

Engineering Ethics

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Type: Case Study
Time: Two weeks
Location: Take Home

Summary

Project goals are to introduce engineering students to engineering ethics problems. The students are asked to make an ethical assessment through moral reasoning of a case study. The students develop critical thinking skills to access moral dilemmas where a person confronts two or more moral obligations that conflict each other. The project is intended for first year engineering students.

ABET Descriptors

Engrg. Sci. Content: First Year
Type: Process, system or component
Elements: Establishment of objectives and analysis
Features: Consideration of alternative solutions, communication, open-ended problems
Constraints: Ethics
Effort: Individual

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Problem Statement:

An engineering moral dilemma is a situation where an engineer confronts two or more conflicting obligations or duties. Many practicing engineers frequently confront these conflicts. A moral problem arises in situations where what should be done is not straightforward or obvious. These problems can fall into two classifications:

1. unclear if a moral considerations applies; or
2. two conflicting moral principles in which both apply to a single situation.

There are several known theories on moral reasoning:

1. goal-based theories: these theories imply that an action is either right or wrong based solely on the morality of its good or bad consequences;
2. duty-based theories: these theories assert that a moral action should be based on the performance of a duty, even though doing it may not produce the most good; and
3. right-based theories: similar to the duty-based theories except the duty is now directed toward the rights of other people.

Your assignment is to review current newspaper articles pertaining to moral issues in engineering and explain how *you* might develop an alternative solution to the dilemma.

Design requirements:

1. Explain the problem that you have selected.
2. Describe the approach that you will take – goal-, duty-, or right-based theories – to solve the moral dilemma.
3. Describe your solution to the moral dilemma and defend your approach.

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Engineering Notes:

Since the beginning of time, engineers have played a paramount role in the development and synthesis of new technology that has increased our ease of living (e.g., automobiles, homes, etc.) and protected us from invasions (e.g., aeronautical engineering, weapons development, etc.). However, we are growing increasingly aware of the 'detrimental effects' of our technology. We now need to teach the next generation of engineers ethical and moral responsibility for their design.

Do we continue to design technology with destruction as its sole purpose? There is no correct answer to this question, but rather ethics in engineering provides us with guidelines.

Objectives/comments:

- Give the students an opportunity to develop group communication.
- Provide a forum for creative thinking.

Expected outcome:

- Design proposal to an open-ended engineering problem

Discussion/follow-on activities:

There exist a synergistic relationship could be developed between this design project and other engineering science disciplines such as Statics, Dynamics, Electrical Science, and Capstone Design where specific component designs could be established.

Discussions on some of the most popular engineering ethics violations as case studies. These case studies (purposely non-specific due to the intended target audience) could be brought in at the beginning of the topic on engineering ethics and moral reasoning. This project should be used as a lead into moral reasoning. The student can begin to synthesis and analysis moral decision making skills.