01/30/11 → UWUCC

Revision

Course Number and/or Title Change

Catalog Description Change

Current Course prefix, number and full title

Proposed course prefix, number and full title

This course is also proposed as a Liberal Studies Course

This course is also proposed as an Honors College Course

Other (e.g., Women's Studies, African)

3. Program Proposals

New Degree Program

Program Title Change

Program Revision

Other

Awards Track

Current program name

Proposed program name

Department Curriculum Committee Chair(s)

11/3/10

College Dean

Part II. Description of Curriculum Change

1. Catalog Description and List of Courses and Credits

historic coal and natural gas producing region with the potential for significant growth in the natural gas industry due to development of the Marcellus Shale. The Energy Resources Track will prepare students for direct entry into the energy industry with a focus on the discovery and development of energy resources and geophysical exploration techniques.

The B.S. in Education, Earth and Space Science prepares students to become certified middle and high

List of courses and credits for the proposed Energy Resources Track:

Bachelor of Science - Geology/Energy Resources Track

Liberal Studies Requirements: **50**
Liberal Studies: As outlined in Liberal Studies section with the following specifications:
Mathematics: MATH 121
Natural Science: PHYS 111-121 and CHEM 111 (or CHEM 113)
Social Science: ECON 121
Liberal Studies Electives: 4cr., MATH 122, no courses with GEOS prefix

Major:
Required Courses: **59**

GEOS 201	Foundations of Geology	4cr
GEOS 202	Quantitative Methods in the Geosciences	2cr
GEOS 203	Surficial Processes	4cr
GEOS 323	Geophysics	4cr
GEOS 324	Geology of Oil and Gas	4cr
GEOS 352	Sedimentation and Stratigraphy	4cr
One of the following:	GEOS 303, 401-402, 403-404, 405-406, 407-408 (1)	4cr
GEOS 470	Research Methods in the Geosciences	2cr
GEOS 480	Geoscience Seminar	2cr
PHYS 112-122	Physics I Lecture and Lab *or*	
	CHEM 112 General Chemistry II (or CHEM 114)	4cr

Controlled Electives: 25cr
Select 25cr from the following list: (2)
One 100- or 200-level GEOS course
Any 300-level or 400-level GEOS course
Foreign Language Intermediate-Level
CHEM 112 (if not taken above), 231, 232, 322, 323, 341
ECON 122, 331, 361
GEOS 415, 440

MATH 216 or 217, 241
PHYS 112-122 (if not taken above), 342
COSC 110, 210, 250, 310, 362

Free Electives: **11**

Total Degree Requirements: **120**

(1) Up to 4cr of a summer field camp, internship, or independent study, all of which must be approved by the department, may substitute for GEOS 303 Field Geology or a Geoscience Field Workshop

(2) Only one Geoscience Field Workshop (including prerequisite 1cr Seminar) may be applied toward controlled

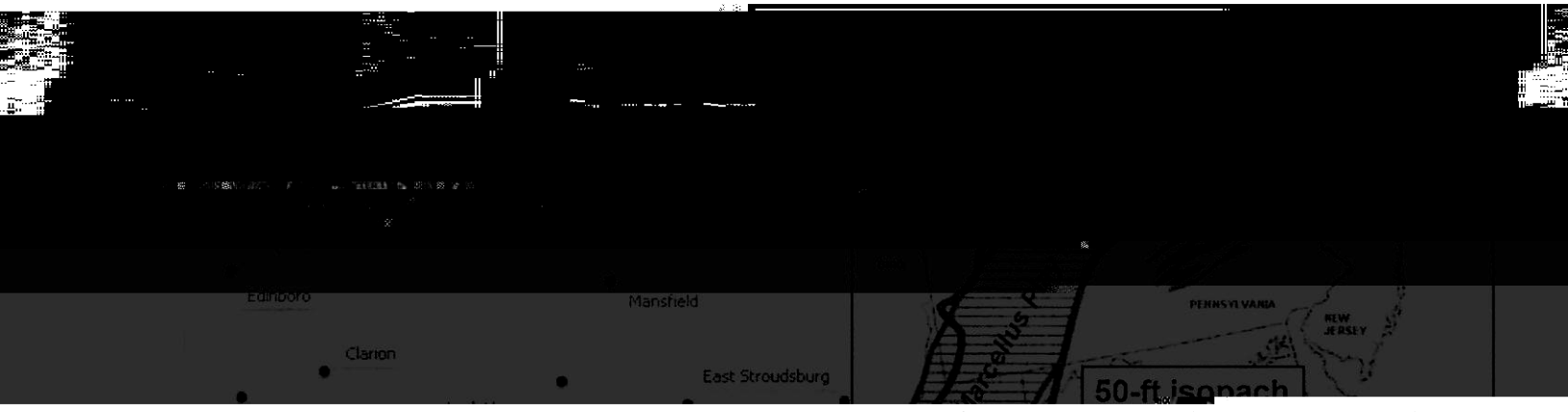
2. Track Description and Rationale

Description: The B.S. in Geology/Energy Resources Track is designed for students who wish to pursue careers in the energy sector. As the world's energy demands continue to grow, nations face the challenge

GEOS 303, 401-402, 403-404, 405-406, or 407-408: A field component is essential to a modern degree program; these courses represent our current field-based offerings. GEOS 303 Field Geology is a locally oriented field courses; all others are off-campus field workshops and preliminary seminar courses. Majors in the Geology and Environmental Tracks are similarly required to take one of these options.

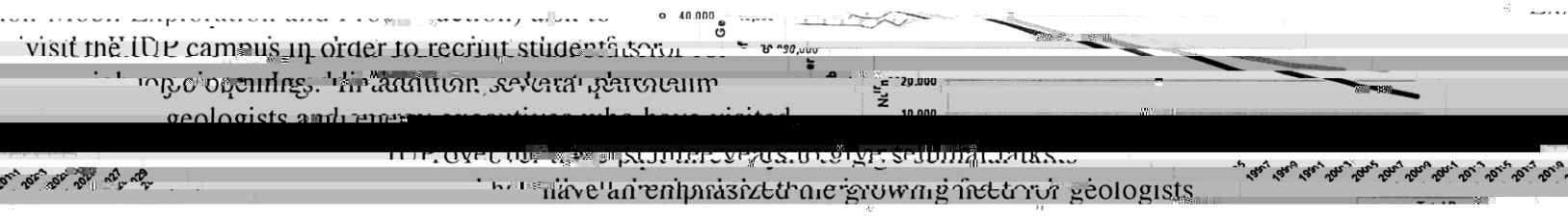
GEOS 470, GEOS 480: These two courses form the basis of students' research experience and are required by all students currently in the Geology and Environmental Tracks. GEOS 470 Research Methods in the Geosciences provides a fundamental understanding of the scientific method, hypothesis

[illegible] resources or unconventional natural gas and [illegible]



[illegible] duced by the American Geologic Institute concluded, "The supply of geologists is not expected to meet the demand for geologists over the next 20 years. Even with an optimistic 3 percent increase in graduate geoscience students by 2020 the [illegible]

[illegible]



[illegible] visit the IUP campus in order to recruit students for [illegible] job openings. In addition, several petroleum geologists and energy executives who have visited IUP over the past three years to give seminars have an enhanced [illegible] have an enhanced [illegible] growing [illegible] of geologists

At the same time as the need for professional oil and gas geologists is growing, the age distribution of

Yes; there are no required facilities or resources not already available. We anticipate allocation of the standard office, laboratory space, and start-up funds for the new faculty member hired in support of this new track.

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?
We anticipate an increase in the number of students majoring in the Geosciences, although the magnitude of that increase is impossible to predict. At present, we have the ability to increase the number of majors [redacted] in the department by 50% or more without impacting our ability to deliver required courses and maintain a significant contribution to the liberal studies program.

5. Intended implementation date?
Fall 2011.

Part IV. Periodic Assessment
The Department of Geoscience has in place an assessment plan approved by the IUP curriculum process during our last major curriculum revision (2007-2009). This approved assessment plan is summarized below.

1. Describe the evaluation plan. Include evaluation criteria. Specify how student input will be incorporated into the evaluation process.
During retreats and planning sessions conducted as part of our five-year reviews in 2004-2005 and 2009-2010, the Geoscience Department came to the following consensus on the goals for students in our three major programs (Geology, Environmental Geology & Earth & Space Science Education). These goals are:

1. Effective oral and written communication skills:
    a. giving a research talk (for geology/environmental majors)
    b. teaching a lesson plan (for education majors)
2. Quantitative skills appropriate for earth science problems
3. Professional skills need for field, lab and computer tasks:
    a. identify common rocks and minerals
    b. keep a detailed and accurate field notebook
    c. use a Brunton Compass
4. Knowledge of the critical content areas:
    a. plate tectonic theory
    b. organic evolution
    c. environmental issues

Our current methods of student learning outcomes assessment have been streamlined and simplified to focus primarily on the measurement of skills and content knowledge at the freshman-level, and then compare those to measurements of the same skills and knowledge at the junior and senior levels. This

learning outcomes and facilitate long-term data acquisition. Education students who are not required to take GEOS 480 Geoscience Seminar will initially be evaluated for the same set of desired skills based on

their student teaching experiences as evaluated by themselves, their faculty supervisors and their cooperating teachers. The department will work to establish an evening equivalent to Geoscience Day for education students, where they can present a lesson that they taught to actual students in their classrooms for faculty rubric evaluation.

2. Quantitative skills appropriate for earth science problems will be assessed for freshmen in their required GEOS 202 Quantitative Methods in the Geosciences course and then again for juniors and seniors in GEOS 470 Research Methods in the Geosciences, as well as GEOS 480 Geoscience Seminar. Learning outcomes will be assessed through problem-solving modules and applied research techniques.

3. Professional skills will be directly measured and evaluated in courses as follows:

Rock & Mineral ID: GEOS 201 Foundations of Geology (freshmen), GEOS 470 Research Methods in the Geosciences (juniors)

Field Notebooks: GEOS 203 Surficial Processes (freshmen) & GEOS 303 or 401-408 (Field

Geology or Field Workshops; juniors and seniors)

Brunton compass use: GEOS 201 Foundations of Geology (freshmen), GEOS 470 Research Methods in the Geosciences (juniors)

Part V. Course Proposals
The Energy Resources Track will require the addition of two new courses, GEOS 323 Geophysics and GEOS 324 Geology of Oil and Gas. Proposals for these two new courses are attached.

Part VI. Letters of Support or Acknowledgment
The Geoscience Department has contacted the following departments and programs requesting letters of support or acknowledgment for the new Energy Resources Track. Letters to departments and received responses are attached.

Department of Mathematics: no response received at time of submission

Department of Chemistry: no response received at time of submission
Department of Physics: received letter of support
Department of Economics: received letter of support

Track prepares students to solve 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 B.S. in Education degree with a major in Earth and Space Science prepares students to become certified teachers in Pennsylvania and other states. Earth and Space Science teachers in middle and high school grades teach subjects that require a broad and solid foundation in science. Coursework includes study of geology, meteorology, oceanography, and astronomy. A basic understanding of the cognate sciences, biology, chemistry, physics, and mathematics is also an essential part of the major. Courses in pedagogy, including the teaching of English language learners and students with special needs,

January 22, 2011

To: Dr. Michael Poage

From: John Woolcock, Chair, IUP Chemistry Department

Subject: GEOS Energy Resources Track

The following recommendation was made by the Chemistry Department Curriculum Committee: "The Department of Chemistry supports the inclusion of CHEM 111/112 or CHEM113/114 as part of the liberal studies requirements for the Proposed new Energy Resources Track in the Geoscience Department B.S.

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The Department Curriculum Committee of the Department of Computer Science has considered the proposed changes to the Geoscience curriculum and supports them. We recognize that each department is in the best position to evaluate its curriculum needs and should therefore be accorded the prerogative to make such changes. However, we do wish to emphasize to Geosciences that in today's information technology-based world it would be extremely beneficial for their majors to

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Subject: **Requesting a letter of support for new Geoscience track**
From: Michael A Poage
Date: 10/18/10 01:48 PM
To:

Mathematics

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Subject: Requesting letter of support for new Geoscience Track

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Subject: **Re: Requesting letter of support for new Geoscience track and course**
From: Devki N Talwar
Date: 10/20/10 09:38 AM
To: Michael A Poage
Cc: talwar@iup.edu, kmarkel@iup.edu

Physics

Hello Michael,
The Physics Department will support the Geoscience Department's BS Geology/Energy Resources Track - requiring your students taking PHYS 111/121 and PHYS 112/122 courses as part of their Liberal Studies Rwequirements or Major Required Courses.

Thanks

Devki Talwar

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Subject: **B.S.-Geology/Energy Proposal**
From: Debbie Bacco
Date: 10/26/10 03:39 PM
To: mpoage@iup.edu
Cc: Nicholas Karatjas, Debbie Bacco

Economics

The following is from Dr. Nicholas Karatjas:

Dr. Poage -

The Department of Economics has reviewed the B.S. Geology/Energy [illegible]

Subject: Re: Requesting letter of support for Geoscience program revisions and new

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Subject: Requesting letter of acknowledgment for Geoscience curriculum changes
From: Michael A Poage
Date: 10/18/10 02:35 PM

French and German

Subject: **Re: Requesting letter of acknowledgment for Geoscience curriculum changes**
From: Sean McDaniel
Date: 10/24/10 03:07 PM
To: Michael A Poage

Spanish