

CIVE 7400 Graduate Seminar Series

**From Function to Phylogeny:
Determining Who's Doing What in an Environmental System**



**Professor Francis de los Reyes
Associate Professor of Civil Engineering
North Carolina State University**

**Tuesday, February 22
1:45 pm to 2:45 pm
335 Shillman Hall, Northeastern University**

ABSTRACT: Determining the identity of microorganisms responsible for specific biotransformation processes in complex environments remains one of the major challenges in environmental microbiology and engineering. Approaches based on rRNA sequence analysis have been used to answer the question “Who’s there?” and have revealed highly diverse microbial communities in biological wastewater treatment systems. However, rRNA generally provides little direct evidence of the in situ metabolic activities of the microorganisms that these sequences represent. The question of which specific organism is performing a specific function is less often answered, but is perhaps the more central question to microbial ecologists and engineers attempting to link community structure to function. This talk will discuss several new molecular approaches that can be used to answer the question “Who’s doing this function?” in complex (dirty) environments. The approaches will be discussed in the framework of research questions in environmental microbiology and environmental biotechnology. These problems involve determining the identity of tert-butyl alcohol (TBA) degraders, active methanogens in landfills, and active nitrite reducers in activated sludge.

BIOGRAPHY: Professor Francis L. de los Reyes III is an Associate Professor of Environmental Engineering, Associate Faculty of Microbiology, and Training Faculty of Biotechnology at North Carolina State University. He obtained degrees from the University of the Philippines at Los Banos, Iowa State University, and the University of Illinois at Urbana-Champaign. He conducts research and teaches classes in environmental biotechnology, biological waste treatment, molecular microbial ecology, and water and sanitation in developing countries. He is a 2009 TED Fellow, and has received Outstanding Alumni Awards from Iowa State University and the University of the Philippines.

(Reception will follow)