**GEOG5400 Environmental Modeling**  
University of North Texas  
Department of Geography  
Fall 2010  
6:00PM---9:00PM, ENV360

**Instructor:** Dr. Feifei Pan  
**Office:** ENV 325K  
**Office hours:** none scheduled, open door policy or by appointment.  
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**Goals:** (1) understand concepts, theories, and physics of hydrologic processes; (2) understand hydrologic modeling and visualization; (3) learn programming using Processing

**Class Website:** [http://www.geog.unt.edu/~fpan/phtml/geog5400_fall2010.html](http://www.geog.unt.edu/~fpan/phtml/geog5400_fall2010.html)

**Processing Website:** [http://www.processing.org/](http://www.processing.org/)

**Topics/Schedule:**

1. **Aug.30** introduction, concepts, conservation laws, DEM  
   Processing, numerical modeling, visualization, time series plot

   **Sep.6** holiday, no class

2. **Sep.13** processing DEM, slope, flow direction, flow accumulation, delineate watershed

3. **Sep.20** precipitation  
   spatial interpolation,

4. **Sep.27** soil, soil moisture, infiltration, Richards’ equation  
   soil database, soil map

5. **Oct.4** evaporation, evapotranspiration (ET)  
   parameterization of ET

6. **Oct.11** surface runoff, subsurface runoff, drainage  
   logistical function

7. **Oct.18** water balance  
   a simple box model

8. **Oct.25** a catchment-based hydrologic model (only water balance)
9 Nov.1 solar radiation, long wave radiation, albedo, emissivity

10 Nov.8 latent heat flux, sensible heat flux

11 Nov.15 energy balance
   Newton-Raphson method, predicting ground temperature

12 Nov.22 coupling of water and energy balance

13 Nov.29 a catchment-based hydrologic model (water and energy balance coupled)

14 Dec.6 no lecture, help students on their project

15 Dec.13 Student presentation and term paper due

Schedule is subject to change.

**Grading:** 10% attendance and class participation, 60% homework, and 30% final project

**Disability Accommodations:** The Department of Geography, in cooperation with the Office of Disability Accommodation, complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request before the 12th class day.

*The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SETE to be an important part of your participation in this class. The link to the SETE website is: https://sete.unt.edu/*