Chapter 1: Professional Ethics

This course focuses on **professional ethics**, not personal ethics or common morality.

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 mankind through technology.

Student: ‘‘WHY SHOULD I STUDY ETHICS? I am an ethical person.’’!!
Instructor: ‘‘You are not being asked to study ethics in general, but your profession’s ethics.’’
Student: ‘‘Well, what is the difference?’’

Profession:

according to the Oxford Shorter Dictionary, the act or fact of ‘‘professing.’’ It has come to mean the occupation which one professes to be skilled in and to follow. . . A vocation in which professed knowledge of some branch of learning is used in its application to the affairs of others, or in the practice of an art based upon it.

Characteristics that are marks of professional status:

1. **Extensive training:**

Entrance into a profession typically requires an extensive period of training, and this training is of an intellectual character.
Today, the professions are usually closely allied in our society with universities, especially the larger and more prestigious ones.

2. **Vital knowledge and skills:**

Professionals’ knowledge and skills are vital to the well-being of the larger society.

3. **Control of services:**

First, the profession convinces the community that only those who have graduated from a professional school should be allowed to hold the professional title.
Second, a profession often attempts to persuade the community that there should be a licensing system for those who want to enter the profession.

4. **Autonomy in the workplace:**

Professionals often have an unusual degree of autonomy in the workplace. The justification for this unusual degree of autonomy is that only the professional has sufficient knowledge to determine the appropriate professional services in a given situation.

5. **Claim to ethical regulation:**

Professionals claim to be regulated by ethical standards, many of which are embodied in a code of ethics.

ENGINEERING AND PROFESSIONALISM

Is engineering a true profession by these criteria? to what extent does engineering qualify as a profession?

Engineering seems to qualify only as a borderline profession.

1. Engineers have extensive training and
2. possess knowledge and skills that are vital to the public.
3. However, engineers do not have anything like complete control of engineering services, because a license is not required to practice many types of engineering.
4. Thus, a claim by engineers to be regulated by ethical standards—at least by compulsory ethical standards—can be questioned. Only licensed engineers are governed by a compulsory code of ethics.
5. Finally, engineers who work in large organizations and are subject to the authority of managers and employers may have limited autonomy.

From the standpoint of professional ethics, however, one of the crucial issues in professionalism is a genuine commitment to ethical ideals.

TWO MODELS OF PROFESSIONALISM

The Business Model

According to the business model, an occupation is primarily oriented toward making a profit within the boundaries set by law.

Just like any other business, a profession sells a product or service in the marketplace for a profit; the major constraint on this activity is regulation imposed by law.

The major difference between the so-called professionals who adopt the business model and most other occupations, such as sales or manufacturing, is that the latter seek profit primarily by selling a physical product, such as automobiles or refrigerators, whereas professionals seek profit by selling their expertise.

Nevertheless, the ultimate goal is the same in both cases: selling something in the marketplace for profit.

The Professional Model

the professional model idea is that engineers and other professionals have an implicit trust relationship with the larger public; a ‘‘social contract’’ with the public, that professionals agree to regulate their practice so that it promotes the public good.

In the words of most engineering codes, they agree to hold paramount the safety, health, and welfare of the public. That is, they agree to regulate themselves in accordance with high standards of technical competence and ethical practice so that they do not take unfair advantage of the public.

Which model contains the whole truth?

It is obvious that neither the business model nor the professional model, taken by themselves, contains the whole truth about the actual practice of professionals. Nevertheless, the notion of professionalism, as it is traditionally understood, requires that a professional embrace the professional model to a substantial degree, and in this model ethical commitment is paramount.

Engineers can certainly adopt the professional model, and this means that the ethical component is of central importance in engineering professionalism.

THREE TYPES OF ETHICS OR MORALITY

How does professional ethics differ from other types of ethics—philosophical ethics, business ethics, personal ethics, and so on?

Common Morality

Common morality is the set of moral beliefs shared by almost everyone. It is the basis, or at least the reference point, for the other two types of morality.

Three characteristics of common morality must be mentioned here.

First, many of the precepts of common morality are negative. According to some moralists, common morality is designed primarily to protect individuals from various types of violations or invasions of their personhood by others.

Second, although common morality is primarily negative, it does contain a positive or aspirational component in such precepts as ‘‘Prevent killing,’’ ‘‘Prevent deceit,’’ ‘‘Prevent cheating,’’ and so forth.

However, it might also include even more clearly positive precepts, such as ‘‘Help the needy,’’ ‘‘Promote human happiness,’’ and ‘‘Protect the natural environment.’’

Third, common morality makes a distinction between an evaluation of a person’s actions and an evaluation of his intention.

Personal Morality

Personal ethics or personal morality is the set of moral beliefs that a person holds. For most of us, our personal moral beliefs closely parallel the precepts of common morality.

Professional Ethics

Professional ethics is the set of standards adopted by professionals insofar as they view themselves acting as professionals. Every profession has its professional ethics: medicine, law, architecture, pharmacy, and so forth. ***Engineering ethics*** is that set of ethical standards that applies to the profession of engineering.

There are several important characteristics of professional ethics.

First, unlike common morality and personal morality, professional ethics is usually stated in a formal code. Many engineering societies have a code of ethics, such as the ***A**merican **S**ociety of **C**ivil **E**ngineers.*

Second, the professional codes of ethics of a given profession focus on the issues that are important in that profession.

Third, when one is in a professional relationship, professional ethics is supposed to take precedence over personal morality—at least ordinarily.

A complication occurs when the professional’s personal morality and professional ethics conflict. Suppose a client asks a civil engineer to design a project that the engineer, who has strong personal environmental commitments, believes imposes unacceptable damage to a

wetland. Suppose this damage is not sufficient to be clearly covered by his engineering code. In this case, the engineer probably should refer the client or employer to another engineer who might do the work.

Fourth, professional ethics sometimes differs from personal morality in its degree of restriction of personal conduct.

examples:

engineer Jane refuses to design military hardware because she believes war is immoral: (personal > Professional morality)

civil engineer Mary refuses to participate in the design of a project that she believes will be contrary to the principles of sustainable development: (Professional > personal morality)

Fifth, professional ethics, like ethics generally, has a negative and a positive dimension. Being ethical has two aspects: preventing and avoiding evil (negative, or ***preventive ethics***) and doing or promoting good (positive, or ***aspirational ethics***). On the one hand, we should not lie, cheat, or steal. On the other hand, we have some general obligation to promote human well-being.

THE NEGATIVE FACE OF ENGINEERING ETHICS: PREVENTIVE ETHICS

Preventive ethics is commonly formulated in rules, and these rules are usually stated in codes of ethics.

Many of the provisions are explicitly negative in that they use terms such as **‘‘not’’** or **‘‘only.’’** For example,

section 1,c under ‘‘Rules of Practice’’ states that ‘‘engineers shall **not** reveal facts, data, or information without the prior consent of the client or employer except as authorized by law or this Code.’’

Section 1,b under ‘‘Rules of Practice’’ states that ‘‘engineers shall approve **only** those engineering documents that are in conformity with applicable standards.’’

Another example:

‘‘Engineers shall ***disclose*** all known or potential conflicts of interest that could influence or appear to influence their judgment or the quality of their services.’’ The word “Disclose” can be replaced by “shall **not** engage in”.

It is easier to enforce negative rules than positive rules.

Another reason for the negative orientation of engineering ethics is the influence of what are often called ‘‘disaster cases,’’ which are incidents that resulted, or could have resulted, in loss of life or harm due to technology.

An example of disaster cases that have been important in the development of engineering ethics is given below:

The DC-10 Case*.*

The DC-10, a wide-bodied aircraft, was introduced into commercial service in 1972.

Since the cargo area is pressurized as well as the cabin, it must be able to withstand pressures up to 38 psi. During the first year of service, a rear cargo door that was improperly closed blew open over Windsor, Ontario. Luckily, a skilled pilot was able to land the plane successfully. Two weeks after the accident, Convair engineer Dan Applegate expressed doubts about the ''Band-Aid'' fixes proposed for the cargo door lock and latch system. Managers rejected his expression of concerns because they believed Convair would have to pay for any fixes they proposed, so the prime contractor, McDonnell Douglas, was not notified of Applegate's concerns. On March 3, 1974, soon after takeoff on a flight from Paris to London, the cargo door of a plane broke off, resulting in a crash that killed 346 passengers.
At that time, it was the worst aircraft accident in history.

These are lessons to be learned about the importance of, and the risks involved in, protecting the health and safety of the public. Preventive ethics should always be an important part of engineering ethics.

THE POSITIVE FACE OF ENGINEERING ETHICS: ASPIRATIONAL ETHICS

Engineers do not choose engineering as a career in order to prevent disasters and avoid professional misconduct. To be sure, many engineering students:

- Desire the financial rewards and social position that an engineering career promises, and this is legitimate.
- attracted by the prospect of making a difference in the world, and doing so in a positive way.
- excited by projects that alleviate human drudgery through labor-saving devices,
- excited by projects eliminate disease by providing clean water and sanitation,
- excited by projects develop new medical devices that save lives,
- excited by projects create automobiles that run on less fuel and are less polluting,
- excited by projects preserve the environment with recyclable products.

Most of us probably believe that these activities—and many others—**improve the quality of human life**. (positive, aspirational ethics).

Example:

Disaster Relief

Fredrick C. Cuny attended engineering school, but he never received his degree in engineering due to poor grades. In his early twenties, however, he learned how to conduct disaster relief in such a way that the victims could recover enough to help themselves. At age 27, he founded the Interact Relief and Reconstruction Corporation. He was soon working in Biafra helping to organize an airlift to rescue Biafrans after a war. Later, he organized relief efforts, involving engineering work, in Bosnia after the war and in Iraq after Operation Desert Storm. When his work in Iraq was completed, the Kurds held a farewell celebration. Cuny was the only civilian in a parade with the Marines with whom he had worked

Cases

It is frequently referred to cases in engineering ethics. They serve several important functions.
First, it is through the study of cases that we learn to recognize the presence of ethical problems, even in situations in which we might have thought there are only technical issues.
Second, it is by studying cases that we can most easily develop the abilities necessary to engage in constructive ethical analysis.
Third, a study of cases is the most effective way to understand that the codes cannot provide ready-made answers to many moral questions that professional engineering practice generates and that individual engineers must become responsible agents in moral deliberation.
Fourth, the study of cases shows us that there may be some irresolvable uncertainties in ethical analysis and that in some situations rational and responsible professionals may disagree about what is right.

Two Further points:
First, the use of cases is especially appropriate in a text on professional ethics.
Second, the study of cases is especially valuable for engineers who aspire to management positions.
The study of cases helps students understand that professional ethics is not simply an irrelevant addition to professional education but, rather, is intimately related to the practice of engineering.