

**DEGREE/PROGRAM CHANGE
FORM C**

Fields marked with * are required

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Phone Number:* 505 2770058 Initiator's Rank / Title* Professor and Chair
Faculty Contact* Scott Freundschuh Administrative Contact* Jazmin Knight
Department* Geography **Division** **Program**
Branch

Proposed effective term:

Semester Fall ▼ Year 2012 ▼

Course Information

Select Appropriate Program Undergraduate Degree Program ▼ CIP Code
Name of New or Existing Program * Minor in Geographic Information Science
Catalog Page Number Select Category Minor ▼ Degree Type
Select Action New ▼

Exact Title and Requirements as they should appear in the catalog.

See current catalog for format within the respective college (enter text below or upload a doc/pdf file)

Minor in Geographic Information Science (GIScience) The required curriculum for the minor in GIScience requires 19 credits of course work. Required Courses include: GEOG 281L Introduction to Maps and Geospatial Information GEOG 381L Introduction to Geographic Information Systems Four electives chosen from the Geographic Information Science Group Geographic Information Science Group: 480L, 482L, 483L, 484L, 485L, 486L, 487L, 488L

This Change affects other departmental program/branch campuses

Reason(s) for Request * (enter text below or upload a doc/pdf file)

See attached .pdf

[Justfication of Minor in GIScience.pdf](#)

Statements to address budgetary and Faculty Load Implications and Long-range planning

* (enter text below or upload a doc/pdf file)

All courses included in the minor are currently taught by geography department faculty. No new resources are required to offer this minor.

The minor in Geographic Information Science has as its core the study and use of geographic information systems (GIS). Central to this program are the theoretical and applied fundamentals of the collection, management, analysis and representation of geographic data. The program builds on this core by exploring both traditional and novel methods for geo-visualization; by teaching about various remote sensing technologies used to collect and classify remotely sensed data, and how to use these technologies; by critically discussing the implications of geo-spatial technologies on individuals and society; by practical examples of how geo-spatial technologies are used effectively in urban and regional planning processes; and by the exploration of applications of GIS to environmental, resource and policy/management issues. The minor interleaves well with majors in computer science, statistics, mathematics, history, political science, anthropology, sociology, criminology, geology, biology, chemistry, environmental studies and environmental sciences.

In 2006 the National Research Council (NRC) published the results of a study that broadly assessed the field of mapping sciences in the U.S. The report titled *Beyond Mapping: Meeting National Needs Through Enhanced Geographic Information Science* offered the following recommendations (among others) that provide rationale for this minor program: *“The country’s colleges and universities must become more flexible if they hope to keep pace with the GIScience industry and with government programs (p.4)...Devising institutional arrangements that favor robust GIS/GIScience and funds necessary to sustain it will yield large dividends in the form of ready employment for undergraduates and advanced degree graduates (p.5)...To meet the need for trained GIS/GIScience professionals as well an informed citizenry, education programs in GIScience should be implemented at all levels of education (K-20 with special attention at K-16) in the United States. These programs should cut across traditional disciplinary borders and employ the latest technologies. (p.5-6)”* Michael Phoenix of Environmental Systems Research Institute (developers of ArcGIS product line) estimates that “the shortfall in producing individuals with an advanced level of GIS education is around 3,000 to 4,000 [annually] in the U.S. alone” (Phoenix, 2000, p.13). The Assistant Secretary for Labor and Training in the U.S. Department of Labor reports that, “87 percent of geospatial product and service providers...had difficulty filling positions requiring geospatial technology skills” (DeRocco, 2004, p.2). Lastly, Duane Marble, one of the leaders of the quantitative revolution in geography and pioneer in the development of GIScience (he created the first graduate program in GIS at SUNY Buffalo 35 years ago) asserted that “Existing GIS education fails to provide the background in GIScience that is necessary to meet the needs of either of the users of GIScience technology or of the scientific community engaged in basic GIScience research and development” (Marble, 1999, p. 31).

A search at two of the top job posting Internet sites indicates that there are many employment opportunities in GIScience. For example, a GIS/geospatial/mapping job search on at www.indeed.com resulted in 5,894 job postings in the U.S., most postings less than one month old. An online search at GIS Jobs Clearinghouse (www.gjc.org) resulted in 46 GIS-related job postings in the first 24 days of October, 2011!

Enrollment in the geography department’s geospatial courses has steadily increased over the past 6 years, with all courses filling to capacity every semester they are offered. Students from a variety of majors take these courses, including students from geography, geology, biology, sociology and anthropology.

The intended geographic service area is comprised of students currently enrolled at UNM. Students will benefit from a minor in GIScience by obtaining highly desirable knowledge and practical skills relevant to geospatial technologies. They will be competitive prospective employees as they enter the workforce in GIScience.

References

DeRocco, E. S. (2004). Speech at AACC & ACCT National Legislative Summit. February 10, Washington DC

Marble, D. F. (1999). Developing a model, multipath curriculum for GIScience. *ArcNews*, 21(2), 1, 31.

Nature, 2004. Mapping opportunities. n.427:376-377 (22 January 2004)
<http://www.nature.com/nature/journal/v427/n6972/full/nj6972-376a.html>

NRC (National Research Council), 2006. Beyond Mapping: Meeting National Needs Through Enhanced Geographic Information Science. Citations from Executive Summary, which can be found at
<http://www.nap.edu/catalog/11687.html>.

Phoenix, Michael (2000) Geography and the Demand for GIS Education. *Association of American Geographers Newsletter*. June, p. 13.

University Consortium for Geographic Information Science, 2006. Geographic Information Science and Technology Body of Knowledge (BOK), Published by the Association of American Geographers.