15-416.
UWUCC: AP 9/1/15
Senate: Info 10/6/15

Template E

Distance Education Course Proposal Template

Steps to the approval process:

1. Complete the applicable template(s) and email them to the departmental or program curriculum committee chair. (If this is a new course that will include DE, complete Templates A and E. If adding DE to an existing course that is otherwise unchanged, complete Template E only. If revising a course and adding DE, complete Templates A and E.)
2. The curriculum chair emails the proposal to the curriculum committee, then to the department program faculty for a vote and finally to the department program chair.
3. The department program chair emails the proposal to curriculum-approval@iup.edu; this email will also serve as an electronic signature.
4. Curriculum committee staff will log the proposal, forward it to the appropriate dean's office(s) for review within 14 days and post it on the X Drive for review by all IUP faculty and administrators. Following the dean's review the proposal goes to the UWUCC/UWGC and the Senate.
5. Questions? Email curriculum-approval@iup.edu.

Contact Person:	John Benhart, Jr.	Email Address:	jbenhart@iup.edu
Proposing Depart/Unit:	Geography & Regional Planning	Phone:	7243572250

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Liberal Studies

Course Prefix/Number	GEOG 109
Course Title	Geographic Information Science and Systems for Energy Applications
Adding DE to an Already Approved Course	☐ Yes – *Template E only required* ☒ No – *Template A and E both required*
Type of Proposal	(*check all that apply*) ☒ Online ☐ ITV
Brief Course Outline – if adding DE to an approved course *Give an outline of sufficient detail to communicate the course content to faculty across campus. It is not necessary to include specific readings, but you may include those as well.*	*Introduction to course*. Discussion of texts, computer facilities, how things are going to done. *What is a Geographic Information System (GIS)? Why is GIS useful for Energy Applications and spatial analysis? Base energy applications and examples.* *A typology of Energy GIS Applications. Standard Energy Geospatial Datasets.* *Map Projections and Coordinate Systems*: Map Scale and Projections. Geographic coordinate systems. Characteristics of geographic information. Metadata. *GIS Data Structures - Vector Data Model:* Geometric Objects. Topology. Higher level objects. *GIS Data Structures - Vector Data Model, Raster Data Model:* Geometric Objects. *Issues in the Integration of Geospatial Field Data with GIS for environmental applications.* Topology. Higher level objects. Types of Raster Data. Integration of Raster and Vector Data. Discussion of GIS functionality. *Vector, Raster Data Input*: Existing spatial data (reading and understanding metadata), Data input methods: digitizing, scanning, Global Positioning System (GPS), image and remote sensing data. *Visualization of phenomena on the earth's surface; Data Display and Cartography. Making Maps with GIS*: Map elements, types of maps, map design. *Introduction to ArcGIS and ArcView 10*: Adding data, working with layers, data frames, and map files

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	Learning ArcGIS 10 continued: Visualization of phenomena on the earth's surface; Data Display and Cartography. Attribute Data Input and Management: Database management, relational database management systems (RDBMS). *Data Exploration.* Attribute Data Query, Spatial Data Query. Understanding RDBMS structure, relational join and relate operations, database (attribute) queries. *Identifying distributions of energy-related phenomena on the earth's surface: Query and Visualization. Learning ArcGIS 10 continued: Attribute Data Input and Management:* Database management, relational database management systems (RDBMS). *Data Exploration.* Attribute Data Query, Spatial Data Query. Understanding RDBMS structure, relational join and relate operations, database (attribute) queries. *Processing Geospatial Data and Reporting by Administrative and Units (Using PADEP Data to Visualize and Analyze Production patterns) . Attribute Data Input and Management:* Database management, relational database management systems (RDBMS). *Data Exploration.* Attribute Data Query, Spatial Data Query. *Learning ArcGIS 10 continued:* Understanding RDBMS structure, relational join and link operations, database (attribute) queries. *Simple Site Identification Applications and Techniques (Identifying Potential Carbon Traps). Learning ArcGIS 10 continued*: Database Operations (Attribute data classification and computation) and Spatial Data Query (Feature Selection by Spatial Relationship). *Vector Data Analysis.* *Simple Site Identification Applications and Techniques. Vector Data Analysis (Utilizing multiple spatial criteria to identify production units).* Describing attribute and spatial data statistically, Spatial analysis, GIS and Spatial Analysis.
Rationale for Proposal (Required Questions from CBA)	
How is/are the instructor(s) qualified in the Distance Education delivery method as well as the discipline?	Instructor (John Benhart, Jr.) has three years of experience teaching distance education courses at IUP. Dr. Benhart has taught at IUP since 1994.
For each outcome in the course, describe how the outcome will be achieved using Distance Education technologies.	1) Understand the geographic dimensions of energy-related phenomena and human-environment interaction (Students will read the text and other readings, study notes, and review websites. An online quiz will be administered to assess mastery of concepts.) 2) Explain what geographic information systems are and how they work (Students will read the text and other readings, study notes, and review websites. An online quiz will be administered to assess mastery of concepts.) 3) Describe how geospatial technologies (geographic information systems (GIS), global positioning systems (GPS), and remote sensing are presently being used in the energy industries, by regulatory agencies, and energy professionals (Students will read the text and other readings, study notes, and review websites. An online quiz will be administered to assess mastery of concepts.) 4) Understand maps as models of the earth, and spatial data derived from maps; the concepts of mapping datums, two and three-dimensional coordinate systems, map projections, map scale, horizontal accuracy, and metadata (Students will read the text and other readings, study notes, and review websites. An online quiz will be administered to assess mastery of concepts.) 5) Identify and explain how the

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	capabilities of GISs enable the visualization and analysis of energy resources and related phenomena Students will read the text and other readings, study notes, complete textbook-based exercises, and review websites. Software based labs will be assigned to encourage students to learn and master simple data-based analyses and cartographic visualization using GIS software. For example, students will be given an assignment to map unconventional gas production in Pennsylvania counties using choropleth and graduated cylinder classification techniques. 6) Demonstrate application of industry-standard GIS software to derive information from databases, and address energy-related problems with spatial dimensions Students will read the text and other readings, study notes, and complete textbook-based exercises, review websites. Software based labs will be assigned to encourage students to learn and master simple data-based analyses and cartographic visualization using GIS software. For example, students will be given an assignment to identify roads proximate to proposed gas exploration [illegible] that could impact the quiet recreational [illegible]
How will instructor-student and student-student, if applicable, interaction take place?	D2L interface, email, and telephone.
How will student achievement be evaluated?	Quiz and exam scores, evaluation of software based laboratories and assignments submitted through the Dropbox interface of learning management system.
How will academic honesty for tests and assignments be addressed?	Most learning management systems address most of these issues. Randomized timed quizzes and exams, thorough instructor review of submitted laboratories and assignments