

UWUCC Proposal # 12-828.
 UWUCC Action - Date: AP-3/5/13

Senate Action Date:
 App-4/30/13

Contact Person(s) John Benhart, Jr.	Email Address jbenhart@iup.edu
Proposing Department/Unit Geography & Regional Planning	Phone 724.357.2250

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: Geog444/544 energy development and compliance I

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

3. Other Designations, as appropriate

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

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:

Proposed program name, if changing:

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)		1/28/13
Department Chairperson(s)		1/28/13
College Curriculum Committee Chair		2/6/13
College Dean		2/6/13
Director of Liberal Studies (as needed)		
Director of Honors College (as needed)		
Provost (as needed)		
Additional signature (with title) as appropriate		
UWUCC Co-Chairs	Gail Sedquist	3/14/13

Received
 MAR 14 2013
 Liberal Studies

Received
 MAR 1 2013
 Liberal Studies

Received
 FEB 8 2013
 Liberal Studies

Sent to grad school 3/25/13

GEOG 444/544 Energy Development and Compliance I Syllabus of Record

I. Catalog Description

Catalog Description

GEOG 444/544 Energy Development and Compliance I

**3 class hours
0 lab hours
3 credits
(3c-01-3cr)**

Prerequisites: GEOG 335, or instructor permission.

Reviews and characterizes energy resources found in northern Appalachia, and the logic and techniques used to identify, quantify and regulate their development and extraction. Focuses in particular on the spatial dimensions of shale gas, coal, and wind as major energy sources in northern Appalachia, and deals with topics such as exploration, environmental and cultural compliance, logistics, production analysis, and infrastructure maintenance.

II. Course Outcomes

By the end of the semester students will be able to:

- 1. Assess the energy resources of northern Appalachia, and their characteristics.*
- 2. Analyze the context of shale gas, coal and wind development and exploration.*
- 3. Explain spatial approaches to energy development, exploration, compliance, logistics, and production analysis.*
- 4. Apply spatial analysis regimes for analyzing energy exploration, compliance, logistics, and production.*
- 5. Assess economic, environmental and planning impacts of energy development in northern Appalachia.*
- 6. Explain the energy development processes from exploration, development, production and distribution for the natural gas, coal, and wind resources**
- 7. Compare the documented environmental impacts and state and federal compliance regimes for the natural gas, coal, and wind resources**

*** Graduate student-specific course outcomes**

III. Detailed Course Outline

Topic

Review syllabus / Introduction to energy development, exploration and compliance (3 hours)

Background and discussion of energy context on the global and national scales

Energy Resource Characteristics / Resource Characteristics – the location of resources (3 hours)

Energy Resource Characteristics – *The Appalachian Realm; the context of shale gas, coal and wind development and exploration; Energy Development Regulation in Pennsylvania*

The Appalachian Realm – The Energy Development Context; conventional and sustainable energy resources (3 hours)

Energy development patterns in the Appalachian and Mid Atlantic regions; Energy Regulation in Pennsylvania

Exam 1 (1 hour): Spatial Approaches to energy exploration – Data and criteria for specific resources (2 hours)

Multi-Scale Regulatory and Compliance Context – Data and criteria for Shale Gas (3 hours)

Spatial Approaches to energy compliance – Environmental compliance for Shale gas (3 hours)

- Marcellus Shale Permits, Wind Turbine Permits, Coal Mining Permits, State Inspection Procedures

Spatial Approaches to energy compliance – Environmental compliance for Shale gas (3 hours)

- Marcellus Shale Permits, Wind Turbine Permits, Coal Mining Permits, State Inspection Procedures

Spatial Approaches to energy compliance – Cultural and Planning compliance for Shale gas (3 hours)

Exam 2 (1 hour): Spatial Approaches to energy logistics (2 hours)

Spatial Approaches to energy logistics (3 hours)

Spatial Approaches to energy production analysis (3 hours)

Spatial Approaches to energy production analysis/facilities management (3 hours)

Spatial Approaches to energy facilities management (3 hours)

Best Management Practices Review (3 hours)

FINAL EXAM (2 hours)

IV. Evaluation Methods

Undergraduate Students

Exam 1 – multiple choice, short answer 25%

Exam 2 – multiple choice, short answer 25%

Final Exam – multiple choice, short answer, essay/problem 25%

Case Study Project – 25%

100%

Graduate Students

Exam 1 – multiple choice, short answer 20%

Exam 2 – multiple choice, short answer 20%

Final Exam – multiple choice, short answer, essay/problem 20%

Case Study Project – 20%

White Paper – Energy Development Regimes or 20%

Environmental Impacts/Compliance Regimes

(Including class presentation)

100%

In-class activities and homework will be assigned. These have no point value towards the final grade, but will assist you in preparation for your exams.

V. **Example Grading Scale.**

A = 90% - 100%

B = 80% - 89%

C = 70% - 79%

D = 60% - 69%*

F = below 60%

* For graduate students there will be no D grades assigned; if a student's percentage is below 70%, they will receive an F grade.

VI. **Course Attendance Policy**

The university encourages course attendance. The instructor of this course will develop a policy consistent with the IUP attendance policy.

VII. **Required Textbook(s), Supplemental Books and Readings**

Required Texts: American Association of Professional Landmen. *Oil and Gas Land*. AAPL. 2012. Ft. Worth, TX.; and Cutter, S. and W. Renwick. *Exploitation, Conservation, Preservation: A Geographic Perspective on Natural Resource Use, 4th Edition*. John Wiley & Sons, Inc. 2004. New York, NY.

VIII. **Special Resource Requirements.** List any materials or equipment the student is expected to supply for this course. Is there a lab fee associated with the course?

There are no special resource requirements for this course

IX. **Bibliography**

Arthur, J.D., Bohm. B., and M. Layne. "Hydraulic Fracturing Considerations for Natural Gas Wells of the Marcellus Shale." Gulf Coast Association of Geological Societies Transactions, Vol. 59. 2009. pp. 49-59.

Drohan, P.J. and Brittingham, M. "Topographic and Soil Constraints to Shale-Gas Development in the Northcentral Appalachians," Soil Science Society of America Journal. Vol. 76. September-October 2012, pp. 1696-1706.

Considine, Timothy. "The Economic Impacts of the Pennsylvania Marcellus Shale Natural Gas Play: An Update." N.p., n.d. Web. 28 Feb 2011.

Craig, R. K. *The Clean Water Act and the Constitution 2nd ed.* ELI Press. 2009. Washington, DC.

Daniels, Tom and Katherine Daniels. *The Environmental Planning Handbook*. 2003. APA Press. Chicago.

Eccleston, C. H. *NEPA and Environmental Planning*. CRC Press. 2008. Boca Raton.

Energy Institute, University of Texas-Austin. *Fact-Based Regulation for Environmental Protection in Shale Gas Development*. Feb. 2012.

The General Assembly of Pennsylvania. House Bill No. 1950 "Amending Title 58 (Oil and Gas) of the Pennsylvania Consolidated Statutes (Act 13 of 2012)." February 14, 2012.

Goldemberg, Jose and Oswaldo Lucon. *Energy, Environment and Development* 2nd ed. Taylor & Francis, Inc. 2009. New York.

Gregory, K.B., Vidic, R.D., and D. A. Dzombak. "Global Water Sustainability: Water Management Challenges Associated with the Production of Shale Gas by Hydraulic Fracturing." *ELEMENTS*, Vol. 7, June 2011, pp. 181-186.

Honachefsky, W. B. *Ecologically Based Municipal Land Use Planning*. Lewis. 2000. Boca Raton.

Kargbo, M., Wilhelm, R.G., and Campbell, D.J. "Natural Gas Plays in the Marcellus Shale: Challenges and Potential Opportunities." *Environmental Science and Technology*, 2010, 44 (15), pp 5679–5684

Lein, J. K. *Integrated Environmental Planning*. 2006. Blackwell. Malden.

Leopold, L. B., et. al. *Fluvial Processes in Geomorphology*. Dover. 1995. Mineola.

Marsh, William, M. *Landscape Planning; Environmental Applications* 4th ed. Wiley. 2005. Hoboken.

Marcellus Shale Education & Training Center. "Marcellus Shale Workforce Needs Assessment Southwest Pennsylvania." N.p., Summer 2010. Web. 28 Feb 2011

Randolph, John. *Environmental Land Use Planning and Management*. Island. 2004. Washington, DC.

Reeder, L.C. "Creating a Legal Framework for Regulation of Natural Gas Extraction from the Marcellus Shale Formation." 34 *William & Mary Environmental Law & Policy Review* (2009-2010). pp. 999-1011.

Rosgen, D. *Applied River Morphology*. Wildland Hydrology. 1996. Pagosa Springs.

Westman, W. E. *Ecology, Impact Assessment and Environmental Planning*. Wiley. 1985. New York.

Course Analysis Questionnaire

Section A: Details of the Course

- A1** How does this course fit into the programs of the department? For what students is the course designed? (majors, students in other majors, liberal studies). Explain why this content cannot be incorporated into an existing course.

This course will be a requirement for the BA Geography-Energy Geotechnology/Energy Environmental Compliance Concentration.

- A2** Does this course require changes in the content of existing courses or requirements for a program? If catalog descriptions of other courses or department programs must be changed as a result of the adoption of this course, please submit as separate proposals all other changes in courses and/or program requirements.

The course will not require changes in the content of other existing courses.

- A3** Has this course ever been offered at IUP on a trial basis (e.g. as a special topic) If so, explain the details of the offering (semester/year and number of students).

No.

- A4** Is this course to be a dual-level course? If so, please note that the graduate approval occurs after the undergraduate.

This course will be listed as a dual-level course.

- A5** If this course may be taken for variable credit, what criteria will be used to relate the credits to the learning experience of each student? Who will make this determination and by what procedures?

The course will not be offered for variable credit.

- A6** Do other higher education institutions currently offer this course? If so, please list examples (institution, course title).

For the most part they do not, and that is one of the reasons we want to offer this curriculum at IUP. There are a few exceptions: Bismarck State University, ENRG 310 Energy Production and Environment; Sonoma State University, ENSP 330 Energy, Technology and Society; University of Tulsa, EMGT 2013 Practical Issues in Energy Management.

- A7** Is the content, or are the skills, of the proposed course recommended or required by a professional society, accrediting authority, law or other external agency? If so, please provide documentation.

No.

Section B: Interdisciplinary Implications

- B1 Will this course be taught by instructors from more than one department? If so, explain the teaching plan, its rationale, and how the team will adhere to the syllabus of record.**

This course will not be taught by instructors from more than one department.

- B2 What is the relationship between the content of this course and the content of courses offered by other departments? Summarize your discussions (with other departments) concerning the proposed changes and indicate how any conflicts have been resolved. Please attach relevant memoranda from these departments that clarify their attitudes toward the proposed change(s).**

There are no other courses similar to this being offered by other departments.

- B3 Will this course be cross-listed with other departments? If so, please summarize the department representatives' discussions concerning the course and indicate how consistency will be maintained across departments.**

This course will not be cross-listed with other departments.

Section C: Implementation

- C1 Are faculty resources adequate? If you are not requesting or have not been authorized to hire additional faculty, demonstrate how this course will fit into the schedule(s) of current faculty. What will be taught less frequently or in fewer sections to make this possible? Please specify how preparation and equated workload will be assigned for this course.**

Yes, faculty resources are adequate, as the department has hired a new tenure track faculty member to teach the course.

- C2 What other resources will be needed to teach this course and how adequate are the current resources? If not adequate, what plans exist for achieving adequacy? Reply in terms of the following:**

**Space - Adequate*

**Equipment - Adequate*

**Laboratory Supplies and other Consumable Goods - Adequate*

**Library Materials - Adequate*

**Travel Funds - Adequate*

- C3 Are any of the resources for this course funded by a grant? If so, what provisions have been made to continue support for this course once the grant has expired? (Attach letters of support from Dean, Provost, etc.)**

No resources for this course are funded by a grant.

C4 How frequently do you expect this course to be offered? Is this course particularly designed for or restricted to certain seasonal semesters?

This course is expected to be taught once per year (every other semester).

C5 How many sections of this course do you anticipate offering in any single semester?

One section of this course will be offered in any single semester.

C6 How many students do you plan to accommodate in a section of this course? What is the justification for this planned number of students?

Twenty five (25) students is the anticipated maximum number of students expected for this course. The justification for this maximum is because more students than 25 would diminish the level of 400-level instruction.

C7 Does any professional society recommend enrollment limits or parameters for a course of this nature? If they do, please quote from the appropriate documents.

No.

C8 If this course is a distance education course, see the Implementation of Distance Education Agreement and the Undergraduate Distance Education Review Form in Appendix D and respond to the questions listed.

This course is not a distance education course.