ENMG 504
Engineering Ethics

REQUIRED TEXTBOOK


COURSE OBJECTIVES

This course introduces students to the engineering profession and to professional ethics. It aims (1) at discussing engineering ethics, as a type of professional ethics, in relation to personal ethics and common moralities and (2) at addressing the question of what the standards in engineering ethics should be and how to apply these standards to particular situations. The course ultimately seeks to help promote responsible engineering practice through exercising preventive ethics.

COURSE DESCRIPTION

A significant part of responsible engineering practice is to exercise sound ethical decision making to avoid more serious problems later. In discussing ethical thinking, the focus is on three sources of ethical rules: (a) professional ethics representing the set of standards adopted by professionals insofar as they see themselves acting as professionals, (b) personal ethics representing the set of one’s own ethical commitments, which are usually acquired in early home or religious training and often modified by later reflection, and (c) common morality representing the set of moral ideals shared by most members of a culture or a society. In connection with the second and third sets of moralities, emphasis is on moral rules such as “The Golden Rule” (The Ethic of Reciprocity), which is well founded in all God-sent religions and other beliefs, as well as on moral values and virtues by great philosophers.

Three concepts of responsibility are covered: obligation, blame, and role responsibilities. Also, ways through which individuals can be responsible for harm are addressed including causing harm intentionally, recklessly, or negligently. In addition, common impediments to the adherence to responsible engineering practice are discussed, including self-interest, fear, self-deception, ignorance, egocentric tendencies, microscopic vision, uncritical acceptance of authority, and groupthink.

The course focuses on moral problem solving. Good moral thinking is emphasized, which shall require the consideration of the known facts, the search for possible unknown facts, and the distinction between relevant and irrelevant facts, followed by the application of relevant facts, concepts, and moral rules or principles to the case in question. Two methods for resolving moral problems are introduced: line-drawing and creative middle way.

Ethical theories introduced include the utilitarian approach and the respect for persons approach to moral problem solving. Such theories can be expected to support what is defensible in common morality, and, at the same time, they serve as a critical check on aspects of common morality. They can help identify relevant moral considerations, allow constructing and predicting the arguments that will be made for or against certain policies or courses of actions, and are often useful in assessing whether an argument has been resolved.
Engineering codes require engineers to be honest and impartial in their professional judgment. The course tackles the various forms of dishonesty including not only lying and deliberate deception but also withholding the truth and failing to seek out the truth. The concept of integrity and reliability are also covered, including intellectual property, expert testimony, confidentiality in client-professional relationships, informing the public, and conflict of interest. Engineering codes also require engineers to hold paramount the safety, health, and welfare of the public, implying that engineers must protect the public from unacceptable risks. Three approaches to risks are discussed: the expert, layperson, and government regulator ones. Engineering codes further require engineers to be faithful agents of their employers. The course sheds light on the engineer-manager relationship, which is at the center of most of the issues that engineers face as employed professionals.

**LEARNING OUTCOMES**

After completing the course, engineering students are expected to:

1. Read, understand, and apply the Ethical Codes that are related to their engineering field.
2. Understand their responsibilities toward themselves, their profession, and others affected by their acts and decisions.
3. When faced with ethical and moral problems, be able to identify and assess all the important relevant facts, concepts, and moral rules and principles and to find plausible solutions with supporting reasons.
4. Promote copyrights and patents of computer software and does not engage in any illegal activities such as hacking and creating of worms and viruses, and assigning responsibility for actions that have undesirable consequences.
5. Act honestly and reliably all the times when dealing with issues that include intellectual property, expert testimony, confidentiality in client-professional relationships, informing the public, and conflicts of interest.
6. Hold paramount the safety, health, and welfare of the public and must protect the public from unacceptable risks.
7. Be faithful and loyal to their employers as long as the safety, health, and welfare of the public are not at stake.
8. Have obligations to protect the environment where human health is not at stake.
9. Respect the culture, traditions, and laws of foreign countries where they work in. Avoid bribery, extortion, grease payments, and gifts.

**COURSE TOPICS**

1. Why Professional Ethics?
2. Responsibility in Engineering
3. Framing the Moral Problem
4. Resolving Problems
5. The Social and Value Dimensions of Technology
6. Trust and Reliability
7. Risk and Liability in Engineering
8. Engineers in Organizations.
GRADING

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REQUIRED HISTORIC READINGS

Students are required to examine three historic readings that are direct translations of original texts from Aristotle, Kant, and Mill work on “morality”. The readings are from “Enduring Issues in Philosophy: Opposing Viewpoints”, by Gerald W. Eichhoefer, Greenhaven, 1995, and include the following philosophical excerpts:


- “Morality is Governed by Consequences of Behavior”, From Jon Stuart Mill, Utilitarianism, London, Parker Son and Dourne, 1863, 209-217.

ADDITIONAL SOURCES OF READING

On Morality-Related Quotes:

- [http://www.valuequotes.net/](http://www.valuequotes.net/)
- [http://www.spaceandmotion.com/Philosophy-Education.htm](http://www.spaceandmotion.com/Philosophy-Education.htm)
- [http://www.brainyquote.com/quotes/authors/d/dalai_lama.html](http://www.brainyquote.com/quotes/authors/d/dalai_lama.html)

On “The Golden Rule”:

- [http://www.jcu.edu/philosophy/gensler/goldrule.htm](http://www.jcu.edu/philosophy/gensler/goldrule.htm)

On Aristotle Work:

- [http://www.blupete.com/Literature/Biographies/Philosophy/Aristotle.htm](http://www.blupete.com/Literature/Biographies/Philosophy/Aristotle.htm)

On Socrate Work:

- [http://philosophy.lander.edu/ethics/socrates.html](http://philosophy.lander.edu/ethics/socrates.html)
- [http://www.brainyquote.com/quotes/authors/s/socrates_2.html](http://www.brainyquote.com/quotes/authors/s/socrates_2.html)
On Engineering Canons of Ethics:
http://www.asme.org
http://www.nspe.org

Books:
“Philosophy for Beginners”, by Richard Osborne, Writers and Readers, 1992
“It was on Fire when I Lay Down on it”, by Robert Fulghum, Ivy Books, 1993

Students are advised to review all relevant University rules and regulations including those related to attendance, cheating, plagiarism, misconduct, and academic integrity, among many others. It shall be expected that strict enforcement of these rules and regulations be exercised.