

191AIC501T**Professional Ethics****UNIT I****HUMAN VALUES**

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self-confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

OBJECTIVES (WHY ENGINEERING ETHICS?)

The objectives of this course on 'Professional Ethics and Human Values' are: (a) to understand the moral values that ought to guide the Engineering profession, (b) resolve the moral issues in the profession, and (c) justify the moral judgment concerning the profession.

HUMAN VALUES

Human values are nothing but basic moral values one ought to possess to live as a citizen or as a person

Human values can be broadly grouped under the following headings

- Love
- Truth
- Right Conduct
- Peace and
- Non - violence

MORALS

Morals are the welfare principles enunciated by the wise people, based on their experience and wisdom. They were edited, changed or modified or evolved to suit the geography of the region, rulers (dynasty), and in accordance with development of knowledge in science and technology and with time.

Morality is concerned with principles and practices of morals such as: (a) What ought or ought not to be done in a given situation? (b) What is right or wrong about the handling of a situation? and (c) What is good or bad about the people, policies, and ideals involved?

"Judgment made according to some perceived standard of good or evil"

ETHICS

The rules of conduct recognized in respect to a particular class of human actions or a particular group or culture. The characteristic spirit or attitudes of a community, people or system .

“The discipline that deals with what is good and bad and with moral duty and obligation”

<i>Morality</i>	<i>Ethics</i>
1. More general and prescriptive based on customs and traditions.	1. Specific and descriptive. It is a critical reflection on morals.
2. More concerned with the results of wrong action, when done.	2. More concerned with the results of a right action, when not done.
3. Thrust is on judgment and punishment, in the name of God or by laws.	3. Thrust is on influence, education, training through codes, guidelines, and correction.
4. In case of conflict between the two, morality is given top priority, because the damage is more. It is more common and basic.	4. Less serious, hence second priority only. Less common. But relevant today, because of complex interactions in the modern society.
5. Example: Character flaw, corruption, extortion, and crime.	5. Example: Notions or beliefs about manners, tastes, customs, and towards laws.

VALUES

A value is defined as a principle that promotes well-being or prevents harm.” Another definition is: *Values are our guidelines for our success—our paradigm about what is acceptable.”* Personal values are defined as: *“Emotional beliefs in principles regarded as particularly favorable or important for the individual.”* Our values associate emotions to our experiences and guide our choices, decisions and actions.

“Values are the scales we use to weigh our choices for our actions, whether to move towards or away from something.”

Values denotes the degree of importance of something or action. Values are the rules by which we make decisions about right and wrong,

TYPES OF VALUES

The five core human values are: (1) Right conduct, (2) Peace, (3) Truth, (4) Love, and (5) Nonviolence.

1. Values related to RIGHT CONDUCT are:

(a) SELF-HELP SKILLS: Care of possessions, diet, hygiene, modesty, posture, self reliance, and tidy appearance

(b) SOCIAL SKILLS: Good behavior, good manners, good relationships, helpfulness, No wastage, and good environment, and

(c) ETHICAL SKILLS: Code of conduct, courage, dependability, duty, efficiency, ingenuity, initiative, perseverance, punctuality, resourcefulness, respect for all, and responsibility

2. Values related to PEACE are: Attention, calmness, concentration, contentment, dignity, discipline, equality, equanimity, faithfulness, focus, gratitude, happiness, harmony, humility, inner silence, optimism, patience, reflection, satisfaction, self-acceptance, self-confidence, self-control, self-discipline, self-esteem, self-respect, sense control, tolerance, and understanding

3. Values related to TRUTH are: Accuracy, curiosity, discernment, fairness, fearlessness, honesty, integrity (unity of thought, word, and deed), intuition, justice, optimism, purity, quest for knowledge, reason, self-analysis, sincerity, spirit of enquiry, synthesis, trust, truthfulness, and determination.

4. Values related to LOVE are: Acceptance, affection, care, compassion, consideration, dedication, devotion, empathy, forbearance, forgiveness, friendship, generosity, gentleness, humanness, interdependence, kindness, patience, patriotism, reverence, sacrifice, selflessness, service, sharing, sympathy, thoughtfulness, tolerance and trust

5. Values related to NON-VIOLENCE are:

(a) PSYCHOLOGICAL: Benevolence, compassion, concern for others, consideration, forbearance, forgiveness, manners, happiness, loyalty, morality, and universal love

(b) SOCIAL: Appreciation of other cultures and religions, brotherhood, care of environment, citizenship, equality, harmlessness, national awareness, perseverance, respect for property, and social justice.

Evolution of Human Values

The human values evolve because of the following factors:

1. The impact of norms of the society on the fulfillment of the individual's needs or desires.
2. Developed or modified by one's own awareness, choice, and judgment in fulfilling the needs.
3. By the teachings and practice of Preceptors (Gurus) or Savors or religious leaders.
4. Fostered or modified by social leaders, rulers of kingdom, and by law (government).

INTEGRITY

Integrity is the quality of being honest and having strong moral principles, moral uprightness. It is generally a personal choice to uphold oneself to consistent moral & ethical standards. "*quality of a person's character*" when it is subject to objects, integrity refers to the wholeness. Intactness or purity of a thing.

- Integrity as Self-Integration
- Integrity as maintenance of Identity
- Integrity as standing for something
- Integrity as moral purpose
- Integrity as virtue

Integrity is defined as the unity of thought, word and deed (honesty) and open mindedness. It includes the capacity to communicate the factual information so that others can make well-informed decisions. It yields the person's 'peace of mind', and hence adds strength and consistency in character, decisions, and actions. This paves way to one's success. It is one of the self-direction virtues. It enthuse people not only to execute a job well but to achieve excellence in performance. It helps them to own the responsibility and earn self-respect and recognition by doing the job. Moral integrity is defined as a virtue, which reflects a consistency of one's attitudes, emotions, and conduct in relation to justified moral values.

WORK ETHICS

A belief in moral benefit and importance of work and its inherent ability to strengthen character. Work ethics is defined as *a set of attitudes concerned with the value of work, which forms the motivational orientation*. The 'work ethics' is aimed at ensuring the economy (get job, create wealth, earn salary), productivity (wealth, profit), safety (in workplace), health and hygiene (working conditions), privacy (raise family), security (permanence against contractual, pension, and retirement benefits), cultural and social development (leisure, hobby, and happiness), welfare (social work), environment (anti-pollution activities), and offer opportunities for all, according to their abilities, but without discrimination.

Work ethic is a cultural norm that advocates being personally accountable and responsible for the work that one does and is based on a belief that work has intrinsic value.

ELEMENT OF WORK ETHICS

1. Interpersonal skills
2. Initiative and
3. Being dependable

SERVICE LEARNING

Service learning refers to learning the service policies, procedures, norms, and conditions, other than 'the technical trade practices'. The service learning includes the characteristics of the work, basic requirements, security of the job, and awareness of the procedures, while taking decisions and actions. It helps the individuals to interact ethically with colleagues, to effectively coordinate with other departments, to interact cordially with suppliers as well as the customers, and to maintain all these friendly interactions.

Alternatively, the service learning may be defined as the *non-paid activity*, in which service is provided on voluntary basis to the public (have-nots in the community), non-profitable institutions, and charitable organizations. It is the service during learning. This includes training or study on real life problems and their possible solutions, during the formal learning the service learning is a methodology falling under the category of experiential education³. It is one of the forms of experiential learning and community service opportunities. It is distinguished in the following ways:

1. *Connection to curriculum*: Integrating the learning into a service project is a key to successful service learning. Academic ties should be clear and built upon existing disciplinary skills.
2. *Learner's voice*: Beyond being actively engaged in the project, trainees have the opportunity to select, design, implement, and evaluate their service activity.
3. *Reflection*: Structured opportunities are created to think, talk, and write about the service experience. The balance of reflection and action allows the trainee to be constantly aware of the impact of their *work*.
4. *Partners in the community*: Partnership with community agencies are used to identify genuine needs, provide mentorship, and contribute input such as labor and expertise towards completing the project.

CIVIC VIRTUES

Civic virtues are the moral duties and rights, as a citizen of the village or the country or an integral part of the society and environment. An individual may exhibit civic virtues by voting, volunteering, and organizing welfare groups and meetings.

Civic virtue is morality or a standard of righteous behavior in relationship to a citizen's involvement in society.

The duties are:

1. To pay taxes to the local government and state, in time.
2. To keep the surroundings clean and green.
3. Not to pollute the water, land, and air by following hygiene and proper garbage disposal.
4. To follow the road safety rules.

On the other hand, the rights are:

1. To vote the local or state government.
2. To contest in the elections to the local or state government.
3. To seek a public welfare facility such as a school, hospital or a community hall or transport or communication facility, for the residents.
4. To establish a green and safe environment, pollution free, corruption free, and to follow ethical principles. People are said to have the right to breathe in fresh air, by not allowing smoking in public.
5. People have inalienable right to accept or reject a project in their area. One has the right to seek legal remedy, in this respect, through public interest petition.

These virtues are divided into four categories:

1. Civic Knowledge
2. Self-Restraint
3. Self-Assertion
4. Self-Reliance

RESPECT FOR OTHERS

This is a basic requirement for nurturing friendship, team work, and for the synergy it promotes and sustains. The principles enunciated in this regard are:

1. Recognize and accept the existence of other persons as human beings, because they have a right to live, just as you have.
2. Respect others' ideas (decisions), words, and labor (actions). One need not accept or approve or award them, but shall listen to them first. One can correct or warn, if they commit mistakes.
3. Show 'goodwill' on others. Love others. Allow others to grow. Basically, the goodwill reflects on the originator and multiplies itself on everybody. This will facilitate collinearity, focus, coherence, and strength to achieve the goals.

LIVING PEACEFULLY

To live peacefully, one should start install peace within (self). Charity begins at home. Then one can spread peace to family, organization where one works, and then to the world, including the environment.

Only who are at peace can spread peace. You can't gift an article which you do not possess. The essence of oriental philosophy is that one should not *fight* for peace. It is oxymoron. War or peace can be won only by peace, and *not by wars* !

One should adopt the following means to live peacefully, in the world:

Nurture

1. Order in one's life (self-regulation, discipline, and duty).
2. Pure thoughts in one's soul (loving others, blessing others, friendly, and not criticizing or hurting others by thought, word or deed).
3. Creativity in one's head (useful and constructive).
4. Beauty in one's heart (love, service, happiness, and peace).

Get

5. Good health/body (physical strength for service).

Act

6. Help the needy with head, heart, and hands (charity). Service to the poor is considered holier than the service to God.

7. Not hurting and torturing others either physically, verbally, or mentally.

The following are the factors that promote living, with internal and external peace:

1. Conducive environment (safe, ventilated, illuminated and comfortable).
2. secured job and motivated with 'recognition and reward'.
3. Absence of threat or tension by pressure due to limitations of money or time.
4. Absence of unnecessary interference or disturbance, except as guidelines.
5. Healthy labor relations and family situations.
6. Service to the needy (physically and mentally-challenged) with love and sympathy.

CARING

Caring is feeling for others. It is a process which exhibits the interest in, and support for, the welfare of others with fairness, impartiality and justice in all activities, among the employees, in the context of professional ethics. It includes showing respect to the feelings of others, and also respecting and preserving the interests of all others concerned. Caring is reflected in activities such as friendship, membership in social clubs and professional societies, and through various transactions in the family, fraternity, community, country and in international councils.

"Caring is knowing, feeling and acting in the interests to others"

SHARING

Primarily, caring influences 'sharing'. Sharing is a process that describes the transfer of knowledge (teaching, learning, and information), experience (training), commodities (material possession) and facilities with others. The transfer should be genuine, legal, positive, voluntary, and without any expectation in return. However, the proprietary information it should not be shared with outsiders. Through this process of sharing, experience, expertise, wisdom and other benefits reach more people faster. Sharing is voluntary and it cannot be driven by force, but motivated successfully through ethical principles. In short, sharing is 'charity'. For the humanity, 'sharing' is a *culture*. The 'happiness and wealth' are multiplied and the 'crimes and sufferings' are reduced, by sharing. It paves the way for peace and obviates militancy. Philosophically, the sharing maximizes the

happiness for all the human beings. In terms of psychology, the fear, divide, and distrust between the 'haves' and 'have-nots' disappear. Sharing not only paves the way to prosperity, early and easily, and sustains it. Economically speaking, benefits are maximized as there is no wastage or loss, and everybody gets one's needs fulfilled and satisfied. Commercially speaking, the profit is maximized. Technologically, the productivity and utilization are maximized by sharing.

HONESTY

"Honesty means expressing your true felings"

Honesty is a virtue, and it is exhibited in two aspects namely,

(a) Truthfulness and

(b) Trustworthiness.

Truthfulness is to face the responsibilities upon telling truth. One should keep one's word or promise. By admitting one's mistake committed (one needs courage to do that!), it is easy to fix them. Reliable engineering judgment, maintenance of truth, defending the truth, and communicating the truth, only when it does 'good' to others, are some of the reflections of truthfulness. But trustworthiness is maintaining integrity and taking responsibility for personal performance. People abide by law and live by mutual trust. They play the right way to win, according to the laws or rules (legally and morally). They build trust through reliability and authenticity. They admit their own mistakes and confront unethical actions in others and take tough and principled stand, even if unpopular.

Honesty is mirrored in many ways. The common reflections are:

(a) Beliefs (intellectual honesty).

(b) Communication (writing and speech).

(c) Decisions (ideas, discretion).

(d) Actions (means, timing, place, and the goals). and

(e) Intended and unintended results achieved.

COURAGE

Courage is the tendency to accept and face risks and difficult tasks in rational ways. Self-confidence is the basic requirement to nurture courage.

Courage is classified into three types, based on the types of risks, namely

- (a) Physical courage,
- (b) Social courage, and
- (c) Intellectual courage.

In physical courage, the thrust is on the adequacy of the physical strength, including the muscle power and armaments. People with high adrenalin, may be prepared to face challenges for the mere 'thrill' or driven by a decision to 'excel'. The social courage involves the decisions and actions to change the order, based on the conviction for or against certain social behaviors. This requires leadership abilities, including empathy and sacrifice, to mobilize and motivate the followers, for the social cause. The intellectual courage is inculcated in people through acquired knowledge, experience, games, tactics, education, and training. In professional ethics, courage is applicable to the employers, employees, public, and the press.

Look before you leap. One should perform Strengths, Weakness, Opportunities, and Threat (SWOT) analysis. Calculate (estimate) the risks, compare with one's strengths, and anticipate the end results, while taking decisions and before getting into action. Learning from the past helps. Past experience (one's own or borrowed!) and wisdom gained from self-study or others will prepare one to plan and act with self-confidence, succeed in achieving the desired ethical goals through ethical means. Opportunities and threat existing and likely to exist in future are also to be studied and measures to be planned. This anticipatory management will help any one to face the future with courage. Facing the criticism, owning responsibility, and accepting the mistakes or errors when committed and exposed are the expressions of courage

The courageous people own and have shown the following characteristics, in their professions:

- (a) Perseverance (sustained hard work),
- (b) Experimentation (preparedness to face the challenges, that is, unexpected or unintended results),
- (c) Involvement (attitude, clear and firm resolve to act), and
- (d) Commitment (willing to get into action and to reach the desired goals by any alternative but ethical means).

VALUING TIME

Time is rare resource. Once it is spent, it is lost forever. It can not be either stored or recovered. Hence, time is the most perishable and most valuable resource too. This resource is continuously spent, whether any decision or action is taken or not.

The history of great reformers and innovators have stressed the importance of time and valuing time. The proverbs, 'Time and tide wait for nobody' and 'Procrastination is the thief of time' amply illustrate this point.

"Time is a measure of ones usefulness and success"

Time management is the rational way to ensure that our limited time is always used effectively

- Clear objectives
- Prioritize tasks
- Stick to scheduled tasks
- Allow time to manage your time
- The unexpected
- Managing time wasters.

COOPERATION

It is a team-spirit present with every individual engaged in engineering. Co-operation is activity between two persons or sectors that aims at integration of operations (synergy), while not sacrificing the autonomy of either party. Further, working together ensures, coherence, i.e., blending of different skills required, towards common goals.

Willingness to understand others, think and act together and putting this into practice, is cooperation. Cooperation promotes collinearity, coherence (blend), co-ordination (activities linked in sequence or priority) and the synergy (maximizing the output, by reinforcement). The whole is more than the sum of the individuals. It helps in minimizing the input resources (including time) and maximizes the outputs, which include quantity, quality, effectiveness, and efficiency.

According to professional ethics, cooperation should exist or be developed, and maintained, at several levels; between the employers and employees, between the superiors and subordinates, among the colleagues, between the producers and the suppliers (spare parts), and between the organisation and its customers.

The codes of ethics of various professional societies insist on appropriate cooperation to nourish the industry. The absence of cooperation leads to lack of communication,

misinformation, void in communication, and undue delay between supply, production, marketing, and consumption. This is likely to demoralize and frustrate the employees, leading to collapse of the industry over time and an economic loss to the society.

The impediments to successful cooperation are:

1. Clash of ego of individuals.
2. Lack of leadership and motivation.
3. Conflicts of interests, based on region, religion, language, and caste.
4. Ignorance and lack of interest. By careful planning, motivation, leadership, fostering and rewarding team work, professionalism and humanism beyond the 'divides', training on appreciation to different cultures, mutual understanding 'cooperation' can be developed and also sustained.

COMMITMENT

Commitment means *alignment to goals and adherence to ethical principles during the activities*. First of all, one must believe in one's action performed and the expected end results (confidence). It means one should have the conviction without an iota of doubt that one will succeed. Holding sustained interest and firmness, in whatever ethical means one follows, with the fervent attitude and hope that one will achieve the goals, is commitment. It is the driving force to realize success.

EMPATHY

Empathy is social radar. 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 ability to imagine oneself in another's place and understand the other's feeling, desires, ideas and actions"

To practice 'Empathy', a leader must have or develop in him, the following characteristics⁵

1. Understanding others: It means sensing others feelings and perspectives, and taking active interest in their welfare.
2. Service orientation: It is anticipation, recognition and meeting the needs of the clients or customers.
3. Developing others: This means identification of their needs and bolstering their abilities.

4. Leveraging diversity (opportunities through diverse people): This leads to enhanced organizational learning, flexibility, and profitability.

5. Political awareness: It is the ability to read political and social currents in an organization.

The benefits of empathy include:

1. Good customer relations (in sales and service, in partnering).
2. Harmonious labor relations (in manufacturing).
3. Good vendor-producer relationship

SELF-CONFIDENCE

Certainty in one's own capabilities, values, and goals, is self-confidence. These people are usually positive thinking, flexible and willing to change. They respect others so much as they respect themselves. Self-confidence is positive attitude, wherein the individual has some positive and realistic view of himself, with respect to the situations in which one gets involved. The people with self-confidence exhibit courage to get into action and unshakable faith in their abilities, whatever may be their positions.

They are not influenced by threats or challenges and are prepared to face them and the natural or unexpected consequences. The self-confidence in a person develops a sense of partnership, respect, and accountability, and this helps the organization to obtain maximum ideas, efforts, and guidelines from its employees. The people with self-confidence have the following characteristics:

1. A self-assured standing,
2. Willing to listen to learn from others and adopt (flexibility),
3. Frank to speak the truth, and
4. Respect others' efforts and give due credit.

CHARACTER

It is a characteristic property that defines the behavior of an individual. It is the pattern of virtues (morally-desirable features). Character includes attributes that determine a person's moral and ethical actions and responses. It is also the ground on which morals and values blossom. People are divided into several categories, according to common tendencies such as ruthless, aggressiveness, and ambition, constricting selfishness, stinginess, or cheerfulness, generosity and goodwill. Individuals vary not only in the type of their character but also in the degree. Those whose lives are determined and directed by the prevailing

habits, fashions, beliefs, attitudes, opinions and values of the society in which they live have at best a developed *social* as opposed to an *individual* character.

The character is exhibited through conduct. Character is determined by the expectations of society. Many act and live within its norms, refusing to fall below the required social minimum, failing to rise above the maximum expected of a normal member of the group. On one extreme are those that do not even conform to the minimum standards, and fail to acquire the socially-required behaviors, attitudes and values. These individuals have an unformed social character. At the other extreme are those whose beliefs, attitudes and values are determined internally by the strength of their own convictions. These are individuals with developed minds and formed characters of their own. Individuals do not live or act in a vacuum. They exist and act in a human social environment of other people that constantly act on them and react to their actions. They also live in a natural environment of physical objects and material forces such as the winds and rains. And those with occult and spiritual traditions recognize that there is also a subtle environment of other planes of existence, both higher planes of spiritual influence and lower planes of negative forces in universal nature seeking to act on the lives. All of the social, material and the occult planes constitute the field of human activity. Each of them functions according to its own laws or principles. Each of them has its own characteristic modes of action and influence on human life.

- The sensitive (humble, contemplative and emotional,
- The active (great and the mediocre), and
- The apathetic (purely apathetic or dull), and
- The intelligent.

SPIRITUALITY

Spirituality is a way of living that emphasizes the constant awareness and recognition of the spiritual dimension (mind and its development) of nature and people, with a dynamic balance between the material development and the spiritual development. This is said to be the great virtue of Indian philosophy and for Indians. Sometimes, spirituality includes the faith or belief in supernatural power/God, regarding the worldly events. It functions as a fertilizer for the soil 'character' to blossom into values and morals.

Spirituality includes creativity, communication, recognition of the individual as human being (as opposed to a life-less machine), respect to others, acceptance (stop finding faults with colleagues and accept them the way they are), vision (looking beyond the obvious and not believing anyone blindly), and partnership (not being too authoritative, and always sharing responsibility with others, for better returns).

Spirituality is motivation as it encourages the colleagues to perform better. Remember, lack of motivation leads to isolation. Spirituality is also energy

1. *Self-awareness* — Realization of self-potential. A human has immense capability but it needs to be developed.
2. *Alertness in observation and quickness in decision making*, i.e., spontaneity which includes quick reflexes, no delay but also no hasty decisions.
3. *Being visionary and value based* — This includes an attitude towards future of the organization and the society, with clear objectives.
4. *Holism* — Whole system or comprehensive views and interconnected with different aspects. Holistic thinking, which means the welfare of the self, family, organization and the society including all other living beings and environment.
5. *Compassion* — Sympathy, empathy and concern for others. These are essential for not only building the team but also for its effective functioning.
6. *Respect for diversity* — It means search for unity in diversity i.e., respect others and their views.
7. *Moral Autonomy* — It means action based on rational and moral judgment. One need not follow the crowd or majority i.e., band-wagon effect.
8. *Creative thinking and constant reasoning* — Think if we can do something new and if we can improve further?
9. *Ability to analyze and synthesize* — Refrain from doing something only traditional.
10. *Positive views of adversity* — Make adversities one's source of power—a typical Karma yogi's outlook! Every threat is converted into opportunity.
11. *Humility* — The attitude to accept criticism (it requires courage!) and willing to correct. It includes modesty and acknowledging the work of colleagues.
12. *Sense of vocation* — Treat the duty as a service to society, besides your organization.

Yogic exercises recharge the body with cosmic energy and facilitates:

Attainment of perfect equilibrium and harmony

- Promotes self- healing.
- Removes negative blocks from the mind and toxins from the body
- Enhances personal power

- Increases self-awareness
- Helps in attention, focus and concentration, especially important for children
- **Reduces stress** and tension in the physical body by activating the parasympathetic nervous system

The aspirant feels rejuvenated and energized. Thus, yoga bestows upon every aspirant the powers to control body and mind.

Benefits of Yoga

The art of practicing yoga helps in controlling an individual's mind, body and soul. It brings together physical and mental disciplines to achieve a peaceful body and mind; it helps **manage stress** and anxiety and keeps you relaxing. It also helps in increasing flexibility, muscle strength and body tone. It improves respiration, energy and vitality. Practicing yoga might seem like just stretching, but it can do much more for your body from the way you feel, look and move.

Yoga asanas build strength, flexibility and confidence. Regular practice of yoga can help lose weight, relieve stress, improve immunity and maintain a healthier lifestyle.

In 2014, Indian Prime Minister Narendra Modi suggested United Nations to celebrate June 21 as the International Yoga Day as it is the summer solstice; the longest day of the year in the Northern Hemisphere.

"Yoga is an invaluable gift of India's ancient tradition. This tradition is 5000 years old. It embodies unity of mind and body; thought and action; restraint and fulfilment; harmony between man and nature; a holistic approach to health and well-being. It is not about exercise but to discover the sense of oneness with yourself, the world and the nature. By changing our lifestyle and creating consciousness, it can help in well being . Let us work towards adopting an International Yoga Day." — Narendra Modi, UN General Assembly, September 2014.

What is the importance of yoga in our daily life?

We do not have even one hour for our self in 24 hours these days, it is really tough to get some time for you now a days. But If we will not do it than we will be in problem one day so if you want to be fit and active than you have to get some time for yourself. Yoga has importance in your daily life.

Day by day Life is an arrangement of work on comprising of eight levels of advancement in the territories of physical, mental, social and otherworldly well-being?

It has been underscored that each activity is polished gradually, organizing development with the breath, stopping un moving in each position and dependable with full fixation. Yoga shows you to concentrate on breathing while you hold the postures. This thoughtfulness regarding breath is quieting it disintegrates stress and tension.

The fundamental objectives of “Yoga in Daily Life” are:

1.)Physical Health

2.)Emotional wellness

3.)Social Health

4.)Profound Health

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For busy employees, the thought of introducing yoga to their lives in 2014 seems a bit of a non-starter.

Busy professionals have a lot of demands on their time and allocating time for yoga just doesn't factor. But what if they understood the potential benefits to their work and home lives?

Stress in the workplace today is a major consideration for employers and anything that can be introduced to alleviate this is a potential benefit to both employers and the employees. Less stressful employees will be more productive and are less likely to need time off through illness. Less stressful employees are likely to have happier home lives and this in turn leads to increased productivity.

Related to this is yoga's ability to create inner peace and calm. It's probably the main image people have of yoga: people with legs crossed, hands over each knee, looking serene. Yet, meditation through regular practice cultivates inner peace and calm. Presence is important in business to command respect; in yoga it's about connecting yourself with the present moment - being in tune with your surroundings. Had too many good business lunches? Yoga helps manage your weight by creating a more positive self-image and, in turn, encourages you to think about nutrition and what you eat.

Flexibility is one of the main benefits of yoga. Over time, ligaments, tendons and muscles lengthen and this leads to increasing elasticity in your body's movement. Yoga provides cardiovascular benefits by lowering resting heart rate and improving oxygen uptake during exercise. The breathing practice, known as Pranayama, helps you slow down and deepen your breaths. It activates the body's parasympathetic system or how we relax.

Finally, yoga can ease pain. Practising postures (or asanas) and meditation reduces back and neck pain or more serious conditions including arthritis or multiple sclerosis.

UNIT II**ENGINEERING ETHICS****(9)**

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

ENGINEERING ETHICS

Engineering Ethics is the activity and discipline aimed at

- (a) Understanding the moral values that ought to guide engineering profession or practice,
- (b) Resolving moral issues in engineering, and
- (c) Justifying the moral judgments in engineering. It deals with set of moral problems and issues connected with engineering.

Engineering ethics is defined by the codes and standards of conduct endorsed by engineering (professional) societies with respect to the particular set of beliefs, attitudes and habits displayed by the individual or group.

SCOPE

The scope of engineering ethics is twofold:

1. Ethics of the workplace which involves the co-workers and employees in an organization.
2. Ethics related to the product or work which involves the transportation, warehousing, and use, besides the safety of the end product and the environment outside the factory.

APPROACH

There are conventionally two approaches in the study of ethics:

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 level. For example, global issues, collective responsibilities of groups such as professional societies and consumer groups.

SENSES OF ENGINEERING ETHICS

There are two different senses (meanings) of engineering ethics, namely the Normative and the Descriptive senses. The normative sense include:

(a) Knowing moral values, finding accurate solutions to 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, and

(c) Using codes of ethics and standards and applying them in their transactions by engineers. The descriptive sense refers to what specific individual or group of engineers believe and act, without justifying their beliefs or actions.

- Engineering Ethics is the activity and discipline aimed at understanding the moral values that ought to guide engineering practice, resolving moral issues in engineering and justifying moral judgments concerning engineering.
- Engineering ethics refers to the set of specific moral problems and issues related to engineering.
- Ethics has widely accepted codes and standards of conduct, which are to be followed by group of engineers and societies
- Ethics is concerned with the set of justified.

VARIETY OF MORAL ISSUES

It would be relevant to know why and how do moral issues (problems) arise in a profession or why do people behave unethically? The reasons for people including the employer and employees, behaving unethically may be classified into three categories:

1. 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.

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.

2. Opportunity

(a) Double standards or behavior of the employers towards the employees and the public.

(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 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.

3. Attitude

Poor attitude of the employees set in due to

(a) Low morale of the employees because of dissatisfaction and downsizing,

(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.

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.

To get firm and positive effect, ethical standards must be set and adopted by the senior management, with input from all personnel.

TYPES OF ISSUES

- Organization oriented
- Clients or customers oriented
- Competitors oriented
- Law, government and public agencies oriented
- Professional societies oriented
- Social and environmental oriented
- Family oriented

INQUIRY

"A seeking or request for truth, information, or knowledge"

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

and factual or descriptive inquiry.

The three types of inquiries are discussed below to illustrate the differences and preference.

1. 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. For example,

1. How far does the obligation of engineers to protect public safety extend in any given situation?
2. When, if ever, should engineers be expected to blow whistle on dangerous practices of their employers?
3. Whose values ought to be primary in making judgment about acceptable risks in design for a public transport system or a nuclear plant? Is it of management, senior engineers, government, voters or all of them?
4. When and why is the government justified in interfering with the organizations?
5. What are the reasons on which the engineers show their obligations to their employees or clients or the public?

2. 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. 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. 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 alternative 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?

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.

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. Good means an action that is obligatory. For example, code of ethics specifies that one should obey the laws and follow standards. Refuse bribe or accept the gift, and maintain confidentiality
2. 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.
3. 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 analyze and rank the decisions. Select the best suitable, under the existing and the most probable conditions.

Steps to Solve Dilemma

The logical steps in confronting moral dilemma are:

1. 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). The most useful resource in identifying dilemmas in engineering is the professional codes of ethics, as interpreted by the professional experience. Another resource is talking with colleagues who can focus or narrow down the choice of values.
2. Collection of all information, data, and facts (factual inquiry) relevant to the situation.
3. 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).
4. 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.
5. Discuss with colleagues and obtain their perspectives, priorities, and suggestions on various alternatives.
6. 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 'satisfying' 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. Alternatively, 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.

"It is the ability to think critically and independently about moral issues and apply this normal thinking to situations that arise during the professional engineering practices"

FACTORS INFLUENCING THE MORAL CONCERN

1. Atmosphere in which the person is brought up
2. Relationship with friends and relatives
3. Interactions with neighbor's

4. Family's structure and economy
5. Religious institutions
6. Educational institution
7. Teachers, Mentors and role models
8. Media like newspaper, novels etc.,
9. Social events

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, and
7. Maintaining moral integrity.

MORAL DEVELOPMENT (THEORIES)

Pre-conventional Level

Whatever benefits oneself or avoids punishment. This is the level of development of all young children. -Avoid punishment & Gain Reward

- **Stage 1. Obedience and Punishment Orientation.**

The child assumes that powerful authorities hand down a fixed set of rules which he or she must unquestioningly obey. The View is "It's against the law," or "It's bad to steal," as if this were all there were to it. When asked to elaborate, the child usually responds in terms of the consequences involved, explaining that stealing is bad "because you'll get punished"

- **Stage 2. Individualism and Exchange.**

This stage children recognize that there is not just one right view that is handed down by the authorities. Different individuals have different viewpoints.

At stage 1 punishment is tied up in the child's mind with wrongness; punishment "proves" that disobedience is wrong. At stage 2, in contrast, punishment is simply a risk that one naturally wants to avoid.

- *Conventional Level*

Uncritical acceptance of one's family, group or society is accepted as final standard of morality. Most adults do not mature beyond this stage. -1. Gain Approval & Avoid Disapproval & 2. Duty & Guilt

- **Stage 3. Good Interpersonal Relationships.**

At this stage children--who are by now usually entering their teens--see morality as more than simple deals. They believe that people should live up to the expectations of the family and community and behave in "good" ways. Good behavior means having good motives and interpersonal feelings such as love, empathy, trust, and concern for others.

- **Stage 4. Maintaining the Social Order**

Stage 3 reasoning works best in two-person relationships with family members or close friends, where one can make a real effort to get to know the other's feelings and needs and try to help. At stage 4, in contrast, the respondent becomes more broadly concerned with *society as a whole*. Now the emphasis is on obeying laws, respecting authority, and performing one's duties so that the social order is maintained.

- *Post-conventional Level*

Motivation to do what is morally reasonable for its own sake, rather than solely from ulterior motives, with also a desire to maintain their moral integrity, self-respect and the respect of other autonomous individuals. They are morally autonomous people. -1. Agreed upon rights & 2. Personal moral standards

- **Stage 5. Social Contract and Individual Rights**

At stage 5, people begin to ask, "What makes for a good society?" They begin to think about society in a very theoretical way, stepping back from their own society and considering the rights and values that a society ought to uphold. They then evaluate existing societies in terms of these prior considerations. They are said to take a "prior-to-society" perspective.

Stage 5 subjects,- then, talk about "morality" and "rights" that take some priority over particular laws. Kohlberg insists, however, that we do not judge people to be at stage 5 merely from their verbal labels. We need to look at their social perspective and mode of reasoning.

- **Stage 6: Universal Principles**

Kohlberg believes that there must be a higher stage--stage 6--which defines the principles by which we achieve justice. Kohlberg's conception of justice follows that of the philosophers Kant and Rawls, as well as great moral leaders such as Gandhi and Martin Luther King. According to these people, the principles of justice require us to treat the claims of all parties in an impartial manner, respecting the basic dignity, of all people as individuals. The principles of justice are therefore universal; they apply to all. Thus, for example, we would not vote for a law that aids some people but hurts others. The principles of justice guide us toward decisions based on an equal respect for all.

GILLIGAN'S THEORY

☐ Pre-conventional Level

This is the same as Kohlberg's first level in that the person is preoccupied with self centered reasoning, caring for the needs and desires of self.

☐ Conventional

Here the thinking is opposite in that, one is preoccupied with not hurting others and a willingness to sacrifice one's own interests in order to help or nurture others (or retain friendship).

☐ Post-conventional Level

Achieved through context-oriented reasoning, rather than by applying abstract rules ranked in a hierarchy of importance. Here the individual becomes able to strike a reasoned balance between caring about other people and pursuing one's own self-interest while exercising one's rights.

DIFFERENCE BETWEEN KOHLBERG'S AND GILLIGAN THEORY

KOHLBERG	GILLIGAN
<i>I. Ethics of rules and rights</i>	<i>Ethics of care</i> <small>www.annauniversity.com</small>
<i>II. Studies based on well educated, white male's only, tending male bias.</i>	<i>Studies included females and colored peoples</i>
<i>III. Application of abstract rules ranked in the order of importance</i>	<i>Application of context-oriented reasoning.</i>
<i>IV. Studies were hypothesized for both the genders even though the study was conducted mostly on males</i>	<i>Study was conducted on both genders and it was found, men based their reasoning on 'justice' and women based theirs on 'care'</i>

<i>Kohlberg's Theory</i>	<i>Carol Gilligan's Theory</i>
<i>A. Basic Aspects</i>	
1. Is based on the study on men. 2. Men give importance to moral rule. 3. Ethics of rules and rights.	1. Is based on the study on men and women 2. Women always want to keep up the personal relationships with all the persons involved in the situations. 3. Women give attention to circumstances leading to critical situations rather than rules: (context-oriented and ethics of care)
<i>B Characteristic Features</i>	
1. Justice 2. Factual 3. Right or wrong 4. Logic only 5. Logic and rule-based 6. Less of caring 7. Matter of fact (practical) 8. Present focus 9. Strict rules 10. Independence 11. Rigid 12. Taking a commanding role 13. Transactional approach	1. Reason 2. Emotional 3. Impact on relationships 4. Compassion too 5. Caring and concern 6. More of caring 7. Abstract 8. Future focus 9. Making exceptions 10. Dependence 11. Human-oriented 12. Shying away from decision-making 13. Transformational approach

The difference in these two theories is explained through the well-known example, *Heinz's dilemma*. 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.

CONSENSUS AND CONTROVERSY

CONTROVERSY:

- All individuals will not arrive at same verdict during their exercising their moral autonomy.
- Aristotle noted long ago that morality is not as precise and clear-cut as arithmetic.
- Aim of teaching engg ethics is not to get unanimous conformity of outlook by indoctrination, authoritarian and dogmatic teaching, hypnotism or any other technique but to improve promotion of tolerance in the exercise of moral autonomy.

CONSENSUS:

The conductor of a music orchestra has authority over the musicians and his authority is respected by them by consensus as otherwise the music performance will suffer. Hence the authority and autonomy are compatible. On the other hand, tension arises between the needs for autonomy and the need for concerns about authority. The difference between the two should be discussed openly to resolve the issue to the common good.

PROFESSIONS AND PROFESSIONALISM

Who is a professional?

- Obviously a member of a profession.

What is a profession?

Job or occupation that meets the following criteria from which a person earns his living.

☐ Knowledge – Exercise of skills, knowledge, judgment and discretion requiring extensive formal criteria.

☐ Organization - special bodies by members of the profession to set standard codes of ethics,

☐ Public good-The occupation serves some important public good indicated by a code of ethics.

Who is a professional engineer?

- Has a bachelor's degree in engineering from an accredited school
- Performs engineering work
- Is a registered and licensed Professional Engineer
- Acts in a morally responsible way while practicing engineering

"Engineers are professionals when they 1) attain standards of achievement in education, job performance or creativity in engineering and 2) accept the most basic moral responsibilities to the public as well as employers, clients, colleagues and subordinates."

MODELS OF PROFESSIONAL ENGINEERS

1. SAVIOR: The representative engineer is a savior who will redeem society from poverty, inefficiency, waste and the drudgery of manual labour.
2. GUARDIAN: Engineers know, the directions in which and pace at which, technology should develop.
3. BUREAUCRATIC SERVANT: The engineer as the loyal organization person uses special skills to solve problems.
4. SOCIAL SERVANT: Engineers, in co-operation with management, have the task of receiving society's directives and satisfying society's desires.
5. SOCIAL ENABLER AND CATALYST: Engineers play a vital role beyond mere compliance with orders. They help management and society understand their own needs and to make informed decisions.
6. GAME PLAYER: Engineers are neither servants nor masters of anyone. They play by the economic game rules that happen to be in effect at a given time.

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

1. *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.

2. *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.

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

RESPONSIBILITY

Senses

There are different senses of responsibility, such as:

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. The obligations such as honesty, fairness, and decency are incumbent on every one. In addition to this, we have role responsibilities assigned by taking up various roles, such as parents, inspectors, and employees. 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 and Accountability for actions. It means that one is liable (with a legal sense) to meet the obligations in better ways. The person is likely to respond legally, if necessary.

Accountable means that one is willing to justify or defend the decisions, actions or means and outcomes. It could include offering a reasonable excuse or accepting the shame for not

having met the end results or accepting the guilt for harming others. One is also answerable to the assessment by others on one's actions (means) or outcomes.

5. Praiseworthiness/Blameworthiness

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.

Types

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 internal good or good outcomes, and eliminating /minimizing unintended side-effects, from engineering and technology. It includes:

(a) *Obligations*: A commitment to moral actions (primary obligation to protect the safety of the human beings and respect their rights),

(b) *Conscientious*: A comprehensive perspective to accept the duties, and diligently do the right things by putting their heart, head and hands (awareness of the experimental nature of the product/project, anticipating possible and unexpected outcomes and putting efforts to monitor them),

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

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

2. Causal Responsibility

It is being a cause of some event. For example, a child playing with matches cause a house to burn. The

child is causally responsible, but the parent who left the child with matches, is morally responsible.

3. Job Responsibility

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

4. Legal Responsibility

It is the response required by law and includes legal obligations and accountability to meet them.

Many of these responsibilities overlap with moral responsibility.

Responsible Professionalism

The most comprehensive virtue of engineers is responsible professionalism. It can also be called Professional Responsibility. This consists of five types of virtues, as follows:

1. Self-direction (Self-governance) virtues are fundamental and necessary in exercising moral responsibility. 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, self-discipline, perseverance, self-respect, and integrity. Honesty a virtue common to both bases as it implies truthfulness in thoughts and words and trustworthiness in actions.
2. Public-spirited virtues focus on the good of the clients and the public. It includes the respect for rights (to make decisions and face the risk), non-maleficence (not harming others intentionally). Engineering codes go a step further and prescribe beneficence that includes preventing or removing harm to others and also promoting the public safety, health, and welfare, generosity (helping the community by voluntarily giving their time, talent, and money-voluntary service to the professional society and community), and justice (unbiased) in all decisions and actions.
3. Team-work virtues enable the professionals to work successfully with others. They include collegiality, cooperativeness, communicative ability, and respect for legitimate authority. Responsible exercise of authority and the ability to motivate others to achieve are also the relevant to team-work virtues.
4. Proficiency virtues, which mean the mastery of technical skills (called as Intellectual Virtue by Aristotle). It includes competence (having qualified, licensed, and prepared to execute the job that is undertaken), diligence (alert to dangers, careful attention, and avoidance of laziness or workaholic nature), creativity (learning to respond to the changing technological society), excellence (perform at the highest level), and self-renewal through continuing education.
5. Cardinal (chief) virtues: Wisdom (prudence), courage (fortitude), temperance and justice. Some of these may overlap other virtues. They are called 'cardinal' (Latin: *cardo*, hinge) 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. Wisdom is perception of truth and ability to

distinguish between the right and wrong. Courage means a firm and elevated mind. Temperance represents order in words and actions. Justice is preserving humanity and observing the faith of contracts. Although these virtues ring religious tones, they are very relevant to the engineering practice.

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, local communities, governments, non-governmental organizations, and the business owners and managers. Besides showing concern with employee relations and other internal organizational matters, the organization is concerned with

(a) How the product/project is marketed, used or misused, how it fails, and how it is disposed or discarded. The ways in which the used battery cells and computers are discarded have been debated in the engineers' forums.

(b) Protecting the work environment during manufacture as well as the external environment during transport or use

(c) Training the disadvantaged or physically-challenged workers

(d) Subcontracting and hiring practices, and

(e) Contribution to local communities to enrich their cultural, social, and civic life. It may be even compensatory against the harm to environment (e.g., planting trees).

THEORIES ABOUT RIGHT ACTION (ETHICAL THEORIES)

Uses and Criteria

The ethical theories are useful in many respects.

1. In understanding moral dilemma. They provide clarity, consistency, systematic and comprehensive understanding.
2. It provides helpful practical guidance in moral issues towards the solution.
3. Justifying professional obligations and decisions, and
3. In relating ordinary and professional morality.

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, i.e., none of its principles conflicts with any other
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 are continually adjusted to each other until we reach a reflective 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 remain complementary always.

Ethical Theories/Approaches

Several ethical theories have been developed over different times, each of them stressing certain ethical principles or features. Each stresses a view and many a times, we find that these theories converge and reinforce the ethics, in deciding upon the actions and justifying the results.

1. Utilitarian Theory

They suggested that 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. In analyzing an issue in this approach, we have to:

- (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.

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 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.

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. For example, stealing an old computer from the employer will benefit the employee more than the loss to the employer. As per Act, utilitarian this action is right. But rule utilitarian observes this as wrong, because the employee should act as 'faithful agent or trustee of the employees'. In another example, some undisciplined engineers are terminated with the blame for the mistakes they have not committed. The process is unfair although this results in promotion of overall 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. As per Kant we have duties to ourselves, as we are rational and autonomous beings. We have a duty not to commit suicide; a duty to develop our talents and a duty to avoid harmful drugs. Kant insisted that moral duties are categorical imperatives. They are commands that we impose on ourselves as well as other rational beings. For example, we should be honest because honesty is required by duty. A businessman is to be honest because honesty pays — in terms of profits from customers and from avoiding jail for dishonesty.

B. On the other hand, 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 entitled to the most extensive amount of 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. The first principle is of prime importance and should be satisfied first. Without basic liberties other economic or social benefits can not be sustained for long. The second principle insists that to allow some people with great wealth and power is justified only when all other groups are benefited. 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.

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.

What makes human beings different from mere things is, that people have dignity based on their ability to choose freely what they will do with their lives, and they have a fundamental moral right to have these choices respected. People are not objects to be manipulated; it is a violation of human dignity to use people in ways they do not freely choose. Other rights he advocated are:

1. *The right to access the truth:* We have a right to be told the truth and to be informed about matters that significantly affect our choices.
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 freely and knowingly do something to deserve punishment or we freely and knowingly choose to risk such injuries.
4. *The right to what is agreed:* We have a right to what has been promised by those with whom we have freely entered into a contract or agreement.

Human rights: Human rights are explained in two forms, namely liberty rights and welfare rights. Liberty rights are rights to exercise one's liberty and stresses duties on other people not to interfere with one's freedom. The four features of liberty rights (also called *moral rights*), which lay the base for Government Administration, are:

1. Rights are natural in so far as they are not invented or 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 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 and when those benefits are 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 rights⁹. 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.

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 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'. The examples shown below illustrate the theory:

<i>Virtue</i>	<i>Excess</i>	<i>Golden mean</i>	<i>Deficient</i>
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
Green environment	Exploitation	Protection	Neglect
Work and earn	Tiresome work (strained)	Balance of work and leisure	Lazy (no work) and more pay

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.

In Ethical Egoism, the self is conceived in a highly individualistic manner. It says that every one of us should always and only promote one's own interest. The ethical egoists do not accept the well being of the community or caring for others. However this self interest should not degenerate into egoism or selfishness, i.e., maximizing only own good in the pursuit of self-interest. The ethical egoists hold that the society benefits to maximum when (a) the

individuals pursue their personal good and (b) the individual organizations pursue maximum profit in a competitive enterprise. This is claimed to improve the economy of the country as a whole, besides the individuals. In such pursuits, both individuals and organizations should realize that independence is not the only important value. We are also interdependent, as much as independent. Each of us is vulnerable in the society. Self-respect includes recognition of our vulnerabilities and interdependencies. Hence, it is compatible with caring for ourselves as well as others. Self-interest is necessary initially to begin with. But it should be one of the prime motives for action; the other motive is to show concern for others, in the family as well as society. One's self-interest should not harm others. The principles of 'Live and let (others) live', and 'reasonably fair competition' are recommended to professionals by the ethicists.

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. Further, there is a strong psychological link between the moral and religious beliefs of people following various religions and faiths. 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. Each religion lays stress on certain high moral standards. For example, Hinduism holds polytheistic (many gods) view, and virtues of devotion and surrender to high order. Christianity believes in one deity and emphasizes on virtues of Love, Faith, and Hope. Buddhism is non-theistic and focuses on compassion and Islam on one deity and adherence of *ishan* (piety or pursuit of excellence) and prayer. Judaism stresses the virtue of 'tsedakah' (righteousness). But many religious sects have adopted poor moral standards, e.g., many religious sects do not recognize equal rights for women. The right to worship is denied for some people. People are killed in the name of or to promote religion. Thus, conflicts exist between the 'secular' and religious people and between one religion and another. Hence, religious views have to be morally scrutinized.

CUSTOMS

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. Should we accept the principle of relativism or not? A few reasons to accept this are explained in the following paragraphs:

1. Laws appear to be objective ways for judging values. The laws and customs tend to be definite, clear and real, but not always. Further moral reasons allow objective criticism of laws, as being morally lacking. 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. Now, of course, these laws have been repealed.
2. Ethical relativism assumes that the values are subjective at the cultural level. Moral standards also vary from culture to culture. The objectivity is supported by the existing laws of that society. The relative morality accepted, supports the virtue of tolerance of differences among societies. This argument is also not fully acceptable. As per ethical relativism, the actions and laws of the Nazis and Hitler who vowed on Anti-Semitism and killed several million Jews would be accepted as right.
3. Moral relationalism or moral contextualism: According to this, the moral judgments must be made in relation to certain factors, which may vary from case to case. The morally important factors for making judgments include the customs and laws. The virtue ethicists hold that the practical wisdom should prevail upon assessing the facts and in the judgment. This principle was accepted by the early anthropologists because they had a specific tendency to over-stress the scope of moral difference between cultures. The human sacrifices and cannibalism were accepted. But the modern anthropologists insist that all cultures shall exhibit the virtue of social welfare and safety against needless death or physical or mental harm. Moral differences were based on the circumstances and facts and not on the difference in moral attitudes. For example, the pharaohs buried the live attendants along with their dead king with the belief that they would continue to serve the king in his after life.

UNIT III - ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

ENGINEERING AS EXPERIMENTATION

❑ Experimentation (Preliminary tests or Simulations) plays a vital role in the design of a product or process.

❑ In all stages of converting a new engineering concept into a design like,

❑ first rough cut design,

❑ usage of different types of materials and processes,

❑ detailed design,

❑ further stages of work design and

❑ the finished product,

Experiments and tests are conducted to evaluate the product. Modifications are made based on the outcome of these experiments.

❑ The normal design process is thus iterative (modifications being made on the basis of feedback information acquired from the tests).

Even though various tests and experiments are conducted at various stages, the engineering project as a whole in its *totality* can be viewed as an *experiment*.

SIMILARITIES TO STANDARD EXPERIMENTS

1. Any project is carried out in partial ignorance due to

❑ The uncertainties in the abstract model used for the design calculations,

❑ The uncertainties in the precise characteristics of the materials purchased,

❑ The uncertainties caused by variations in processing and fabrication of materials and

❑ The uncertainties about the nature of stresses the finished product will encounter.

Indeed, Engineer's success lies in the *ability to accomplish tasks* with only a *partial knowledge* of scientific laws about nature and society.

2. The final outcome of engineering projects, like those of experiments, is generally uncertain. Very often, possible outcomes are not even known and great risks may be presented which could never be thought of.

3. Effective Engineering relies upon knowledge gained about products both before and after they leave the factory- knowledge needed for improving current products and creating better ones. That is, ongoing success in engineering depends upon gaining new knowledge.

LEARNING FROM THE PAST

Engineers should learn not only from their own earlier design and operating results, but also from other engineers.

Engineers repeat the past mistakes of others due to the following reasons.

❑ Lack of established channels of communication.

❑ Misplaced pride in not asking for information

❑ Embarrassment at failure or fear of litigation (legal problems).

❑ Negligence.

Examples:

1. The *Titanic* lacked sufficient number of life boats resulting in the death of 1522 out of 2227 (life boat capacity available was only 825), a few decades later *Arctic* perished due to the same problem.
2. In June 1966, a section of the Milford Haven Bridge in Wales collapsed during construction. A bridge of similar design, erected by the same bridge- builder in Melbourne, Australia, also partially collapsed in the month of October, same year. During this incident 33 people were killed and many were injured.
3. Malfunctions occurred at nuclear reactors at various locations and the information reports were with Babcock and Wilcox, the reactor manufacturer. In spite of these, no attention was paid leading to a pressure relief valve giving rise to the Three Mile Island nuclear accident on March 28, 1979.

CONTRASTS WITH STANDARD EXPERIMENTS**1. EXPERIMENTAL CONTROL:**

In standard experiments, members are in two different groups. Members of *one group receive special* experimental treatment. The other group members, called "*control group*" *do not receive* special treatment, though they are from the same environment in all other respects.

But this is not true in engineering, since most of the experiments are not conducted in laboratories. The subjects of experiments are human beings who are outside the experimenter's control.

Thus it is not possible to study the effects of changes in variable on different groups.

Hence only historical and retrospective data available about various target groups has to be used for evaluation. Hence engineering as a social experimentation seems to be an extended usage of the concept of experimentation.

2. INFORMED CONSENT:

Have two elements, *knowledge* and *voluntariness*. The subjects (human beings) should be given all the information needed to make a reasonable decision. Next, they must get into the experiment without being subjected to *force, fraud or deception*. Supplying complete information is neither necessary nor in most cases possible. But *all relevant information* needed for making a reasonable decision on whether to participate should be conveyed. Generally, we all prefer to be the subject of our own experiments rather than those of somebody else.

Conditions defining *Informed or Valid Consent*

- a. The consent is given voluntarily
- b. The consent is based on information a rational person would want, together with any other information requested and presented to them in understandable form.
- c. The consent was competent to process the information and make rational decisions.
- d. Information has been widely disseminated.
- e. The subject's consent is offered by proxy by a group that collectively represents many subjects like interests, concerns and exposure to risk.

"Engineering experiments are not conducted to gain new knowledge unlike scientific experiments". Is this distinction necessary?

This distinction is not vital because we are concerned *about the manner* in which the experiment is conducted, such as *valid consent* of human subjects being sought, *safety measures* taken and means exist for *terminating* the experiment *at any time* and providing all participants a *safe exit*.

Features of morally responsible engineers in social experimentation

Conscientiousness: A primary obligation to protect the safety of human subjects and respect their right of consent.

Relevant information: A constant awareness of the experimental nature of any project, imaginative forecasting of its possible side effects and a reasonable effort to monitor them.

Moral autonomy: Autonomous, personal involvement in all steps of the project.

Accountability: Accepting accountability for the results of the project.

CONSCIENTIOUSNESS:

☐Conscientious moral commitment means sensitivity to the full range of relevant moral values.

☐Sensitivity to responsibilities that is relevant.

☐Willingness to develop the skill and expend the effort needed to reach the best balance possible among these considerations.

☐Conscientiousness means consciousness because mere intent is not sufficient.

Conceiving engineering as social experimentation restores the vision of engineers as guardians of the public interest in that they are duty bound to guard the welfare and safety of those affected by engineering projects.

RELEVANT INFORMATION:

Conscientiousness is blind without relevant factual information. Moral concern involves a commitment to obtain and assess all available pertinent information.

Another dimension to factual information is the consequences of what one does.

While regarding engineering as social experimentation points out the importance of context, it also urges the engineer to view his or her specialized activities in a project as part of a larger whole having a social impact that may involve a variety of unintended effects. It may be better to practice „defensive engineering“ (Chauncy Starr) or “preventive engineering” (Ruth Davis).

MORAL AUTONOMY

☐People are morally autonomous when their moral conduct and principles of action are their own.

☐Moral beliefs and attitudes must be a critical reflection and not a passive adoption of the particular conventions of one’s society, religion or profession.

☐Moral beliefs and attitudes cannot be agreed to formally and adhered to merely verbally.

☐They must be integrated into the core of one’s personality and should lead to committed action.

☐ It is wrong to think that as an employee when one performs „acts“ serving company's interests, one is no longer morally and personally identified with one's actions.

☐ Viewing engineering as a social experimentation helps to overcome this flawed thought and restores a sense of autonomous participation in one's work.

☐ As an experimenter, an engineer is exercising the specialized training that forms the core of one's identity as a professional.

☐ A social experiment that can result in unknown consequences should help inspire a critical and questioning attitude about the adequacy of current economic and safety standards.

☐ In turn, this leads to better personal involvement with work.

ACCOUNTABILITY:

☐ Responsible people accept moral responsibility for their actions.

☐ Accountability is the willingness to submit one's actions to moral scrutiny and be open and responsive to the assessment of others.

☐ It should be understood as being culpable and blameworthy for misdeeds.

Submission to an employer's authority creates in many people a narrow sense of accountability for the consequences of their action. This is because of

i) Only a small contribution is made by one individual, when large scale engineering work is fragmented. The final product which is far away from one's immediate workplace, does not give a proper understanding of the consequences of one's action.

ii) Due to the fragmentation of work, a vast diffusion of accountability takes place. The area of personal accountability is delimited to the portion of work being carried out by one.

iii) The pressure to move on to another new project does not allow one to complete the observations long enough. This makes people accountable only for meeting schedules and not for the consequences of action.

iv) To avoid getting into legal issues, engineers tend to concentrate more on legal liabilities than the containment of the potential risks involved in their area of work.

Viewing engineering as a social experimentation makes one overcome these difficulties and see the problem in whole rather than as part.

ENGINEERING CODES OF ETHICS

Engineering Codes of Ethics have evolved over time

EARLY CODES

- Codes of personal behavior
- Codes for honesty in business dealings and fair business practices
- Employee/employer relations

NEWER CODES

- Emphasize commitments to safety, public health and environmental protection
- Express the rights, duties and obligations of members of the Profession

- Do not express new ethical principles, but coherently restate existing standards of responsible engineering practice
- Create an environment within the Profession where ethical behavior is the norm
- Not legally binding; an engineer cannot be arrested for violating an ethical code (but may be expelled from or censured by the engineering society)

Are Engineering Codes Needed? NO:

- Engineers are capable of fending for themselves
- Common law is available to defend in ethical disputes
- Offended public can seek redress through courts

Are Engineering Codes Needed? YES:

- Engineers have few or no resources to defend themselves in an ethical dispute
- Common law is available in reality only with great difficulty
- Conversely, the public has similar problems in seeking redress through legal channels

Objections to Existing Engineering Codes of Ethics:

- Relatively few engineers are members of engineering societies.
- Non-members don't necessarily follow the ethical codes.
- Many engineers either don't know that the codes exist, or have not read them.

Which ethical codes apply?

- Depending upon your discipline and organizational affiliations, you may be bound by one, two or even more ethical codes:
- Discipline related (ASME, IEEE, ASCE, IIE etc.)
- National Society of Professional Engineers (NSPE)
- Employee codes (corporation, university, etc.)
- Union Codes

Engineering Ethics

Our engineering ethics codes are derived from a Western cultural tradition

- Ancient Greeks
- Judeo-Christian religions
- Philosophers and thinkers (e.g. Locke, Kant, Mills)

The Hammurabi Code

If a builder has built a house for a man and has not made his work sound, and the house he has built has fallen down and so caused the death of the householder, that builder shall be put to death. If it causes the death of the householder's son, they shall put the builder's son to death....

(Hammurabi, King of Babylon, 1758 B.C.)

Code of Ethics for Engineers

Accreditation Board for Engineering and Technology (ABET)

The Fundamental Principles

Engineers shall uphold and advance the integrity, honor, and dignity of the engineering profession by:

- *using their knowledge and skill for the enhancement of the human race;*
- *being honest and impartial and serving with fidelity the public, their employers, and clients;*
- *striving to increase the competence and prestige of the engineering profession.*
- *supporting the professional and technical societies of their discipline.*

The Fundamental Cannons

Engineers shall

- *Hold paramount the safety, health, and welfare of the public in the performance of their professional duties;*
- *perform service only in areas of their competence;*
- *issue public statements only in an objective and truthful manner;*
- *act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest;*
- *build their professional reputations on the merits of their services and shall not compete unfairly with others*
- *act in such manner as to uphold and enhance the honor, integrity and dignity of the profession;*
- *continue their professional development throughout their careers, and shall provide opportunities for the professional development of those engineers under their supervision.*

CODES OF ETHICS - ROLES OR FUNCTIONS

1. Inspiration and Guidance:

☑Codes provide positive stimulus for ethical conduct and helpful guidance by using positive language.

☑Codes should be brief to be effective and hence such codes offer only general guidance.

☑Supplementary statements or guidelines to give specific directions are added by a number of societies or professional bodies.

2. Support:

☑Codes give positive support to those seeking to act ethically.

☑An engineer under pressure to act unethically can use one of the publicly proclaimed codes to get support for his stand on specific moral issues.

☑Codes also serve as legal support for engineers.

3. Deterrence and discipline:

- ☐Codes can be used as a basis for conducting investigations on unethical conduct.
- ☐They also provide a deterrent for engineers to act immorally.
- ☐Engineers who are punished by professional societies for proven unethical behavior by revoking the rights to practice as engineers are also subjected to public ridicule and loss of respect from colleagues and local community.
- ☐This helps to produce ethical conduct even though this can be viewed as a negative way of motivation.

4. Education and mutual understanding:

The codes can be used for discussion and reflection on moral issues and thereby improves the understanding of moral responsibilities among all engineers, clients, public and good organizations.

5. Contributing to the profession's public image:

Codes present the engineering profession as an ethically committed society in the eyes of the public thus enhancing their image.

6. Protecting status quo:

Codes establish ethical conventions, which can help promote an agreed upon minimum level of ethical conduct.

7. Promoting business interests:

Codes can place unwarranted restraints of commerce on business dealings.

Relative importance of the various functions of codes of ethics

- ☐The perspective of engineering as social experimentation clearly emphasizes the primary role supportive function" of the codes of ethics. This is so because, only this support enables engineers, speak out clearly and openly their views, to those affected by engineering projects.
- ☐The, "inspiration and guidance" and "educative" functions are also important in promoting mutual understanding and in motivating engineers to act with higher moral standards.
- ☐The "disciplinary" function in engineering codes is of secondary importance. Those with unethical conduct when exposed are subject to law. Developing elaborate paralegal procedures within professional societies duplicates a function which can be done better by legal system. At best, codes should try to discipline engineers in areas which are not covered by law.
- ☐The worst abuse of codes has been to restrict honest moral effort in the name of "preserving profession's public image" and "protecting status quo". The best way to increase trust is by encouraging and aiding engineers to speak freely and responsibly about public safety.

Limitations of Codes of Ethics

1. Codes are restricted to general and vague wording. They cannot be straightaway applied to all situations. It is impossible to foresee the full range of moral problems that can arise in a complex profession like engineering.
2. It is easy for different clauses of codes to come into conflict with each other. Usually codes provide no guidance as to which clause should have priority in those cases, creating moral dilemmas.
3. They cannot serve as the final moral authority for professional conduct. If the code of a professional society is taken as the last word, it means that we are getting into a particular set of conventions i.e. ethical conventionalism.
4. *Andrew Oldenquist and Edward Slowter pointed out how the existence of separate codes for different professional societies can give members the feeling that ethical conduct is more relative than it is and that it can convey to the public the view that none is "really right". The current codes are by no means perfect but are definitely steps in the right direction.*

The problems of law in engineering

1. The greatest problem of law in engineering is of „minimal compliance“. Engineers and employers can search for loop holes in the law to barely keep to its letter while violating its spirit. Engineers will tend to refer to standard readymade specifications rather than come up with innovative ideas. Minimal compliance led to the tragedy of the “Titanic”.
2. Continually updating laws and regulations may be counter-productive and will make law always lag behind technology. This also overburdens the rules and regulators.
3. Many laws are “non-laws” i.e. laws without enforceable sanctions. These merely serve as window dressing, frequently gives a false sense of security to the public.
4. The opponents of the law may burden it intentionally with many unreasonable provisions that repeal will not be far off.
5. Highly powerful organizations, like the government can violate the laws when they think they can get away with it by inviting would be challengers, to face them in lengthy and costly court proceedings. This also creates frustration with the law.

Role of law in engineering

- ☑It is wrong to write off rule-making and rule following as futile. Good laws, effectively enforced, clearly produce benefits.
- ☑Reasonable minimum standards are ensured of professional conduct.
- ☑It also provides a self-interested motive for most people and corporations to comply.
- ☑They also serve as powerful support and defense for those who wish to act ethically in situations where ethical conduct might not be welcome.
- ☑Viewing engineering as social experimentation provides engineers with a better perspective on laws and regulations.
- ☑Precise rules and enforceable sanctions are appropriate in cases of ethical misconduct that involve violations of well established and regularly reexamined procedures that have as their purpose the safety of public.
- ☑In areas of experimentation, rules must not attempt to cover all possible outcomes of an experiment, nor must they force the engineer to adopt a rigidly specified course of action.

Here the regulations should be broad based guidelines but should hold the engineer accountable for his or her decisions.