MODULE 2

- Engineering Ethics & Professionalism. Senses of Engineering Ethics - Variety of moral issues- Types of inquiry- Moral dilemmas –Moral Autonomy – Kohlberg's theory- Gilligan's theory- Consensus and Controversy-Profession and Professionalism- Models of professional roles-Theories about right action –Self interest-Customs and Religion- Uses of Ethical Theories.

- Engineering Ethics is the activity and discipline aimed at
  - understanding the moral values that ought to guide engineering profession or practice,
  - resolving moral issues in engineering, and
  - justifying the moral judgments in engineering. It deals with set of moral problems and issues connected with engineering.

SENSES OF ENGINEERING ETHICS

- There are two different senses (meanings) of engineering ethics:
  - Normative sense
  - Descriptive senses.

- NORMATIVE SENSE
  - The normative sense include:
    - Knowing moral values, finding accurate solutions to moral problems and justifying moral judgments in engineering practices,
    - Study of decisions, policies, and values that are morally desirable in the engineering practice and research.
    - Using codes of ethics and standards and applying them in their transactions by engineers.
- DESCRIPTIVE SENSE
  - The descriptive sense refers to what specific individual or group of engineers believe and act, without justifying their beliefs or actions.

VARIETY OF MORAL ISSUES

- Resource Crunch
- Opportunity
- Attitude

Resource Crunch

- Due to pressure, through time limits, availability of money or budgetary constraints, and technology decay or obsolescence.
- 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.
- Solution
    - Involving individuals in the development of goals and values and developing policies that allow for individual diversity, dissent, and input to decision-making will prevent unethical results.

Opportunity

- Double standards or behavior of the employers towards the employees and the public
- Management projecting their own interests more than that of their employees.
- Emphasis on results and gains at the expense of the employees, and
- Management by objectives, without focus on empowerment and improvement of the infrastructure.
- Solution
  - This is best encountered by developing policies that allow 'conscience keepers' and whistle blowers and appointing ombudsman, who can work confidentially with people to solve the unethical problems internally.

Attitude

- Poor attitude of the employees set in due to
  - Low morale of the employees because of dissatisfaction and downsizing,
  - Absence of grievance redressal mechanism,
  - Lack of promotion or career development policies or denied promotions,
  - Lack of transparency,
  - Absence of recognition and reward system, and
  - Poor working environments.
- Solution
  - Giving ethics training for all, recognizing ethical conduct in work place, including ethics in performance appraisal, and encouraging open discussion on ethical issues, are some of the directions to promote positive attitudes among the employees

TYPES OF INQUIRIES

- Normative Inquiry
- Conceptual Inquiry
- Factual or Descriptive Inquiry

Normative Inquiry

- It seeks to identify and justify the morally-desirable norms or standards that should guide individuals and groups.
- It also has the theoretical goal of justifying particular moral judgments.
- Normative questions are about what ought to be and what is good, based on moral values
- Eg:
  - How far does the obligation of engineers to protect public safety extend in any given situation?
  - When, if ever, should engineers be expected to blow whistle on dangerous practices of their employers?
  - When and why is the government justified in interfering with the organisations?

Conceptual Inquiry

- It is directed to clarify the meaning of concepts or ideas or principles that are expressed by words or by questions and statements.

- Eg:
  - What is meant by safety?
  - How is it related to risk?
  - What is a bribe?
  - What is a profession?

Factual or Descriptive Inquiry

- It is aimed to obtain facts needed for understanding and resolving value issues.
- Researchers conduct factual inquiries using mathematical or statistical techniques.
- 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 not only the reasons for moral problems but also enable us to develop alterative ways of resolving moral problems
- Eg:
  - How were the benefits assessed?
  - What are procedures followed in risk assessment?
  - What are short-term and long-term effects of drinking water being polluted? and
  - Who conducted the tests on materials?

MORAL DILEMMA

- Dilemmas are situations in which moral reasons come into conflict, or in which the application of moral values are problems, and one is not clear of the immediate choice or solution of the problems.

- Moral reasons could be rights, duties, goods or obligations.

- These situations do not mean that things had gone wrong, but they only indicate the presence of moral complexity.

- 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.

- The three situations leading to moral dilemmas are:
  - The problem of *vagueness*: One is unable to distinguish between good and bad (right or wrong) principle. Good means an action that is obligatory.
  - The problem of *conflicting reasons*: One is unable to choose between two good moral solutions. One has to fix priority, through knowledge or value system.
  - The problem of *disagreement*: There may be two or more solutions and none of them mandatory. These solutions may be better or worse in some respects but not in all aspects. One has to interpret, apply different morally reasons, and analyse and rank the decisions. Select the best suitable, under the existing and the most probable conditions.

Steps to Solve Dilemma

- Identification of the moral factors and reasons. The clarity to identify the relevant moral values from among duties, rights, goods and obligations is obtained (conceptual inquiry).
- Collection of all information, data, and facts (factual inquiry) relevant to the situation.
- Rank the moral options i.e., priority in application through value system, and also as obligatory, all right, acceptable, not acceptable, damaging, and most damaging etc. For example, in fulfilling responsibility, the codes give prime importance to public safety and protection of the environment, as compared to the individuals or the employers (conceptual inquiry).
- Generate alternate courses of action to resolve the dilemma. Write down the main options and sub-options as a matrix or decision tree to ensure that all options are included.
- Discuss with colleagues and obtain their perspectives, priorities, and suggestions on various alternatives.
- Decide upon a final course of action, based on priority fixed or assumed. If there is no ideal solution, we arrive at a partially satisfactory or 'satisficing' solution.

MORAL AUTONOMY

- Moral autonomy is defined as, decisions and actions exercised on the basis of moral concern for other people and recognition of good moral reasons.
- Moral autonomy means 'self determinant or independent'.
- The autonomous people hold moral beliefs and attitudes based on their critical reflection rather than on passive adoption of the conventions of the society or profession.
- Moral autonomy may also be defined as a skill and habit of thinking rationally about the ethical issues, on the basis of moral concern.

- Moral autonomy can be practised by improving various skills that will help independent thoughts about moral issues.
- The skills are
  - 1. Proficiency in recognising moral problems and issues in engineering.
  - 2. Skills in comprehending, clarifying and critically assessing arguments for and against moral issues.
  - 3. The ability to form consistent and comprehensive view based on relevant facts.
  - 4. Creative solutions for practical difficulties
  - 5. Sensitivity to genuine difficulties and delicate issues
  - 6. Use of common ethical language
  - 7. Reasonable dialogue in resolving moral conflicts.
  - 8. One has to maintain moral uprightness.

MORAL DEVELOPMENT (THEORIES)

- Lawrence Kohlberg's Theory
- Carol Gilligan's Theory

Lawrence Kohlberg's Theory

- According to Lawrence Kohlberg, there are three levels of moral development.
  - Pre - conventional level
  - Conventional level
  - Post - conventional level

Pre- conventional level

- The concept of pre conventional level is to satisfy one's own needs.
- At pre conventional level, the individual is interested in things which directly benefit oneself.
- Individuals are motivated by the desire to avoid punishment and by a desire to satisfy their own needs.
- Again divided into 2:
  - Avoid punishment
  - Self interest
- This is the level of development of all young children. A few adults also fall under this category.

Conventional level

- The concept of conventional level is to follow accepted norms and satisfy expectation of others.
- At conventional level, the norms of one's family, group or society are accepted as the standards of morality.
- Divided into 2 sub stages:
    - Getting peoples to like them
    - Maintain functioning in society
- Individuals at this level are motivated by the desire to please others and they try to meet the expectations of others.
- While doing so, they are least concerned of immediate effects on their self interest.
- Kohlberg studies reveal that most adults never mature beyond this stage.

Post- Conventional level

- The concept of post conventional level is to follow the "golden rule" namely, "Do to others as you expect others to do to you "
- Two sub stages:
  - Reject rigidity of rules
  - Sense of justice
- At post conventional level, an individual recognises the standards of right and wrong as a set of principles concerning rights.
- Kohlberg calls these individuals as morally autonomous because they think for themselves and they do not assume that customs are always right.
- They live by the general principles such as "golden rule ".
- Also these people have a moral desire to maintain their moral integrity, self-respect and the respect for other autonomous individuals.
- Kohlberg thinks that only a few people in society reach the post conventional level.

Carol Gilligan's Theory

- Gilligan's Theory studies about the approaches made by male professionals and female professionals to attain moral autonomy.
- She criticises that Kohlberg's Theory on Moral autonomy is more male oriented.
- Gilligan is pointing out that her studies suggest that men are interested in trying to solve moral problems by applying moral principles.
- Male professionals solve moral dilemmas by determining the most important moral rule.
- In contrast to this, women professionals try to preserve personal relationships with all people involved in a situation.
- They focus greater attention on the context in which dilemmas arises rather than calling for a help and try to solve by following general moral rules.

- *Pre- conventional level*
  - This is roughly same as Kohlberg's first level. At this level, a person is preoccupied with self centred reasoning. Right conduct is viewed in a selfish manner, viewing what is good for oneself.
- *Conventional Level*
  - At this level, the person does not want to hurt others. He is willing to sacrifice his own interests in order to help others. Women are always willing to give up their personal interests in order to serve the needs of others.
- *Post conventional level*
  - At this level, an individual strikes a balance between caring about other people and pursuing one's own self interest , while exercising one's rights. The aim is to balance one's own needs and with the needs of others. In Gilligan's Theory, moral autonomy cares for other people based on personal relationships. To Kohlberg, moral autonomy is sensitive to general principles and human rights .

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 give attention to circumstances leading to critical situations rather than rules: (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

Consensus and Controversy

- When individuals exercise moral autonomy, there is no assurance that they will arrive at the same opinion as other people also exercise their moral autonomy.

- There will be some basic moral differences. And is inevitable.

- Tolerance is needed among people when there is disagreement.

- The principle of tolerance suggests that aim of teaching engineering ethics is not to produce a unanimous conformity of outlook.

- Sometimes consensus would be achieved by resorting to intimidation, coercion or dogmatic teaching.

- One major goal with the field of engineering ethics is to promote tolerance, while exercising moral autonomy by the engineers.

- Two general points about authority are that
  (1) moral autonomy and respect for authority are not incompatible, they go together.
  (2) sometimes tension may arise between individual's need for autonomy and the need for consensus about authority.
- Controversies and conflicts between autonomy and authority arise when authority is abused.
- When an opportunity is given to express feelings of employees, conflicts may subside and consensus will be arrived at.

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 high status socially and economically.
- Characteristics of profession are:
  - Advanced expertise
  - Self regulation
  - Public good

Professional

- Professional relates to a person or any work that a person does on profession, and which requires expertise, self regulation and results in public good.

- The term professional means a 'person' as well as a status'.

professionalism

- It is a status of a professional which implies certain attitudes or typical qualities that are expected of a professional.

- Professionalism is defined as the services related to achieving the public good. In addition to the practices of the knowledge of moral ideals.

- The *criteria* for achieving and sustaining professional status or professionalism are:
  - *Advanced expertise*: The expertise includes sophisticated skills and theoretical knowledge in exercising judgment. This means a professional should analyse the problem in specific known area, in an objective manner
  - *Self-regulation*: One should analyse the problem independent of self-interest and direct to a decision towards the best interest of the clients/customers. An autonomous judgment (unbiased and on merits only) is expected. In such situations, the codes of conduct of professional societies are followed as guidance.
  - *Public good*: One should not be a mere paid employee of an individual or a teaching college or manufacturing organization, to execute whatever the employer wants one to do. The job should be recognised by the public. The concerted efforts in the job should be towards promotion of the welfare, safety, and health of the public.

Self interest

- Self-interest is being good and acceptable to oneself.
- It is pursuing what is good for oneself.
- It is very ethical to possess self-interest.
- As per utilitarian theory, this interest should provide for the respect of others also.
- Duty ethics recognizes this aspect as duties to ourselves. Then only one can help others.
- Right ethicist stresses our rights to pursue our own good.
- Virtue ethics also accepts the importance of self-respect as link to social practices.
- At the same time, each of these theories insist that the self interest must be balanced by moral responsibilities to other people.
- There is another view to challenge all these theories.
- The view called "Ethical Egoism " says that the main duty of each individual is to maximise his or her own good.
- This view attempts to reduce morality to the pursuit of self interest. But one who is selfishly preoccupied with one's own good and neglect the good of others, will generally lose friendship and love, thus the paradox of happiness occurs.

Customs

- Customs have great moral significance in guiding us how we should act.
- Moral values are many and flexible.
- Moral difference between cultures are to be respected.
- **Ethical Pluralism:** Various cultures in our pluralistic society lead to tolerance for various customs, beliefs, and outlooks. Accordingly ethical pluralism also exists. Although many moral attitudes appear to be reasonable, the rational and morally concerned people can not fully accept any one of the moral perspectives. There are many varied moral values, which allow variation in the understanding and application of values by the individuals or groups in their everyday transactions. It means that even reasonable people will not agree on all moral issues and professional ethics.

- **Ethical Relativism:** According to this principle, actions are considered morally right when approved by law or custom, and wrong when they violate the laws or customs. The deciding factor is the law or the customs of the society.

RELIGION

- Religions have played major roles in shaping moral views and moral values, over geographical regions.
- Christianity has influenced the Western countries, Islam in the Middle-East countries, Buddhism and Hinduism in Asia, and Confucianism in China.
- Religions support moral responsibility.
- They have set high moral standards.
- Faith in the religions provides trust and this trust inspires people to be moral.
- The religions insist on tolerance and moral concern for others.
- Many professionals who possess religious beliefs are motivated to be morally responsible.

Models of Professional Roles

- Engineers are " Professional Models" .
- They have to play the role of professional models in promoting the public good, public safety and welfare.
- The various Models of Professional roles are :
  - Saviour
  - Guardian
  - Bureaucratic servant
  - Social servant
  - Social enabler and catalyst
  - Game player

- *Saviour*
  - Engineers are responsible in creating an ideal society, through technological developments. This will lead to material prosperity. Thus engineers save society from poverty, inefficiency, waste and overwork of manual labour.
- *Guardian*
  - Even though engineers are not capable of creating an ideal society, they know the best direction in which technology should develop. Hence they should be given positions of higher authority based on their expertise.
- *Bureaucratic Servant*
  - In corporations, companies, industries, engineers will have to play the role of a servant, who receives the directives of management. The engineer's special skill lies in solving problems assigned by the management.
- *Social Servant*
  - 'Society ' is the true master of an engineer. In co- operation with the management, engineers have to satisfy society's desires and needs.
- *Social Enabler and Catalyst*
  - Though ultimate power and authority is with the management, engineers have to play a vital role beyond merely implementing management's decisions. At times, engineers need to help the management and society to understand their own needs and means of technological developments.
- *Game Player*
  - Engineers have an economic game to play in their company. Since their organisation is functioning in a competitive world, engineers will have to play successfully within organisations.

Theories about Right Action

- Right actions are virtues that provide a rough guidance about how to act.

- **Uses and Criteria**
  - The ethical theories are useful in many respects.
    - In understanding moral dilemma.
    - They provide clarity, consistency, systematic and comprehensive understanding.
    - It provides helpful practical guidance in moral issues towards the solution.
    - Justifying professional obligations and decisions, and
    - In relating ordinary and professional morality. .

- Different *criteria* may be applied for evaluating various ethical theories and deciding upon the best.
  - The theory must be clear and (coherent) formulated with concepts that are logically connected.
  - It must be internally consistent, i.e., none of its principles conflicts with any other
  - The theory and its defense must depend, only upon facts.
  - It must organize basic moral values in systematic and comprehensive manner. It is to fix priority of values and provide guidance in all situations
  - It must provide guidance compatible with our moral convictions (judgments) about concrete situations.

Utilitarian Theory

- the standard of right conduct is maximization of good consequences.
- Good consequences mean either 'utilities' or the 'balance of good over evil'.
- This approach weighs the costs and benefits.
- Right actions are the ones that produce the greatest satisfaction of the preferences of the affected persons
- Amount of good produced-Amount of evil produced=Utility of the act

- Steps:
  - (*a*) Identify the various courses of action available to us.
  - (*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.

- ACT UTILITARIAN
- RULE UTILITARIAN

- **ACT UTILITARIAN**
  - 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.
- **RULE UTILITARIAN**
  - 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 required by set of rules which maximizes the public good.

Duty Ethics

- 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.

- The DUTY ethics theory, as enunciated by **John Rawl**, gave importance to the actions that would be voluntarily agreed upon by all persons concerned, assuming impartiality. His view emphasized the autonomy each person exercises in forming agreements with other rational people

Rights Theory

- Rights are entitlement to act or to have another individual act in a certain way. Minimally, rights serve as a protective barrier, shielding individuals from unjustified infringement of their moral agency by others. For every right, we have a corresponding duty of non interference.

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 act at proper balance between extremes of conduct, emotion, desire, attitudes to find the golden mean between the extremes of 'excess' or 'deficiency'.

Self-realisation Ethics

- Right action consists in seeking self-fulfillment. In one version of this theory, the self to be realized is defined by caring relationships with other individuals and society. In another version called *ethical egoism*, the right action consists in always promoting what is good for oneself. No caring and society relationships are assumed.

Justice (Fairness) Theory

- The justice or fairness approach to ethics has its roots in the teachings of the ancient Greek philosopher Aristotle, who said that "equals should be treated equally and unequals unequally." The basic moral question in this approach is: How fair is an action? Does it treat everyone in the same way, or does it show favoritism and discrimination?