Soil & Groundwater Restoration

GEO 410 Section 001

Spring 2014, Lecture

Dr. Geoffrey Tick

CRN 13159/13199

Lecture: T/Th 3 - 4:15 p.m.

Prerequisites

UA Course Catalog Prerequisites
Prerequisite(s): GEO 101 and CH 101 or CH 117 and CH 102 or 118.

Course Description

UA Course Catalog Information
Methods for restoring contaminated soil groundwater by examining the factors and processes influencing the efficacy of remediation systems. Emphasis placed on the scientific principles upon which soil and groundwater remediation is based.

Student Learning Outcomes

This course will give students the skills to evaluate which technologies and techniques used to remediate soil and groundwater are best suited for different environments, remediation objectives, and particular types of contaminants. Students will exit this course with the knowledge of remediation options and design criteria, and provide skills necessary to choose appropriate techniques for effective contaminant control, remediation, and restoration.

Required Texts

UA Supply Store Textbook Information

- NONE / NO TEXT REQUIRED (Required)

Other Course Materials

Recommended/Optional:


**Outline of Topics**

**January**

9 [Th] Introduction to Course; Superfund, Planning, & Evaluation (RI/FS)

14 [T] Contaminant Transport and Distribution

16 [Th] Contaminant Transport and Distribution

21 [T] Site Characterization

23 [Th] Containment/Control: Barriers, Immobilization Drains, Wells

28 [T] Pump and Treat: Fundamentals

30 [Th] Pump and Treat: Performance

**February**

4 [T] Pump and Treat: Performance/ Pump and Treat: Case Study – Plant 44

6 [Th] Pump and Treat: Case Study – Plant 44


13 [Th] Enhanced Flushing Techniques; Discussion of Term Project

18 [T] EXAM 1

20 [Th] Enhanced Flushing Techniques

25 [T] Enhanced Flushing Techniques

27 [Th] Air Sparging, UVB Systems

**March**

4 [T] Soil Venting
6 [Th] Enhanced Soil Venting, Steam
11 [T] In-situ Treatment – Physical/Chemical
13 [Th] In-situ Treatment – Physical/Chemical
18 [T] In-situ Treatment – Physical/Chemical
20 [Th] In-situ Treatment – Biological

25 [T] Spring Break (No Class)
27 [Th] Spring Break (No Class)

April
1 [T] In-situ Treatment – Biological

3 [Th] EXAM 2
8 [T] Case Study: NAPL Remediation

10 [Th] Class Project Presentations
15 [T] Class Project Presentations
17 [Th] Class Project Presentations

22 [T] Natural Attenuation/Phytoremediation/Pollution Prevention
24 [Th] Pollution Prevention; Course Wrap Up

28 (Monday) FINAL EXAM 7:00 PM – 9:30 PM (2.5 hour exam).

READING: Reading material will be assigned at the end of each lecture session.

*NOTE: The syllabus is subject to change at the instructor’s discretion.

Exams and Assignments

EXAMS

Each student is expected to take all exams at the designated time and place. Students who miss an exam will receive a grade of zero for that exam. Make-up exams will be given only on presentation of approved medical excuse, or by pre-excused permission of the instructor. No exceptions! One and only one make-up exam will be given after each regularly scheduled exam. Time and place for the make-up exam will be arranged at the next regularly scheduled class following each exam. The format of make-up exams may differ from that of the regular exam. All exams are closed book; however, the use of a calculator is permitted. Students who want to appeal a grade should do it in writing, at latest one day after the exam was returned. Please note the date of the final exam.
According to University regulations, no final exam will be given at an earlier date. Disability accommodations must be documented and approved by the Office of Disability Services.

ASSIGNMENTS

Homework will be assigned throughout the semester. Students are encouraged to work in groups; however each student is expected to submit their own individual work. Reference materials are reserved in the Science and Engineering Library (SEL). All homework (problem sets) must be completed by the due date and in a professional manner. Care should be taken to assure that a neat, organized, understandable, and concise product is the result of your work. Late work will not be accepted.

PROJECT

410/510: All students will be required to submit a project report (oral and written) utilizing the principles learned in class to construct an RI/FS study for a contamination site.

510: All graduate students will be required to submit an additional synthesis and report (oral and written) related to a specific class of contaminants and discuss appropriate remediation technologies that apply.

Grading Policy

COURSE GRADING

410: 3 Exams {Exam 1 = 20%, Exam 2 = 20%, Final = 20 %} + HW {15%}

+ Project {25%}.

510: 3 Exams {Exam 1 = 15%, Exam 2 = 15%, Final = 15%} + HW {15%}

+ Project {20%} + Independent Project {20%}.

GRADING SCALE

GEO 410

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GEO 510

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**Severe Weather Guidelines**

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When West Alabama is under a severe weather advisory, conditions can change rapidly. It is imperative to get to where you can receive information from the [National Weather Service](http://www.noaa.gov) and to follow the instructions provided. Personal safety should dictate the actions that faculty, staff and students take.

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- Weather advisory broadcast over WVUA-TV/WUOA-TV, and on the website [http://wvuatv.com/content/weather](http://wvuatv.com/content/weather). WVUA-TV Home Team Weather provides a free service you can subscribe to which allows you to receive weather warnings for Tuscaloosa via e-mail or cell phone. Check [http://wvuatv.com/content/free-email-weather-alerts](http://wvuatv.com/content/free-email-weather-alerts) for more details and to sign up for weather alerts.
In the case of a tornado warning (tornado has been sighted or detected by radar; sirens activated), all university activities are automatically suspended, including all classes and laboratories. If you are in a building, please move immediately to the lowest level and toward the center of the building away from windows (interior classrooms, offices, or corridors) and remain there until the tornado warning has expired. Classes in session when the tornado warning is issued can resume immediately after the warning has expired at the discretion of the instructor. Classes that have not yet begun will resume 30 minutes after the tornado warning has expired provided at least half of the class period remains.

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See the [Code of Student Conduct](#) for more information.
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