

Engineering Profession & Ethics

(ENGG450/650)



Chapter 1
Why Professional Ethics?

Dr. Bassam Hussein

Chapter's Main Ideas

- This book focuses on professional ethics, not personal ethics or common morality.
- Engineering is a profession by some definitions of professionalism and not as clearly a profession by other definitions.
- Ethical commitment is central to most accounts of professionalism.
- Professional ethics has several characteristics that distinguish it from personal ethics and common morality.
- Possible conflicts between professional ethics, personal ethics, and common morality raise important moral questions.
- Professional engineering ethics can be divided into a negative part, which focuses on preventing disasters and professional misconduct, and a positive part, which is oriented toward producing a better life for humankind through technology.

The Engineering Profession & Ethics

- You are not being asked to study general ethics but engineering ethics.
- A profession is a number of individuals in the same occupation voluntarily organized to earn a living by openly serving a moral ideal in a morally permissible way beyond what law, market, morality, and public opinion would otherwise require.
- Engineering is not only an occupation, it is a profession that has special characteristics: Extensive training, vital knowledge & skills, control of services, autonomy in the workplace & claim to ethical regulation.
- All professions are occupations. Some occupations are professions.

Two Models of Professionalism

- **The Business Model**

- Make profit within the boundaries set by law.
- Gain a monopoly over certain *services* to increase profit.
- Persuade governmental regulators that a great autonomy should be granted in the workplace.



- **The Professional Model**

- Implicit trust relationship with the public (Social contract).
- Hold paramount the safety, health & welfare of the public.
- May seek monopoly or at least considerable control, but this is in order to protect the public from incompetent providers. In return, the public confers on professionals a number of benefits.

Three Types of Ethics or Morality

- **Common Morality**
 - The set of moral beliefs shared by almost everyone.
 - Characteristics: Precepts are negative (Don't do), contain a positive or aspirational component (Help, prevent ...) and distinction between actions & intentions.
- **Personal Morality**
 - The set of moral beliefs that a person holds.
 - Beliefs closely parallel the precepts of common morality, but differ in some areas where common morality seems to be unclear or in a state of change.
- **Professional Ethics**
 - The set of standards adopted by professionals.
 - Characteristics: Formal codes, focus on important profession's issues, take precedence over personal morality, differ from personal morality in the degree of restriction of personal conduct and have negative/positive dimensions.

Elements of Ethics



Preventive Ethics

- Consist of provisions that are negative and prohibitive in character (Do not, shall not, only ...).
- Common morality supports the idea that the first duty of moral agents, including professionals, is not to harm others (Not to murder, lie, cheat or steal, ..).
- Codes are formulated in terms of rules that can be enforced. It is easier to enforce negative rules than positive ones.
- The influence of what are often called “disaster cases”.
- Limitation is the relative absence of the motivational dimension.

Aspirational Ethics

- Emphasis on the more positive and welfare-promoting aspect of engineering (Save lives, reduce pollution, ...).
- Good works: Exemplary actions that may go beyond what is professionally required.
- Ordinary positive engineering: No heroism or self sacrifice.
- The “good engineer” is the engineer who has those traits of *professional character* that make the best or ideal engineer.
- Professional character traits: Pride in technical excellence, social awareness and environmental consciousness.

Examples

Air Bags

Carl Clark (1924-2006) helped to develop air bags. Even though he was a scientist and not a degreed engineer, his work might well have been done by an engineer. He advocated air bags on bumpers, and he had even invented wearable air bags for the elderly to prevent broken hips. He never got paid for all of his time, and the bumper air bags were even patented by someone else.



Examples

Engineers Without Borders

Engineers Without Borders is an international organization for engineering professionals and engineering students who want to use their professional expertise to promote human welfare. Engineering students from the University of Arizona chapter are working on a water supply and purification project in the village of Mafi Zongo, Ghana, West Africa. The project will supply 30 or more villages, with approximately 10,000 people, with safe drinking water. In another project, engineering students from the University of Colorado installed a water system in Muramka, a Rwandan village. The system provides villagers with up to 7000 liters of safe water for everyday use. The system consists of a gravity-fed settling tank, rapid sand filters, and a solar-powered sanitation light.



*

The Philosophy of Engineering

One of the most positive views of the engineer comes from Samuel Florman. He suggests that engineering is in effect a very high calling, which involves fundamental ‘existential pleasures’ involving the whole person – reason, feeling and physical. Engineering, he suggests, is an attempt to engage with and utilize the social and physical environment in order to fulfil human needs, desires and aspirations. Existential pleasures include:

- The very act of being able to change the world in some way. There is a human impulse to change and improve, and the pull of these endless possibilities ‘bewitches the engineer of every era’.
- The joy of the applied scientist who is able to begin to understand the laws of the universe in the context of the creative enterprise. This is not a sterile or simply functional relationship to the universe, or a grasp of numbers and formulae. Florman suggests that it is a relationship to the environment that can actually involve ‘quasi-mystical moments of peace and wonder’.
- The engineer is also involved in response to what Florman calls ‘mammoth undertakings’ that appeal to the human passions.
- The engineer finds pleasure through using technology. This is partly the pleasure of control and of attempts to solve problems.
- There is finally the pleasure of service. ‘The main existential pleasure of the engineer will always be to contribute to the well-being of his fellow man’. Florman calls on the testimony of engineers who have reflected on their work. What makes the task worthwhile is its contribution.

Exercise

Along with 3-4 other students:

1. Discuss how you see the identity of the engineer in light of Florman's view.
1. Identify the aspects that you agree or disagree with.
1. What reason would you give for your conclusion?

Key Terms Translation

| Term | المرادف | Term | المرادف |
|-----------------|----------------|---------------|------------------|
| Ethics | أداب المهنة | Aspirational | طموحة |
| Profession | مهنة | Beliefs | معتقدات |
| Commitment | الالتزام | Codes | شريعة |
| Morality | أخلاق | Precedence | أسبقية |
| Conflict | تضارب/تعارض | Prohibitive | تحريمي |
| Occupation | شغل | Consciousness | وعي |
| Autonomy | استقلالية | Disaster | كارثة |
| Regulation | تشريع | Duty | واجب |
| Monopoly | احتكار | Harm | أذى |
| Social contract | العقد المجتمعي | Enforce | يضع موضع التنفيذ |
| Welfare | رفاهية | Implicit | ضمني |

Q & A

Ethics

Values

