

C.W
22/3/25

Professional Ethics for Engineers

- Rajib Kumar Sahu sir

Module-1

Ethics - Basic understanding of what is wrong and right for someone / something is known as ethics.

- In general ethics refer to a system of moral principal (core objective), a sense of right & wrong, fair and unfair and goodness & badness of actions, their motives and their consequences.

- Ethics is the science of judging specifically human ends and the relationship of means to those ends.

Ethical Objectives

- Study of human behaviour, makes evaluative assessment about that as moral or immoral. (a diagnostic goal)
- Establish moral standard / norms of behaviour.
- Makes judgement upon human behaviour based on these standard and norms.
- Prescribe moral behaviour; makes recommendation about how to or how not to behave.

Values

Value can be defined as qualities that are important to us. Values are benchmarks or standards on which the desirability of an action can be measured. Values acts as an internal compass which help a person evaluate different choice of conduct and behaviour.

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29/7/25

ENGINEERING ETHICS

→ It constitutes the rules and standards governing the conduct of engineers in their role as professional.

→ Engineering ethics encompass the more general definition of ethics but applies it more specifically to situation involving engineers in their professional life.

→ Thus engineering ethics is a body of ~~psycho~~ ^{psychology} indicating the way that engineers should conduct themselves in their professional capacity.

Significance

(4 mark Q)

→ The work of engineer can affect public health & safety and can influence business practices and even politics.

→ One result of this increase in awareness is that, nearly every major corporation now has an ethics office that has the responsibility to ensure that employees have ability to express their concern about the issues such as safety & corporate business practices in a way that, it will produce result and won't result in retaliation against the employee.

→ Ethics officers also try to foster an ~~ethical~~ ethical culture that will help to head off ethical problems encountered in engineering practice are very complex

and involves conflicting ethical principles.

#

Types of:
ethical
inquiry:

- ① Normative inquiry
- ② Conceptual inquiry
- ③ Factual inquiry

(8 marks)

Engineering ethics combines inquiry into value, meaning and fact. Normative inquiries which are more central, seek to identify the values that should guide individual or groups. Conceptual inquiries seek to clarify important concept / idea, whether the ideas are expressed by single words or by statements or question. Factual inquiries seek to provide facts, needs for understanding and resolving value issues. (12 marks)

① NORMATIVE INQUIRY

every
*whistle
blowing
is called
normative
inquiry

- First and foremost engineering ethics involves normative inquiries aimed at identifying and justifying the morally desirable norms or standards that ought to guide individuals or groups.
- Normative questions are about what ought to be and what is good.
- Some examples of normative questions are.
 - ① How far does the obligations of the engineers to protect public safety extend in given situation?
 - ② When if ever, should engineers be expected to blow the whistle on dangerous practices

particular of more
groups to (a)

② Structural Impairment

Conceptual inquiries are directed towards clarifying the meaning of concepts/issues in engineering ethics.

For example: What does safety mean and how it is related to the idea risk.

(ii) what does it mean when code of ethics says engineers should protect the safety, health and ~~welfare~~ welfare of public.

Conceptual issues have to do with the meaning or applicability of an idea.

In engineering ethics, this might mean defining what is a bribe, and what constitutes an ~~bribe~~ opposed to an acceptable gift or determining certain business or information is priority.

③ FACTUAL INQUIRY

→ Also called descriptive ^{inquiries} ~~inquiry~~, seeks to uncover information bearing upon value issues where possible ^{research or attempt} ~~to~~ ^{to} ~~conduct~~ ^{conduct} factual inquiries using ~~proper~~ ^{proven} scientific techniques.

They provide important information about business realities of contemporary engineering
↓
realities

profession & effectiveness of professional society in fostering moral conduct.

- The procedure used in ~~fact~~ ^{risk assessment} ~~and psychological~~ ^{practices in engineering} ~~practices in engineering~~.

~~Conceptual~~ ^{Factual} inquiries involve what actually known about a case, i.e. what the facts are. Although ~~the concept seems~~ ^{the concept seems} straightforward, the fact of a particular case are not ~~always~~ ^{always} clear & maybe controversial.

MORAL AUTONOMY

→ Autonomy literally means self determining or independent, but not just any kind of independent reflection about ethics amount to moral autonomy.

→ Moral autonomy can be viewed as a skill and habit of thinking rationally about ethical issues on the basis of moral concern.

→ Moral autonomy can be accomplished by improving various practical skills that will help produce effective independent thoughts about moral issues. As related to engineering ethics these skills include the followings:

- (i) Proficiency in recognising moral problems and issues in engineering. This involves being able to distinguish them from, as well as related them to problems in law, economy

religion or the description of physical system.

(ii) Skills in comprehending, clarifying and critically accessing arguments on opposing side of moral issues.

(iii) The ability to form consistent and comprehensive view point based upon consideration of relevant facts.

(iv) Imaginative awareness of alternative responses to the issues and creative solution for practical difficulties.

(v) Enhanced precision in the use of a common ethical language, which is necessary to be able to ^{express} defend one moral views adequately to others.

PROFESSIONAL RESPONSIBILITY

It refers to the ethical obligations and duties that individuals in a profession must uphold in their practice.

Professional responsibility involves adhering to ethical guidelines established by relevant professional organisation which vary by field. A

Work culture is the involvement of workmen with work. The degree of his involvement impact performance, whether he gives high or low quality. Work ethics

will be different at different levels.

- At the basic level, it is about discipline i.e. to maintain punctuality, coming to work on time, behaving properly with senior, colleagues, subordinate.
- At top level it is about commitment and accountability. ~~towards~~
- Protecting the interest of the organisation - no employee should make any adverse comment about the organisation out in public.
- There are other fundamental principles which govern ~~the~~ the conduct of professionals, can be broadly identified as
 - (i) Need to ^{absorb} ~~obtain~~ certain values which encompasses personal, corporate and social values.
 - (ii) Need to achieve professional competence - one should strive to achieve high standards of efficiency before offering any service of professional nature.
 - (iii) Need to quality of service - this depends on personal attributes like personality and personal qualities, knowledge which must be constantly updated.

Basis of comparison.

LAW

ETHICS

Meaning

The law refers to a systematic body of rules that govern the whole society and the actions of its individual members.

Ethics is a branch of moral philosophy that guides people about the basic human conduct.

What is it?

set of rules

set of guidelines.

Governed by

Government

Individual, legal & professional norms.

Expression

Expressed and published in writing

They are abstract.

Violation

It is not permissible which may result in punishment like imprisonment or fine or both

There is no punishment for violation of ethics.

Objective

Law is created with an intent to maintain social order and peace in the society and provide protection to all the citizen.

Ethics are made to help people decide what is right or wrong and how to act.

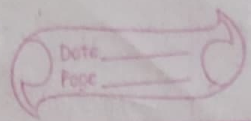
Binding

Law has a legal binding

Ethics do not have a binding nature.

Date
5/8/25

Case study based questions



Case-1

Ms. Shashi after completion of 12th standard wanted to become a doctor. In the family Mother Sunya Kumari was traditionally orthodox but with modern thinking, father Dwankadas had modern outlook. Father had no studies, so he was keen to make all children study well. Sashi had two brothers and a sister all younger to her. When she wanted to do medicine, relatives took the objection stating that she will touch the dead bodies daily and come home. She has to take daily bath. Relatives said that they would not visit home.

• what should parents do?

- Support Sashi's aspiration: parents should prioritize their daughter's career goals and dreams over societal pressure. They can educate the relatives about the importance of the medical profession and how it aligns with societal values like service, compassion and knowledge.
- Open communication: Discuss the concerns raised by relatives with Sashi and address them logically (e.g. hygiene practices).
- Stand Firm: As parents with a modern outlook, they should, respectfully but firmly defend their daughter's choice, emphasizing that education and career decisions should not be bound by outdated customs.

• What should Sashi do?

→ Stay determined: Sashi should remain focused on her goal of becoming a doctor, understanding that her profession will contribute positively to society.

→ Educate others: She can calmly explain to relatives how medical training works to dispel misconceptions.

→ Seek support: If relatives persist in their objections, she can rely on her parents and siblings for emotional support and ignore undue pressure.

• How do you differentiate between a value and the custom in this case?

→ Value: Values are enduring principles like education, service to humanity, and gender equality. Here supporting Sashi's education and career aligns with the values of empowerment and progress.

→ Custom: Customs are traditional practices. In this case, the relative's objection is based on outdated customs that conflict with modern values.

→ Values evolve to uphold societal good, while customs may become irrelevant over time.

→ "Customs are practices of the past; values are principles for the future."

Case-2

Sharad is a chemical engineer who changed employment from Company A to Company B.

Before leaving Company A, they asked him to sign document by which he agreed to keep confidential any proprietary information which he acquired at Company A. Soon after he arrived at company B, Sharad is assigned to solve a problem involving emission of a new chemical compound X, though noxious was not regulated by the Pollution control board. Sharad

New manager did not know whether to be concerned about compound X or not. However Sharad realized that some of the proprietary information he had information would be used in an entirely different way than it was used by Company A and would not harm the competitive position of Company A with respect to company B, but Sharad still wonders whether he should approach his new manager with a proposal that requires the use of the information.

- What issues does Sharad face?

→ Confidentiality agreement violation: Sharad signed a document at Company A agreeing to keep proprietary information confidential. Using or disclosing this information at Company B could breach this agreement, even if the intent is not harmful.

→ Ethical Dilemma - while the information could help company B solve a problem, Sharad must weigh the ethical implications of using knowledge gained from a previous employer.

→ Legal risk - If company A discovers Sharad used their proprietary data, they could take legal action against him or company B for misappropriation of trade secrets.

→ Trust and professionalism - Sharad's action could damage his professional reputation if he is perceived as untrustworthy or unethical.

• What should Sharad do?

→ Avoid direct use of proprietary information : Sharad should not disclose or apply Company A's confidential data without explicit permission, even if the application seems harmless.

→ Consult legal / compliance teams : Before proceeding, Sharad should seek advice from Company B's legal or compliance department to understand the risks and potential workarounds.

→ Propose a general solution without confidential details : Sharad could suggest a modified process

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→ Propose a general solution without confidential details - Sharad could suggest a modified process

based on his expertise and let Company B's team develop it independently.

- Explore Alternative solution :- Shared should collaborate with colleagues at Company B to find innovative ways to ~~address~~ address the emissions problem without relying on confidential information.
- Transparency with Managers: Shared should inform his manager about the potential conflict and seek guidance on how to proceed ethically.

marks) CONSEQUENTIALISM / CONSEQUENCE THEORY

- Consequentialist theory see good as defined not by action but by the consequence.
- In this theory, killing another human being may be morally good, provided it gives rise to some greater good.
- One particular form of this theory is "Utilitarianism" see good as being defined by the maximization of good consequences, "the greatest the good for the greatest number".
- This theory states that we can know what is good only when we have fully understood the context. This is also known as 'Teleological' approach.
- The consequentialist approach ignores the importance of intention & motive in any ethical judgement.
- It is also run the danger of the end and justifying any means and even of denying the right of minorities.
- In deciding between different options there has to be some understanding of what constitute good in the first place.

Utilitarianism

- It holds that those actions are good that serve to maximize human well being.

The emphasis in this theory is not in maximizing the well being of individual but rather on maximizing the well-being of society as a whole, and such it is somewhat of a collective approach.

→ An example of this theory is - building of a dam.

Dams often lead to create benefit to society by providing stable supplies of drinking water, flood control & recreational opportunities.

→ This theory tries to balance the need of society with the need of individual, with the emphasis on what we provide is most benefit to most people.

→ According to 'John Stuart Mill' (**Act Utilitarianism**) this theory focusses on individual actions rather than on rules.

→ The best known ^{proponent} of

Act Utilitarianism was John Stuart Mill, who felt that most of the common rules of morality are good guidelines derived from centuries of human experience.

→ However, Mill felt that individual actions should be just based on

whether the most good was produced in a given situation and rules should be broken, if doing so, it will lead to the most good.

→ Rule utilitarianism differs from Act utilitarianism and it is told that the moral rules are most important.

→ Rule utilitarianism content that, adhering to these rules might not always maximize good in a particular situation, overall adhering to moral rules will ultimately leads to most good.

→ These two different types of utilitarianism can lead to slightly different result when applied to specific situation.

DEONTOLOGICAL THEORY

→ Deontology is a study of the nature of duty and obligations.

→ Deontological theories see good as something that is self-evident and can be some sum of in general rules which applies to all.

→ In this theory the action of killing is always wrong.

→ It breaks the basic rule of respect for life.

→ Moral good is discovered through reason reflection.

→ focuses on morality of a person.

→ This approach is concerned primarily with the quality of an action, with the means of achieving a desired end.

→ This approach has more of a religious undertone.

→ The deontological theory assumes the reasonableness of human beings; that is, they are capable of seeing what is good. Ironically deontological theory relies upon consequentialist considerations to justify themselves.

→ The deontological theory was given by Immanuel Kant.

Kantian Ethics

→ These theories hold that those actions are good that respect the right of the individual.

→ A major proponent of Duty ethics (Right ethics) was Immanuel Kant, who held that moral duties are fundamental.

→ Ethical actions are those actions that could be written down as a list of duties like

(i) Being honest

(ii) Don't cause suffering to others.

(iii) Be fair to others, etc.

→ These actions are our duties, because they express respect for persons.

with an unqualified regard for an autonomous moral agent, and are universal principles.

→ Once a person's duties are recognized, the ethically correct moral actions are obvious.

Duty Ethics

→ Deontological / duty ethics are concerned with what people do and not with consequences of their actions like,

(i) do right thing

(ii) do it because it's the right thing to do.

(iii) don't do wrong things.

(iv) Avoid them because they are wrong.

→ Duty based ethics teaches that, some acts are right and wrong because of the sort of things they are, and people have a duty to act accordingly.

→ Regardless of the good or bad consequences that may be produced.

Significance of Duty Ethics.

→ Emphasis on the value of every human being.

- Duty based ethical system tend to focus on giving equal respect to all human being.

- This provides a basis for 'human rights'.

It forces you to regard to the interest of a single person even if it is at odds with the interest of a larger group.

→ Kantian duty ethics says that something should be never done, no matter what good consequences they produce.
→ This seems to reflect the way some human being thinks.

→ Duty based ethics don't suffer from the problem because they are concerned with the action itself. If an action is a right action, then a person should do it, if it is a wrong action then he shouldn't do it, providing there is a given set of moral rules to follow that causes some person with to face a moral choice should be able to take a decision with moral reasonable certainty.

H.W Research on Gandhian ethics.

mid 30s to 1940s
would prove to show it as modern
of best writing kinds and good.
would be of better large price as
would not mind a whole lot.
would be of better of day and it
to be as it is now and it is to
change again a to be with it.