Unit 2 : Professional Ethics

Objectives of the study on Professional Ethics :

(A) Improvement of the cognitive skills (skills of the intellect in thinking clearly)

1. Moral awareness (proficiency in recognizing moral problems in engineering)

2. Cogent moral reasoning (comprehending, assessing different views)

3. Moral coherence (forming consistent viewpoints based on facts)

4. Moral imagination (searching beyond obvious the alternative responses to issues and being receptive to creative solutions)

5. Moral communication, to express and support one's views to others.

(B) To *act* in morally desirable ways, towards moral commitment and responsible conduct

1. Moral reasonableness i.e., willingness and ability to take moral responsibility.

2. Sense of conduciveness, Respectfulness and obligation with respect to the people around(showing concern for the well-being of others, besides oneself) (Sanskrit Verse- *Bahu Jana Sukhaaya BahuJana Hitaaya* principle)

3. Tolerance of diversity i.e., endurance and respect for ethnic, cultural and religious differences, and acceptance of reasonable differences in moral perspectives.

4. Moral hope i.e., believe in using rational dialogue for resolving moral conflicts.

5.Moral Integrity, which means integrating one's professional life and personal convictions in the profession(Kannada Verse-*Nudidante Nade).*

Engineering Professional Ethics

5.1 OVERVIEW

Engineering ethics is defined by the codes and standards of conduct endorsed by engineering (professional) societies in terms of a set of beliefs, attitudes and habits displayed by the individual or group.
Engineering is the largest profession and the decisions and actions of engineers affect all of us in almost all areas of our lives, namely public safety, health, and welfare.

Objectives of Professional ethics

- **understanding the moral values and their implementation in professional practice,**
- **Justification of judgements and decisions in in engineering profession.**
- **Discovery of justified moral principles of obligation, rights and ideals.**
- **Resolving complex moral issues in engineering profession**

Scope Professional ethics

Twofold scope:

1. Ethics of the workplace related to employees in an organization.

2. Ethics related to the production in terms of product quality, transportation, storage, safety, marketing and social environment.

Approaches to Professional Ethics

The Two approaches are

1. Micro-ethics which deals with decisions and problems of individuals, professionals, and companies.
2. Macro-ethics which deals with the societal problems on a regional/national/global level. .

5.2 SENSES(meanings) OF ENGINEERING ETHICS

1. Normative and 2. Descriptive senses.

The normative sense includes:

(*a*) Knowing moral values, resolving moral problems and justifying moral judgments in engineering practices,

(*b*) Study of decisions, policies, and values that are morally desirable in the engineering practice and research

(a) Using codes of ethics and standards and implementation

The descriptive sense includes:

Specific individual or group of engineers believe and act, without justifying their beliefs or actions.

5.3 VARIETY OF MORAL ISSUES

The reasons for people (the employer and employees) behaving unethically may be classified into three categories:

1. Resource Crunch 2. Opportunity 3. Attitude

1. Resource Crunch

Occurs due to pressure, time limits, budgetary constraints, and technology obsolescence(outdating).

Example: Pressure from the government to complete the project in time (e.g., before the elections), Reduction in the budget because of sudden war or natural calamity (e.g., Tsunami) and

Obsolescence due technology innovation by the competitor lead to manipulation and unsafe and unethical execution of projects.

In such situation, involving individuals in the development of goals, values and developing policies that consider individual diversity, dissent(disagreement), and input to decision-making will prevent unethical results.

2. Opportunity(Misuse of opportunities)

Reasons for unethical behavior in a Profession

(*a*) Double standards or behavior of the employers towards the employees and the public. The unethical behaviors of World Com (in USA), Enron (in USA as well as India) executives in 2002 resulted in bankruptcy for those companies,

(*b*) Management projecting their own interests more than that of their employees. Some organizations over-emphasize short-term gains and results at the expense of themselves and others,

(*c*) Emphasis on results and gains at the expense of the employees, and

(*d*) Management by objectives, without focus on empowerment and improvement of the infrastructure.

This issue can be resolved by developing policies that allow 'conscience keepers' and whistle blowers and appointing ombudsman(grievance cell), who can work confidentially with people to solve the unethical problems internally.

3. Attitude

Poor attitude of the employees set in due to

(*a*) Low morale of the employees because of dissatisfaction and downsizing(shedding of staff)

(*b*) Absence of grievance redressal mechanism,

(*c*) Lack of promotion or career development policies or denied promotions,

(*d*) Lack of transparency,

(*e*) Absence of recognition and reward system, and

(*f*) Poor working environments.

Methods of Improving Attitude

- **Giving ethics training for all the employees.**
- **Recognizing ethical conduct in work place**
- **Including ethics in performance appraisal.**
- **Encouraging open discussion on ethical issues for promoting positive attitude**
- **Setting and adopting ethical standards by the management, with inputs from all the personnel(human resources)**

5.4 TYPES OF INQUIRIES(Investigations)

The three types of inquiries, in solving ethical problems are:

1. **Normative(standard) inquiry 2. Conceptual(Theoretical) inquiry 3. Factual or descriptive inquiry.**

1. Normative Inquiry

Normative questions are about what ought to be and what is good, based on moral values.

For example,

1. How far does the obligation of engineers to protect public safety extend in any given situation?

2. What are the reasons on which the engineers show their obligations to their employees or clients or the public?

2. Conceptual Inquiry

It is aimed to clarify the meaning of concepts or principles that are expressed by words or by questions and statements. For example,

(*a*) What is meant by safety?

(*b*) How is it related to risk?

(c) What is a bribe?

(*d*) What is a profession?

When moral concepts are discussed, normative and conceptual issues are closely interconnected.

3. Factual or Descriptive Inquiry

It is aimed to obtain facts needed for understanding and resolving value issues. The inquiry provide important information on business realities, engineering practice, and the effectiveness of professional societies in fostering moral conduct, the procedures used in risk assessment, and psychological profiles of engineers. The facts provide the reasons for moral problems develop alterative ways of resolving moral problems. For example,

1. How were the benefits assessed?

2. What are procedures followed in risk assessment?

3. What are short-term and long-term effects of drinking water being polluted? and

4. Who conducted the tests on materials?

5.4 MORAL DILEMMA

1 Definition

Dilemmas are situations in which moral reasons come into conflict, where one is not clear of the immediate choice or solution of the problems.Moral reasons could be rights, duties, goods or obligations. This makes the decision making complex.

- **For example, a person promised to meet a friend and dine, but he has to help his uncle who is involved in an accident — one has to fix the priority.**

There are some difficulties in arriving at the solution to the problems, in dilemma. The three complex situations leading to moral dilemmas are:

1. The problem of *vagueness*: One is unable to distinguish between good and bad (right or wrong) principle.

2. The problem of *conflicting reasons*: One is unable to choose between <u>two good moral</u> solutions. One has to fix priority, through knowledge of value system.

3. The problem of *disagreement*: There may be two or more solutions and none of them is Mandatory then select the best suitable, under the existing conditions.

2 Steps to Solve Dilemma

The logical steps in overcome moral dilemma are:

1. Identification of the moral factors and reasons referring the professional codes of ethics, as interpreted by the professional experience i.e Conceptual Inquiry.

2 Talking with colleagues who can focus or narrow down the choice of values.

3. Collection of all information, data, and facts (factual inquiry) relevant to the situation.

3. Rank the moral options in the perspective of their impact on the society and indivisual. For example,give higher priority to public and environment issues, as compared to the individuals issues.

4. Explore alternate courses of action to resolve the dilemma by writing the main options and sub-options chart.

5.If no ideal solution possible choose course of action of average satisfaction level.

5.6 MORAL AUTONOMY

Moral autonomy is defined as 'self determinant or independent adoption of ethical conventions based on their own moral beliefs and attitudes rather than on passive adoption of the conventions of the society or profession.

Factors affecting Moral Autonomy

Moral Autonomy can be promoted by considering engineering as social experimentation .It retains professional identity.

Moral autonomy is discouraged by Periodical performance appraisals, tight-time schedules and fear of foreign competition .

Moral autonomy is discouraged if the management is concerned more on *profitability* than on *consistent quality and retention of the customers.*

Moral autonomy can be obtained by the help of labour unions or legal persuit.

The engineering skills related to moral autonomy are listed as follows:

1. Proficiency in recognizing moral problems in engineering and ability to distinguish as well as relate them to problems in law, economics, and religion,

2. Skill in comprehending, clarifying, and critically-assessing arguments on different aspects of moral issues,

3. Ability to form consistent and comprehensive view points based on facts,

4. Awareness of alternate responses to the issues and creative solutions for practical difficulties,

5. Sensitivity to genuine difficulties and subtleties, including willingness to undergo and tolerate some uncertainty while making decisions,

6. Using rational dialogue in resolving moral conflicts and developing tolerance of different perspectives among morally reasonable people

7. Maintaining moral integrity.

Autonomy which is the independence in making decisions and actions, is different from authority. Authority provides freedom for action, specified within limits, depending on the situation. Moral autonomy and respect for authority can coexist. They are not against each other. If the authority of the engineer and the moral autonomy of the operator are in conflict, a consensus is obtained by the two, upon discussion and mutual understanding their limits.

5.7 MORAL DEVELOPMENT (THEORIES)

1. Kohlberg Theory

Moral development in human being occurs over age and experience. There are three levels of moral development 1. pre-conventional 2. Conventional 3.post-conventional, based on the type of reasoning and motivation of the individuals in response to moral questions.

Pre-conventional level: Here right conduct exhibited for an individual welfare and benefit elf. At this level, individuals are motivated by obedience or the desire to avoid punishment(not by law) or to satisfy their own needs. Ex: Innocent people and children exhibit this tendency.

Conventional level: Here **people respect the law and authority. Rules and norms of one's family or group or society is accepted, as the standard of morality. Individuals in this level wish to meet the expectations of the society first and get acceptance from the society first(rather than their self interest). Loyalty is most important at this level. Ex: Getting reward or certification as Good Employee**

Post-conventional level: Here **people are called *autonomous*. They think originally with conscience and want to live by universal good principles and welfare of others. They have less priority to self-interest. They follow the golden rule, 'Do unto others as you would have them do unto you'(Vasudhaiva Kutumbakam, Aatmavat Sarva Bhooteshu). They maintain moral integrity, self-respect and respect for others.**

Kohlberg believed that individuals could only progress through these stages, one stage at a time.

He believed that most of the moral development occurs through social interactions.

2. Gilligan's Theory

Carol Gilligan found that Kohlberg's theory had a strong male bias. According to Gilligan's studies,while resolving moral dilemma

- **Women follow the context oriented focus in maintaining personal relationships, called the *ethics of care***
- **On the other hand men follow the *ethics of rules and rights*.**

Gilligan revised the three levels of moral development of Kohlberg, as stages of growth towards ethics of caring.

- **The pre-conventional level, right conduct, is viewed in a selfish manner solely as what is good for oneself.**
- **The *conventional level*, the importance is on not hurting others, and willing to sacrifice one's own interest and help others. This is the characteristic feature of women.**
- **post-conventional level, a reasonable balance is found between caring about others and pursuing the self-interest. This is achieved by context-oriented reasoning, rather than by hierarchy of rules.**
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Comparison of the Two theories

The theories of moral development by Kohlberg and Gilligan differ in the following respects.

Kohlberg's Theory	*Carol Gilligan's Theory*
A. Basic Aspects	
1. Is based on the study on men.	**1. Is based on the study on men and women**
2. Men give importance to moral rule.	**2. Women always want to keep up the personal relationships with all the persons involved in the situations.**
3. Ethics of rules and rights.	**3. Women consider context-oriented and ethics of care**
B Characteristic Features	
1. Justice	**1. Reason**

2. Factual	**2. Emotional**
3. Right or wrong	**3. Impact on relationships**
4. Logic only	**4. Compassion too**
5. Logic and rule-based	**5. Caring and concern**
6. Less of caring	**6. More of caring**
7. Matter of fact (practical)	**7. Abstract**
8. Present focus	**8. Future focus**
9. Strict rules	**9. Making exceptions**
10. Independence	**10. Dependence**
11. Rigid	**11. Human-oriented**
12. Taking a commanding role	**12. Shying away from decision-making**
13. Transactional approach	**13. Transformational approach**

Example: The difference in these two theories is explained through the well-known example, *Heinz's dilemma*1. Heinz being poor and a debtor could not buy the costly medicine for his sick wife, at ten times the normal cost. Initially he begged the Pharmacist to sell at half the price or allow him to pay for it later. Pharmacist refused to oblige him either way. Finally he forcibly entered the Pharmacy and stole the drug.

According to Kohlberg study, men observed that the theft was morally 'wrong' at the conventional level, because the property right was violated. But men at the post-conventional level, concluded that the theft was 'right', as the life of the human being was in danger. But women observed that Heinz was wrong. They observed that instead of stealing he could have tried other solutions (threatening or payment in installments?) to convince the Pharmacist. Gilligan however attributed the decision by women as context-oriented and not on the basis of rules ranked in the order of priority.

5.8 CONSENSUS and CONTROVERSY

In the study of moral autonomy, consensus and controversy are relevant factors to discuss on. Consensus means agreement and controversy means conflict or disagreement.

In exercising moral autonomy, one is not likely to obtain the same results as by others. This situation is likely to end in a controversy. In this case, good amount of tolerance among the individuals who are autonomous, reasonable and responsible is necessary. This does not mean forcing the engineers to reach unique moral solutions. Many reasonable solutions are possible to a given ethical problem. The ethics make the engineers realize the importance of tolerance among them, in case of disagreement while applying moral autonomy.

5.9 PROFESSION

PROFESSION is defined as any occupation/job/vocation that requires advanced expertise (skills and knowledge), self-regulation, and concerted service to the public good. It brings a high status, socially and economically. The characteristics of a profession are:

The *criteria* for achieving and sustaining professional status or professionalism are:

1. *Advanced expertise*: A professional should analyse the problem in the relevant area, in an objective manner using sophisticated expertise and knowledge.

2. *Self-regulation*: Giving an autonomous judgment (unbiased and on merits only) following the codes of conduct of professional societies towards the best interest of the clients/customers.

3. *Public good*: The concerted efforts in the job should be towards promotion of the welfare, safety, and health of the public.

5.8 Characteristics of Profession

The characteristics of the 'profession' as distinct from 'non-professional occupation' are listed as follows:

1. Extensive Training

Entry into the profession requires an extensive period of training of intellectual (competence) and moral (integrity) character. The theoretical base is obtained through formal education Diploma/UG/PG

2. Knowledge and Skills

Knowledge and skills (competence) are necessary for the well-being of the profession and society. Example:Knowledge of physicians protects us from disease and restores health.

3. Monopoly

The monopoly control is achieved in two ways:
(*a*) legally prescribing the professional qualifications and establishing accreditation standards
(*b*) Legal licensing system for those who want to enter the profession.

4. Autonomy in Workplace

Professionals are empowered with certain rights to establish their autonomy with possession of specialized Knowledge.

5. Ethical Standards

Professional societies promulgate(propagate) the codes of conduct to regulate the professionals to avoid unethical decisions and actions affecting the individuals or groups or the society.

5.10 MODELS OF PROFESSIONAL ROLES

Promotion of public welfare is the primary concern of the professional engineers. There are several role models through which the engineers and professionals are motivated. These models provoke their thinking, attitudes and actions.

1. Savior

The engineer as a savior, save the society from poverty, illiteracy, wastage, inefficiency, ill health, human (labor) dignity and lead it to prosperity, through technological development and social planning. For example, R.L. Stevenson.

2. Guardian

He guards the interests of the poor and general public. Ex: Lawrence of Arabia (an engineer).

3. Bureaucratic Servant

He serves the organization and the employers. The management of an enterprise fixes its goals and assigns the job of problem solving to the engineer, who accepts the challenge and shapes them into concrete achievements. For example, Jamshedji Tata.

4. Social Servant

It is one who exhibits social responsibility. For example, Sir M.Viswesvarayya.

5. Social Enabler and Catalyst

One who changes the society through technological development and minimize the negative effects of technology on people and their living environment. For example, Sri Sundarlal Bahuguna.

6. Game Player

He plays a unique role successfully within the organization, enjoying the excitement of the profession and having the satisfaction of surging ahead in a competitive world. For example, Narayanamurthy, Infosys and Dr. Kasthurirangan, ISRO.

5.11 RESPONSIBILITY

1. Senses of responsibility

1. Characteristic Quality

Primarily responsibility implies duty with care and efforts.

2. Obligations

These are one's moral responsibility i.e., duty to act right and in moral ways. For example, a Safety Engineer has a responsibility to make regular inspections in a factory shops.

3. General Moral Capacity

One has the general capacity for moral agency, including the understanding and action on moral reasons.

4. Liability and Accountability

Liability means one is liable (with a legal sense) to meet the obligations satisfactorily. Accountability means the act of justifying or defending the decisions, actions and outcomes.

5. Praiseworthiness/Blame worthiness

When accountability for wrong actions or results is at issue, responsibility means blameworthy. When the right conduct or successful result is at issue, responsible is synonymous with praiseworthy.

2. Types of Responsibilty

Different types of responsibilities exhibited in human transactions are:

1. Moral Responsibility

Moral responsibility as applied to a professional: A professional must be responsible morally, in creating goodness in and around and good outcomes, and eliminating /minimizing un- intended side-effects by following:

(*a*) *Obligations*: A commitment to moral actions

(*b*) *Conscientious(Meticulous):*A comprehensive approach in accepting and performing the duties with desirable outcomes

(*c*) Accountability (being accountable for the decisions, actions, and the results of product/project including safety), and

(*d*)Readiness to be Praiseworthy/Blameworthy as applied to context of doing things right/doing things wrongly, respectively.

2. Causal Responsibility

Responsibility for some causal event during routine course.

Ex: a.Damage to a motor due to unintended maloperation.

3. Job Responsibility

It consists of assigned tasks at the place of employment and achieving the objectives.

4. Legal Responsibility

It is the responsibility associated with legal obligations and accountability to meet them.
Ex: Higher level Financial transactions.
Many of these responsibilities overlap with moral responsibility.

5.12 Social Responsibility

Corporate organizations have social responsibility to all of their 'stakeholders'. Social responsibility includes the well being of the employees and their unions, investors, customers, dealers, suppliers,local communities, governments, non-governmental organizations, and the business owners and managers. environment, health and education.

Ex: Providing education to the communities staying around the industry

Various types of responsibilities such as causal, moral, and legal are distinguished through appropriate examples, as shown below:

Events	***Responsibility***
1. A stray cattle on the rail track caused	(*a*) Although cattle is the cause, the owner of the cattle is morally responsible
	(*b*) For letting the cattle go astray on the railway track, that is trespassing the owner is legally responsible the derailment of goods train
2. A child playing with matches causes fire	Although the child is the cause, the parents who who have left the match box within the reach of the child, are morally responsible
3. (*a*) Seth was driving a car. He failed to stop at the red signal, which caused an accident	(*a*) Seth is causally responsible
(*b*) Suppose he applied brakes, but brakes they failed	(*b*) Seth has been negligent of maintenance of
4. The products sold have caused harm	The engineer or the engineering firm is legally responsible for the harmful effects of defects in

	their products. But they are not morally responsible for the harm or defects while being used
5. A fitter lost one his eyes while inserting a chip by using a hammer	The hammer manufacturer was legally responsible on the basis of the doctrine of strict liability, which does not require any proof of effect in the design of the hammer.Morally the manufacturer was not responsible
6.In a contract, it is not implied that the engineer to be held for not observing the possibility of danger.But an accident occurs	The engineer is free from legal to be held but he has moral responsibility to observe the work done

5.13 Accountability

Accountability can be defined as the capacity to understand and act on moral reasons and preparedness to be answerable for meeting specific obligations assigned.

The terms 'corporate responsibility' and 'corporate accountability' have different meanings.

Corporate responsibility related to the voluntary compliance of to particular codes of conduct in a particular organization by the groups of individuals in the organization through policy manuals and flow charts.

The corporate accountability means holding all the corporate organizations accountable to the public, employees, customers, and stock holders, as empowered by rules and laws.

5.14 Responsible Professionalism(Professional Responsibilty)

The most comprehensive virtue of engineers is responsible professionalism. This consists of five types of virtues, as follows:

1. **Self-direction (Self-governance) virtues:**

   On the basis of 'understanding and cognition', it includes self-understanding, Humility (proper assessment of one's character), and good moral judgment (termed as 'practical wisdom' by Aristotle).

   On the basis of 'commitment and action', it covers courage, selfdiscipline, perseverance, self-respect, and integrity.

   Honesty as a virtue in terms of truthfulness in thoughts and words and trustworthiness in actions.

2. **Public-spirited(directed) virtues: F**ocus on the welfare of the clients and the public, respect for rights , public safety and health justice, social welfare, unbiased decisions and actions.

3. **Team-work virtues:** Focus on Collegiality(team work and learning), cooperation, communicative ability,motivation and respect for higher authority.

4. **Proficiency virtues:** Focus on technical skills , competence (in terms of qualification, license, execution) , diligence(alertness) , creativity, excellence (perform at the highest level), and self-renewal through continuing education.

5. **Cardinal (chief) virtues:** Focus on Wisdom (prudence), courage (fortitude), temperance and justice.
They are called 'cardinal' because they are hinges on which all virtues depend.
These are also called *moral* (Latin:mores, fixed values). because they govern our actions, regulate our passions, and guide our conduct according to faith and reason

5.15 Social Responsibility

Corporate organizations have social responsibility to all of their 'stakeholders'. This includes the wellbeing of the employees and their unions, socially responsible investors, customers, dealers, suppliers, health and culture of local communities, governments, non-governmental organizations, and the business owners and managers, marketing and distribution system, protection of environment.

5.16 Obligation

The performance, production, quality, supply, safety and other social obligations of professional engineers are justifiable based on the following aspects.
1. Moral obligations through laws and enforced codes of conduct
2. Through membership of professional society
3. Contractual agreement with the employers
The *paramount(main) obligation* means, giving importance to the safety, health, and welfare of the public in performing the professional duties.

Chapter 6

6.1 THEORIES ABOUT RIGHT ACTION (ETHICAL THEORIES)

1.Uses of Ethical theories

The ethical theories are useful in many respects.

a. In understanding moral dilemma. They provide clarity, consistency, systematic and

comprehensive understanding.

b. It provides helpful practical guidance in moral issues towards the solution.

c. Justifying professional obligations and decisions, and

d. In relating ordinary and professional morality.

2.Criteria for Evaluation of Ethical theories

Different *criteria* may be applied for evaluating various ethical theories and deciding upon the best.

1. The theory must be clear and (coherent) formulated with concepts that are logically connected.

2. It must be internally consistent, without conflicts within.

3. The theory and its defense must depend, only upon facts.

4. It must organize basic moral values in systematic and comprehensive manner. It is to fix priority of values and provide guidance in all situations

5. It must provide guidance compatible with our moral convictions (judgments) about concrete situations.

For example, if an ethical theory says that it is all right for engineers to make explosive devices without the informed consent of the public, we can conclude that the theory is inadequate.

Theories and judgments adjust mutually to reach a reflective(thoughtful) equilibrium. Most of the theories converge towards the welfare of the humanity. The duty ethics and right ethics differ in great extent on their emphasis but they are complementary to each other.

3. Ethical Theories/Approaches

Several ethical theories have been developed over different times as follows

1. Utilitarian Theory

The term Utilitarianism was conceived in the 19th century by **Jeremy Bentham** and **John Stuart Mill** to help legislators determine which laws were morally best.

The steps in analyzing an issue in this approach,

(*a*) Identify the various courses of action available .

(*b*) Ask who will be affected by each action and what benefits or harms will be derived from each.

(*c*) Choose the action that will produce the greatest benefits and the least harm. The ethical action is the one that provides the greatest good for the greatest number.

The ACT UTILITARIAN theory proposed by J.S. Mill (1806-73) focuses on actions, rather than on general rules. An action is right, if it generates the most overall good for the most people involved.

The act utilitarian theory permitted a few immoral actions. Hence, there was need to develop rule *utilitarian theory to* establish morality and justice, in the transactions

The RULE UTILITARIAN theory, developed by Richard Brandt (1910-97), stressed on the rules, such as 'do not steal', 'do no harm others', 'do not bribe', as of primary importance. He suggested that individual actions are right when they are guided by set of rules which maximizes the public good.

2. Duty Ethics

A. The duty ethics theory, proposed by Immanuel Kant (1724-1804) states, that actions are consequences of performance of one's duties such as, 'being honest', 'not cause suffering of others', 'being fair to others including the meek and week', 'being grateful', 'keeping promises' etc. The stress is on the universal principle of respect for autonomy i.e., respect and rationality of persons. For example,we should be honest because honesty is required by duty. A businessman is to be honest because honesty results in profits from customers and avoids prosecution for dishonesty.

B. On the other hand, the DUTY ethics theory (agreement based), by John Rawl, gave importance to the actions that would be voluntarily agreed upon by all persons concerned, assuming impartiality. Rawl proposed two basic moral principles;
(1) each person is entitled to adequate liberty compatible with an equal amount for others,and
(2) differences in social power and economic benefits are justified only when they are likely to benefit every one, including members of the most disadvantaged groups.
In the business scenario, for example, the free enterprise is permissible so far it provides the capital needed to invest and prosper, thereby making job opportunities to the public and taxes to fund the government spending on the welfare schemes on the poor people.

C. Prima facie duty Ethics theory(justified exceptions) by W.D. Ross, the British philosopher . Ross assumed that the prima facie duties are intuitively obvious (self-evident), while fixing priorities among duties. 'Do not kill' has higher respect and priority than 'Do not lie' (less harmful).
He has listed various aspects of Duty Ethics that reflect our moral convictions, namely:
1. Fidelity : duty to keep promises.
2. Reparation : duty to compensate others when we harm them.
3. Gratitude : duty to thank those who help us.
4. Justice : duty to recognize merit.
5. Beneficence : duty to recognize inequality and improve the condition of others.
6. Self-improvement : duty to improve virtue and intelligence.
7. Non-malfeasance : duty not to injure others.

3. Rights Theory(Theory of Rights)

Rights serve as a protective barrier, shielding individuals from unjustified infringement(enchroachment,violation) of their moral agency(organization) by others. For every right, we have a corresponding duty of noninterference.

A. The RIGHTS theory by philosopher Immanuel Kant, who focused on the individual's right to choose for oneself based on their dignity and freedom of choice. Other rights he advocated are:

1. *The right to access the truth*:
2. *The right of privacy*: We have the right to do, believe, and say whatever we choose in our personal lives so long as we do not violate the rights of others.
3. *The right not to be injured*: We have the right not to be harmed or injured unless we harm others.
4. *The right to what is agreed*: We have a right to what has been promised by the people in the professional transactions.More serious violation of rights more , the more wrongful actions.

B. The RIGHTS theory by John Locke states that the actions are right, if they respect human rights namely *life, liberty*,and *property* of every one concerned.

His views were reflected in the modern American society, when Jefferson declared the basic rights as life, liberty, and pursuit of happiness.

C. As per A.I. Melden's theory highlighted that the rights should be based on the social welfare system.

D. Human rights: Human rights are explained in two forms, namely liberty rights and welfare rights.

1.Liberty Rights are natural in so far as they are not created by government.
2. They are universal, as they do not change from country to country.
3. They are equal since the rights are the same for all people, irrespective of caste, race, creed or sex.
4. They are inalienable(indisputable) i.e., one cannot hand over his rights to another person such as selling oneself to slavery.

The Welfare Rights are the rights to benefit the needy for a decent human life, when one can not earn those benefits available in the society.

E. Economic rights: In the free-market economy, the very purpose of the existence of the manufacturer, the sellers and the service providers is to serve the consumer. The consumer is eligible to exercise some rights. The consumers' six basic rights are: Right to Information, Right to Safety, Right to Choice, Right to be Heard, Right to Redressal, and Right to consumer Education.

Rights ethics makes human rights the ultimate appeal — the moral bottom line.

Human rights constitute a moral authority to make legitimate(legal) moral demands on others to respect our choices, recognizing that others can make similar claims on us.

Thus, we see that the rights ethics provides a powerful foundation for the special ethical requirements in engineering and other professions.

F. The Virtue Theory

This emphasizes on the character rather than the rights or duties. The character is the pattern of virtues (morally-desirable features). The theory advocated by Aristotle, stressed on the tendency to find the golden mean between the extremes of 'excess' or 'deficiency' of conduct,emotions and attitude. The examples shown below illustrate the theory:

Virtue	***Excess***	***Golden mean***	***Deficient***
Truthfulness (governs communication)	Revealing all in violation of tact and confidentiality	Necessary and sufficient, to proper person	Secretive
Courage (face danger, risk)	Roguishness, bold	Firm and humble	Cowardice
Generosity (giving)	Wasting resources	Give, in appropriate measure	Miserly
Friendliness (governs relationship)	Without anger, effusive	Within decent limits	Bad-tempered

H. Justice (Fairness) Theory

The justice or fairness approach to ethics by the ancient Greek philosopher Aristotle, who said that "equals should be treated equally and unequals unequally." It is based on bad impacts(controversies) of iscrimination, favouratism

6.2 SELF-CONTROL

It is a virtue of maintaining personal discipline by avoiding evil conduct such as fear, hatredness,laziness, passiveness, untoward discrimination, self deception . Self-respect promotes self-control.

6.4 SELF-INTEREST

Self-interest is an act of being good and acceptable to oneself without harming others. It is very ethical (in duty,right,virtue justice) to possess self-interest and be concerned for the interest of others also. However this self interest should not degenerate into egoism or selfishness, i.e., maximizing only own good in the pursuit of self-interest. Self-interest is necessary initially to begin with and it should be one of the prime motives for action .

The principles of 'Live and let (others) live', and 'reasonably fair competition' are recommended for good profession.

6.5 CUSTOMS

Ethical Pluralism: Various cultures and customs result in Ethical Pluralism. There are diverse moral values, which allow variation in the understanding and application of values by the individuals or groups in their transactions. It is difficult to agree on all moral issues and professional ethics.

Ethical Relativism: According to this principle, the ethics relative to laws, customs and culture should be considered by following a balance between customs, laws and practical wisdom to maintain good profession.

Ethical Relativism should be followed in implementing professional ethics to avoid professional and social unrest.

For example, the Apartheid laws of South Africa violated the human rights of the native Africans. No legal protection was available for native citizens for a long time. Later, these laws have been repealed.

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6.6. RELIGION

Religions have played major roles in shaping moral views and moral values.

Religions create trust and beliefs, support moral responsibility, set high moral standards, tolerance , harmony and inspires people to be moral. But sometimes, due to poor ethics in the past atrocities happened to promote religion for monopoly. Thus, conflicts exist between the 'secular' and religious people and between one religion and another. Hence,religious views have to be morally scrutinized.

6.7 Divine Command Ethics

As per this principle, the right action is defined by the commands by God. It implies that to be moral, a person should believe in God and an action is right only if it is commanded by God. There are some difficulties in this approach, namely, (*a*) whether God exists or not is not clear. (*b*) How to know what are the God's commands? and (c) How to verify the genuineness of the commands? Further, religions such as Hinduism, Islam, and Christianity accept the existence of God. But Buddhism, Taoism, and Confucianism adopt only faith in a right path and do not believe in God.

Socrates was said to have argued that God, an entity which is responsible, morally good, and beyond fear or favor, would not command murder, rape, torture, immoral activities, and even mass suicide. Many such crimes were committed in the name of God then and continue even now in different parts of the world. Some Western leaders had claimed that God had commanded them to invade against the Middle-East countries. If anyone claims to have obtained commands from God to kill people merciless, then we have to conclude that the person is not religious but insane.

6.8 SELF-RESPECT

Self-respect includes recognition self appraisal in terms of moral standards and professional commitments

Feeling of self-respect is sense of honor and feeling of poor self respect is intense agony(distress).

Self respect promotes virtues of sense of honor, self-control and courage

Self-respect is different from self-esteem in the following manner:

Self-respect	***Self-esteem***
1. A moral concept	1. A psychological concept
2. Valuing oneself in morally-suitable ways	2. Having a positive attitude towards oneself.It may be excessive or unwarranted or normal
3. It includes virtues of recognition and appraisal. It promotes virtues of sense of honor, self-control and courage	

6.9 CASE STUDY: CHOICE OF THE THEORY

The ground water gets contaminated and significant health problems surface in the community. The choice of the ethical theory to study a problem is illustrated herein with an example. In tackling ethical problems, we can apply all the theories and analyze the actions and results from different angles and see what result each theory

gives rise to. This enables us to examine the problem in different perspectives. Many a time, the result will be the same though we have applied various theories.

Case: A chemical plant near a small town is discharging hazardous wastes into the fields nearby. Since harm is caused to the residents, the action is unethical as per rights ethics. The agriculturists who have the agrarian right of water supply have been over looked. The pollutants may endanger their profession and welfare. Hence, *rights* ethics also concludes that the action is unethical. The effects of polluted water and the cost to purify the water by the municipality may out weigh the economic benefits of the plant. Hence, the *utilitarian* analysis leads to the same conclusion. The groundwater harms the people and caused health problems. Hence, discharging the pollutants is unethical as per *duty* ethics. Generally, because the rights of the individuals should weigh strongly than the needs of the society as a whole, rights and duty ethics take precedence over utilitarian considerations.

Caution is necessary in applying theory of virtue ethics. When we use the word 'honor', we mean it to be a measure of dignity and integrity. It is a positive virtue. When it points to 'pride' it is not a virtue and has a negative connotation. History abounds with examples of war, which have been fought and atrocities were committed on innocent people in order to preserve the honor (pride) of an individual or a nation. In using virtue ethics, we have to ensure that the traits of virtue are actually virtuous and will not lead to negative consequences.

6.10 Engineering as Social Experimentation

a. ENGINEERING AS EXPERIMENTATION

The development of a product or a project as a whole may be considered as an experiment. Before manufacturing a product or providing a project, we make several assumptions and trials, design and redesign and test several times till the product is observed to be functioning satisfactorily. We try different materials and experiments. From the test data obtained we make detailed design and retests. Thus, design as well as engineering is iterative process.

Several redesigns are made upon the feedback information on the performance or failure in the field or in the factory. Besides the tests, each engineering project is modified during execution, based on the periodical feedback on the progress and the lessons from other sources. Hence, the development of a product or a project as a whole may be considered as an experiment.

b. ENGINEERS AS RESPONSIBLE EXPERIMENTERS

Engineers facilitate experiments by sharing their responsibility with the production and research Development organizations, government, society and environment others as follows. Based on this, they can take decisions to participate or protest or promote.

The engineer, as an experimenter, owe several responsibilities to the society, namely,

1. A conscientious(hard working) commitment to live by moral values.
2. Having a comprehensive perspective(outlook, perception) on relevant information.
3. Having constant awareness of the progress of the experiment and readiness to monitor the side effects.
3. Unrestricted free-personal involvement in all steps of the project/product development (autonomy).
4.Be accountable for the outcomes of the project (accountability).

As a summary, engineers must possess open eyes, open ears, and an open mind (i.e., moral vision, moral listening, and moral reasoning). This makes the engineers as social experimenters.

Chapter 7

7.1 CODES OF ETHICS

The ‘codes of ethics’ exhibit, rights, duties, and obligations of the members of a profession and a professional society.

a. Roles of Codes of Ethics:

1. *Inspiration and guidance* for the professionals and the professional societies.
2. *Support to engineers*. The codes give positive support to professionals to discharge professional obligations.
3. *Deterrence (discourage to act immorally)* and discipline (regulate to act morally). The codes serve as the basis for investigating unethical actions.
4. *Education and mutual understanding*. Codes of Ethics develop a shared understanding by the professionals, public, and the government on the moral responsibilities of the engineers.
5. *Create good public image.* The codes present positive image of the committed profession to the public, help the engineers to serve the public effectively and establish public trust.
6. *Protect the status quo*. Primary obligation namely the safety, health, and welfare of the public, declared by the codes serves and protects the public.
7. *Promotes business interests*. The codes offer inspiration to the entrepreneurs, establish shared standards, healthy competition, and maximize profit to investors, employees, and consumers.

b. Limitations of Codes of Ethics:

The codes are not remedy for all evils because of many limitations, namely:

1. General and vague wordings make them unable to solve all the ethical problems.
2. Not applicable to all situations.
3. Codes of Ethics are sometimes mutually controversial causing internal conflicts.
4. They can not act as final moral authority for professional conduct because of undefined perview.
5. Lack of awareness of codes of Ethics among the members the professional society.
6. Non uniform codes of ethics for different societies .
8. Codes are said to be coercive, sometimes claimed to be threatening and forceful.

7.2 ENVIRONMENTAL ETHICS

Environmental ethics includes (*a*) ensuring protection (safety) of environment (*b*) Preventing the degradation of environment, and (*c*) reducing the exploitation of the natural resources, so that the future generation can survive.

Duties of Engineers regarding environmental ethics:

1. *Environmental impact assessment*: One major unintended effect of technology is wastage and the resulting pollution of land, water, air and even space.

2. *Establish standards*: Study and to fix the tolerable and actual pollution levels.

3. *Counter measures*: Design the protective or eliminating measures are available for immediate implementation in the form of ***Plastic Waste Disposal, e-Waste Disposal, Industrial Waste Disposal, Depletion of Ozone Layer and Global Warming, Acid Rain***

4. *Environmental awareness*: Educate the people on environmental practices, issues, and possible remedies.

7.3 COMPUTER ETHICS

Computer ethics is defined as (*a*) study and analysis of nature and social impact of computer technology,(*b*) formulation and justification of policies, for ethical use of computers.

Problems in computer ethics.

(a) Hacking b) Spreading virus (c) Health hazard due to e –Waste and radiation

d) defrauding a bank or client

e). Elimination of routine and manual jobs and creation of skilled and IT-enabled service jobs

f)Computer failure and disturbance in transactions.

Measures to maintain Computer Ethics

1.The privacy of the individuals or organizations, confidentiality, integrity by deploying only the authorized persons
2.Uninterrupted service. By installing appropriate uninterrupted power supply or back-up provisions
3.Protection against hacking are Licensed anti-virus packages and firewalls are used by all computer users to ensure this protection.
4. Computer software Security: By Passwords and data encryption
5.Constitution Cyber laws.

Professional Responsibility

The computer professionals should be aware of different conflicts of interests as they transact with other at different levels. The IEEE and Association for Computing Machinery (ACM) have established the codes of ethics to manage such responsibilities.

7.4 ENGINEERS AS MANAGERS

The duties of engineers as managers are:
1. Promote an ethical climate, through framing of organization, administration, planning, finance,production and marketing, health and safety, evaluation policies and responsibilities and by considering personal attitudes and obligations.

2. Resolving conflicts, by evolving priority, developing mutual understanding, generating options as alternative solutions to problems.

3. The engineers have the responsibility to protect the safety, health, and welfare of the public. .

7.5 Ethics and code of business conduct in MNC

Globalization means integration of countries through commerce, transfer of technology, and exchange of information and culture. Organisations who have established business in more than one country, are called multinational corporation. For the engineers, the issues such as multinational organizations, computer, internet functions, military development and environmental ethics have assumed greater importance for their very sustenance and progress.

The headquarters are in the home country and the business is extended in many host countries. The Western organizations doing business in the less-economically developed (developing, and overpopulated) countries gain the advantage of inexpensive labor, availability of natural resources, conducive-tax atmosphere, and virgin market for the products. At the same time, the developing countries are also benefited by fresh job opportunities, jobs with higher remuneration and challenges, transfer of technology, and several social benefits by the wealth developed. But this happens invariably with some social and cultural disturbance. Loss of jobs for the home country, and exploitation of natural resources, political instability for the *host* countries are some of the threats of globalization.

Codes of business conduct in MNC:

1. MNC should respect the basic human rights of the people of the host countries.
2. The activities of the MNC should give economic and transfer technical benefits, and implement welfare measures of the workers of the host countries.
3. The business practices of the multinational organisations should improve and promote morally justified institutions in the host countries.
4. The multinationals must respect the laws and political set up, besides cultures and promote the cultures of the host countries.
5. The multinational organisations should provide a fair remuneration to the employees of the host countries. If the remuneration is high as that of home country, this may create tensions and if it is too low it will lead to exploitation.
6. Multinational institutions should provide necessary safety for the workers when they are engaged in hazardous activities and 'informed consent' should be obtained from them.

Adequate compensation should be paid to them for the additional risks undertaken.

Example

Union Carbide Company, Bhopal, Gas Leakage case 4 December,1984: Poisonous gas escaped into the air and spread over 40 sq. km. About 600 people died and left 7000 injured and the health of about 2 million people was affected adversely. Even after 22 years, influence of the Central Government and the courts, the compensation had not reached all the affected people.