LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
		06-18a	App. 11-21-06	App. 12-5-06

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person	Email Address
John Benhart, Jr.	jbenhart@iup.edu
Proposing Department/Unit	Phone
Geography & Regional Planning	724.357.7652

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

1. Course Proposals (check all that apply)

__X__ New Course _____ Course Prefix Change _____ Course Deletion

_____ Course Revision _____ Course Number and/or Title Change _____ Catalog Description Change

GEOG 219: Global Positioning Systems (GPS) Fundamentals	
***Current* Course prefix, number and full title**	***Proposed* course prefix, number and full title, if changing**

2. Additional Course Designations: check if appropriate

_____ 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, Pan-African)

3. Program Proposals

_____ Catalog Description Change _____ Program Revision

_____ New Degree Program _____ Program Title Change _____ Other

_____ New Minor Program _____ New Track

***Current* program name**	***Proposed* program name, if changing**

4. Approvals		**Date**
Department Curriculum Committee Chair(s)		10/12/06
Department Chair(s)		10/12/06
College Curriculum Committee Chair		10/18/06
College Dean		10/18/06
Director of Liberal Studies *		
Director of Honors College *		
Provost *		7/10/07
Additional signatures as appropriate: (include title)		
UWUCC Co-Chairs	Gail S Sechrist	11-21-06

* where applicable

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Part II. Description of Curricular Change

1. Syllabus of Record

I. CATALOG DESCRIPTION:

GEOG 219 Global Positioning System Fundamentals **1 class hour**
0 lab hours
1 credit
(1c-01-1cr)

Prerequisites: None
Provides the student with a basic knowledge of the Global Positioning System. The student will learn how to use NAVSTAR GPS to locate precise positions on the globe; to plot a course, and navigate using a handheld global positioning receiver. Civil drafting data may be collected with a GPS receiver and input into the computer to generate plot plans.

II. COURSE OBJECTIVES:

Upon completion of the course the student will be able to:
1. demonstrate knowledge of the Global Positioning System and its' components.
2. use a handheld GPS receiver.
3. collect data using a handheld GPS receiver.
4. correct GPS data errors.
5. integrate GPS data with computer systems data.

III. COURSE OUTLINE:

I. Concepts of Global Positioning Systems (2 hours)
- A. Global Positioning Systems and Geographic Information Systems
- B Nature of Geospatial data
- C. Determining where we are
- D. Components of NAVSTAR
  1. The earth
  2. Satellites
  3. Ground based systems
  4. Global Positioning Receivers
  5. US Department of Defense

II. Using a Global Positioning Receiver (2 hours)
- A. GPS receiver fundamentals
- B. Setting receiver parameters
- C. Correlating GPS data with map data
- D. **Point data collection exercise**
- E. **QUIZ**

III. Automated Data Collection (4 hours)
- A. Measuring distance by sound and time
- B. Factors affecting data collection
- C. Geometric dilution of precision

D. Planning a data collection set
E. Collecting data in the field
F. **Field data collection Exercise (ala GeoCaching)**

IV. Correcting GPS Data (4 hours)
A. GPS accuracy
B. Differential correction
C. Correcting clock errors
D. Correcting receiver errors
E. Correcting Ephemeris (Satellite Position) errors
F. Correcting atmospheric errors
G. **GPS data correction exercise**
H. **QUIZ**

V. Integrating GPS data into mapping software (2 hours)
VI. **Final Exam** (1 hour)

IV. EVALUATION METHODS:
1. GPS field projects & exercises (25 points each)
2. Two quizzes (50 points each)
3. Final exam. (100 points)

V. GRADING SCALE (Percent)
A = 100-90
B = 89-80
C = 79-70
D = 69-60
F = 59 & below

VI. ATTENDANCE POLICY: Regular attendance is essential for successful understanding and skill development. Failure to attend will negatively impact your ability to score well on quizzes and the final and may prevent you from completing out of class assignments.

VII. REQUIRED TEXTBOOK

Steede-Terry, Karen. 2000. Integrating GIS and the Global Positioning System. ESRI Press.
Spencer, John. *Et.al.* 2003. Global Positioning System: a Field Guide for the Social Sciences. Blackwell Publishing.

VIII. SPECIAL RESOURCE REQUIREMENTS

There are no special resource requirements expected of the students who enroll in this course.

Bibliography

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Kleusberg, Alfred and Peter J. G. Teunissen (eds.) 1996. GPS for Geodesy (Lecture Notes in Earth Sciences, Vol 60) Springer-Verlag.
Leick, A., 2004. GPS satellite surveying, John Wiley & Sons, Inc., 3rd Ed..
Misra, Pratap and Per Enge. 2001. A GPS Textbook for the Graduate Classroom. Ganga-Jamuna Press.
Parkinson, Bradford and James Spilker. 2005. Global Positioning System: Theory and Application American Institute of Astronautic and Aeronautics.
Segall, P. and J.L. Davis, 1997. "GPS applications for geodynamics and earthquake studies", Annual Reviews of Earth and Planetary Science, 25, 301-36.
Strang and Borre, 1997. Linear Algebra, Geodesy, and GPS, Wellesley-Cambridge Press.
Wells D, 1987 Guide To GPS Positioning, 2nd ed, Canadian GPS Associates, Frederiction, New Brunswick, Canada

2. Course Analysis Questionnaire

Section A: Details of the Course

A1. *How does this course fit into the programs of the department? For which 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 is designed for a broad range of students with no previous experience in geography or use of Global Positioning. Any student desiring an operational knowledge of precision GPS equipment and its operation will find the course of great practical value. Majors who will routinely find this course useful include Geoscience, Biology, Safety Sciences, and Anthropology. The course meshes with our existing Geographic Information System track and courses as GPS output is usable, and a significant form of input, in a GIS environment. This course differs from GEOG 425, in that it is designed for students who would like to learn the basics of GPS for basic knowledge or recreational purposes. GEOG 425 conversely is designed for advanced students and covers the conceptual and scientific underpinnings of GPS in much greater detail.

To date, we have been incorporating snippets of the course content into upper level courses in the GIS track. These courses have required prerequisites that preclude most non-majors. As GPS has become more utilitarian many outside the GIS track are seeking the intended content. We

also believe that there will be continuing education demand for the course as GPS enters the mainstream of technology.

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.* No.

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.* No.

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?* This 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).* Yes, a short list of example list of courses follows:

Arizona State University	An Introduction to GPS with wireless applications
University of Arizona	Space Geodesy
University of Arkansas	Introduction to GPS
George Mason University	Introduction to GPS and Photogrammetry
Ventura College	Introduction to GPS
University of Connecticut	Introduction to GPS
College of Southern Idaho	Introduction to GPS
The Ohio State University	Introduction to GPS
San Jose State University	Introduction to GPS/GIS
University of Colorado	GPS Technology
Indiana State University	Introduction to GPS/GIS
University of New Mexico	Introduction to GPS and GIS
University of Montana	GPS Fundamentals and Applications in Mapping

University of New Mexico Introduction to GPS and GIS

University of Montana GPS Fundamentals and Applications in Mapping

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.* Not presently.

Section B: Interdisciplinary Implications

B1. *Will this course be taught by instructors from more than one department or team taught within the department? If so, explain the teaching plan, its rationale, and how the team will adhere to the syllabus of record.* No.

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 is no course offering this content.

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.* No.

B4. *Will seats in this course be made available to students in the School of Continuing Education?* Yes.

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.* We anticipate offering the course through a one or two credit overload for the faculty member teaching it.

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?* The course will be taught in the Geography department's environmental lab. We currently have six GPS receivers that the students will share. We anticipate four students sharing each device. There will be no need for lab supplies or consumables other than paper. The library collection of relevant materials is adequate to support this course.

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?* No.

C4. *How frequently do you expect this course to be offered? Is this course particularly designed for or restricted to certain seasonal semesters?* At least once an academic year, although it may be more if we can offer the course in a non-traditional setting such as a satellite campus, over a weekend, or during semester breaks.

C5. *How many sections of this course do you anticipate offering in any single semester?* One to Two.

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?* 24. (four per GPS unit)

C7. *Does any professional society recommend enrollment limits or parameters for a course of this nature?* 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.* Not Applicable.

Section D: Miscellaneous

None.