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| LSC Use Only No: | LSC Action-Date: | UWUCC USE Only No. | UWUCC Action-Date: | Senate Action Date: |
|---|---|---|---|---|
| | | 04-47a | App-2/22/05 | App 2/28/06 |

## 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 | 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

| *Current* Course prefix, number and full title | *Proposed* course prefix, number and full title, if changing |
|---|---|
| GEOG 418/518 Geographic Information Systems (GIS) for Crime Mapping and Social Scientific Analysis | |

**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) | Kim J Patrick | 1/26/05 |
| Department Chair(s) | | 1/27/05 |
| College Curriculum Committee Chair | Gail Buck | 2/2/05 |
| College Dean | Ann | 2/2/05 |
| Director of Liberal Studies * | | |
| Director of Honors College * | | |
| Provost * | | |
| **Additional signatures as appropriate:** (include title) | | |
| UWUCC Co-Chairs | Gail S Sechrist | 2/22/05 |

* where applicable

FEB – 3 2005

Part II. Description of Curricular Change

1. Syllabus of Record

# GEOG 418
# Geographic Information Systems
# (GIS) for Crime Mapping and Social Scientific Analysis

Texts: **A.** K.C. Clarke. 2004. *Getting Started With Geographic Information Systems.* 4th Edition. Prentice Hall: Upper Saddle River, NJ. (required) **B.** S. Hutchinson and L. Daniel. 2000. *Inside ArcView GIS 3rd Edition.* OnWord Press: Santa Fe, NM. (optional) Also, **C.** *Introduction to GIS Class Notes* available at Pro Packet (required). D. K. Harries. Crime Mapping Research Center. 1999. *Mapping Crime: Principle and Practice.* A course web site that you will be introduced to is also a resource.

**Catalog Description:** GEOG 418/518 Geographic Information Systems (GIS) for Crime Mapping and Social Scientific Analysis; 3c-0l-3cr; Provides students with knowledge of the theoretical basis of Geographic Information Systems (GIS) and its applications for criminologists and other social scientists. In the process of demonstrating some of the capabilities of GIS, the specifics of selected GIS and database software packages will also be covered. During the course of the semester, students will develop the skills to use GIS packages, manipulate and query geographic data to solve problems, perform simple spatial analysis, and understand how to utilize GIS in law enforcement/social science problem-solving and decision-making processes. **Prerequisites:** Student must have completed 60 credits of coursework or have permission of instructor.

**Course Objectives: By the end of the semester, students will be able to:** 1) Understand the geographic dimensions of crime occurrences and other social phenomena 2) Understand what geographic information systems are and how they work 3) Understand how geospatial technologies are presently being used by federal state, and local law enforcement and governmental communities 4) Understand how the capabilities of GISs enable the visualization, analysis, and reporting of crime occurrences and other social phenomena 4) use industry-standard GIS software to derive information and address problems with spatial dimensions

**Attendance Policy:** Attendance will not be taken, but you are strongly encouraged to attend. Students who miss class will miss important class material, which will adversely affect their performance on exams and their class participation grade.

## Class Schedule

| Week of | Topic(s) |
|---|---|
| .5 weeks | Introduction to course. Discussion of texts, computer facilities, how things are going to done. *What is a Geographic Information System (GIS)?* Unique functions and problem-solving capabilities of GISs. Applications areas. Functional elements of a GIS. **Read A. Chs. 1-2, C. Mapping the Path to Problem Solving, T. Rich; Web Reading, The Hunter by Jake MacDonald** |
| 1.5 weeks | *GISs Roots in Cartography*: Map Scale and Projections, Geographic coordinate systems, Characteristics of geographic information. *Maps as Numbers*: GIS Data Structures, Topology. Discussion of raster and vector data structures. **Read A. Ch. 3, D. Chs. 1-2.** |
| 1 week | *Maps as Numbers*: GIS Data Structures, Topology. Discussion of raster and vector data structures. Discussion of GIS functionality. **Read A. Ch. 4** |
| 1 week | *Getting the Map into the Computer*: Existing spatial data (reading and understanding metadata), Data input methods: digitizing, scanning, Global Positioning System (GPS), image and remote sensing data. *Introduction to ArcView 9 for criminology applications*: Adding data, working with themes, views, and project files **Read A. Ch. 5** |
| 1 week | *What is Where?*: Database management, relational database management systems (RDBMS), searching by attribute, searching by geography. *Learning ArcView 9 continued:* What is Where? (RDBMS and attribute data): understanding RDBMS structure, relational join and link operations, database (attribute) queries. |
| 1 week | *Learning ArcView 9 continued*: What is Where? (Searching by Geography): identify, classification (recoding), geographic selection, selecting features within a distance (buffer), overlay (spatial join) operations. **Read A. Ch.7** |
| 1 week | **MIDTERM EXAM** *Learning ArcView 9 continued*: What is Where? (Searching by Geography): identify, classification (recoding), geographic selection, selecting features within a distance (buffer), overlay (spatial join) operations. *Making Maps with GIS*: Map elements, types of maps, map design. *Learning ArcView 9 continued*: Geocoding, and Displaying and representing spatial and attribute data. **Read A. Ch. 6., D. Spatial Analyses of Crime (pp. 155-204).** |
| 1 week | *Why is it There?*: Describing attribute and spatial data statistically, Spatial analysis, GIS and Spatial Analysis. *Learning ArcView 9 continued*: Geocoding, Performing statistical and spatial analysis in ArcView. **Read D. Chs. 3-4** |
| 1 week | *Why is it There?*: Describing attribute and spatial data statistically, Spatial analysis, GIS and Spatial Analysis. *Learning ArcView 9 continued*: Performing statistical and spatial analysis in ArcView. |
| 1 week | Advanced GIS functionality for Criminologists: Spatial aggregation, spatial merges, hot links, editing tables, report generation. *Using Crime Analyst and CrimeStat.* **Read D. Spatial Distribution (pp. 205-274).** |
| 1 week | Advanced GIS functionality: Spatial aggregation, spatial merges, hot links, editing tables, report generation. Advanced GIS functionality: ArcView Extensions...*Using Crime Analyst and CrimeStat*, Spatial Analyst, Network Analyst, 3-D Analyst **Read A. Ch. 9.** |
| 1 week | Some more advanced GIS functionality: ArcView Extensions...Spatial Analyst, Network Analyst, 3-D Analyst. Learning to think spatially...using GIS to analyze specific crime-related problems. **Read A. Ch. 10** |
| 2 weeks | Learning to think spatially...using GIS to analyze specific law enforcement problems. **FINAL EXAM TBA** |

**Grading Procedure:** Grades are based on exercises, exams, and class participation. Exercises will be graded as follows: 80 to 85% of the total points will be awarded based on following instructions and/or deriving the correct answer; the other 10 to 15% of the points will be given based on initiative, care, creativity, and professionalism of the final product turned in. This means I want attention to detail and cartographic correctness to be evident in the exercises you turn in for evaluation. **Late exercises will be penalized 20% of the total possible points for each day late** (by the way I don't expect to have to deal with this). There will be two exams of equal value (a midterm and a final). Class participation (which includes attendance, hands-on computer work, in-class exercises and participation) will be worth **30%** of your final grade. More than two unexcused absences will result in a **5% reduction** in a student's final calculated percentage, with an **additional 5% reduction** for each additional unexcused absence. Students receiving 90% or more of the course total points will receive an A, 80%-90% a B, 70-80% a C, 60-70% a D,

and below 60% an F.

## Bibliography


Bolstad, Paul. *GIS Fundamentals: A First Text on Geographic Information Systems*. (White Bear Lake, MN: Eider Press, 2003).

Brail, Richard K., and Richard E. Klosterman, Eds. *Planning Support Systems*. (Redlands, CA: ESRI Press, 2001).

Chang, Kang-tsung. *Introduction to Geographic Information Systems*. (New York: McGraw-Hill, 2004).

Harries, Keith. *Mapping Crime: Principle and Practice*. (Washington, DC: Crime Mapping Research Center National Institute of Justice, 1999).

Price, Maribeth. *Mastering ArcGIS*. (New York: McGraw-Hill, 2004).

Rich, Thomas. "Mapping the Path to Problem Solving." *National Institute of Justice Journal* October 1999: 2-9.

U.S. Department of Justice Taskforce on Crime Mapping and Data-Driven Management. "Mapping Out Crime: Providing 21st Century Tools for Safe Communities." (Washington, DC: U.S. Department of Justice, 1999).


## 2. Course Analysis Questionnaire

Section A: Details of the Course

2A1. The course is designed principally for undergraduate and graduate criminology majors, as well as social science students outside of the geography program, who would like to learn about geographic information systems (GIS) and increase their technical skills. The Department of Geography and Regional Planning presently offers GIS courses, however, they are oriented towards learning about GIS itself, rather than law enforcement and social science applications of the technology.

2A12. The course will not require changes in the content of other existing courses. The course will be an elective for all students who take it.

2A3. The course has not been offered on a trial basis. Some criminology students have taken our existing Introduction to GIS course (GEOG 316/516) in the past, and in fact it was through these experiences that we identified the need for a new course.

2A4. This course will be proposed as a dual level course (GEOG 418/518). Graduate approval will be sought after the proposal has been reviewed by UWUCC.

2A5. The course will not be offered for variable credit.

2A6. Some other universities offer comparable courses, for example: University of Central Florida, Crime Mapping and Analysis in Criminal Justice; University of New Haven, Crime Mapping and Analysis for Problem-Solving; George Mason University, Crime Mapping and Analysis.

2A7. The content of this course is not presently required for accreditation or professional membership.

Section B: Interdisciplinary Implications

2B1. This course will not be taught by instructors from more than one department.

2B2. There have been no conflicts regarding the content of this course with any other departments. The only discussions that have occurred have been with the Department of Criminology, which strongly supports the course proposal (see attached letter).

2B3. This course will not be cross listed with other departments.

2B4. Seats in this course could be made available to students in the School of Continuing Education.

Section C: Implementation

2C1. No additional faculty will be needed to teach this course. The department is already teaching a significant number of Criminology students and other social sciences majors in existing GIS courses. The new course will allow the department to serve these students better by providing a more customized and focused course on crime mapping and GIS.

2C2. The current resources are adequate to teach the course. All of the department's GIS courses require the use of the James Payne GIS Laboratory, which needs updated computing equipment every 2-3 years. The proposed course does not increase these facility maintenance requirements.

2C3. None of the resources for this course are funded by a grant.

2C4. We expect the course to be offered once an academic year.

2C5. Not Applicable (see above).

2C6. The course will be designed for a maximum of 18 students per section. The rationale for this is based upon the number of computer workstations in the James Payne GIS Laboratory.

2C7. No.

2C8. This course is not a distance education course.

# Indiana University of Pennsylvania

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October 31, 2004

John Benhart
Geography & Regional Planning
Indiana University of Pennsylvania
Leonard Hall 12B
Indiana, PA 15701

Dear John,

I would like to offer my full support for your curriculum proposal for a "Crime Mapping and Geographic Information Systems (GIS) for Law Enforcement" (GEOG 418) course for criminology students. I have carefully reviewed the proposed syllabus of record and find that this course would be of great value to both our undergraduate and graduate students. In fact, in this day and age courses of this nature are become imperative for our graduates. Our graduates are expected to have technical skills when they graduate from college and, for them to remain competitive, they need to develop such skills during their tenure at IUP. I want to thank you for developing this course with our students in mind. Please let me know if I can be of any assistance as you move this proposal through the curriculum process.

Sincerely,

Dennis Giever, Ph.D.
Professor and Chair