Spatial Data Modeling and Design (U90 GIS 421 - Fall 2014)
Length: 17 weeks (15 class meetings)

Summary
This course expands on the fundamental principles of GIS and applications of geographic information systems (GIS) and features common spatial database concepts. The course is divided into two parts; the first exploring spatial database design with emphasis on the ESRI Geodatabase, and the second focusing on ESRI ModelBuilder. Topics include user needs assessment; conceptual modeling, logical design, and physical implementation; using models to define spatial analysis processes, and iteration with data. Lectures are supplemented with lab exercises to develop proficiency and problem-solving skills using GIS software and associated tools.

Texts
Other readings as assigned

Weekly Schedule
8/25 Week 1 – Review of GIS Fundamentals, Introduction to Data Modeling
9/1 Week 2 – NO CLASS - Labor Day Holiday
9/8 Week 3 – Introduction to GDB & Conceptual Design (PS1)
9/15 Week 4 – Conceptual Design: Assessment & Translation of User Needs
9/22 Week 5 – Logical Design: Plan your work (PS1 due)
9/29 Week 6 – Physical design: Work your Plan - GDB Creation and Documentation (Q1)
10/6 Week 7 – Working with the ESRI File Geodatabase & Multi-user schemas (PS2)
10/13 Week 8 – Modeling Geography and Spatial Data
10/20 Week 9 – Foundations of Modelbuilder (PS2 due)
10/27 Week 10 – Geoprocessing & ArcPython Scripting (Q2)
11/3 Week 11 – Bringing it all together (PS3)
11/10 Week 12 – Advanced Modeling Techniques
11/17 Week 13 – Collaborative data model considerations (PS3 due)
11/24 Week 14 – NO CLASS - Thanksgiving
12/1 Week 15 – Work on projects (Q3)
12/8 Week 16 – Work on projects
12/15 Week 17 – Presentations
Grading

- Quizzes 3 (50 pts each) 150 pts
- Problem Sets 3 (50 pts each) 150 pts
- Project 100 pts
- Class Participation 50 pts

450 pts total

- All problem sets are due 2 weeks after assignment.
- Late assignments will be assessed a 15 point deduction for each week they are overdue.
- Quizzes will be in class with a time limit.

Graduate Credit

Students enrolling in the course for graduate credit may be required to complete additional assignments as directed by their Dean.

Attendance

While attendance is expected at each class session, I understand that this may not always be possible. Absences from class should be prearranged with the instructor when feasible. Any missed assignments should be coordinated with the instructor. Absence from more than two class sessions will negatively impact your class participation score (50pts).

Final Project

A final project will be required for this course. You should use the project assignment to demonstrate your understanding of the GIS concepts covered during the course and show how they can be applied to a real-world problem.

You are encouraged to use a scenario/dataset that is of interest to you or that you may already be researching. If you are having difficulty in selecting a project, please let me know and we can brainstorm.

A short paper (3-5 pages) should explain your project and how design and/or modeling concepts from this class were applied to complete the project. A presentation will also be required. Each student will be given 15 minutes to present their project and take questions.

The Final Project assignment has 100 points possible.

Quizzes

There will be three quizzes during the semester. The quizzes will be structured around topics covered and reading assignments. Each quiz will be timed. Makeup of missed quizzes should be coordinated with the instructor.