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Civil and Environmental Engineering
ENCE 215 – Engineering for Sustainability

Changes on syllabus and “style” of teaching – Changes will go in effect Fall 2015

ENCE215 – Engineering for Sustainability was designed to provide an introduction to topics within the broad field of “Sustainable Engineering” and to provide a bridge between freshman science courses and engineering applications. The department of Civil and Environmental Engineering offered this course in the past under the name “Applied Engineering Science” and in 2009 the course was changed to the current name and format. The course is required to all Civil and Environmental Engineering students. These students will eventually choose an area of specialization. There are six areas available to the students: environmental, geotechnical, project management, structural, transportation, and water resources. ENCE 215 has presented some successes and some challenges with the students. Over the years, it has become clear that the broad approach to engineering sustainability has become outdated and a heavier focus in the specialization areas offered by the department is needed.

Sustainability is the main topic of the course, my participation in the Chesapeake Project was then not to obtain content for class modification, but enhancing and learning new teaching styles to better incorporate the teaching of sustainability in the many engineering fields that need to be addressed in this class. New learning objectives will be introduced in the class as well and can be seen in the table below along with the type of assessment.

Learning Objectives to be Introduced	Assessment
Tragedy of the Commons/Carrying Capacity	Online Game
Environmental Justice	Group Project Debate
Consumption and Consumerism	Visioning Exercise
The Local-Global Nexus	Visioning Exercise

A visioning exercise, similar to the one conducted during the Chesapeake Project with faculty, will be conducted in class with the students on the first day of class. Though the visioning exercise list of questions will be used as a guideline, more specific questions pertaining civil and environmental engineering will be posed. The students will then work in groups and write down their vision. At the end of the semester, the students will be requested to bring the record of their vision and reflect upon it and how it changed with the new material learned. The focus of the visioning exercise will be on types of energy sources, consumption, and local-global nexus.

The class will feature two smaller project, which is a major change from previous semesters. In the past, one project, due at the end of the semester, was responsible for about 20% of the students’ final grade. Fall 2015 will feature two projects, one individual, and another in group. The individual project will be an online game:

Energities. The class will meet on a computer lab, where the students will have access to the online game. This class will happen after we cover energy sources in class (refer to syllabus for detailed schedule) so that the game makes more sense and the students can relate what they have learned in class with what is taught in the online game. The students will then see a demonstration of how the game is played and will be allowed to play the game themselves for about 30-40 minutes. The students will then be required to answer a series of questions. Some of these questions will evaluate the benefits of using an online game to teach sustainability and some of the questions will be designed to guide the students to write a report about sustainable development in the context of what the game encompasses (tragedy of the commons, carrying capacity, among other sustainability major topics). This assignment will be graded by the instructor and also peer-reviewed and graded.

The group assignment will focus primarily on environmental justice. The class will be divided into groups of three students and they will be given reading materials that will address two points of view of the same situation. Then, two groups are going to have a face-off, a debate, each group defending one position. The topics of the debate is not well-settled at this point, however, it will focus on environmental justice in the context of civil engineering. Topics will focus on transportation, construction, and infrastructure engineering.