

CHAPTER 2

ENGINEERING ETHICS

2.1. INTRODUCTION

Engineers rarely work as lone individuals, generally work in teams. Further, the products – automobiles, roads, chemicals, and computers – impact society as a whole. Thus, engineers need set of interaction rules outlining the expected sets of behavior between the engineer, other individuals, and the society as a whole. *Interaction rules* go both ways: the engineer has obligations to society (e.g., to be honest, unbiased, hardworking, and careful) and society has obligations to the engineer (e.g., to pay for work performed, to protect intellectual property).

2.2. INTERACTION RULES

Engineers rarely work as lone individuals, they generally work in teams. Further, the product of their labor – automobiles, roads, chemical plants, and computers – impact society as a whole. Therefore, a set of interaction rules outlining the expected sets of behavior between the engineer, other individuals, and the society as a whole is needed. Interaction rules go both ways; the engineer has obligations to society (to be honest, unbiased, hardworking, careful) and society has obligations to the engineer (pay for the work performed, to protect intellectual property).

Interaction rules can be classified as etiquette, law, morals, and ethics.

(A) Etiquette

Etiquette consists of codes of behavior and courtesy. It addresses such issues as how many forks to place on the dinner table, proper dress at weddings, seating arrangements, and invitations to parties.

The rules of etiquette are often arbitrary, and they evolve rapidly. The consequences of violating rules of etiquette are generally not severe. Within the engineering world, proper etiquette is manifested by showing proper respect to employers and clients, not embarrassing colleagues, answering the phone in a professional manner, and so forth.

(B) Laws

Law is a system of rules established by authority, society, or custom. Violations of law carry penalties such as imprisonment, fines, community service, death, dismemberment, or banishment. Each society has its own consequences for law violations.

Legal rights are just claims given to all humans within a government's jurisdiction. Most governments grant their citizens rights through a constitution. Constitution protects citizens from cruel and unusual punishments.

(C) Morals

Morals are accepted standards of right and wrong that are usually applied to personal behavior. Moral standards are derived from our parents, religious background, friends, and the media (TV, movies, books, and music). Many moral codes are recorded in religious writings. Despite the variety of cultures and religions in the world, there is agreement on many moral standards.

Moral rights belong to all humans, regardless of whether these rights are recognized by governments. Civilization recognizes that simply being a human endows us with rights: we need not do anything to earn these rights.

According to rights analysis, moral actions are those that equally respect each human being.

(D) Ethics

Ethics consists of general and abstract concepts of right and wrong behavior culled from philosophy, theology, and professional societies. Most professional societies have a formal code of ethics to guide their members.

(E) Comparison of Interaction Rules

There are complex web of interaction rules governing our behavior. In some cases all the interaction rules agree. For example, murder is illegal, immoral, unethical, a violation of human rights, and certainly bad etiquette. In general lawmakers try to formulate laws that are consistent with morality. However, there can be conflict between the law and morality for the following reasons:

- **The legal system has not considered the situation:** A newly developed chemical not listed in banned materials may cause environmental problems. Thus, its release by the company is legal but immoral.
- **Encoding some moral standards into law would be unenforceable:** Prohibition of alcohol is not easy for enforcing.
- **Laws must be impartial and treat everybody the same:** You need computer disks in your project, but there are no money in budget for computer disks, and there are money for books. You buy computer disks but invoiced them as books. This is not immoral but illegal. Government cannot make a regulation stating that “honest employees are entitled to reimburse themselves with computer disks instead of books, while dishonest employees cannot do.”
- **Laws must govern observable behavior:** In some moral codes, thinking a bad thought is equivalent to having performed it. How could a law be written that bans bad thoughts?
- **Laws may be enacted by immoral regimes:** Dictators may generate laws which may segregate citizens or societies, “ruling class”.

2.3. THE ETHICAL ENGINEER

Most of the professional societies have prepared ethical codes for their members. The purpose of these codes is to provide guidance to engineers on ethical behavior. A distillation of these codes provides the following guidelines:

1. Protect the public safety, health and welfare.
2. Perform duties only in the areas of competence.
3. Be objective and truthful.
4. Behave in an honorable and dignified manner.
5. Continue learning to sharpen technical skills.
6. Provide honest hard work to employers or clients.
7. Inform the proper authorities of harmful, dangerous, or illegal activities.
8. Be involved with civic and community affairs.
9. Protect the environment.
10. Do not accept bribes, or gifts that would interfere with engineering judgment.
11. Protect confidential information of employer or client.
12. Avoid conflict of interest.

Conflict of interest is a situation in which an engineer's loyalties and obligations may be compromised because of self-interest or other loyalties and obligations. This can lead to biased judgment.

Informing authorities of harmful, dangerous, or illegal activities is often called whistle blowing. An engineer who is involved with an organization that is doing activities has a conflict of interest. He has obligations to protect society, but he also has obligations to his fellow workers and employers. When performing public duty, the whistle blower must be prepared to pay the consequences, he may lose his job. **Insider trading** is another example for negative whistle blowing. This is generally taking place in commercial share exchanges where an insider officer informs an outsider for the commercial value of the company which is not only immoral but illegal in all countries.