UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

Senior Design Project Description

Company Name	**UNC Charlotte**	**Date Submitted**	October 13, 2017
Project Title	**FM Water Efficiency (FM_OPTIM)**	**Planned Starting Semester**	Spring 2018

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project. 250 hours are expected per person. Complete the following table if this information is known, otherwise the Senior Design Committee will develop based on the project scope:

Discipline	Number	Discipline	Number
Mechanical	2	Electrical	
Computer		Systems	5
Other ( )			

Project Overview:

Plumbing fixtures on the UNC Charlotte campus span decades of technology, and many lack or have limited features to improve water conservation. Examples include: low-flow faucets, showerheads, urinals, and toilets; waterless urinals; occupancy/use sensors; and timers. There are also devices that may waste water (e.g. automatic flushing). Water costs are the fastest rising utility cost to the university, and return-on-investment may be favorable for water-conserving technologies.

Project Requirements:

The Facilities Management department will provide current inventories of what currently exists in the campus buildings. This project will study the current inventories of plumbing fixtures on campus and create a cost-benefit model for adopting various technologies in campus buildings. The project will research state-of –the art equipment in terms of energy savings, water savings, cost and reliability. Based on this research and building usage data, the students will first develop a cost benefit model that can be applied on a building by building basis to determine the optimal decisions to make considering the constraints and objectives. The model will include costs for installation, operation, maintenance and compliance to energy and conservation goals. Once the model is developed, it will be implemented on buildings and a report generated for each building which details the current state, what changes are recommended, the cost required to do the implementation and the projected savings and payback expectation.

Expected Deliverables/Results:

- A model that includes the technologies investigated, options analyzed and a cost benefit analysis for the preferred system or systems. Model to be flexible enough to be used on any campus building
- Verification of the model through the demonstrated application on a subset of the total campus building population that is agreed with the Supporter and Faculty Mentor.

Disposition of Deliverables at the End of the Project:

Software model to be supplied to the FM department

List here any specific skills, requirements, knowledge needed or suggested (If none please state none):

- None