

EXECUTIVE SUMMARY [NON-CONFIDENTIAL, NON-TECHNICAL ABSTRACT FOR PUBLIC INFORMATION OR PROGRAM PROMOTION]:

Over the past decade, the restoration of the environment using effective and inexpensive bioremediation techniques (e.g., *in situ* bioremediation.) has been transformed from its academic and theoretical origins to an actively applied field technique. Many engineering consulting firms are hiring biologists and ecologists to help them design and build remediation systems that will restore contaminated environments to acceptable conditions using microbes and plants. In some cases, specific microbes and plants are being “bioengineered” for specific contamination scenarios. In the past, engineers relied heavily on experience and field-training in designing appropriate biological solutions to problems. However, with the ever-increasing numbers and types of contaminants that are being introduced into the environment, a more fundamental grasp of the biological mechanisms is necessary. On the other hand, many biologists working in engineering firms obtain the necessary design skills after years of hands-on training and practice. This course will bring engineers and biologists together in groups with the goal of using modeling to develop and design a bioremediation system for a contaminated site. The engineers will have a background in the fate and transport of contaminants in soil and groundwater and the biologists will have had a course in environmental microbiology. We will group engineers and biologists together to design and model the bioremediation of a contaminated site. Each group will contain at least one engineer and one biologist to ensure that it contains the necessary technical skills. The culminating experience will be oral and written group presentations of the remedial design and projected outcome of the bioremediation of the contaminated site.