

Green Chemistry Grant Recipient Project Summary

Wayne State University
STE/CHE 6100
Introduction to Sustainable Engineering

In 2008, Wayne State University was awarded a grant from the Michigan Department of Environmental Quality for their proposal of an engineering course titled "Introduction to Sustainable Engineering." The course was designed to address environmental, economic, technological, and social issues from the side of sustainable systems. The course also included the topics of green chemistry, green chemical engineering, profitable pollution prevention, and sustainable manufacturing engineering.

The objectives of the course are to:

- Address the principles behind engineering sustainability and holistic methods for sustainability assessment, analysis, and decision making under uncertainty.
- Show students how to develop skills of analyzing sustainability problems appeared in industrial systems.
- Teach students how to investigate real-world problems for solutions for sustainable development.

Under these objectives the main topics addressed in the course included, but were not limited to, economic globalization and opportunities for engineering sustainability; the 12 principles of green chemistry, and basic principles of green engineering and sustainable engineering; sustainability metrics, assessment methodologies, and life cycle analysis; system modeling, design, and decision making for industrial sustainability; energy, resource, water, and industrial sustainability; and sustainable manufacturing and supply chain.

The course was developed during the fall 2008 semester through the spring 2010 semester and was offered to students in the summer 2010 semester. The course was given the name STE/ChE 6100 and is cross listed within two programs: the Sustainable Engineering Graduate Certificate Program, and the Chemical Engineering and Materials Science Department.