MODULE-1

INTEGRITY

Integrity is a term used to describe a person's level of honesty, moral commitments, and willingness to do what's right.

ACADEMIC INTEGRITY

Academic integrity is the commitment to and demonstration of honest and moral behaviour in an academic setting.

The International Centre for Academic Integrity (ICAI) has identified five pillars of academic integrity

Five Pillars of Academic Integrity:

- Pillar 1: Honesty
- Pillar 2: Trust
- Pillar 3: Fairness
- Pillar 4: Respect
- Pillar 5: Responsibility

WORK ETHICS

Work ethics has been understood as a value based on hard work and diligence.

Importance of Work Ethic:

- Productive Work
- Cooperation

Basic Work Ethic for an Organization

- Uniform rules and regulations
- Communication of the rules and regulation to all employees
- Allow a degree of freedom to employees

- Confidentiality
- Initiative

CARING AND SHARING

- *Caring* includes feelings, relationship, protecting others and causing least damage to others.
- Caring is feeling for others
- It includes showing respect to the feelings of others, and also respecting and preserving the interests of all others concerned.
- *Sharing* means 'sharing' of feelings, ideas thoughts, resources and profits. Sharing is always mutually beneficial
- Sharing is voluntary and it cannot be driven by force, but motivated successfully through ethical principles
- Sharing should be genuine, legal, positive, voluntary, and without any expectation in return

EMPATHY

- Sensing what others feel about, without their open talk, is the essence of empathy.
- Empathy begins with showing concern, and then obtaining and understanding the feelings of others, from others' point of view

The benefits of empathy include:

- Good customer relations
- Harmonious labor relations
- Good vendor-producer relationship

Service Learning

- Service-learning refers to learning that actively involves students in a wide range of experiences, which often benefit others and the community, while also advancing the goals of a given curriculum

Qualities of service-learning

MODULE-2

MORAL DILEMMAS

Moral dilemmas are situations in which two or more moral obligations, duties, rights, goods, or ideals come into conflict with each other

Causes of Moral Dilemmas

- Problem of vagueness;
- Problem of conflicting reasons;
- Problem of disagreement

Steps / Procedures in facing moral dilemma

- Identifying the relevant moral factors and reasons
- Collecting all the available facts which are relevant to the moral factors
- Ranking the moral considerations or principles on the basis of importance as applicable to the situation
- Considering alternative courses of action for resolving the problems
- Suggestions and alternative ideas on resolving that dilemma from colleagues, friend etc.,
- Arriving at solution by taking into consideration of all important moral factors

MORAL AUTONOMY

- Moral Autonomy is the philosophy which is self-governing or self-determining
- The moral autonomy is the ability to think critically and independently about moral issues and apply this moral thinking to situations that arise during the professional engineering practice.
- Moral autonomy helps in improving self-determination

Skills required for Moral Autonomy

- Ability to relate the problems with the problems of law, economics and religious principles

3. *Post-Conventional Level*

The third level of Moral thinking, which is generally found after the high school level. The thinker at this stage tends to think and behave based on a sense of justice.

There are two sub-stages in this

- Reject rigidity of laws
- Sense of justice

PROFESSION AND PROFESSIONALISM

Profession

- Profession means a job or an occupation, that helps a person earn his living. The main criteria of a profession involves the following.
- Advanced expertise
- Self-regulation
- Public good

Professional

- A person who is paid for getting involved in a particular profession in order to earn a living as well as to satisfy the laws of that profession

Professionalism

- The art of Professionalism can be understood as the practice of doing the right thing, not because how one feels but regardless of how one feels
- Professionalism covers comprehensively all areas of practice of a particular profession.
- It requires skills and responsibilities involved in engineering profession.
- Professionalism implies a certain set of Attitudes

Rights-based Ethical Theory

- This theory was proposed by John Locke.
- According to this theory, the solution to a problem is by realizing that every person has a right to live.
- Live and let live is the philosophy behind this theory. The rights of a person towards life, health, liberty, possession, etc. are taken care of under this theory

Duty-based Ethical Theory

- The duty-based ethical theory was proposed by Immanuel Kant.
- According to this theory, every person has a duty to follow which is accepted universally, with no exceptions.
- Kant observed that everyone is bound to follow some moral laws.

There are four virtues that come under this law

- Prudence - Every individual has duties which should be done without any exception.
- Temperance - The temptations that might lead to the violation of duties and ethics have to be restrained
- Fortitude - Sense of having tolerance
- Justice - Truth and fairness

Utilitarian Ethics

- The Utilitarian ethics was proposed by John Stuart.
- According to this theory, the happiness or pleasure of a greatest number of people in the society is considered as the greatest good.

There are two main types of Utilitarianism. They are −

- Act Utilitarianism - "A particular action is right if it is likely to produce the higher level of good for the most people in a given situation, compared to alternative choices that might be made."
- Rule Utilitarianism - "Right actions are those required by rules that produce the higher level of good for the most people."

MODULE-3

CODES OF ETHICS

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

The codes exhibit the following essential roles:

- Inspiration and guidance
- Support to engineers
- Serving and protecting the public
- Education and Mutual understanding
- Shared Standards
- Create good public image
- Deterrence (discourage to act immorally) and discipline (regulate to act morally).
- Promotes business interests

Advantages of Codes of Ethics

- Set out the ideals and responsibilities of the profession.
- Improve the profile of the profession.
- Motivate and inspire practitioners
- Provide guidance.
- Raise awareness and consciousness of issues.
- Improve quality and consistency.

Limitations of Codes of Ethics

- General and vague wordings
- Not applicable to all situations
- Often have internal conflicts

- Challenger space shuttle mainly consisted of an orbiter, two solid propellant boosters and a single liquid-propeller booster, which was actually designed to be a reusable one. All the boosters were ignited and the orbiter took a lift-off from the earth. But the cold temperature caused trouble to the O-rings which were eroded.
- Delayed in launch due to many factors
- President Regan appointed a commission called the Rogers Commission which constituted of many distinguished scientists and engineers.
- The investigation results show how lack of responsibility and morality, improper functions, and lax performance of duties of the engineers resulted in the crash.

The Challenger Case study: Inferences

- *Moral/Normative Issues*
  - The crew had no escape mechanism. A 'safe exit' was rejected as too expensive
  - The crew were not informed of the problems existing in the field joints.
  - Engineers gave warning signals on safety. But the management group prevailed over and ignored the warning.
- *Conceptual Issues*
  - NASA counted that the probability of failure of the craft was one in one lakh launches.
  - There were 700 criticality items, which included the field joints. A failure in any one of them would have caused the tragedy. No back-up or stand-bye had been provided for these criticality components.

ENGINEERING AS EXPERIMENTATION

- The process of engineering lets you go through a series of different experiments when it comes to practical use.
- Experimentation plays an important role in the process of designing the product.
- Though it is not like an experiment in laboratory under controlled conditions, which is done while learning, an engineer should be ready to do the same on a social scale involving human subjects.

Engineering Projects v/s Standard Experiments

Similarities	Contrasts
Uncertainty (E.g., leakage of nuclear radiation)	Experimental control
Continuous monitoring	Humane touch (Medicine)
Learning from the past	Informed consent
Partial ignorance	Close Observation

ENGINEERS AS RESPONSIBLE EXPERIMENTERS

In the process of developing a product, an engineer generally learns through experimentation.

Responsibility of Engineers in Experimentation

- Conscientiousness (Sense of awareness)
- Informed Consent (One should be informed of the facts)
- Moral Autonomy
- Accountability (Moral responsibility)

MODULE-4

COLLEGIALITY

- Collegiality is the tendency to support and cooperate with the colleagues. it is a virtue essential for the team work to be effective
- Collegiality is the relationship between colleagues. It consists of
  - Respect
  - Commitment
  - Connectedness

LOYALTY

- Loyalty is a devotion and faithfulness to a nation, cause, philosophy, country, group, or person
- Loyalty is the faithful adherence to an organization and the employer. Loyalty to an employer can be either of the two types
  - Agency-loyalty − Agency-loyalty is acting to fulfill one's contractual duties to an employer
  - Attitude-loyalty − Attitude-loyalty has a lot to do with attitudes, emotions and a sense of personal identity as it does with actions.

MANAGING CONFLICT

- Conflict refers to any kind of opposition or antagonistic intersection between two or more parties.
- If it is managed correctly, it can be helpful (functional) in meeting the organisational goals.
- If it is mishandled or not managed correctly, it can be destructive (dysfunctional).

- It is the responsibility of an organization to look into the welfare of the section of people working in it.
- In order to deal with such complex situations, an Employee Union is formed wherein, each employee becomes a member and a leader is elected to represent the group whenever needed.

Types of Collective Bargaining

There are four main types of collective bargaining

- Distributive Bargaining − In this, one party's gain is another party's loss. Example − Wages
- Integrative Bargaining − In this, both the parties may gain or none of the parties may face a loss. Example − Better training programs
- Attitudinal Structuring − When there is backlog of bitterness between both the parties then attitudinal structuring is required to make smooth industrial relations.
- Intra-organizational Bargaining − There can be conflicting groups in both management and unions also. So, there is need to achieve consensus in these groups.

Process of Collective Bargaining

6 steps

- Preparing for Negotiations
- Identifying Bargaining Issues
- Negotiations Procedure
- Reaching the Agreement
- Ratifying the Agreement
- Administration of the Agreement

EMPLOYEE RIGHTS

- It includes moral or legal rights that involves the status of being an employee. They are:
  - Privacy
  - Equal Opportunity – Non-discrimination
  - Equal Opportunity – Sexual Harassment
  - Equal opportunity – Affirmative Action

Intellectual Property Rights (IPR)

- Intellectual property right is a type of property right which allows the creators or owners of patents trademarks or copyrighted works to benefit from their own work or investment.
- The global IPR system strengthens protection, increases the incentives for innovation, and raises returns on international technology transfer.

Protection of IPR / Why IPR?

- IPR protection stimulates creativity, research, and innovation by ensuring freedom to individuals and organizations to benefit from their creative intellectual investments. The IP serves many purposes, namely
  - It prevents others using it,
  - Prevent using it for financial gain,
  - Prevent plagiarism
  - Provides a strategy to generate steady income etc,.

MODULE-5

MULTI NATIONAL CORPORATIONS (MNCs)

- A multinational company is one which is incorporated in one country (called the home country); but whose operations extend beyond the home country and which carries on business in other countries (called the host countries)
- A multinational corporation is known by various names such as: global enterprise, international enterprise, world enterprise, transnational corporation etc.
- E.g.: Cadbury, Coca-Cola Corporation, Unilever etc,

Advantages of MNCs from the Viewpoint of Host Country

- Employment Generation
- Automatic Inflow of Foreign Capital
- Proper Use of Idle Resources
- Technical Development
- Managerial Development
- End of Local Monopolies
- Improvement in Standard of Living
- Promotion of international brotherhood and culture

Limitations of MNCs from the Viewpoint of Host Country

- Danger for Domestic Industries
- Repatriation of Profits
- No Benefit to Poor People
- Danger to Independence
- Disregard of the National Interests of the Host
- Country
- Careless Exploitation of Natural Resources
- Selfish Promotion

MORAL LEADERSHIP

- Engineers contribute to technological process, as managers provide many forms of leadership in developing and implementing technology.
- Moral leaders, are the individuals who direct, motivate, organize groups towards morally valuable goals.

Moral Leadership is Important because:

- To build Morally creative leaders
- Participation in Professional Societies
- Voluntary service
- Leadership in Communities
- Motivate the group

BUSINESS ETHICS

- The term 'Business Ethics' refers to the system of moral principles and rules of the conduct applied to business.
- A business should aim to have fair dealing with everyone dealing with it

3 Sources of Business Ethic:

- Religion
- Culture
- Law

Importance of Business Ethics

- Corresponds to Basic Human Needs
- Credibility in the Public
- Credibility with the Employees
- Better Decision Making
- Profitability
- Protection of Society

MODELS OF PROFESSIONAL ROLES

(PROFESSIONAL ROLES TO BE PLAYED BY AN ENGINEER)

- Engineers as Saviours
- Engineers as Guardians
- Engineers as Bureaucratic Servants
- Engineers as Social Servants
- Engineers as Social Enablers and Catalysts
- Engineers as Game Players

THEORIES ABOUT RIGHT ACTION

(Ethical Theories)

Types of Ethical Theories: Depending upon the ethics a person is intended to follow, four theories were postulated by four different philosophers

- Golden Mean Ethics
- Duty Based Ethics
- Right Based Ethics
- Utilitarian Ethics

The Golden Mean ethical theory

- This theory was proposed by Aristotle
- According to this theory, the solution to a problem is found by analysing the reason and the logic

What is Golden Mean?

- The Golden Mean virtue can be understood as the virtue of reaching a proper balance between extremes in conduct, emotion, desire and attitude
- This theory phrased by Aristotle states that virtues are tendencies to find the golden mean between the extremes of too much (excess) and too little (deficiency) with regard to particular aspects of our lives

- Skill to process, clarify and understand the arguments against the moral issues
- Ability to suggest the solutions to moral issues
- Must have the imaginative skill to view the problems from all the viewpoints
- Tolerance while giving moral judgment

KOHLBERG'S THEORY

- Lawrence Kohlberg proposed that people progress in moral reasoning based on their ethical behaviour.
- He postulated this theory based on the thinking of younger children throughout their growing period as adults.
- He conveyed that younger children make judgment based on the consequences that might occur and the older children make judgment based on their intuitions.

3 Stages of Kohlberg's Theory

1. *Pre-conventional Level*

The first level of moral thinking, which is generally found at Elementary school level. The thinker at this stage tends to think and behave based on the direct consequences that might occur

There are two sub-stages in this:

- Avoid Punishments
- Self–interest

2. *Conventional Level*

The second level of moral thinking, which is generally found at the primary and high school level. The thinker at this stage tends to think and behave based on the want to please others.

There are two sub-stages in this:

- Getting people to like them
- Maintain functioning in society

- Integrative
- Reflective
- Contextualized
- Strength-Based
- Reciprocal
- Lifelong

COOPERATION

- It is a team-spirit present with every individual
- Cooperation is activity between two persons or sectors that aims at integration of operations (synergy), while not sacrificing the autonomy of either party
- Cooperation promotes collinearity, coherence (blend), co-ordination and the synergy.
- The absence of cooperation leads to lack of communication, misinformation etc.,

COMMITMENT

- Commitment means acceptance of the responsibilities and duties
- Commitment means alignment to goals and adherence to ethical principles during the activities.

Commitment helps:

- Maintain quality
- Attain production targets
- Decreasing complaints from team members
- Limited conflict between team members

- Clear and uniform holiday schedule

How to develop strong work ethic

Step 1: Be professional about your work

- Reliability and honesty
- Deliver best outputs
- Be consistent in delivering good quality work and earn good reputation

Step 2: Manage your time

- Know your strength and weaknesses
- Set yourself deadlines for delivering even small tasks
- Prioritize tasks
- Avoid procrastination
- Avoid negative talk and gossip

Step 3: Keep a balance and deliver consistent high-performance work

Step 4: Develop good work habits

- Create and learn habits
- "Do it now" habit

Elements of a strong work ethic

- Honesty & Integrity
- Alertness
- Openness
- Respect for others
- Reliability and Dependability
- Determination & Dedication
- Accountability & Responsibility

- Factual/Descriptive Issues
  - Field joints gave way in earlier flights. But the authorities felt the risk is not high.
  - NASA has disregarded warnings about the bad weather, at the time of launch, because they wanted to complete the project, prove their supremacy, get the funding from Government continued and get an applaud from the President of USA.

BHOPAL GAS TRAGEDY

- Bhopal's Gas tragedy is the world's worst industrial disaster that occurred in 1984, due to the gas leakage from a pesticide production plant, The Union Carbide India Limited (UCIL) located in Bhopal, Madhya Pradesh.
- It was believed that slack management and deferred maintenance together created a situation where routine pipe maintenance caused a backflow of water into the MIC tank, triggering the disaster.
- It was understood that a large volume of water had been released into the MIC tank and this further caused a chemical reaction that forced the pressure release valve to open and allowed the gas to leak
- As per government's announcement, a total of 3,787 deaths occurred immediately. Around 8,000 of the survivors died within two weeks and other 8,000 or more died from acute diseases caused due to the gas later.

PLAGIARISM

- Princeton perceives plagiarism as the "deliberate" use of "someone else's language, ideas, or other original (not common-knowledge) material without acknowledging its source."
- Oxford characterizes plagiarism as the use of "a writer's ideas or phraseology without giving due credit."
- Plagiarism can occur in many forms (writing, art, music, computer code, mathematics etc.,)
- What we call originality is actually the innovative
- combining, amending, or extending of material from
- that pool.

The Challenger Case study

- Explosion of the space shuttle 'Challenger'
- This case had been reviewed vigorously by media coverage, government reports and transcripts of hearings. This case deals with many ethical issues which engineers faced.
- It poses many questions before us. A few questions are listed below –
  - What is the exact role of the engineer when safety issues are concerned?
  - Who should have the ultimate authority for decision making to order for a launch?
  - Whether the ordering of a launch be an engineering or a managerial decision?
- The accident took place on 28th January 1986, due to the failure of one of the solid boosters. In the design of the space shuttle, the main parts which needed careful design of the fields joints where the individual cylinders were placed together.

Objectives of Collective Bargaining

- To increase mutual confidence between the employer and employees;
- To regulate terms and conditions of employment without intervention of a third party;
- To create cordial environment in the establishment;
- To protect the interest of the employees; through collective action and by preventing unilateral action on the part of the employer;
- To raise the socio-economic attributes of the employees.

Advantages of Collective Bargaining

- Effective in Protecting and Promoting Interests of Workers
- Control of Management's Autocracy
- Promotion of Durable Industrial Peace
- Conducive to the Enhancement of Managerial Efficiency
- Establishment of Industrial Rules and Creation of Labour Standards

PROFESSIONAL RIGHTS

The rights that engineers have as professionals are called Professional Rights.

These professional rights include:

- *The basic right of professional conscience*: Moral right to exercise professional judgment in pursuing professional responsibilities.
- *The right of conscientious refusal*: Right to refuse to engage in unethical behaviour
- *The right of professional recognition*: Right to the recognition of one's work and accomplishments.

Causes of Conflict

- Unfamiliar language
- Ambiguous or incomplete information
- Organisational structure
- Power struggles

Methods for Managing Conflict

Collective Bargaining: Negotiations

Conciliation: Series of conferences, including informal sitting between representatives of the two parties

Mediation: Third party acts as a moderating influence on the two contending parties

Arbitration: A third person is chosen as the Arbitrator by agreement between the employers and employees

Conflict Management Process

- Preliminary step — knowing the conflict
- Diagnosing the issue
- Conflict Handling Modes
  - To avoid appearance of conflict
  - Not permitting conflict to surface
  - Mediation
  - Letting the parties in conflict to settle their scores
  - To solve the problems mutually

COLLECTIVE BARGAINING

- The process of voluntary negotiations between the employers and a group of employees to resolve the conflicts is called Collective Bargaining.

COMPUTER ETHICS

- Computer ethics are related to all the computer professionals such as programmers, analysts, operators, designers, etc. along with the users.

The ten commandments of Computer Ethics, created in 1992 by the Computer Ethics Institute consists of the following

One should never use a computer –

- To harm the people (anti-social activities)
- To interfere with other's work (illegal manipulations)
- To snoop into other's files (malware)
- To steal a computer/data (hacking)
- To bear false witness (manipulation and morphing)
- To use/ copy a software you didn't pay for (like illegal downloads and usages)
- To use other's intellectual output inappropriately (violating IPR)
- Doing without thinking of social consequences of the program being written
- Always use a computer ensuring consideration and respect towards fellow beings.
- To use or copy other's software without compensations (illegal pirated versions)

ENGINEERS AS MANAGERS

- An Engineer is responsible in promoting ethics in an organization, through framing organizational policies, responsibilities and by personal attitudes and obligations.
- An engineer should be able to work as a manager in such situations, resolving conflicts according to priorities, keeping the organizational benefits in mind.
- The issue must be resolved without hurting anyone's feelings and by developing a mutual understanding

Types of Protection

1. *Patents*

- A Patent is an exclusive right granted for an invention. It provides the patent owners with protection generally, for a period of 20years.
- Once the patent protection is granted, that invention cannot be commercially made, used, distributed or sold without the patent owner's consent.
- Courts provide the legal safety for these patent rights.

2. *Trademarks*

- It means certain distinctive marks or signs that identifies certain goods or services produced or provided by an individual or a company.
- The protection offered through the trademarks is limited for a period, but can be renewed indefinitely upon payment of the corresponding fee.

3. *Copyright*

- The copyright is a specific and exclusive right, describing rights given to creators for their literary and artistic works. E.g., software, multimedia, paintings, sculptures Etc.,

4. *Trade Secret*

- A trade secret is the information which is kept confidential as a secret.
- This information is not accessed by the any other (competitor) than the owner.
- The trade secrets may be formulae, methods, programs, process, test results, data collected, analyzed, synthesized etc.,