GEGN 598A – Integrated Surface Water Hydrology Modeling
T 9:00-12:00, CTLM B62
Class web site: see Blackboard

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Overview: This class will cover topics related to numerical solution of the equations used to describe components of the hydrologic cycle. Emphasis will be placed on simulation of diffusive (e.g. groundwater) and wave equations (e.g. overland flow) using explicit and implicit techniques for both serial and parallel processor configurations. The class will be problem-based with students developing solution techniques for these systems through class projects before applying numerical simulation platforms to problems in hydrology.

Textbook: This class has one required textbook:

suggested/optional, on reserve in Authur Lakes Library:

Grading:
This class will be graded based entirely on class projects. There will be approximately four assignments that will be both group and individual efforts and will range in size. There will be no final exam.

Course Topics:
Explicit finite-difference techniques: Solution of overland flow routing
Linear solver techniques: Solution of the groundwater equation
Nonlinear solver techniques: Solution of Richards’ equation
Fundamental of parallel numerical solution
Introduction to geostatistical simulation in hydrology
The use of common graphics and other postprocessing analysis techniques in hydrology
Putting it all together: Integrated solution techniques in hydrology
Integrated Hydrologic Simulation: Application of ParFlow to an integrated watershed problem.