



## Objectives

Aim 1: You will be able to summarize the most common ethical theories,

Aim 2: Given a specific case study, you will be able to apply the ethical theories with an engineering perspective,

Aim 3: Given a specific case study, you will be able to distinguish and apply the appropriate ethical theory,

Aim 4: You will be able to state the importance of the aspects of moral autonomy.

## MORAL AUTONOMY

**Moral autonomy** is the ability to think critically and independently about moral issues and to apply this moral thinking to situations that arise in the course of professional engineering practice.

### Why should a future engineer bother studying ethics at all?

After all, at this point in your life, you're already either a good person or a bad person. Good people already know the right thing to do, and bad people aren't going to do the right thing no matter how much ethical training they receive. The answer to this question lies like the ethical problems that are often encountered by an engineer. In most situations, the correct response to an ethical problem is very obvious. However, many times, the ethical problems encountered in engineering practice are very complex and involve conflicting **ethical principles**.

## ETHICAL THEORIES

Four ethical theories will be considered here, each differing according to what is held to be the most important moral concept. *Utilitarianism* seeks to produce the most utility, defined as a balance between good and bad consequences of an action, taking into account the consequences for everyone affected. A different approach is provided by *duty ethics*. Duty ethics contends that there are duties that should be performed (for example, the duty to treat others fairly or the duty not to injure others) regardless of whether these acts lead to the most good. *Rights ethics* emphasizes that we all have moral rights, and any action that violates these rights is ethically unacceptable. Like duty ethics, the ultimate overall good of the actions is not taken into account. Finally, *virtue ethics* regards actions as a right that manifest good character traits (virtues) and regards actions as bad that display bad character traits (vices); this ethical theory focuses on the type of person we should strive to be.

### 1- The Utilitarianism

The first of the moral theories that will be considered is **utilitarianism**. Utilitarianism holds that those actions that serve to maximize human well-being are good. The emphasis in utilitarianism is not on maximizing the well-being of the **individual**, but rather on maximizing the **well-being of society** as a whole, and as such, it is somewhat of a collectivist approach. An example of this theory that has been played out in this country many times over the past century



is the building of dams. Dams often lead to great benefit to society by providing stable supplies of drinking water, flood control, and recreational opportunities. However, these benefits often come at the expense of people who live in areas that will be flooded by the dam and are required to find new homes or lose the use of their land. Utilitarianism tries to balance the needs of society with the needs of the individual, with an emphasis on what will provide the most benefit to the most people.

Utilitarianism is fundamental to many types of engineering analysis, including risk-benefit analysis and cost-benefit analysis. However, as good as the utilitarian principle sounds, there are some problems with it. First, as seen in the example of the building of a dam, sometimes what is best for everyone may be bad for a particular individual or a group of individuals. The utilitarian approach can seem to ignore the needs of individuals, especially if these needs seem relatively insignificant. Another objection to utilitarianism is that its implementation depends greatly on knowing what will lead to the most good. Frequently, it is impossible to know exactly what the consequences of an action are. It is often impossible to do a complete set of experiments to determine all of the potential outcomes, especially when humans are involved as subjects of the experiments. So, maximizing the benefit to society involves guesswork and the risk that the best guess might be wrong.

Despite these objections, utilitarianism is a valuable tool for ethical problem solving, providing one way of looking at engineering ethics cases. The best-known proponent of utilitarianism was John Stuart Mill (1806–1873), who felt that most of the common rules of morality (e.g., don't steal, be honest, don't harm others) are good guidelines derived from centuries of human experience. However, Mill felt that individual actions should be judged based on whether the most good was produced in a given situation, and rules should be broken if doing so will lead to the most good.

## **2- The Duty Ethics**

A major proponent of duty ethics was Immanuel Kant (1724–1804), who held that moral duties are fundamental. Ethical actions are those actions that could be written down on a list of duties: be honest, don't cause suffering to other people, be fair to others, etc. These actions are our duties because they express respect for persons, express unqualified regard for autonomous moral agents, and are universal principles. Once one's duties are recognized, the ethically correct moral actions are obvious. In this formulation, ethical acts are a result of the proper performance of one's duties.

## **3- The Rights Ethics**

Rights ethics was largely formulated by John Locke (1632–1704), whose statement that humans have the right to life, liberty, and the property was paraphrased in the Declaration of Independence of the soon-to-be United States of America in 1776. Rights ethics holds that people have fundamental rights that other people have a duty to respect.

Duty ethics and rights ethics are really just two different sides of the same coin. Both of these theories achieve the same end: Individual persons must be respected, and actions are ethical



that maintain this respect for the individual. In duty ethics, people have duties, an important one of which is to protect the rights of others. And in rights ethics, people have fundamental rights that others have duties to protect.

As with utilitarianism, there are problems with the duty and rights ethics theories that must be considered. First, the basic rights of one person (or group) may conflict with the basic rights of another group. How do we decide whose rights have priority? Using our previous example of the building of a dam, people have the right to use their property. If their land happens to be in the way of a proposed dam, then rights ethics would hold that this property right is paramount and is sufficient to stop the dam project. A single property holder's objection would require that the project be terminated. However, there is a need for others living in nearby communities to have a reliable water supply and to be safe from continual flooding. Whose rights are paramount here? Rights and duty ethics don't resolve this conflict very well; hence, the utilitarian approach of trying to determine the most good is more useful in this case.

The second problem with duty and rights ethics is that these theories don't always account for the overall good of society very well. Since the emphasis is on the individual, the good of a single individual can be paramount compared to what is good for society as a whole.

#### **4- Virtue Ethics**

Another important ethical theory that we will consider is virtue ethics. Fundamentally, virtue ethics is interested in determining what kind of people we should be. Virtue is often defined as a moral distinction and goodness. A virtuous person exhibits good and beneficial qualities. In virtue ethics, actions are considered right if they support good character traits (virtues) and wrong if they support bad character traits (vices). Virtue ethics focuses on words such as responsibility, honesty, competence, and loyalty, which are virtues. Other virtues might include trustworthiness, fairness, caring, citizenship, and respect. Vices could include dishonesty, disloyalty, irresponsibility, or incompetence. As you can see, virtue ethics is closely tied to personal character. We do good things because we are virtuous people and seek to enhance these character traits in ourselves and others.

In many ways, this theory may seem to be mostly personal ethics and not particularly applicable to engineering or professional ethics. However, personal morality cannot, or at any rate should not be separated from professional morality. If behavior is virtuous in the individual's personal life, the behavior is virtuous in his or her professional life as well.

How can virtue ethics be applied to business and engineering situations? This type of ethical theory is somewhat trickier to apply to the types of problems that we will consider, perhaps because virtue ethics seems less concrete and less susceptible to rigorous analysis and because it is harder to describe nonhuman entities such as a corporation or government in terms of virtue. However, we can use virtue ethics in our engineering career by answering questions such as Is this action honest? Will this action demonstrate loyalty to my community and/or my employer? Have I acted responsibly? Often, the answer to these questions makes the proper course of action obvious. To use virtue ethics in an analysis of an ethical problem, you should first



identify the virtues or vices that apply to the situation. Then, determine what course of action each of these suggests.

As with any ethical theory, it is important to be careful in applying virtue ethics. Problems can arise with words that on the face seem to be virtues, but can lead to vices. For example, the concept of “honor” has been around for centuries and is often viewed positively. One sense of the word “honor” is a code of dignity, integrity, and pride. Honor may seem like a very positive thing, especially the aspects related to integrity. But the aspects related to pride can often have negative consequences. There are numerous examples in the history of wars that have been fought and atrocities committed to preserving the honor of an individual or a nation. Individuals have often committed crimes as a way of preserving their honor. In using virtue ethics, it is important to ensure that the traits you identify as virtues are indeed virtuous and will not lead to negative consequences.

**Over to You: Research “The Disaster at Bhopal” and think about theories.**

## REFERENCES

- Fleddermann, C. B. (1999). *Engineering ethics* (Vol. 4). Upper Saddle River, NJ: Prentice Hall.
- Rabins, M.J., Harris, E., Pritchard, M.S., and Lowery, L.L., “Engineering Ethics,” <http://ethics.tamu.edu>
- Roland Schinzinger and Mike W. Martin, *Introduction to Engineering Ethics*, McGraw-Hill, New York, 2000.
- Charles E. Harris, Jr., Michael S. Pritchard, and Michael J. Rabins, *Engineering Ethics: Concepts and Cases*, Wadsworth Publishing Company, Belmont, CA, 2000.