GEO 7318 – GIS IN ENVIRONMENTAL GEOGRAPHY
TEXAS STATE UNIVERSITY*, SPRING 2006

Instructor: Mark A. Fonstad
Office: 383 Evans Liberal Arts (ELA) Building
Telephone: (512) 245-7809
Email: mfonstad@txstate.edu
Office Hours: 4:30 PM – 6:30 PM Wednesdays or by appointment
Class Time: 6:30 PM – 9:00 PM Wednesdays
Classroom: Evans Liberal Arts (ELA) Building, Room 313
Course Line Number: 296562

CATALOG DESCRIPTION

This course examines the nature of environmental problems and explores the potential of GIS for environmental modeling and management. The conceptual basis for using GIS as well as the framing of environmental research problems will be covered.

COURSE STRUCTURE

This course will be managed as a single, communal project course. Participants in the class will work both individually and in teams on parts of a large dynamic model. The project of interest will be a dynamic (i.e. changing-through-time) spatial model of the interactions between urban growth and geomorphic/hydrologic processes. The project will likely center on these subparts: 1) develop an urban growth model, 2) develop a geomorphic activity model, 3) develop rules that predict the effects of urban growth on the geomorphic activity, 4) develop rules that predict the response of urban growth to geomorphic activity, 5) calibrate and test the model with historic remote sensing and GIS data, and make future predictions and descriptions of historic pattern development. We will likely build each of these submodels using the cellular automata schema.

KNOWLEDGE OUTCOMES

Develop a meaningful and theoretically significant plan for construction of a dynamical model of environmental change..
Demonstrate understanding of the components of a large, collaboratively constructed dynamic model.

SKILLS OUTCOMES

Write a report on the construction, calibration, and analysis of results of a large, dynamic, geospatial model.
Complete development of a submodel of a larger GIS simulation system.

EVALUATION AND GRADING POLICIES

Your grade for this course will reflect your ability to help develop the class project in collaboration with your colleagues, the effort you put forth, and your ability to write up your efforts in a coherent way. I will evaluate your performance based on two major areas of work in this course. First, I will assess your ability work collaboratively through class participations in weekly research discussions and in-class presentation of your modeling efforts. Second, an individually-written report at the semester's end is also used to evaluate your final grade. All students are expected to prepare assignments by the scheduled time. Late assignments (presentations or reports) will have their grade lowered 5 points per class day late. I will endeavor to grade reports within a week of their submission.

There is a maximum of 100 points for all of the discussion, presentation, and project activities. The basis for grading will be as follows: 75 points for weekly reading discussions, 25 points for the final project presentation, and 100 points for the final project. There is NO final exam in this course, but final reports will be due on the final exam date. The final grades will be determined based on the following rules:

A	≥90% (≥90 points)
B	≥80% and <90% (80 – 89 points)
C	≥70% and <80% (70 – 79 points)
D	≥60% and <70% (60 – 69 points)
F	<60% (< 59 points)

REQUIRED MATERIALS

There are no required materials for this course. If you do not yet have access to the department's GIS laboratories, you will need to get this access from Dan Hemenway.

CLASSROOM AND ATTENDANCE POLICIES

Good attendance in the class is key to your success in this course. First, the student discussions in class will require knowledge from previous weeks. Second, the individual research projects will require a deep familiarity with class material. They key to a large, collaborative project is steady progress from each member of the team. Large gaps of missed days or low-output performance will significantly affect the project development of all of the participants. This is particularly the case during the middle section of the project, where programming of the submodels will require considerable sustained effort.

If you must miss class because of an illness, a personal emergency, or some other extenuating circumstance, please contact me as soon as possible so I can make alternative arrangements for you (this is key). Of course, good attendance means more than just showing up for class. Please read and adhere to the policy on classroom etiquette that appears below. These codes of conduct will allow everyone to participate equally as learners. Thank you for your cooperation.

In the Department of Geography, instructors strive to create an atmosphere of mutual trust and respect in which learning, debate, and intellectual growth can thrive. Creating this atmosphere, however, requires that instructors and students work to achieve a classroom in which learning is not disrupted. At the most basic level, this means that everyone should attend class, be prepared with readings and assignments completed, and that students pay attention. This means no conversations with friends, reading the newspaper, coming late, or leaving early. Such behavior is disruptive to the instructor and to your fellow classmates.

STUDENTS WITH DISABILITIES

Students having special needs/disabilities (as documented by the Office of Disability Services) that will require compensatory arrangements must contact the instructor no later than the fourth class period to discuss specific arrangements and logistics. Students who have not already done so will be required to contact the Office of Disability Services located at LBJ 5-5.1 (512-245-3451). Texas State is dedicated to providing these students with necessary academic adjustments and auxiliary aids to facilitate their participation and performance in the classroom.

TEXAS STATE ACADEMIC HONESTY POLICY

Learning and teaching take place best in an atmosphere of intellectual fair-minded openness. All members of the academic community are responsible for supporting freedom and openness through rigorous personal standards of honesty and fairness. Plagiarism and other forms of academic

dishonesty undermine the very purpose of the university and diminish the value of an education. Specific sanctions for academic dishonesty are outlined in the *Texas State Student Handbook*.

Schedule by Week	Topics
Jan 18	Introduction to the modeling project
Jan 25	Decisions on Project Location, Submodels
Feb 1	Data Procurement and Submodel Algorithm Development
Feb 8	Data Procurement and Submodel Algorithm Development
Feb 15	Data Preparation and Submodel Algorithm Development
Feb 22	Data Preparation and Submodel programming
Mar 1	Submodel programming
Mar 8	AAG WEEK – NO CLASS
Mar 15	SPRING BREAK – NO CLASS
Mar 22	Submodel programming
Mar 29	Submodel programming
Apr 5	Model Integration and Calibration
Apr 12	Model Integration and Calibration
Apr 19	Model Forecasting and Analysis
Apr 26	Model Forecasting and Analysis
May 3	**Final Projects Reports Due Wednesday, May 3, 6:30- 9pm**

ABOUT THE INSTRUCTOR

The instructor is Mark A. Fonstad, assistant professor of geography. He is a specialist in spatial and hydrological analysis of river systems, theoretical geomorphology, and applied remote sensing. Mark received his Ph.D. in Geography from Arizona State University (2000) where he researched mountain fluvial systems and the prediction of channel change in New Mexico. For the past four years, Mark has directed the field research on channel morphology, watershed hydrology, and the remote sensing of rivers in Yellowstone National Park.

[*] A member of the Texas State University System