

Bioremediation and Phytoremediation

ESP 403

Sample Syllabi

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Text: Handouts, free EPA downloads*

Philosophy: The objective of this course is to explore the remediation of environmental pollution. We will focus on soil and water pollution by organic contaminants, and the biodegradation and phytoremediation of those contaminants. In order to fully understand soil and water contamination you must first review the physical, chemical and microbial properties of soil, along with the characteristics of the associated contaminants. By the end of the semester you will be able to discuss the fates of contaminants found in surface and subsurface environments, and make decisions regarding proper remediation techniques.

Lecture Schedule (subject to change)

<u>Date</u>	<u>Topic</u>	<u>Assignments</u>	
Sept	2	Introduction, types of contaminants	
	4	Types of contaminants, sources, risks	
	9	The soil environment – physical & chemical	
	11	The soil environment - microbial	
	16	<i>work on term project</i>	
	18	<i>work on term project</i>	
	23	Sampling and quantifying microbes	
	25	Nutritional classification of microbes	<i>topic summary due</i>
	30	Exam 1	
	Oct	2	Microbial transformations of natural organics
7		Microbial transformations of natural organics	
9		Biodegradation of hydrocarbon contams	
14		No class - Oct break	
16		Biodegradation of xenobiotic contams	<i>term project outline due</i>
21		Intro to BR, environmental factors	
23		Assessing applicability of BR	
28		Advanced BR technologies	
30		Exam 2	
Nov.	4	<i>work on term project</i>	
	6	<i>work on term project</i>	
	11	No class - Veteran's Day	
	13	Intro to phytoremediation	<i>term project first draft due</i>
	18	Phytoremediation mechanics	*Downloads (see below)
	20	Phytoremediation mechanics	
	25	Phytoremediation mechanics/ BR/PR case studies	
	27	No class - Thanksgiving	

Dec 2 BR/PR case studies
4 BR/PR case studies
9 Term project presentations
11 Term project presentations
16 **Final Exam** – 1:30-3:30 pm

term project due

- *download (<http://clu-in.org>) and read: The Bioremediation and Phytoremediation of Pesticide Contaminated Sites
- The Use of Plants for the Removal of Toxic Metals from Contaminated Soils
- Citizens Guide Updates