to our Environmental program, as a MS—Geoscience is now nearly essential for post entry-level positions in the environmental field. Indeed, most of our students apply to attend a graduate geoscience program within two years of graduation. It is thus crucial that our students obtain the necessary foundation required not only for immediate employment in an environmental firm, but also for entry and success in graduate-level Geoscience programs.

Our strategy is to collapse our existing programs into a single degree program with different tracks. Our new program emphasizes the commonality of various disciplines in the Earth Sciences by specifying a core curriculum to be completed by both our Geology and Environmental majors. This approach provides a more accurate representation of the foundational coursework expected of geoscience majors nationwide. It also adds flexibility for the department: as our research facilities expand and the composition of our faculty changes additional geoscience tracks may be added.

BS—Geology/Geology Track

The BS—Geology/Geology Track is a modification of our existing BS—Geology degree program. As the field of Geology has become more quantitative, computer applications and data analysis skills have become increasingly important for competition in the job market, and for entry into graduate school. To encourage students to take courses in statistics and in Geographic Information Systems (GIS), we have added MATH 216 and GEOG 316 as controlled electives to our BS—Geology/Geology Track. Employers and graduate schools are also looking for students with considerable field experience. For this reason we have deleted the option of substituting a summer field camp for Field Geology, GEOS 326. Instead, students will now be required to take GEOS 326, which gives students training in eastern U.S. field geology. This field experience is invaluable as many students seek employment in the eastern U.S. Our students will continue to receive credit for enrollment in summer field camp (credited towards their controlled electives), and our department will continue to strongly encourage students to enroll in such courses to augment their field experiences.

BS—Geology/Environmental Track

The BS—Geology/Environmental Track is a modification of our existing BS—Environmental Geoscience degree. Our new degree program emphasizes a core curriculum, which covers the foundational aspects of the Earth Sciences. The need for such changes has arisen due to recent changes in the profession of environmental geoscience. First, as the number of people entering the Environmental Geoscience field grows, the need for graduate-level work in Geology has increased. Without an MS—Geoscience, employees are unlikely to reach beyond entry-level positions. Second, the Environmental field has expanded beyond the sub-disciplines of chemistry and biology. For example, in the current environmental job market, geoscience majors with a background in GIS, statistics, or the safety sciences are highly desirable. To use these skills effectively, students require training in the foundational aspects of Geology, especially field geology, and those disciplines related to sediments and sedimentary environments. Finally, as noted above, an MS—Geoscience degree is becoming almost universally essential for employees to advance beyond entry-level positions. Our original program was designed to fulfill an employment niche that, while important a decade or two ago, is not entirely representative of the needs of environmental employers today. Our new program better reflects employment trends and the rising need of our graduates to be prepared for success in Geoscience graduate programs.

To ensure that students receive the requisite background for either immediate employment, or entry into a geoscience graduate program, we have established a Geoscience core curriculum. This core includes the components of Sedimentary Petrology, Stratigraphy and field geology, the contents of which are crucial for an understanding/interpretation of modern and ancient environments. In addition to course content, these upper-division courses comprise most of our departmental 'cap-stone' courses. It is within these courses, (after students have completed essential freshman and sophomore coursework) where the skills of scientific investigation are most explicitly practiced in our program. Students must acquire these skills to be successful both as professional environmental geologist and as graduate student. As many graduate schools now require some physics background for admission we have also added PHYS 111/121. To make room for these courses some requirements in BIOL and CHEM have been moved to controlled electives. To respond to the recently developed and above-mentioned needs in the environmental field we have also added (to our 'Allied Fields' electives section) MATH 217 (Probability and Statistics), GEOG 316 (Introduction to Geographic Information Systems) and SAFE 101 (Introduction to Occupational Safety and Health).

To make these changes we have cut into the biology and chemistry requirements of our existing program. This does not mean that we believe such courses are unimportant. In the balance, however, we view it as far more crucial that students attain the skills and background needed to succeed in the geoscience profession. Our department nevertheless desires that students sample biology and/or chemistry coursework beyond the introductory level. In the design of the controlled electives we enforce such breadth by requiring students to select at least one course from a list of chemistry and biology electives. Student are then allowed to select a third course, where they may follow up on their interests in chemistry, biology, or a course from our Allied Field electives list. With these changes students obtain the geologic background essential for employment in a broad array of environmental disciplines, as well as entry into graduate school. In an undergraduate program it is impossible to train students for expertise an several subdisciplines, however, with the revised controlled electives list students are able to explore a variety of avenues of specialization in the environmental field. Students can utilize their free electives if they desire to further pursue a particular sub-discipline.

Part III. Implementation

1. Q: How will the proposed revision affect students already in the existing program?
A: Students currently enrolled in the program will be unaffected—their requirements will not be changed from the requirements in effect when they declared a geology major. All current students will nevertheless be encouraged to follow the new program as closely as possible.

2. Q: How will the proposed revision affect faculty teaching loads?
A: Faculty teaching load will not be affected.

Q: Have additional faculty been authorized?
A: No additional faculty have been authorized.

Q: If you are adding requirements, how will adequate seats be provided?
A: Seats are available for all upper division courses that have been added to the program.

3. Are other resources adequate?
A: Yes.

4. Q: Do you expect and increase or decrease in the number of students as a result of these revisions?
A: No change in enrollment is anticipated.

Part IV. Course Proposals
Not applicable

Part V. Letters of Support

IUP Department Chair Letters Attached
Dr. Gerald Buriok, Chair, Department of Mathematics
Dr. Robert Sechrist, Chair, Department of Geography and Regional Planning
Dr. Lon H. Ferguson, Chair, Department of Safety Sciences

Professor Putirka:

In response to your memo stating the Geoscience Department wishes to add MA217 Probability and Statistics to the list of controlled electives for the Geology and Environmental degrees, I want to inform you the Mathematics Department supports your proposal. In fact, some of your students might benefit by taking the four credit course, MA216 Probability and Statistics for Natural Sciences, which has calculus as a prerequisite and is somewhat more rigorous.

The Mathematics Department offers approximately ten sections of MA217 each semester and four during the summer. We should be able to accomodate changes in enrollment patterns due to your listing this course as a controlled elective.

Thank you for informing me of your proposal. Rest assured we are anxious to accomodate your students and continue the excellent working relationship our departments have developed over the years.

Gerald Buriok

-----Original Message-----
From: Keith Putirka <kputirka@grove.iup.edu>
To: Karen Rose Cercone <kcercone@grove.iup.edu>; Connie Sutton <cjsutton@kputirka.gs.iup.edu>; Darlene S. Richardson <drchrdsn@grove.iup.edu>; John Taylor <jftaylor@kputirka.gs.iup.edu>; Frank Hall <FWHall@grove.iup.edu>; Joe Clark <jcclark@grove.iup.edu>
Cc: jburiok@kputirka.gs.iup.edu <jburiok@kputirka.gs.iup.edu>
Date: Tuesday, August 08, 2000 11:53 AM
Subject: Geoscience Prog. Rev.

>Gerald- The Geoscience Dept. will be submitting a program revision for our
>Geology and Environmental degrees (see attachment). We would like to add
>MA217 as a controlled elective. Could you please write a letter regarding
>your thoughts on this addition, and the potential impact on your dept.
Thank
>you.
>
>Cheers,
>
>Keith Putirka
>Geoscience Dept.

TO: Keith Putirka; Geoscience Dept.
From: Bob Sechrist, Geography & Regional Planning Dept.
Subject: Program Revision
Date: August 12, 2000

The department of Geography & Regional Planning fully supports the inclusion of GE316, GE415, and GE417 into the Geoscience controlled elective listing. These technical courses represent a body of knowledge crucial to geologic investigation, exploration, and information transfer. We also recommend the inclusion of GE213: Introduction to Cartography to your controlled elective list.

The department of Geography & Regional Planning already offers a special section of GE316 for natural science majors which we recommend to your majors as well. We have already anticipated a growing need for these courses and have planned for expanding the number of available sections over the next few semesters, so we anticipate no significant unanticipated impacts on our department and its other offerings.

Hi Keith:

This email is in support of the Geoscience proposed changes, specifically the addition of SAFE 101 and SAFE 210 as controlled electives within the BS Geology/Environmental Track.

Dr. Lon H. Ferguson
Chairperson - Safety Sciences
116 Johnson Hall
Indiana, PA 15705
(724) 357-3018
----- Original Message -----
From: Keith Putirka <mailto:kputirka@grove.iup.edu>
To: ferguson@grove.iup.edu <mailto:ferguson@grove.iup.edu>
Sent: Wednesday, October 18, 2000 1:56 PM
Subject: Prog. Revision - GEOS

Dear Dr. Ferguson,

The Geoscience department is currently undertaking a revision of its BSGeology and BSEnvironmental Geoscience. Please note that in our new Environmental Track, several BIOL and CHEM courses are listed as controlled electives (compare to the existing Environmental Geoscience degree program) and courses from SAFE have been added as controlled electives. For the purposes of a UWUCC review, we would appreciate your comments regarding our revisions. Thank you.

Keith Putirka
Geoscience Dept.