GEO 5370 – SEMINAR IN APPLIED PHYSICAL GEOGRAPHY
"MODELING IN PHYSICAL GEOGRAPHY"
TEXAS STATE UNIVERSITY, SPRING 2004

Instructor: Mark A. Fonstad
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Office Hours: 4:00 PM – 6:30 PM Wednesdays or by appointment
Class Time: 6:30 PM – 9:15 PM Wednesdays
Classroom: Evans Liberal Arts (ELA) Building, Room 315
Course Line Number: 263531

COURSE DESCRIPTION

This course is a critical analysis of theories, models and techniques of physical geographic research with the focus on application to real-world problems. This seminar will present a broad theoretical foundation for different types of models used in the simulation of physical geographic processes. These might include, but are not limited to formalized conceptual models, systems analysis, static vs. dynamic models, network models, spatial and temporal association models, analog and physical models, black-box and process-response empirical models, models of pattern classification, models based on continuum and statistical mechanics, cellular automata and multi-agent simulations.

LEARNING OUTCOMES

By The end of this course, you should be able to understand and critique advanced models of applied physical geography processes. Toward this end, an integral part of this course will be both small lectures/discussions and research project work on an individual physical modeling project.

COURSE MATERIALS

Readings for this class will be from several recent physical geography research articles. Most of these articles will be distributed electronically as PDF files, although a few will be distributed as paper copies. There will be no charge for the articles, and there is no required text for the course.

EVALUATION AND GRADING POLICIES

I will evaluate your performance and assign grades based on two major areas of work in this course. First, I will assess your ability to communicate advanced material through class participations in weekly research article discussions, and in-class presentation of your modeling research projects. Second, a significant individual written research project is also used to evaluate your final grade. All students are expected to prepare assignments by the scheduled time. I will endeavor to grade projects within a week of their submission.

There is a maximum of 200 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. The final grades will be determined based on the following rules:

A	≥90% (≥180 points)
B	≥80% and <90% (160 – 179 points)
C	≥70% and <80% (140 – 159 points)
D	≥60% and <70% (120 – 139 points)
F	<60% (< 119 points)

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.

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 provide these students with necessary academic adjustments and auxiliary aids to facilitate4 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 21	Formalized Conceptual Models, Systems Analysis
Jan 28	Empirical Black-box Models & Elementary Matrix Algebra
Feb 4	Empirical Models of Spatial and Temporal Association I
Feb 11	Empirical Models of Spatial and Temporal Association II

Feb 18	Physical Models *(with Joanna Curran, I will be in Colorado)*
Feb 25	Empirical Process-Response ("Gray-Box") Models
Mar 3	Models of Pattern Classification I
Mar 10	Models of Pattern Classification II
Mar 17	*No Class (Spring Break)*
Mar 24	Models Based on Continuum Mechanics I
Mar 31	Models Based on Continuum Mechanics II
Apr 7	Cellular Automata Models I
Apr 14	Cellular Automata Models II
Apr 21	Cellular Automata Models III & Project Presentations
Apr 28	Multi-Agent System Models
May 5	**Final Projects Due Wednesday, May 5, 6:30 pm**

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 fluvial 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.