# GIS Capstone Course
## UST 486 Fall 2007

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**Objectives**:
The goal of the GIS capstone course is to integrate the GIS knowledge and skills learned from the first portion of this course as well as accumulated from the prerequisite courses and apply to each student's individual GIS project. The student will use the GIS functionality found within ESRI ArcGIS software as a tool to complete their project. Homework exercises will be completed using ArcGIS software.

**Prerequisites**:
The prerequisites for this class are the successful completion of UST 401 (Computer Applications for Urban Research), UST 403 (Cartography & Graphics), and UST 434 (Introduction to GIS). A prerequisite will only be waved if the student has completed a similar course at another university or where a student has tested out of a prerequisite course.

**Readings**:
Text: **GIS Tutorial** (Workbook for ArcGIS 9.2) 2nd edition by Wilpen Gorr & Kriten Kurland, 2007 ISBN 978-1-58948-127-5 The book is required for the course as it contains free ArcGIS software for 6 months and has all homework exercise assignments and files.

**Assignments and Grading**:

1. *Homework—exercises using ArcGIS software*….....….....(45%)
2. *GIS lecture topic student presentation* …..……..…… (05%)
3. *GIS Project-outline*….....….....(05%)
4. *GIS Project- oral presentation*.....….....….....(15%)
5. *GIS Project- written report* …….(30%)

Grading Scale:

| | | | |
|---|---|---|---|
| A | 92.51 to 100 | C+ | 77.51 to 79.50 |
| A- | 89.51 to 92.50 | C | 69.51 to 79.50 |
| B+ | 87.51 to 89.50 | D | 60 to 69.50 |
| B | 82.51 to 87.50 | F | < 60 |
| B- | 79.51 to 82.50 | | |

**Homework- ArcGIS Exercises:**

All homework exercises are from the **GIS Tutorial** workbook

- GIS Tutorial 1: Map documents and data properties
- GIS Tutorial 2: Map design- create choropleth maps, pin maps, & hyperlinks
- GIS Tutorial 3: GIS outputs- Map layout & export file formats
- GIS Tutorial 4: Geodatabases
- GIS Tutorial 5: Import spatial and attribute data
- GIS Tutorial 6: "Heads-up" digitizing to create new data features and edit existing layers
- GIS Tutorial 7: Geocoding
- GIS Tutorial 8: Spatial data processing- data queries, clip, dissolve, & append
- GIS Tutorial 9: Spatial analysis- buffer objects & apportion data

**GIS lecture topic- presented by student**

Each student will be assigned a GIS topic by the instructor. The topic will correspond to the exercise for that week's lesson. The student will explain and demonstrate how to complete the function or application using ArcGIS. Minimum lecture time of 5 minutes and maximum of 10 minutes.

**GIS Project**:

Each student will explore and determine the topic for their GIS project. Project goals and procedures will be developed by each student. The project will be worked on INDIVIDUALLY. An outline of the project must be submitted to instructor by **October 15, 2006**. The project GIS functionality must be completed in ArcGIS. Oral Project Presentations will be **December 3, 2007**. The written project report will be due on **December 10, 2007**.

Project Outline (due **October 15, 2006**):

State objective(s) of project.

Data layers required with description of spatial and attribute components.

Create a diagram that shows analysis methodology

List GIS functions needed to complete the analysis to reach objectives. The minimum required functions are listed in project requirements- See GIS functions below.

Project Requirements:

Project must be completed in ArcGIS and place data in a project folder.

Must acquire data layers from a minimum of 3 sources (NODIS, websites, etc.).

GIS Functions:

Geocode an attribute database table or create points using x,y coordinates.

Minimum of 3 Attribute SQLs (must include a relational join).

Update a column or calculate values for an attribute field.

Create a thematic map.

Overlay 2 data layers to show at least 1 of following: clip, merge, or dissolve with apportioned data associated.

Minimum of 3 spatial SQLs (select by location).

Create a buffer, then perform a spatial SQL to determine if other data layer objects are within, partly within, intersect, or outside the buffer (only 1 required).

Create presentation quality maps- layouts, save all map documents or workspaces.

Export map from ArcGIS to create jpg, emf or pdf files.

Create a Power Point slide presentation- import .jpg or .emf files; or
create an Adobe Acrobat presentation- from pdf files; or create a Word document with imported map images

Oral Presentation (due **December 3, 2007**):

Show Power Point, Word, or Adobe Acrobat presentation.

Slides can be maps, tables, graphs, photographs, and/ or text.

Presentation must 10 to 15 minutes long.

Questions from classmates & instructor to follow each presentation.

Submit Power Point files, jpg, emf &/or pdf files, project folder files to instructor (Burn CD).

Written Project Report (due to instructor by **December 10, 2007**):

Must include introduction: state objectives, similar studies or subject matter, data integral for analysis & cite sources, GIS functions/procedures, results, recommendations & conclusion.

Metadata should be included in an appendix (can be abbreviated as in Intro to GIS project).

Report should be 7 to 10 pages of TEXT (not including maps, graphs, metadata) – double spaced font size 12, and 1 inch margins.

Presentation quality maps are of the utmost importance in the final report.

Be sure to give a detailed description of each GIS function used- objective or why function is used, layers used, and results of the processed files.

**Students with Special Needs**:

Anyone requiring special assistance to complete assignments must identify themselves to the instructor by the end of the second week of classes. These include accommodations for physical handicaps and learning disabilities.