AISSMS
INSTITUTE OF INFORMATION TECHNOLOGY
ADDING VALUE TO ENGINEERING

Department Of Computer Engineering

A CODE OF CONDUCT REPORT ON

1. **Introduction to Ethical Reasoning and Engineer Ethics**
2. **Professional Practice in Engineering**
3. **Ethics as Design**
4. **Workplace Responsibilities and Rights**

Home

SUBMITTED TO THE DEPARTMENT OF COMPUTER ENGINEERING
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ETHICAL REASONING AND ENGINEERING ETHICS

SENSES OF ENGINEERING ETHICS

Engineering is the process of developing an efficient mechanism which quickens and eases the work using limited resources, with the help of technology. Ethics are the principles accepted by the society, which also equate to the moral standards of human beings. Engineering ethics is the study of decisions, policies and values that are morally desirable in engineering practice and research.

VARIETY OF MORAL ISSUES

The term morality concerns with (a) what ought or ought not to be done in a given situation, (b) what is right or wrong in handling it, (c) what is good or bad about the persons, policies and principles involved in it.

The variety of moral issues are -

1) Micro - ethics - This approach stresses more on the problems that occur on a daily basis in the field of engineering and its practice by engineers.
2) Macro - ethics - This approach deals with social problems which are unknown. However, these may unexpectedly face the heat of both regional and

national levels.

TYPES OF INQUIRY

Inquiry means an investigation. The types of inquiries are.

1) Normative inquiries - These are helpful to identify the values which guide the groups and individuals in taking a decision.
2) Conceptual inquiries - These are for describing the meaning of concepts, principles and issues related to engineering ethics.
3) Factual inquiries - These help to provide facts for understanding and finding solutions to value based issues.

MORAL DILEMMAS

A moral dilemma is a problem in the decision making process between two possible options, neither of which is absolutely acceptable from an ethical perspective. The steps in facing moral dilemmas are-

1) Identification
2) Ranking
3) Inquiries
4) Discussions
5) Final solutions

MORAL AUTONOMY

Moral autonomy is the philosophy which is self-governing or self-determining i.e acting independantly without the influence or distortion of others. It is concerned with independant attitude of a person related to moral/ethical issues. It helps in improving self-determination.

KOHLBERG's THEORY

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 judgements based on the consequences that might occur and the older children make judgements based on their intutions.

GILLIGAN's THEORY

According to Gilligan, Kohlberg seemed to have studied only privileged men and boys. She believed that women face a lot of psychological challenges and they are not moral widgets. The women's point of view on moral development involves caring which shows its effect on human relationships. She said that changes occur due to change of self and not critical thinking.

PROFESSIONS AND PROFESSIONALISM

Profession means a job or an occupation. that helps person earn his living. while as, professionalism covers comprehensively all areas of practice of a particular profession. It implies a certain set of attitude. 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.

PROFESSIONAL IDEALS AND VIRTUES

The virtues represent excellence in core moral behaviour. The behaviour shows the moral ideology of the professional. Some ideals and virtues are

1) Public spirited virtues
2) Profeciency virtues
3) Team work virtues
4) Self - governance virtues.

USES OF ETHICAL THEORIES:

The most important uses of ethical theories are

1) Understanding moral dilemmas
2) Justifying professional obligations and ideas
3) Relating ordinary and professional morality.

2.Professional Practice in Engineering

Global Issues -Multinational Corporations:

Conflicts that occur over technical, economic, and time factors such as cost, time, and performance level. Conflict arising in administration such as authority, responsibility, accountability, and logistics required. Conflicts of personality, human psychology and ego problems.
Economic globalization and technological change are posing new ethical challenges to multinational corporations. As companies operate across diverse cultural and legal frameworks, moral dilemmas arise in labor standards, marketing practices, environment, corruption and human rights.

Business Ethics - Environmental Ethics:

Engineering ethics is the field of system of moral principles that apply to the practice of engineering. The field examines and sets the obligations by engineers to society, to their clients, and to the profession.
Engineering Ethics is the set of rules and guidelines that engineers adhere to as a moral obligation to their profession and to the world. Engineering is a professional career that impact lives. ... Engineering Ethics applies to every engineer and is very important.

Computer Ethics - Role in Technological Development:

Computer ethics is the application of moral principles to the use of computers and the Internet. Always identify the user accurately. Never use someone else's account. Do not use fraudulent means to avoid accounting for the use of computing services. Respect copyrights and licenses. Computing professionals perform a variety of tasks: They write specifications for new computer systems, they design instruction pipelines for superscalar processors, they diag- nose timing anomalies in embedded systems, they test and validate software systems, they restructure the back-end databases of inventory.

Weapons Development:

It is easy to surmise that a weapons engineer is somebody who develops artillery and weapons. ... Overall, a weapons engineer develops, designs, tests and manages weapons and weapons systems as part of a contractor for a military apparatus or a large-scale private-sector company. Because firearms engineers are a subset of mechanical engineers, becoming a firearm engineer typically involves attaining a bachelor's degree in mechanical engineering and gaining additional education and experience in firearms.
Employed by the Department of Defense, the military, or a private defense contractor, they're essentially Engineers – usually Mechanical Engineers, although they might also be Electrical Engineers, Nuclear Engineers, Aerospace Engineers, or Chemical Engineers
Aeronautical Engineering - deals with the design and manufacturing of air-crafts, missiles and helicopters.

Engineers as Managers:

Engineers, in the fulfillment of their professional duties, shall:

• Hold paramount the safety, health, and welfare of the public.

• Perform services only in areas of their competence.

• Issue public statements only in an objective and truthful manner.

• Act for each employer or client as faithful agents or trustees.

Engineering design ethics concerns issues that arise during the design of technological products, processes, systems, and services. This includes issues such as safety, sustainability, user autonomy, and privacy.

Consulting Engineers:

A Professional Engineer (PE) is an engineer licensed by a state board of registration to practice engineering. The PE license is the engineering profession's highest standard of competence, a symbol of achievement and assurance of quality. The three things that I will be talking about are the creation of new technologies, social responsibilities, and the development of new solutions.

In terms of median pay and growth potential, these are the 10 highest paying engineering jobs to consider.

• Computer Hardware Engineer. ...

• Aerospace Engineer. ...

• Nuclear Engineer. ...

• Systems Engineer. ...

• Chemical Engineer. ...

• Electrical Engineer. ...

• Biomedical Engineer. ...

• Environmental Engineer.

Engineers as Expert Witnesses and Advisors:

Engineers as expert advisors An expert advisor, sometimes also known as an independent expert, can be appointed by a party to assist in the formulation and/or preparation of a party‟s claim or defence. 1Engineers must act as consultants by providing expert testimony in adversarial contexts. 2They must involve in public planning and policy making. 3They should act as impartial seekers and communicators of truth. 4They should function as advocates in the interest of their corporations, instead of becoming hired guns.

“An expert witness is a witness who has knowledge beyond that of the ordinary lay person enabling him/her to give testimony regarding an issue that requires expertise to understand.” USLEGAL goes on to explain, “Experts are allowed to give opinion testimony which a non-expert witness may be prohibited from testifying

Honesty:

The IEEE's code of ethics states, “to accept responsibility in making **engineering** decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment.” This statement is very closely tied in with the **honesty** component to the jobThe more **honest you** are, the more easy it is to trust. Not only will others trust **you**, but **you** can also feel more confident when trusting others. It's always good to pay it forward and develop good karma. That's much easier to do with **honesty** than it is to do with not being true or faithful.

Moral Leadership:

Respect for Persons − The persons involved in the issue, should be treated with genuine concern by one. Such concern should also be there with oneself along with being there for others.
Tolerance of diversity − One should have a broader perspective towards ethnic and religious differences that the people have.
Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct. Engineers, in the fulfillment of their professional duties, shall:

- Hold paramount the safety, health, and welfare of the public.
- Perform services only in areas of their competence.
- Respect: Acknowledge the worth of other engineers engaged in producing socially useful and safe products.
- Commitment: Share a devotion to the moral ideals inherent in the practice of engineering.
- Connectedness: Aware of being part of a co-operative undertaking created by shared commitments and expertise.

Sample Code of Conduct:

Examples of professional behavior include, but are not limited to: Showing compassion for others; responding appropriately to the emotional response of patients and family members; demonstrating respect for others; demonstrating a calm, compassionate, and helpful demeanor toward those in need; being supportive The National Institute of Engineering Ethics (NIEE) and National Society of Professional Engineers (NSPE) are responsible for publishing codes of ethics to guide engineers. Engineers, in the fulfillment of their professional duties, shall: Hold paramount the safety, health, and welfare of the public. Perform services only in areas of their competence. Issue public statements only in an objective and truthful manner.
Here are a few that immediately came to mind:

- • Keeping your word. This is a big one. ...
- • Being honest. ...
- • Supporting others.
- • Knowing your stuff. Please notice I didn't say “know everything”.

3.Ethics as design

Engineer's responsibility for safety:

Engineering is a vast and growing field comprising of several branches of operation, one of which is health and safety engineering. It is also known as safety engineering and focuses on the safety of products and processes in a working environment. A health and safety engineer are responsible for developing new solutions to identify and minimize potential threats or risks. In order to carry out his/her job responsibilities effectively, the engineer must be educated, experienced and highly trained.

Responsibilities and Duties of a Health and Safety Engineer:

- Provide health and safety measures in a working environment
- Support staff with the identification of environmental aspects and determining the project objectives and target
- Identify and evaluate the unsafe environment and practices
- Identify the root causes of safety and industrial hygiene
- Develop hazard control processes, methods and programs
- Recommend solutions to issues that need improvement
- Advise several ways of controlling potential threats
- Monitor implementation of safety plans according to plans and objectives
- Monitor and track safety systems by using computer systems and spreadsheets
- Communicate plans and strategies across the entire business unit from time to time
- Maintain and manage equipment and processes related to each project of health and safety
- Suggest several preventive methods and practices like recycling, waste disposal, pollution control, etc.
- Collaborate with other levels of engineering staff, quality assurance, quality improvement, regulatory compliance specialists, etc.
- Measure and audit the effectiveness of hazard control programs
- Prepare future safety plans based on past experiences and facts
- Work in compliance with ISO 14000/ 14001 standards and practices

Safety and risk:

The terms of safety and risk are inter-related. It is amazing to know that what may be safe enough for one person may not be for someone else. It is because of either different perception about what is safe or different predispositions to harm.

Safety:

According to William W Lowrance, the famous consultant of those times, Safety was defined as "**A thing is safe if its risks are judged to be acceptable**."

Safety is frequently expressed in terms of degree and comparisons. The words like **fairly-safe** and **relatively-safe** are used where an individual is judged on the basis of settled values and it is further decided that the risks of anything are more or less acceptable in comparison with the risks of the other thing. For example, the consideration that road travel is safer than air-travel.

Risk:

Any work which might lead to harm us and is not considered safe, can be understood as a risk. According to a popular definition, "**A risk is the potential that something unwanted and harmful may occur**." According to William D Rowe, **potential for the realization of unwanted consequences from impending events**.

Risk is a broad concept covering many different types of unwanted occurrences. When it comes to technology, it can equally well include dangers of bodily harm, of economic loss or of environmental degradation. These in turn can be caused by delayed job completion, faulty products or systems or economically or environmentally injurious solutions to technological problems.

With the advancement in technology, people are now aware of all that goes into a process. Further, risks are understood as those that can be identified.

Assessment of safety and risk:

A safety risk assessment is a systematic procedure for identifying and managing hazards. It encompasses thorough examination of the entire work environment, processes and equipment to determine any hazard to the health of the employees in the short or long term and implementing remedies.

Safety risk assessments are essential for protecting employees, businesses and complying with the law. Assessments promote employee awareness regarding workplace hazards, aide in identifying personnel at risk, determine existing control measures and their adequacy, prevent illness and injuries, and prioritize hazards and their control measures.

Safety risk assessments are usually conducted at the beginning of a new project, when a new or renovated machine or new or an amended process is to be implemented, when a machine is relocated, appointment of new employees, introduction of new raw materials or on receipt of new information about a product.

Safety assessments consist of the following stages:

- Identifying a hazard

- Collecting information and analyzing risk associated with it
- Determining how to remove or reduce its effect by completely eliminating the process or equipment
- Replacement with a better equipment or process
- Using advanced technology or design and physically isolating processes or direct contact of user by the use of appropriate collective or personal protective equipment.

Risk Benefit Analysis:

Risk Analysis:

The study of risk analysis covers other areas such as risk identification, risk analysis, risk assessment, risk rating, suggestions on risk control and risk mitigation. The risk management study also includes residual risk transfer, risk financing, etc.

Risk Benefit Analysis:

As per the famous saying, "A Ship in harbor is safe. But that's not what ships are built for" risk is somewhat common to be accepted. The most common risk we all take is driving an automobile in a traffic. Though we are not sure about the perfect functionality of the brake system and the timings of other drivers' responses, we take risk. The controlling factor appears to be their perception of their individual ability to manage the risk-creating situation.

The risk to benefit analysis is made depending on the types such as the ones mentioned below.

- The risk to be occurred in future is completely known after it gets fully developed. It is called as **Real future risk**.
- If the idea of risk is developed using current data, such one is called as **Statistical risk**.
- The risk which is analytically based on system models structured from historical studies is called as **Projected risk**.
- The risk which is intuitively seen by individuals is called as **Perceived risk**

If risks of traveling on an air-plane is considered for observation, then the flight insurance. company can observe it as a statistical risk, while the risk the passenger faces is Perceived Risk and the Federal aviation administration, faces a Projected risk. Hence, the view of accepting the risk and the idea of risk to benefit ratio motivates the individual.

Risk Reduction:

The risks we generally face can be reduced to a great extent by proper analysis with steps. as mentioned below −

- Define the Problem.
- Generate Several Solutions.
- Analyze each solution to determine the pros and cons of each.
- Test the solutions.
- Select the best solution.
- Implement the chosen solution.
- Analyze the risk in the chosen solution.
- Try to solve or move to next solution.

The Government's Regulator's Approach to Risk:

The risk management has to be viewed in a wider angle at times when sudden disasters occur due to lack of proper care and assessment. The government which has the responsibility to take care of all the public needs to take some risk. The government's approach towards the public lies in saving as many lives as possible.

The two major approaches of the government are −

- Lay person − Wants to protect himself or herself from risk.
- The government regulator − Wants as much assurance as possible that the public is not being exposed to unexpected harm.

For example, at the times of flood or some fire accident, the government of any place should aim at protecting as many lives as possible rather than looking for a benefit or protecting some property. It will count as a successful attempt towards facing risk if the authority is able to protect its people even after the destruction of property.

4.RESPONSIBILITIES AND RIGHTS

Collegiality:

- Tendency to support and cooperate with colleagues.
- Engineers should not attempt to injure, unkindly or falsely, directly or indirectly the employment of other engineers. Engineer should not untruthfully criticize others work. Engineers should bring unethical practice of other engineer to the proper authority for action.
- The central elements of collegiality are
  – Respect – Commitment – Connectedness

Loyalty:

• Quality of being true and faithful in one's support.

• Senses of Loyalty: – Agency Loyalty – Identification Loyalty

• Some duties of loyal employees: – To avoid conflicts of interest – To protect confidential information – To be honest in making estimates – To admit one's errors

Respect For Authority:

• Authority is the right to make decisions, the right to direct the work of others, and the right to give orders.

• Senses of Authority: – Institutional authority – Expert authority

Institutional Authority:

• The institutional right given to a person to exercise power based on the resources of the institution.

• It is acquired, exercised and defined within institutions.

• It is given to individuals to perform their institutional duties assigned within the organization. There is not always a perfect match between the authority granted and the qualifications needed to exercise it.

Expert Authority:

The possession of special knowledge, skill or competence to perform some task or to give sound advice. In large companies, engineers, advisors and consultants in staff function carry expert authority, while institutional authority is vested only with line managers.

Zone of Acceptance of Authority:

A subordinate is said to accept authority whenever he permits his behavior to be guided by the decision of a superior, without independently examining the merits of that decision- Herbert Simon . Simon notes that all employees tend to have a 'zone of acceptance' in which they are willing to accept their employer's authority. •Within that zone, an individual, relaxing his own critical faculties, permits the decision of the employer to guide him.

Collective Bargaining:

International Labor Organization (ILO) has defined collective bargaining as "negotiation about working conditions and terms of employment between an employer and one or more representative employee's with a view to reaching agreement".

Step I: Presenting the character of demands by the union

Step II: Negotiations at the bargaining table.

Step III: Reaching the agreement.

Benefits of Collective Bargaining: Unions have created healthy salaries and high standard of living of employees. They give a sense of participation in company decision making. They are a good balance to the power of employers to fire employees at will. They provide an effective grievance redressal procedure for employee complaints.

Harms Caused by Collective Bargaining: Unions are devastating the economy of a country, being a main source of inflation. With unions, there is no congenial (friendly), cooperative decision making. Unions do not promote quality performance by making job promotion and retention based on seniority. They encourage unrest and strained relations between employees and employers.

Confidentiality:

Information considered desirable to be kept secret. Any information that the employer or client would like to have kept secret in order to compete effectively against business rivals. This information includes how business is run, its products, and which directly affects the ability of the company to compete in the market place. Helps the competitor to gain advantage or catch up.

TERMS RELATED TO CONFIDENTIALITY

• Privileged information: – Information available only on the basis of special privilege such as granted to an employee working on a special assignment.

• Proprietary information: – Information that a company owns or is the proprietor of. – This is primarily used in legal sense. – Also called Trade Secret. A trade secret can be virtually any type of information that has not become public and which an employer has taken steps to keep secret.

• Patents: – Differ from trade secrets. – Legally protect specific products from being manufactured and sold by competitors without the express permission of the patent holder..

Conflicts of Interest:

Conflict of Interest arises when two conditions are met:

The professional is in a relationship or a role that requires exercising good judgment on behalf of the interests of an employer or client. The professional has some additional or side interest that could threaten.

Types of Conflicts of Interest

• Actual Conflicts of interest – Purchase Manager

• Potential Conflicts of interest – Become Friend to supplier

• Apparent Conflicts of interest – Design Engineer AVOIDING CONFLICTS OF INTERESTS

• Taking guidance from Company Policy.

Occupational Crime:

Occupational crimes are illegal acts made possible through one's lawful employment. It is the secretive violation of laws regulating work activities. When committed by office workers or professionals, occupational crime is called 'white collar crime'. Most of the occupational crimes are special instances of conflicts of interest. Usually have high standard of education. From a non-criminal family background.

Professional Rights:

The right to form and express one's professional judgment freely. The right to refuse to carry out illegal and unethical activity. The right to talk publicly about one's work within bounds set by confidentiality obligation. The right to engage in the activities of professional societies. The right to protect the clients and the public from the dangers that might arise from one's work. The right to professional recognition of one's services. Right of Professional Conscience. There is one basic and generic professional right of engineers, the moral right to exercise responsible professional judgment in pursuing professional responsibilities.

Employee Rights:

The rights that apply or refer to the status or position of employee. Types of employee rights Contractual Rights. Non-Contractual Employee Rights – Rights to outside activities – Rights to privacy

Intellectual Property Rights:

Intellectual Property is a product of the human intellect that has commercial value. Many of the rights of the ownership common to real and personal property are also common to Intellectual Property. Intellectual Property can be bought, sold, and licensed. Similarly it can be protected against theft and infringement by others.

Elements of Intellectual Property Rights

• Patents • Industrial Designs • Trademarks • Copy rights • Trade secrets • Design of integrated circuits • Geographical indications

Discrimination:

Discrimination generally means preference on the grounds of sex, race, skin color, age or religious outlook. In everyday speech, it has come to mean morally unjustified treatment of people on arbitrary or irrelevant grounds