

### Certificate Programs in Geographic Information Systems (GIS)

The Department of Geosciences offers undergraduates a Certificate in Geographic Information Systems and an Advanced Certificate in Geographic Information Systems. Departmental majors or other students who complete the programs with a grade of "C" or better in each course are entitled to the GIS Certificates. Students should consult with their departmental advisor or another faculty member about registration for these programs. Students may use these courses in the completion of a major.

#### Certificate in Geographic Information Systems

<b>Required Courses</b>		
Introduction to Mapping and GIS	GIS 3015C	3
Remote Sensing of the Environment	GIS 4035C	3
Principles of GIS	GIS 4043C	3
<i>Choose one course from the following list:</i>		
Photogrammetry and Aerial Photograph Interpretation	GIS 4021C	3
Digital Image Analysis	GIS 4037C	3
Applications in GIS	GIS 4048C	3
Geovisualization and GIS	GIS 4138C	3

#### Advanced Certificate in Geographic Information Systems

The Advanced Certificate in Geographic Information Systems allows students to develop an in-depth understanding of programming and spatial data analysis through two required courses, and it allows them to expand their expertise in one additional applied area of Geographic Information Science. The requirements for completing the advanced certificate are: the GIS certificate plus the two required courses and one additional course from the list below.

<b>Required Courses</b>		
Programming in GIS	GIS 4102C	3
Spatial Data Analysis	GEO 4167C	3
<i>Choose one of the following applied courses:</i>		
Photogrammetry and Aerial Photograph Interpretation	GIS 4021C	3
Digital Image Analysis	GIS 4037C	3
Transportation and Spatial Organization	GEO 4700	3
Geovisualization and GIS	GIS 4138C	3