

# GLY 4703 – ADVANCED ENVIRONMENTAL & ENGINEERING GEOLOGY

COURSE SYLLABUS  
SPRING SEMESTER 2005

## GENERAL INFORMATION

**Instructor:** Dr. William P. Anderson, Jr.

**Office:** 162 Rankin Science

**Phone:** 262.7540

**Email:** andersonwp@appstate.edu

## OFFICE HOURS

**M:** 9:00 am – 10:00 am, 11:00 am – 12:00 pm, 1:00pm – 3:00pm

**Tu:** 11:00 am – 12:00 pm, 2:00 pm – 3:00 pm

**W:** 9:00 am – 10:00 am, 11:00 am – 12:00 pm

**Th:** 11:00 am – 12:00 pm, 2:30 pm – 3:30 pm

**Appointment:** If you cannot make my scheduled office hours, please do not hesitate to call or email me to arrange a meeting time.

## REQUIRED TEXTS

*Groundwater Science*, by Charles Fitts, Academic Press

## REQUIRED TEXTS (on reserve)

*Geotechnical Engineering – Principles and Practices*, by Donald Coduto

*Exploration Geophysics of the Shallow Subsurface*, by Robert Burger

## GRADING

### *Exams (30%)*

There will be three in-class exams: Tuesday, February 1 (Chapters 1 and 2 and supplemental materials); Thursday, March 3 (Chapters 3 and 4 and supplemental materials); and Tuesday, April 12 (Chapter 5 and supplemental materials).

### *Final Exam (10%)*

The comprehensive final exam is scheduled for Tuesday, May 3, from 3:00pm to 5:30pm.

### *Homework (20%)*

There will be six problem sets throughout the semester (see tentative schedule for specific dates). Homework sets should be presented in a clear and concise manner, with all work shown on calculation problems. Please take note that neatness counts. No employer will accept sloppy and illegible writing with problems crammed onto one sheet of paper; neither will I. Points will be deducted for sloppy work. On the other hand, I may give extra points for neat meticulous work.

### *Term Paper & Talk (15%)*

A ten-page term paper is required for this class. The topic may cover an environmental topic that pertains to any water resources, engineering geology, or geophysics issue that interests you as long as I approve of the topic. The paper should include at least five references from peer-reviewed journals. In addition to the paper, you will be required to do a 15-minute presentation to the entire class. The presentation should be of professional meeting quality (something that you would expect to see at an AGU or GSA meeting).

There are several key due dates that you need to meet. All submissions should be done in MS Word and should be sent to me as an attachment via email by the due date. I will return graded papers to you via email attachments with comments/corrections done directly within the file. The term paper is due to me on February 20<sup>th</sup>. The submission should include the topic, a brief (short paragraph)

description of its relevance to the course, and the reason for your interest. An outline of the paper is due on February 8<sup>th</sup>. This should be more than a simple outline in that you should have at least several sources and a working knowledge of your topic. A rough draft of the paper is due on March 22<sup>nd</sup>. I will make extensive comments on this rough draft that I will expect to be incorporated into the final submission. The final paper is due on April 21<sup>st</sup>. On that day, during lab, each student will be required to give a professional talk on their paper.

#### *Lab (25%)*

The lab consists of several group projects. The lab schedule is shown in the tentative class schedule. The projects cover a range of environmental topics including water budget, fractured bedrock hydrology, water-level monitoring, and groundwater modeling. The lab will include several field trips. While most of the field trips will be local, one field trip will be to Hatteras Island, NC. That trip will occur from April 1<sup>st</sup> through 3<sup>rd</sup>. We will use this field trip to collect water-level data, perform single-well pumping tests (slug tests), and collect resistivity data for analysis with a geophysicist from Radford University.

Each lab project will require a lab report describing your analyses. Each lab report must include the following sections: (1) Cover Page, (2) Introduction, (3) Field or Laboratory Methods, (4) Data, (5) Analysis, and (6) Discussion. A sample cover page, to be included with each lab report, is included below. Lab reports are due on the dates indicated on the tentative lab schedule.

### **REPORT ON LAB ASSIGNMENT #1**

Student's Name

February 3, 2005

**Abstract:** Here you should write a summary of your lab report. Do not write a couple of sentences indicating the various sections of your report, which amounts to a Table of Contents written in sentence form. Rather, write a paragraph or two describing the activities and findings of the assignment. The abstract should be able to stand on its own; in many work situations, this may be the only portion of your report that your client or reviewer will read. The abstract should not exceed 250 words.

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#### **Introduction**

In this section you should describe the lab assignment.

#### **Field (or Laboratory) Methods**

In this section you should describe the processes that you used to collect the data. For example, if the lab required the use of a constant-head permeameter to determine the hydraulic conductivity of a sediment sample, you should describe the use of a constant-head permeameter.

#### **Data**

This section should include a table showing the data that were collected and a paragraph or two describing the data that were collected.

#### **Analysis**

This section should include a discussion of the methods of analysis. In the constant-head permeameter example given above, you would (1) describe methods that are used to evaluate constant-head permeameter data, including formulae used in calculations, and (2) discuss the outcome of those calculations.

#### **Discussion**

In this section you should discuss and summarize the findings of your report.