GEO 4325 – FLUVIAL PROCESSES
TEXAS STATE UNIVERSITY*, FALL 2008

Instructor: Mark A. Fonstad
Office: 383 Evans Liberal Arts (ELA) Building
Telephone: (512) 245-7809
Email: mfonstad@txstate.edu
Office Hours: 12:00 PM – 2:00 PM Tuesdays or by appointment
Class Time: 2:00 PM – 3:15 PM Tuesdays and Thursdays
Classroom: Evans Liberal Arts (ELA) Building, Room 312
Course Line Number: 335042

COURSE DESCRIPTION
Students analyze modern principles of river processes and forms within a geographical perspective. This course examines the fundamental mechanics of fluvial channels with an emphasis on quantitative geographic evaluation of their processes. The course emphasizes natural scientific perspectives and includes linkages to ecology, engineering, resources management and policy. Prerequisite: GEO 3325 or 3434.

KNOWLEDGE OUTCOMES
Students will discuss physical principles of river geomorphology, hydraulics, hydrology, and ecology with emphasis on spatial patterns and forms.
Students compile and integrate information about the dynamics and change processes in rivers from sources such as direct measurements, maps, imagery, empirical relationships, and physical laws.
Students are able to explain the basic physical nature of rivers, the spatial and temporal results of these processes, and the utility of this processes knowledge in prediction and management.

SKILLS OUTCOMES
Students will apply skills learned in lecture and exercises in the understanding of current and past river dynamics in a variety of geographical settings.
Students will analyze patterns and processes of the riverscape during accurately conducted fieldwork.

COURSE PREREQUISITE
GEO 3434 with a minimum C grade or
GEO 3325 with a minimum C grade

REQUIRED MATERIALS
Readings for this class will be from the textbook, *Fluvial Forms and Processes: A New Perspective* by David Knighton (1998) available at the Texas State Bookstore, and other academic bookstores.

EVALUATION AND GRADING POLICIES
I will evaluate your performance and assign grades based on three major areas of work in this course. First, I will assess your ability to understand course material through four homework exercises.

Second, there are two exams (one midterm and one final) also used to evaluate your final grade. Third, students will complete a final project on river processes due near the end of the term. All students are expected to prepare assignments by the scheduled time. **Late assignments** (presentation or project) will have their grade lowered 10 percent of the maximum points for that assignment per class day late. I will endeavor to grade projects within a week of their submission. All students are expected to take exams at the scheduled time. **Make up exams** will be given to students who have excused absences; however, make up exams will be different than those given at the scheduled time, and make up exams for students with unexcused absences will be given on the same day as the Final Exam. Exams should be returned to students within one week of the exam date.
There is a maximum of 500 points for all of the lecture exams, homework exercises, and final project. The basis for grading will be as follows: 100 points for the each of the two examinations, 100 points for the final project, and 200 points for the laboratory section grade.

The final grades will be determined based on the following rules:

A	≥90% (≥450 points)
B	≥80% and <90% (400 – 449 points)
C	≥70% and <80% (350 – 399 points)
D	≥60% and <70% (300 – 349 points)
F	<60% (< 300 points)

CLASSROOM AND ATTENDANCE POLICIES

Good attendance in the class is key to your success in this course. First, the lectures and discussions in class will require knowledge from previous weeks. Second, the individual homework and final 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 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.*

Tentative Course Schedule

Schedule	Topics & Assignments	Textbook Readings*
August 28th	Introduction, simple physics of river flow (1)	Chapters 1
September 2nd, 4th	Physics of river flow (2), "slope-area" and "step-backwater" techniques	Chapter 4
September 9th, 11th	Fluvial forces, sediment erosion, transport, and deposition	Chapter 4
September 16th, 18th	Channel Morphology I: hydraulic geometry, thresholds, allometric change, equilibrium vs. nonequilibrium systems, **EX. 1 DUE**	Chapter 5
September 23rd, 25th	Channel Morphology II: conceptual and quantitative models of channel change: regime, physically-based, extremal, stochastic.	Chapter 5
September 30th, October 2nd	Channel Morphology III: channel patterns, switching behavior, Einstein's meandering paper, quantitative analysis of patterns, cellular automata and braiding, **EX. 2 DUE**	Chapter 5
October 7th, 9th	Basins and Networks I: network topology and landscape evolution	Chapter 2
October 14th, 16th	Catch-up and review day **MIDTERM EXAM (THURS, OCT. 16)**	
October 21st, 23rd	Basins and Networks II: hydrology and sediment yield	Chapters 2 & 3
October 28th, 30th	Basins and Networks III: GIS and hydrologic modeling, remote sensing of basin hydrologic information	Chapter 3
November 4th, 6th	Floods: Types and causes of floods, flood hydroclimatology, remote flood analysis	Chapter 6
November 11th, 13th	Effects of humans: dams, channelization, land cover change, physical integrity, contaminant transport, **EX. 3 DUE**	Chapter 6
November 18th, 20th	Effects of climate and land cover change: difficulties in cause and effect, policy implications	Chapter 6
November 25th, 27th	River restoration and river ecology **NO CLASS ON THURSDAY**	Chapter 6
December 2nd, 4th	The research frontier, **EX. 4 DUE**	

	Catch-up and day, **FINAL PROJECTS DUE**	
December 16th	**FINAL EXAM, 11:00 a.m. – 1:30 p.m.**	

***Supplemental readings may also be assigned throughout the semester.**

ABOUT THE INSTRUCTOR

The instructor is Mark A. Fonstad, associate 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). For the past eight years, Mark has directed the field research on watershed hydrology, channel morphology, and the remote sensing of rivers in Yellowstone National Park.

* A member of the Texas State University System