



Engineering Codes of Ethics Application

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Abstract

Engineering Codes of Ethics play a key role in professional practice, professional licensing and college preparation. Students graduating from a program accredited by ABET Engineering Accreditation Commission must demonstrate "an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgement, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts." While the application of ethical canons is often applied to previously resolved case studies, the ability to grapple with current issues and the application of engineering ethics provides the opportunity for learners to deepen their ability to critically evaluate the complexities of gray situations while they deepen their understanding of ethical standards. Civil engineering ethical dilemmas are situated in infrastructure and the built environment and have the potential to impact every member of a society. This module draws upon the many built environment unresolved dilemmas and challenges that engineering students and professionals encounter. Most compelling is the discussion springboard that stories provide. This module allows for learners to choose stories which most resonate with the learner.

Story Link

<https://www.undertoldstories.org/2004/05/28/south-africas-water-meters/>

Learning themes/topics for consideration

The purpose of this assignment is for learners to analyze issues in professional ethics. As a result of this lesson, students should be able to demonstrate an ability to recognize ethical and professional responsibilities in engineering situations. Students should be able to apply engineering ethic frameworks to make informed judgements and students should be able to identify the impact of engineering solutions in global, economic, environmental and societal contexts.

Preparation

In this assignment learners investigate, synthesize and communicate to others analysis in professional ethics in global, economic, environmental and societal contexts. To prepare for this assignment learners read the following published codes of engineering ethics and professional responsibilities:

- ASCE Code of Ethics <https://www.asce.org/code-of-ethics/>
- NSPE <https://www.nspe.org/resources/ethics/code-ethics>
- NCEES see FE Handbook section on ethics and the Model Rules, Section 240.15 Rules of Professional Conduct <https://ncees.org/wp-content/uploads/ModelRules-2017.pdf>

Context

Learners are asked to consider the people who are impacted by infrastructure which civil engineers design, maintain and operate. The challenging contexts in which many Under-Told Stories are set provides examples of the intersection of infrastructure and ethical challenges. By exploring the ethical implications and applying engineering ethic frameworks students build empathy for future project stakeholders who they may be designing for and they build their capacity to apply engineering codes of ethics. Students then choose two Under-Told Stories and analyze the stories through the lens of their engineering codes of ethics. Choice allows for a deeper investment in the contexts and an understanding of the vast applications in which ethical dilemmas may be encountered.

Discussion Questions

Students are asked to place themselves forward ten years and imagine that they are a professional engineer and that they must explain the context of the story to engineers in their professional field. Students are asked to succinctly summarize their response

to the case study as they consider the persons whose lives were Impacted in the story. For each case study identify and discuss the following:

1. What are the issues in this Under-Told story?
2. What ethical issues are woven into the story?
3. What is the source of the issues?
4. Who are the stakeholders?
5. Were solutions are present or possible?
6. What is the concrete experience of each stakeholder? (Describe)
7. What are your observations? (Interpret in as many ways as possible)
8. Which engineering ethics/professional practice issues apply? (Apply)
9. How do the ethical frameworks help solve the problem or make the decision?
(Evaluate)
10. What may be the impact of an engineering solution in a global context?
11. What may be the impact of an engineering solution in an economic context?
12. What may be the impact of an engineering solution in an environmental context?
13. What may be the impact of an engineering solution in a societal context?

Further Study

Students then apply a similar application of Codes of Ethics analysis to two stories of their choice. Learners pick two stories from the following categories. Additional Under-Told Stories may be chosen.

1. Disaster Aftermath and Recovery
 - a. <https://undertoldstories.stthomas.edu/one-year-after-the-earthquake/>
 - b. <https://undertoldstories.stthomas.edu/pakistan-still-grappling-with-flood-aftermath/>
 - c. <https://undertoldstories.stthomas.edu/typhoon-of-aid-hits-disaster-area-in-philippines/>
 - d. <https://undertoldstories.stthomas.edu/after-the-collapse/>
 - e. <https://undertoldstories.stthomas.edu/haiti-hurricane-relief/>
 - f. <https://undertoldstories.stthomas.edu/thailand-rebuilds-after-tsunami/>

- g. <https://undertoldstories.stthomas.edu/tsunami-recovery-in-sri-lanka/>
 - h. <https://undertoldstories.stthomas.edu/pakistan-earthquake-recovery/>
2. Water access
- a. <https://undertoldstories.stthomas.edu/how-off-grid-navajo-residents-are-getting-running-water/>
 - b. <https://undertoldstories.stthomas.edu/can-water-atms-solve-indias-water-crisis/>
 - c. <https://undertoldstories.stthomas.edu/indias-population-strains-water-supply/>
 - d. <https://undertoldstories.stthomas.edu/821/>
 - e. <https://undertoldstories.stthomas.edu/in-ethiopia-clean-water-never-a-given/>
3. Building
- a. <https://undertoldstories.stthomas.edu/rebuilding-nepals-temples/>
 - b. <https://undertoldstories.stthomas.edu/navajo-nation-does-solar-power-offer-a-brighter-future-for-off-the-grid-residents/>
 - c. <https://undertoldstories.stthomas.edu/nicaraguas-controversial-mega-canal-project/>
4. Climate Change and the Environment
- a. <https://undertoldstories.stthomas.edu/tackling-indias-towering-landfills-takes-cultural-innovation/>
 - b. <https://undertoldstories.stthomas.edu/fighting-to-breathe-in-the-worlds-most-polluted-city/>
 - c. <https://undertoldstories.stthomas.edu/pakistan-still-grappling-with-flood-aftermath/>

References

ABET (2019). Criteria for Accrediting Engineering Programs, 2019-2020. Baltimore, MD. Downloaded from <https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2019-2020/#GC3>

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