# Master Syllabus Department of Geography

## **GEOG 344-544: Advanced Geographic Information Systems Analysis**

### **Course Description**

Examination and use of analysis techniques in geographic information systems (GIS). Introduction to basic GIS programming. Diagramming, GIS logic and processing flows. Exposure to widely used GIS data models. *Prerequisite*: GEOG 240, 265 or permission of the instructor. (3 credit hours).

## **Course Objectives**

The objectives of the course are to provide the student with:

- 1) a working knowledge and vocabulary of GIS terms and concepts,
- 2) knowledge in the use of GIS techniques, and
- 3) practical experience in applying the technology to real-world data.

Each Student will be required to do laboratory exercises, most of it outside of class hours.

#### **Course Rationale**

This is the second course in 4-course sequence. Students taking this course learn many of the tools and concepts used to solve real-world GIS problems.

## **Course Content and Format**

Although this is the 2<sup>nd</sup> course of a 4-course sequence in GIS, a rapid rehash of introductory GIS serves as a refresher and assures that basic GIS fundamentals and concepts are known. The content may change based on the expertise of the instructor.

#### 1. Introduction to GIS

What is GIS?
Digital Representation of Geographic Data (Data Models)

Map Projections and Coordinate Systems Drawing and Symbolizing Feature Data

Working with Tables Joins

**Attribute Queries Spatial Queries** 

**Spatial Joins** Vector Map Overlay

Geocoding Geodatabase

## 2. (A Few) Advanced GIS Topics

Raster Data Model Terrain Analysis

Map Algebra Cartographic Models

Distance and Density

Using Cell, Neighborhood, and Zonal Statistics

Surface Data Models Surface Interpolation

Symbolizing and Analyzing 3D Data

Data Standards and Data Quality New Developments in GIS

#### **Methods for Evaluating Student Performance**

Forms of evaluation might include examinations, quizzes, and programming assignments. Graduate students are required to do a literature review paper in addition to class requirements.

#### **Evaluation of the Course**

Student evaluation of the course, administered anonymously.