CE 405 – REMEDIATION OF ORGANICALLY CONTAMINATED SOIL AND GROUNDWATER

Type (check one): Required: _____ Elective: __X__

2005-2006 Catalog Data: CE 405. Remediation of Organically Contaminated Soil and Groundwater. Soil remediation: soil venting, air sparging, vapor extraction, bioremediation, soil washing, land farming, and thermal desorption; groundwater remediation: pump and treat, and carbon adsorption; cost estimates; case histories. Written communication skills are required. Prerequisites: Senior standing.
One semester; three credits.

Prerequisites: Senior standing

Corequisites: None

Textbook: Class notes by instructor

Other Required Materials: None

Other References: EPA publications

Instructor: Dr. K. Madhavan, Professor of Civil Engineering

Course Objectives: Expose the students to various methods of soil and groundwater remediation.

Prerequisites by Topics:

1. Basic Chemistry (symbols for elements, compounds, etc.)
2. Fundamentals of Hydraulics or Fluid Mechanics: Bernoulli's Equation, Hydraulic Gradient

Topics:

1. Introduction
2. Environmental Site Assessment, Phase I and II
3. Environmental Sampling and Laboratory Analysis
4. Corrective Action Plan
5. In-situ and Non-in-situ Soil Remediation Techniques
6. Groundwater Remediation Techniques
7. Case Studies in Soil and Water Remediation

Class Schedule: Two 75-minute sessions per week

Prepared by: Dr. K. Madhavan **Date:** August 2005

Professional Component:
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Category (check one)	____ Math/Basic Science __X__ Engineering ____ General Education ____ Other
Design (check one)	____ Significant __X__ Some ____ None
Realistic Constraints (check all that apply)	__X__ Economic __X__ Environmental ____ Sustainability ____ Manufacturability ____ Ethical __X__ Health & Safety ____ Social ____ Political

Relationship to Program Outcomes:

Check all that apply:

__X__ (a) an ability to apply knowledge of mathematics, science, and engineering
____ (b) an ability to design and conduct experiments, as well as to analyze and interpret data
__X__ (c) an ability to design a system, component, or process to meet desired needs
____ (d) an ability to function on multi-disciplinary teams
__X__ (e) an ability to identify, formulate, and solve engineering problems
__X__ (f) an understanding of professional and ethical responsibility
__X__ (g) an ability to communicate effectively
__X__ (h) the broad education necessary to understand the impact of engineering solutions in a global and societal context
____ (i) a recognition of the need for and an ability to engage in life-long learning
____ (j) a knowledge of contemporary issues
__X__ (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice