GEOL 573.01: Groundwater Modeling

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**GEOLOGY 573**

**GROUNDWATER MODELING**

**FALL 2003**

INSTRUCTOR: William Woessner (Phone - 243-5698)

BOOKS: Anderson and Woessner, APPLIED GW MODELING - On Electronic Reserve  
(Wang and Anderson, INTRO TO GW MODELING - Optional)

PREREQUISITES: Geology 480, Computer Language

COURSE GOALS AND OBJECTIVES: Prepare students to evaluate and quantitatively analyze hydrogeologic problems.

TIME: Proposed for Tuesdays, 4:10-6:40 p.m.

<table>
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<tr>
<th>CLASS MEETS</th>
<th>TOPIC</th>
<th>READING</th>
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<tbody>
<tr>
<td>September 2</td>
<td></td>
<td>A+W</td>
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<tr>
<td></td>
<td>Intro to Modeling</td>
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<td>September 4</td>
<td>Richelle Allen-King Darcy Lecture - 12:10 and 2:00 p.m.</td>
<td>A+W</td>
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<td>September 9</td>
<td>Conceptual Models Problem, Chapter 2</td>
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<td>September 16</td>
<td>No Class – Homework Assignment</td>
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<td>September 22</td>
<td>LAST DAY TO DROP/ADD BY CYBERBEAR</td>
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<td>September 23</td>
<td>Intro to Modeling and Numerical Methods Finite Differences, Chapter 3</td>
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<td>September 25-26</td>
<td>River Center Conference</td>
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<td>September 30</td>
<td>Finite Differences and Finite Elements</td>
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October 2-3  AWRA Meeting – Butte

October 7  Finite Element - Solving Techniques

October 13  **LAST DAY TO DROP/ADD (NO $$$ BACK)**

October 14  Solving Techniques

TRANSLATING HYDROGEOLOGIC CONCEPTS TO THE NUMERICAL MODEL

October 21  Intro to FLOWPATH - Steady State
Boundary Conditions
Problem, Chapter 4

October 28  Boundary Conditions, Grids
Source and Sink Terms
Problem, Chapter 5

November 4  **NO CLASS**

November 11  Intro to MODFLOW
Problem, Chapter 6

November 18  Intro to MODFLOW
Transient Simulations
Problem, Chapter 7

November 25  Model Calibration
Problem, Chapter 8

November 27  **HOLIDAY**

December 2  Other Models, Sensitivity Analysis

December 9  Work on Finishing Assignment – **NO CLASS**

**FINAL EXAM:**  Wednesday, December 17, 3:20-5:20 p.m.

**COURSE ASSESSMENT:**  Quality of completed assigned problems and class participation.

*Additional reading will be assigned. Wang and Anderson is a good reference.*
GROUNDWATER MODELING ASSIGNMENTS AND GRADING

All assignments are to be run on computers other than those found in the Hydro Computer Lab. **Please do not tie up my Hydro Lab Computers for homework!**

All programs supplied have some kind of licensing restrictions. Use of a code does not grant ownership. Do not copy or distribute codes used as part of this course.

Assignments will be made as appropriate including selections from the following list of problems:

Three to four short problems associated with Chapters 1 and 2.

1. Anderson and Woessner - As assigned from textbook chapters. Typically one or two problems/chapters. Three to five hours per week should be allocated on the average. The learning curve is steep for the MODFLOW model. Last problem requires 10-20+ hours.

**GRADING:** 90% on completion of problems, 10% on class participation and discussion.