Engineers have significant power to influence individual clients and wider society through their contributions. There is a need for engineers not only to utilize their expertise but also become aware of the impact of their design decisions. As the bridge between science and society, engineers constantly have to balance the demands of industry, government, and the public. Likewise, sustainability requires the balancing of natural, human, and economic resources to enhance the safety, welfare, and quality of life for all of society so that future generations can meet their own needs.

The modern ethical engineer is uniquely equipped and placed to take on the challenges of sustainable development. An engineering degree at Utah State University must prepare students for those challenges by incorporating sustainability themes into their curriculum. The more sustainability is incorporated into individual engineering classes, the more likely a student will be to accept their role to adhere to the principles of sustainable development in an ethical and responsible manner. This poster introduces the approach to introduce early engineering students to sustainability during Fall 2016.

ENGR 1500: Introduction to Engineering is a newly revamped course offering in the College of Engineering at Utah State University. The main objective of the class is to help students acquire basic problem-solving techniques while helping students identify which careers in engineering that best fits their interests and needs. With a focus on problem-solving, improving communication, and professional responsibility, the class is designed to help engineering and non-engineering students understand what is required of them to be a 21st century engineer.

Professional responsibility and ethics is a recurring theme in the class and is introduced in Module 2: Ethics and Professional Responsibility. Students were actively engaged in discussion and perception of who they are serving.

During the Module 2 lecture, students were asked to read and reflect on a case study (see "Content" box) that integrated an environmental theme that they follow (ethically) and their duty to their stakeholders.

Sustainability themes were integrated into an “Introduction to Engineering” Course by incorporating them into a module about engineering ethics and professional responsibility. In this module students should learn that:

- All engineering decisions involve recognizing and considering the point of view of multiple stakeholders.
- Engineering solutions should consider broader ethical and social issues.
- In serving the public interest, the professional code of ethics encourages engineers to “adhere to the principles of sustainable development in order to protect the environment for future generations”.

Students were actively engaged in discussion and responded well to the topic. They quickly grasped that their priority in decision making can affect their perception of who they are serving.

It is our hope to incorporate more sustainability themes into next semester for this course. There is great potential in incorporating environmental responsibility into lectures and activities in more holistic ways throughout discussions of each engineering discipline.

SUSTAINABILITY QUESTIONS TO STUDENTS

- In your opinion, are engineers ethically obligated to consider sustainability in their designs? Why or why not?
  - Focus on multiple stakeholders:
    - No doubt many people in the area besides Marvin Johnson and Edgar Owens have an important stake in how Marvin responds to Edgar's request. How many kinds of people are affected by his decision and how do they think they would react? (e.g., employees at Wolfog.)
    - Consider if this same situation occurred with an American-owned company operating in a country with less stringent environmental regulations than in the United States. Would this still be an ethical dilemma? Does this change how you would react?
    - Who do you think the code of ethics is referring to when they mention the public? Does it apply to your immediate surroundings, the country, or the world?