

New Course Proposal Template

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Proposing Depart/Unit:	Geoscience	Phone:	7-2379

Course Prefix/Number	See the Registrar's list of Unavailable course numbers at http://www.iup.edu/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=129323 GEOS 409
Dual/Cross Listed	<p><i>Dual Listed</i> - Courses listed at two levels, such as undergraduate and graduate, masters and doctoral, etc. <i>Cross Listed</i> - Course has more than one prefix such as GEOG/ RGP/ 233</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If yes with: Click here to enter text.</p>
Number of Credits	(UG) Class Hours - 2 (UG) Lab Hours - 3 Credits - 3
Prerequisite(s)	GEOS 119
Corequisite(s)	<i>This means that another course must be taken in the same semester as the proposed course</i> none
Additional Information (Check all that apply. Note: Additional documentation will be required)	<input type="checkbox"/> Liberal Studies (please also complete Template C) <input type="checkbox"/> Teacher Education (Is it Step I a prerequisite or is it part of the Professional Education Sequence If so please also complete Template D) <input type="checkbox"/> Distance Education (Please also complete Template E)
Course Title	Geology of Shale Gas – Field Workshop
Recommended Class Size (optional) (provide justification)	<p>Are you recommending a class size: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes: (check one of the following reasons and provide a narrative explanation)</p> <input checked="" type="checkbox"/> Pedagogical <input checked="" type="checkbox"/> Physical limitation of classroom <input type="checkbox"/> Accreditation body standards/recommendations <input type="checkbox"/> Other Explanation (<i>required</i>): This course is designed as an intensive laboratory and field-based workshop. This will involve travel in vans to field-based locations and rig-floor environments. Safe operational and travel requirements limit class size to 16 students, similar to each of the field workshop courses offered in the Geoscience Department.
Catalog Description	<p><i>Guidelines: Do not include pre/co-requisite information here. The registrar prefers a concise description of course content, beginning with an active verb.</i></p> <p>Intensive laboratory and field based investigations of the geology of shale gas energy formation, development and extraction. Explores the geological formation and history of natural gas found in deep shale deposits and investigate technology used to extract these from the subsurface and how economic, environmental and political factors influence the development of shale gas resources. Includes travel to field-based locations and rig-floor environments.</p>
Student Learning Outcomes (These should be measurable, appropriate to the course level, and	Students will gain a deeper understanding of the role geology plays in the formation and development of natural gas from shale. In particular, students will:

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<p><i>phrased in terms of student achievement, not instructional or content outcomes)</i></p> <p><i>If dual listed, indicate additional learning objectives for the higher level course</i></p>	<ol style="list-style-type: none"> 1. examine how shale gas deposits are formed by geological processes associated with organic decay, sedimentary basin development and geothermal heating. 2. investigate conceptual models of ancient geologic environments and tectonic events to create a stratigraphical model of shale gas deposits 3. evaluate and assess the prospecting potential of a regional natural gas play using geological and geophysical data 4. synthesize the process of gas development from exploration to production and distribution 5. evaluate socio-economic and political factors that impact natural gas energy markets and synthesize how they influence energy policy.
<p>Brief Course Outline: <i>Give an outline of sufficient detail to communicate the course content to faculty across campus. It is not necessary to include specific readings, calendar, or assignments.</i></p>	<p style="text-align: center;">Brief Course Outline GEOS409 Geology of Shale Gas Field Workshop</p> <p>Part A: Shale Gas Geology An overview of shale, its formation, depth and distribution Stratigraphic framework for shale gas play Lab Project (2-labs): Mapping shale distribution, thermogenic and burial history Field Trip: Marcellus Shale Outcrop</p> <p>Part B: Drilling and Hydraulic Fracturing Placement of gas wells Technology used in drilling vertical and horizontal wells Hydraulic fracturing processes Production wells Lab Project (2 labs): Stratigraphy of Marcellus from down hole log data</p> <p>Part C: Gas Production and Distribution Collection and treatment of natural gas Markets for natural gas Systems for transporting natural gas Environmental impacts of coal use Field Trip: Marcellus Rig (when available)</p> <p>Part D: Environmental Concerns Surface water, subsurface water, treatment Naturally occurring radioactive materials Ecological and natural habitats Global carbon output and sequestration Lab Projects (2 labs): Hydraulic Fracturing Fluid and Fugitive methane Field Trip: Abandoned and Orphaned Wells</p> <p>Part E: Social Impact and Infrastructure Municipalities, Transportation, Economics Workforce and Education Field Trip: Emergency Response Team</p> <p>Part F: Long-range Energy Policy Population growth and energy demand US Energy policy and decision-making Lab Projects (2 labs): Energy Production, Usage, Future Demand – US Energy Policy</p>
<p>Rationale for Proposal</p>	
<p>Why is this course being proposed?</p>	<p>This course is designed for students seeking a deeper understanding of the geological factors that influence the development and extraction of natural gas from deep shale units. Geoscience Majors and well as non-science majors in fields such as energy management, geography and regional planning, safety science and political science will benefit from this course. With this understanding, students will be better prepared to make more informed decisions about energy development, efficient use of energy, and reduce environmental risks and negative impacts of energy usage. This new course will cover the material using team-based laboratory exercises and field-based instruction, allowing students to explore energy related issues in a way that will help them become Responsible as well as Informed and Empowered Learners. In addition, this course</p>

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	will serve as part of the requirements for a professional certificate program in Shale Gas Studies that we hope to propose in the near future.
How does it fit into the departmental curriculum? (Check all that apply)	<input type="checkbox"/> Major Requirement <input type="checkbox"/> Minor Requirement <input type="checkbox"/> Core Requirement <small>(Interdisciplinary core - e.g. Business Education)</small> <input type="checkbox"/> Required Elective <input type="checkbox"/> Liberal Studies <input checked="" type="checkbox"/> Open Elective <input checked="" type="checkbox"/> Other - Controlled Elective
Is a similar class offered in other departments?	<input type="checkbox"/> Yes Please provide comment: <input checked="" type="checkbox"/> No
Does it serve the college/university above and beyond the role it serves in the department?	<input checked="" type="checkbox"/> Yes Please provide comment: This course will provide a unique examination of when, where and how shale gas deposits occur in Pennsylvania. As such it will likely serve as a desirable course for students majoring in related disciplines, particularly those enrolled in Geography and Regional Planning and Safety and Environmental Sciences. <input type="checkbox"/> No
Who is the target audience for the course?	<input checked="" type="checkbox"/> Course Designed for Majors (<input type="checkbox"/> Required <input checked="" type="checkbox"/> Not Required) <input type="checkbox"/> Course Designed for Minor <input type="checkbox"/> Departmental Elective <input type="checkbox"/> Restricted to Majors/Minors <input type="checkbox"/> Open to Any Student <input type="checkbox"/> Liberal Studies <input checked="" type="checkbox"/> Other – This course will provide advanced learning experiences for any student desiring a greater knowledge of Pennsylvania’s shale-gas resources. This course will eventually be included in an inter-disciplinary professional certificate program planned by departments of Geoscience, Safety Sciences, and Geography and Regional Planning.
Implications for other departments	<p>A. What are the implications for other departments (For example: overlap of content with other disciplines. requirements for other programs)?</p> <p>Other departments may wish to include this course in energy-related programs in Eberly College of Business, Safety and Environmental Sciences, and Geography and Regional Planning. This course might also be appropriate for students enrolled in a Sustainability Studies.</p> <p>B. How have you addressed this with other department(s) involved? What was the outcome of that attempt? (Attach documents as appropriate)</p> <p>Department Chairs and program coordinators from each of the programs mentioned (Geography, Safety Sciences, Sustainability, and Management) were sent an initial draft of our course proposal outlining the content and learning goals. Department Chairs and program coordinators from each of the programs mentioned (Safety Sci, Geography, Sustainability, Management) were sent an initial draft of our course proposal outlining the content and learning goals. Each indicated their support (letters attached).</p>
For Dean's Review	
<ul style="list-style-type: none"> • Are resources available/sufficient for this course? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA • Is the proposal congruent with college mission? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA • Has the proposer attempted to resolve potential conflicts with other academic units? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA 	
Comments: Click here to enter text.	