Faculty Name __Dr. Chul Park__________________________________________________

Phone _____413-545-9456_______________________________________________________

Department ____CEE_________________Email: _____park@ecs.umass.edu_____________

Brief description of Summer Research Project (please explain the interdisciplinary nature of this project).

Interest in anaerobic digestion has increased in recent years because of its ability to remove organic matter without aeration, which requires extensive use of energy, and to recover bioenergy from wastes in the form of methane. Not only waste sludge but various organic wastes, such as food waste, have been considered as substrates for anaerobic digestion. However, the feasibility of anaerobic digestion on various organic materials has not been studied in depth and the effect of digestion on the characteristics of digestion product, such as dewatering rates and pathogen inactivation, remains unknown.

The objective of this project is to investigate the anaerobic co-digestion of various organic wastes to generate biomethane and study its subsequent effect on anaerobic digestion products.

Brief description of what the student will be doing:
The REU student will work with Dr. Park and his graduate students to conduct a bench-scale anaerobic digestion study during summer. At least three different types of organic materials will be digested under mesophilic (37 ºC) anaerobic conditions, including waste sludge from wastewater treatment plants, food wastes collected from the waste management, and microalgae cultivated in Dr. Park's laboratory. The student will learn the principle of anaerobic digestion, operate and monitor the digesters, and measure essential parameters to evaluate the biogas generation and the health of anaerobic digesters. Some of the parameters to be measured are: quantity and composition of biogas, solids and chemical oxygen demands, volatile fatty acids, dewatering rates, and enumeration of pathogen indicating organisms.

The student will participate in Dr. Park's weekly research group meeting for research update, discussion on various lab topics, and journal reviews. The REU student will also gain a chance to work with other undergraduate and graduate students working in the lab and will be involved in cultivating microalgae to be used for one of the anaerobic digestions studied during this summer research.

Is this a CASA-related project?  Yes ___ No _x_

Preferred background of student (major(s), class, GPA, pre-requisites, etc.):
Civil and Environmental Engineering
Chemical Engineering
Biological Sciences

Did you mentor a student last summer in the College REU Program?
Yes____ No __x__

If yes, please describe the outcomes for that student (i.e. Honor's thesis, conference presentations, manuscripts, papers, etc. Describe accomplishments to date as well as plans for the spring semester if the work has continued.