Fall 9-1-2000

GEOL 573.01: Groundwater Modeling

William W. Woessner

University of Montana - Missoula, william.Woessner@umontana.edu

Let us know how access to this document benefits you.

Follow this and additional works at: https://scholarworks.umt.edu/syllabi

Recommended Citation

https://scholarworks.umt.edu/syllabi/5100

This Syllabus is brought to you for free and open access by the Course Syllabi at ScholarWorks at University of Montana. It has been accepted for inclusion in Syllabi by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.
GEOLOGY 573
GROUNDWATER MODELING
FALL 2000

INSTRUCTOR: William Woessner (Phone - 243-5698)

BOOKS: Anderson and Woessner, APPLIED GW MODELING
(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: Tuesday, 4:10-5:40 p.m. Thursday class will be rescheduled as Dr. Woessner serves on the Executive Committee of the Faculty Senate on Thursdays from 3:00-6:00 p.m.

<table>
<thead>
<tr>
<th>Week of</th>
<th>TOPIC</th>
<th>READING</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 5</td>
<td>Intro to Modeling</td>
<td>A+W</td>
</tr>
<tr>
<td></td>
<td>Problem 1</td>
<td></td>
</tr>
<tr>
<td>September 12</td>
<td>Numerical Methods</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Finite Differences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Problems 2 and 3</td>
<td></td>
</tr>
<tr>
<td>September 19</td>
<td>Finite Differences or Finite Elements</td>
<td>2</td>
</tr>
<tr>
<td>September 25</td>
<td>LAST DAY TO DROP/ADD BY DIAL BEAR</td>
<td></td>
</tr>
<tr>
<td>September 26</td>
<td>Finite Element - Solving Techniques</td>
<td></td>
</tr>
<tr>
<td>October 3</td>
<td>Solving Techniques</td>
<td></td>
</tr>
</tbody>
</table>

NUMERICAL METHODS

IMPORTANCE OF UNDERSTANDING THE HYDROGEOLOGY

Conceptual Models
Problem, Chapter 3
October 10  Conceptual Models

TRANSLATING HYDROGEOLOGIC CONCEPTS TO THE NUMERICAL MODEL

October 16 LAST DAY TO DROP/ADD (NO $$ BACK)

October 17 Intro to FLOWPATH - Steady State 4
                Boundary Conditions 4
                Problem, Chapter 4

October 24 Boundary Conditions 4
                 Source and Sink Terms 5
                 Problem, Chapter 5

October 31 Profile Modeling 6
                 Intro to MODFLOW * 4
                 Problem, Chapter 6

November 7  Holiday (Nov. 7)
           Intro to MODFLOW 7
           Transient Simulations
           Problem, Chapter 7

November 14 NO CLASS

November 21 Model Calibration 8
                 Problem, Chapter 8
                 Holiday (Nov. 23)

November 28 Sensitivity Analysis 8

December 5 Other Models

December 12 Capture Zones 11

FINAL EXAM: Monday, December 18, 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. You will need a math co-processor, Windows-DOS machine or an Apple that can run DOS programs. Please do not tie up my Hydro Lab Computers for homework! All programs 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

   Problems:
   3.1
   3.3
   3.5
   4.1**
   4.2**
   4.3**
   4.4
   4.6**
   5.4**
   5.1**
   6.1
   6.3
   6.4
   7.3**
   8.5***

   **Lengthy problem, plan accordingly
   ***Very long problem, plan accordingly

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