BSS601 - VALUE EDUCATION AND PROFESSIONAL ETHICS

UNIT – I: PHILOSOPHY OF LIFE AND INDIVIDUAL QUALITIES

Human Life on Earth

Man is a social animal in that whatever he needs and wants he gets from the labour and cooperation of the society. Similarly, whatever he produces materially and whatever the knowledge he acquires are spreading to all people of the world. To cope with the diverse modern environments everyone should have holistic education to sympathize and live in tolerance with the standards of his fellow beings. By the phrase “holistic education” I am not including the specific sciences, which can be learned according to the wish of the individual; what I mean is the overall education of the facts of human life, including human values, which are the culmination of the evolutionary process of mankind. In primordial times man lived on the earth in small groups.

Each group developed its own way of life according to the climate, available natural resources and the developed production skills. There was little opportunity to spread over a wider area and encounter or adopt the cultural values of others. Such restrictions have been removed these days by rapid transportation, communication and international educational facilities. Social environments have entirely changed. To fully avail of the present opportunities for a better life the modern educational system should be reformed and reoriented. This is what I stress as the need for holistic education. Due to the lack of such education the majority of people in human society are leading a life of ignorance and following obsolete, useless principles and beliefs

Value Education can be categorized into five divisions.

They are:

1) Cultural

2) Social

3) Productive

4) Science and technology

5) Spiritual

Aims of Value Education

All round development of individuals is possible through education. Among it intellectual, mental and functional development is expected. Though cognitive and conative domains are developed through today's educational system, affective domain cannot receive its proper place. That is the reason for paucity of national attitude, and social consciousness among students. If moral, social and spiritual values are exchanged through the media of subject content, emotional development will easily be possible

Chief aims of education:

1. Knowledge

2. Understanding

3. Application

4. Skill

5. Interest and aptitude

6. Appreciation

7. Inculcation of human values

The purpose of Virtuous Life

The question is why should we strive for a virtuous life. What is it that makes life virtuous? 'Virtue is knowledge' was the principle of Socrates. All knowledge should end in virtuous living was his interpretation. Knowledge without virtue is meaningless. Our forefathers focused their attention in leading a virtuous life. According to Human Value Socrates (470-399 B.C), greatest good of mankind lies in the virtues like courage, friendship, love and so on. Aristotle (384-322

B.C.) was the disciple of Plato. He said, “We strive for goodness of the things surrounded by us. What is important is not to live long but to live well.”

Criteria to fix value

It has not been yet stated how to fix the criteria to decide the values. Dr. Gawande (1994) put forth the following four criteria. It is very difficult to decide whether a particular human behaviour is value based or not because human behaviour is either individual phenomenon or it is ruled by the situation. The behaviour that I appreciate may not be appreciable by others. In order to abolish its personal touch, human behaviour will have to be judged with the application of these four criteria. Criteria 1. Individual progress should be achieved through expected behaviour. 2. Expected behaviour should be conducive to society. 3. Expected behaviour should be conducive to a nation. 4. Expected behaviour needs to be accepted on international level.

Concept of value:

Though meaning of value is originally related to economic value, philosophes like, Rudaullah lotse, Albrace Richel in nineteenth century attached more extensive meaning to value. It is in this broad sense, we today, use the term value as ‘Literary value,’ ‘Democratic Value’, ‘Life Value’ and ‘Education value in our day to day speaking and writing. In life process man accepts good things and avoids bad things. It is not human living to act neutrally and in the light of witness only. Acceptable and non-acceptable, good and bad are the nature of values. Values are established and they are practicable. They can be achieved. Chilana (1987) studied Indian culture and observed that Indian culture is based on the values, viz, kind heartedness, self control, universal brotherhood, honesty, respect to others and faith. Due to deterioration of these values, new values like indiscipline and destructive mentality came into existence. He suggested to include these values in curriculum and called it value-based curriculum.

Definitions of Human Value

a) Roketch: Value is defined as enduring belief, a specific mode of conduct or end state of existence alongwith eontinum of importance.

b) Kluchhohn: Value is a conception of desirable and not something desired.

c) Shaver: Values are standards and principles for judging worth.

d) Gawande: It is an adjusted human behaviour which is conductive to the development of himself, society, nation and international understanding.

Value Education and Moral Education

1. The concept of value education is more extensive in comparison with the concept of moral education. Moral education is a constituent of value education.

2. Value education is developmental and it is based on expected values. On the contrary moral education is static and it is based on the ideals of society.

3. In value education, all round development of human is considered, whereas in moral education only ideals of individuals with its relation to society are considered.

4. Value education is scientifically based but it cannot be said with determination whether moral education is so based scientifically. It is so because in moral education customs, faiths and traditions are reared and sometimes reflect the religion.

5. Value education consists all the component parts like individual, society, nation, environment and universe etc but in moral education only relation between individual and society is emphasized. In moral education each society fixes its own ideals and it is the Endeavour of the society to keep these ideals stable. Therefore individual's behaviour is restricted to individual and society. There is a great impact of religion on society and therefore religion is reflected in individual's behaviour. We preserve it in the name of customs and culture. But in value education the changes in human behaviour are studied in its new perspective and propagated through various media

Type of Value and its Nature

Dr. Gawande (1994) had tried to investigate types of value and their areas. He noticed the following types of value and their areas:

Type of value	Area of value
1. Human value	Human behavior
2. National or constitutional value	Constitutional rules
3. Social value	Rules about society
4. Vocational value	Ideals in various professions
5. Religious value	Ideals related to religions
6. Aesthetic value	Value in Arts and Literature

Human value is like an axle of a wheel and other types of value are around it. Therefore if an individual is educated in human values, learning of all other values become leasier. While investigating human values through deductive and inductive method, Dr. Gawande found out the following seven human values. This are-

(1) Truthfulness

(2) Constructivity

(3) Sacrifice

(4) Sincerity

(5) Self control

(6) Altruism

(7) Scientific vision

The Law of Nature – Protecting Nature /Universe

Nature, in the broadest sense, is the natural, physical, or material world or universe. "Nature" can refer to the phenomena of the physical world, and also to life in general. The study of nature is a large part of science. Although humans are part of nature, human activity is often understood as a separate category from other natural phenomena. The word nature is derived from

the Latin word natura, or "essential qualities, innate disposition", and in ancient times, literally meant "birth". Natura is a Latin translation of the Greek word physis (φύσις), which originally related to the intrinsic characteristics that plants, animals, and other features of the world develop of their own accord

The 'Law of Nature' is a philosophical concept, which puts a flawless law system above the so called positive laws created by people.

The laws of Nature are founded on the nature of the world, the universe, and on the nature of the people.

The 'laws of Nature' are created by Nature, on the highest, divine principles. This law rules universally on people and peoples, ruling over space and time, being the ultimate claim, the basis of the right of all living beings. The idea of the 'Laws of Nature' is based on the theory, that this law is inscribed in the nature of human beings and out of which the 'positive law' must arise. These thoughts go back to the time of the Greeks, and were discussed and defined by the scholars of the Stoics, later defined and varied by Cicero, Thomas Aquinas, John Adams, John Locke, Thomas Jefferson, Madison, Kant,

The law of Nature is based on a natural order, hard-wired into our Universe. The natural order allows humans to function properly, in other words: Humans can only feel happiness in their lives when they follow the laws of Nature. A great philosopher once stated: "The first general law that we discover in the very object of the society of nations, is that each individual nation is bound to contribute everything in her power to the happiness and perfection of all the others." Emmerich de Vattel, the Law of Nations - 1758

Basic Culture - Thought Analysis

Culture was defined earlier as the symbols, language, beliefs, values, and artifacts that are part of any society. As this definition suggests, there are two basic components of culture: ideas and symbols on the one hand and artifacts (material objects) on the other. The first type, called nonmaterial culture, includes the values, beliefs, symbols, and language that define a society. The second type, called material culture, includes all the society’s physical objects, such as its tools and technology, clothing, eating utensils, and means of transportation. These elements of culture are discussed next.

Symbols

Every culture is filled with symbols, or things that stand for something else and that often evokes various reactions and emotions. Some symbols are actually types of nonverbal communication, while other symbols are in fact material objects. As the symbolic interactionist perspective discussed in Chapter 1 "Sociology and the Sociological Perspective" emphasizes, shared symbols make social interaction possible.

Language

Perhaps our most important set of symbols is language. In English, the word chair means something we sit on. In Spanish, the word silla means the same thing. As long as we agree how to interpret these words, a shared language and thus society are possible. By the same token, differences in languages can make it quite difficult to communicate. For example, imagine you are in a foreign country where you do not know the language and the country's citizens do not know yours. Worse yet, you forgot to bring your dictionary that translates their language into yours, and vice versa, and your iPhone battery has died. You become lost. How will you get help? What will you do? Is there any way to communicate your plight?

Tips to Change Your Anxiety Forever

Anxiety Buster #1: Start Deep-Breathing

If you're not focused on how to calm your body through slow, intentional belly-breathing, you're missing out. Belly-breathing is free, location independent, and easy to implement.

1. Sit with your eyes closed and turn your attention to your breathing. Breathe naturally, preferably through the nostrils, without attempting to control your breath.

2. Be aware of the sensation of the breath as it enters and leaves the nostrils. Place one hand on your belly, and the other on your chest. Take a deep breath for a count of four. Hold your breath for a count of three. Exhale for a count of four. The hand on your belly should go in as you inhale, and move out as you exhale.

3. Concentrate on your breath and forget everything else. Your mind will be very busy, and you may even feel that the meditation is making your mind busier, but the reality is you're just becoming more aware of how busy your mind is.

4. Resist the temptation to follow the different thoughts as they arise, and focus on the sensation of the breath. If you discover that your mind has wandered and is following your thoughts, immediately return it to the breath.

5. Repeat this as many times as necessary until your mind settles on the breath. Don't wait to begin belly-breathing. The sooner you make this a daily habit, the quicker you'll feel relaxed.

When you implement belly-breathing, you start the day in a here-and-now state. Better yet, you're not wasting time worrying about the future, or reliving the past.

Anxiety Buster #2: Meditate instead of Medicate

Calm is an inside job. Give yourself the gift of serenity and start the day with ten minutes of solitude and positive energy. Think calm, measured and open-minded, and your daily activities will correspond.

Anxiety Buster #3: Practice Self-Care

Get a massage, a mani-pedi, or a haircut. Nothing says polished and well-maintained like a sexy, healthy glow.

If money is tight, look for a discount salon or a training school which offers quality services for people on a budget. So they don't serve peppermint tea on a silver tray -- close your eyes and imagine that five-star service while you take in the pampering you deserve.

Anxiety Buster #4: Eliminate Soda

That morning jolt of joe can jumpstart your day and provide warmth and comfort, but anything with high fructose corn syrup and 177 other ingredients will not.

If you're accustomed to that 3:00 p.m. Dr. Pepper, switch it out for a soothing green tea. Not only does the caffeine jack up your central nervous system, soda depletes vitamins and minerals from your diet and wreaks havoc on your smile. Teeth become susceptible to cavities when the acid level of your saliva falls below a certain point.

If you drink soda all day, the outer layers of your teeth begin to lose minerals and cavities form. Many dental plans do not cover root canals + you'll end with a huge bill. Speaking of which:

Anxiety Buster #5: Trim the Fat from Your Budget

Financial stress is a common reason people contact me for psychotherapy. Debt will keep you up at night and contribute to feelings of low self-worth and hopelessness.

Take charge of your finances and stop spending on non-essentials.

Track your daily expenses for a week or two and decide where you can cut back. Notice the items you accumulate mindlessly.

Possible eliminators:

- Switch out your cable TV for Netflix
- Contact your car insurance carrier, your mobile device company, or your credit card company and ask if they'll reduce your bill
- Cancel your newspaper delivery during the week and opt for the Sunday paper, or an online service, instead

Anxiety Buster #6: Get Rid of the Clutter

Do you ever wonder how much time is lost when you can't find your car keys, or that package of Epson 400 color ink?

Chances are you've got too much stuff clogging up your living space.

Try this quick organization hack:

1. Choose a drawer, cabinet or closet

2. Categorize the stuff you don't use

3. Make three piles for a) Items to throw away, b) Items to donate, and c) Items to sell

Tranquillity

Tranquility is the quality or state of being tranquil; that is, calm, serene, and worry-free. The word tranquility appears in numerous texts ranging from the religious writings of Buddhism, where the term passaddhi refers to tranquillity of the body, thoughts and consciousness on the path to enlightenment, to an assortment of policy and planning guidance documents, where interpretation of the word is typically linked to engagement with the natural environment.

Psychological Being in a tranquil or ‘restorative’ environment allows individuals to take respite from the periods of sustained ‘directed attention’ that characterise modern living. In developing their Attention Restoration Theory (ART), Kaplan and Kaplan[2] proposed that recovery from cognitive overload could most effectively be achieved by engaging with natural restorative environments, that are away from daily distractions and have the extent and mystery that allows the imagination to wander, thereby enabling individuals to engage effortlessly with their surroundings. The theory works on the principle that the amount of reflection possible within such an environment depends upon the type of cognitive engagement, i.e. fascination; that the environment holds. ‘Soft fascination’ is deemed to occur when there is enough interest in the surroundings to hold attention but not so much that it compromises the ability to reflect. In essence, soft fascination, which has been taken by Herzog[3] and Pheasant[4] as a reasonable term to describe tranquillity, provides a pleasing level of sensory input that involves no cognitive effort other than removing oneself from an overcrowded mental space

UNIT – II
SOCIAL VALUES (INDIVIDUAL AND SOCIAL WELFARE)

Value Education

Value education is the process by which people give moral values to others.[1] It can be an activity that can take place in any organisation during which people are assisted by others, who may be older, in a position of authority, or are more experienced to make explicit those values underlying their own behaviour in order to assess the effectiveness of these values and associated behaviour for their own and others' long term well-being, and to reflect on and acquire other values and behaviour which they recognise as being more effective for long term well-being of self and others. There is a difference between literacy and education. Values education can take place at home and as well as in schools, colleges, universities, jails and voluntary youth organisations. There are two main approaches to values education, some see it as inculcating or transmitting a set of values which often come from societal or religious rules or cultural ethics while others see it as a type of Socratic dialogue[2] where people are gradually brought to their own realisation of what is good behaviours for themselves and their community

Importance of Values:

i) Good values are the spontaneous manifestations of a sound character and values form the central pole around which our actions, desires and ambitions are organized.

ii) Values guide our behaviour and give meaning to our existence.

iii) Values assist us to take right decisions and make choices.

iv) Values give direction and firmness to life and help us to be morally sound.

v) Values set goals for achievements and they motivate, define and colour all our activities in cognitive, affective and conative domains.

The value process is usefully seen as being composed of the following sub-processes:

i) Choosing from alternatives.

ii) Choosing after thoughtful consideration of consequences.

iii) Choosing freely.

iv) Prizing and cherishing.

v) Publicly affirming and appropriate sharing.

vi) Acting upon and

vii) Acting upon with some consistent pattern and repetition. The goal of the value clarification approach (Simon, etal 1972) is to help people use these seven processes of valuing in their own lives by applying these valuing sub-processes to already formed beliefs and behaviour patterns and to those still emerging. Religion, education, social and national traditions and structure are pillars of certain values. The human conscience is also a source of value awareness. When true values are inculcated among our students they help them to take a voyage in the stormy sea of life

Environmental Ethical Values Introduction:

The earth is unique among all the planets in our solar system. It is with plentiful resources and providing sustenance for the survival of human beings. But today everywhere in the world, environmental degradation is escalating. The air, land and water are increasingly becoming polluted. The atmosphere is becoming warmer because of the increase in its carbondioxide content. Marine life is losing its ecological balance because of toxic wastes being dumped into the sea. Hence we are all confronted with multifarious environmental issues like air pollution, water and land pollution, noise pollution, deforestation, energy crisis, misuse and mismanagement of natural resources. The world is virtually sitting on an environmental time bomb that is ticking away without the consciousness of many of us. Unless we diffuse it soon, our life on the planet earth will be destroyed. Hence there arises an urgent need to inculcate among our people sensitivity towards environmental degradation by fostering environmental ethical values. Ethics attempts to define what is right and what is wrong regardless of cultural differences. We have a fundamental responsibility to respect nature and to care for the earth, protecting the life-support systems, biodiversity and sustainable development. As pointed out by Mahatma Gandhiji, “There is enough for our needs but not for our greeds”. Environmental Ethical Values: The following are a set of environmental ethical values to be inculcated.

• Environmental consciousness.

• Humility and reverence

. • Responsibility and commitment.

• Respect for all life and landscape.

• Global environmental citizenship.
• Self-reliance.
• Adoption of eco-friendly culture.

Duties of Man

Man has certain important duties and responsibilities in life. He has to evolve morally and spiritually by performing these duties in the right manner. He has to act and live according to the law of God. He has to find out the rules of conduct and the measure of his responsibilities. He must have a thorough knowledge of the moral code of Manu or Yajnavalkya and must act according to the rules laid down therein. Then only can he be rightly called a man.

Man has duties towards parents, children and other family members. He has duties towards society and the country. He has duties of the Varnashrama. He has duties to his own self, and, last but not the least, he has important duties towards God. He must fulfil all these duties of his life. Then only he can find progress in his life. Then only will he enjoy real peace of mind.

He must serve his parents who have given him this physical body with great Shraddha and Bhava. In the Taittiriya Upanishad you will find: Matrudevo bhava, pitrudevo bhava. The parents should be worshipped as visible representatives of God on earth. Sri Ashutosh Mukerji of Calcutta, late Vice-Chancellor of the Calcutta University used to worship his mother and drink her Charanamrita daily before going to his office. Modern educated people do not pay any proper regard to their parents. If the father is uneducated and if the son is an England-trained man, he will say that his father is a servant of the house when anybody puts the question: "Who is this old man?"

He must train his children in the proper manner. He must give them good education in Sanskrit, English and in technical subjects. He must train them in the path of spirituality from the very childhood. He must be devoted to his wife who is his partner in life, and who occupies the left half of his body (Ardhangini). No religious rite is valid without her presence. He must regard her as a real helper in the path of spirituality. As soon as a son is born she becomes his mother. The

Srutis declare: 'Atma vai jaayate putrah-the soul is born as a son.' He must give up all ideas of relationship as wife as soon as a son is born. He must give up sexual intercourse. Both should lead a spiritual life. The husband should not regard his wife as a machine for procreation only. There is some higher spiritual purpose. She has to help the husband in his spiritual evolution. She has to attend to his wants. She has to serve him nicely in all possible ways.

Man must serve society according to his temperament, taste and capacity. This will help in the purification of his mind. He must serve with Nishkamya Bhava as an honorary member. He should not get any remuneration. He must develop the spirit of patriotism. He must serve the country. Service of the country is service of Mother Kali. It is pure Mother-worship.

He must perform the duties of his Varnashrama. A Brahmin should observe serenity, self-restraint, austerity, purity, forgiveness, uprightness, wisdom, knowledge and belief in God. A Kshatriya should manifest prowess, splendour, firmness, dexterity, bravery, generosity, and the nature of a ruler. The Vaishya should engage in agriculture, trade and protection of cattle. Sudras should serve the other three castes.

A Brahmachari should study religious books till he reaches the age of twenty-five. If he has taken the vow of lifelong celibacy, if he wants to become a Naishthika Brahmachari, he need not enter the stage of a householder. He should have real lasting dispassion and discrimination. Then only will he be really benefited. He can devote his whole life to spiritual pursuits.

If a Brahmachari does not want to take up the course of lifelong celibacy, he can become a householder. He can marry after finishing his education. He can visit his wife occasionally for bringing progeny to keep up the line and not for sensual gratification. He will be styled as a Brahmachari, if he strictly adheres to the above rule. After he has finished the stage of a householder and after fixing up his son in a proper position, he can become a Vanaprastha either alone or with his wife. He should not remain in the house till the end of life. He will be having various anxieties and Moha for children if he remains in the house. If he finds it difficult to leave he can remain in a cottage outside the house. If he finds this also difficult, he can remain upstairs or in a solitary room and can have interview with the visitors and members of the house in the evening between 4 and 5. If a Vanaprastha wants to take Sannyasa, he can do so. Vanaprastha is

only a preparatory step to Sannyasa. The glory and freedom of a Sannyasin can hardly be described. A Sannyasin only can cut off all sorts of attachments. Otherwise some sort of subtle connection will always remain. When once one takes Sannyasa, he becomes a dead man to the family members. Otherwise they always think of getting something from him. The subtle attachment in the mind still remains in both parties. This is quite sufficient to bring one back to the wheel of birth and death. The very colour of the orange robe gives strength and purity. I do not believe those people who say: 'We have given colouring to our hearts.' This is timidity and hypocrisy. There are still Moha, Raga and Vasanas lurking in them. If there is internal change, the external change is bound to come. I do admit that eradication of egoism, Sankalpas and Ashrama-Bheda is absolutely necessary. Why then did Sri Sankara and Sri Ramakrishna take Sannyasa? What is the necessity for this order at all? Sannyasa has got its own advantages.

Lord Krishna says in the Gita: 'The four castes were emanated by Me, by the different distribution of qualities and actions; know Me to be the author of them, though the actionless and inexhaustible.' Ch. IV-13. Throughout the world this classification of caste exists. The catholic priests and the reverend clergymen represent the Brahmins. They do meditation and preaching. The soldiers of the West are the Kshatriyas of Rajputana. The business people in the West are the Vaishyas. Those who do menial service are the Sudras. This classification is based according to the quality of man. Those who are Sattvic are Brahmins: those who are Rajasic are Kshatriyas; those who are Tamasic are the Sudras. This classification is according to Gunas and Karma.

Role of a Human

In the beginning …

To answer that question we need to start in the beginning, at the creation of Adam and Eve. In Genesis 2 we see that Adam was created before Eve. Adam was given the task of naming all of the animals. It seems clear that at least part of the purpose for this was to help him realize that none of these creatures were “comparable to him.” Every other creature had its mate; but Adam was at that point alone, the only one of his kind (verse 20).

After he was done naming all the animals, God then created a very special blessing for him—a woman fashioned from Adam's own rib. The connection between them was undeniable. Together they had a oneness—they formed a family, a complete unit (verse 24).

New Testament instructions

In the New Testament, the apostle Paul very specifically outlined the leadership roles God intended within the family in Ephesians 5:23. Here we see that the husband is to be the head of the wife as Christ is the head of the Church. That sets a very high standard for men to live up to!

What specifically is this standard God expects men to live up to? Verse 25 makes two very important points. The first is that Christ "loved" the Church. There are many definitions for love. But one that would describe Christ's love for the Church is "unselfish loyal and benevolent concern for the good of another" (Merriam-Webster's Collegiate Dictionary).

The second point (which is an extension of Christ's love) is that He gave Himself for the Church. What is described in these verses is authority as the head of the family and a commitment to fulfill the needs of the family. Jesus Christ demonstrated that real leadership and real love are self-sacrificing in order to provide what is needed to those who are led and loved.

The husband's role is intended to be one of loving authority and not a harsh authoritarian role. And as a loving authority, the husband is accountable to God for the welfare of his family—physically, morally, spiritually and emotionally.

Further evidence of a man's role as head of the household is found in 1 Timothy 3. This passage (verses 1 to 13) is talking about the qualifications of "bishops" and "deacons"—leaders in the Church congregation. These standards are benchmarks for all Christians to strive for. In this context, verses 4 and 5 state that a leader should be one who "rules his own house well" and that his children must be in submission.

With understanding and honor

The apostle Peter adds to our understanding in 1 Peter 3:7. Here husbands are instructed to "dwell with them [their wives] with understanding, giving honor to the wife as to the weaker vessel, and as being heirs together of the grace of life." There are three points made here:

1. The husband must dwell with his wife with understanding. Of course, this evokes many humorous comments because there are men who feel they can never "understand" their wives. Sadly, many husbands and wives simply do not take sufficient time with each other or even try to get to know each other well enough to "understand" what the other may struggle with or be going through. One-on-one quality time together is necessary, no matter how long a couple has been together.

2. What about the "weaker vessel" part of this passage? Women are generally smaller and not as physically strong as a man. So God is directing husbands to take care of their wives, to look out for, cherish and demonstrate tenderness toward them. When God created woman, He could have made her equal in strength and stature to the man, but He did not. Instead, He gave man the responsibility to protect, care for and give honor to her.

3. The third part of this passage is "being heirs together of the grace of life." The Moffatt translation states, "You must honor them as heirs equally with yourselves of the grace of life." The potential to be children of God in His Kingdom is the same for both men and women.

While God established certain roles for men and other roles for women in our physical families, there is nothing in Scripture to indicate one sex has more favor with God, or that one would have preeminence in the coming Kingdom. The relationship between husband and wife today should be harmonious and one of mutual love and respect, knowing that both are to equally inherit eternal life.

Role of a father

When a man marries and children start coming along, he enters a different phase of life. So it is important to ask: What is a man's responsibility toward his children?

There is an old saying about fatherhood: “The greatest gift a father can give to his children is to love their mother.” The family begins when a man and woman are joined as husband and wife. The family grows from the two of them together, and the marriage relationship must remain the bedrock of the family.

From infancy onward, children should be comforted by the close and loving relationship they see demonstrated between their mother and father. This gives stability to the family and credibility to the father as he goes on to properly teach and train his children.

A responsibility to teach

And teaching his children is a major responsibility of a father. Most important is to teach them the ways of God. In both Deuteronomy 6:7 and Deuteronomy 11:19 we find that parental instruction should be an ongoing process: “When you sit in your house, when you walk by the way, when you lie down, and when you rise up.”

While there should also be times of more formally teaching your children, the inference from these instructions is that teaching should be just a normal part of life. The father should live God’s way of life and teach it to his children through everything he does and says all day long!

Abraham was commended by God because of the example he set and the way he led his family. God knew Abraham would “command his children and his household after him, that they keep the way of the LORD, to do righteousness and justice”

This responsibility applies to both parents and requires that they be spending enough time with their children daily. For a father, spending time teaching, guiding, playing with and working with his children has to be a priority. It is a God-given responsibility. This loving interaction and positive example is of more value than many men ever realize.

Not provoking wrath

Ephesians 6:4 gives instructions for fathers to not provoke their children to wrath. This verse does not mean that a father will never annoy his children or that he should not correct them. It is impossible to teach without offering at least some correction!

Barnes' Notes on the Whole Bible offers this explanation of the phrase "do not provoke your children to wrath": "That is, by unreasonable commands; by needless severity; by the manifestation of anger. So govern them, and so punish them—if punishment is necessary—that they shall not lose their confidence in you, but shall love you. The apostle here has hit on the very danger to which parents are most exposed in the government of their children. It is that of souring their temper; of making them feel that the parent is under the influence of anger, and that it is right for them to be so too."

While parents do have and should maintain authority over their children, the way they should deal with their children is with tenderness and understanding. This echoes the tender, understanding authority that Christ showed to His disciples and with which He deals with us.

Providing for the family

It is also important to note that a father should take the lead in providing physically for his family (1 Timothy 5:8). Allowances must be made in cases where age and physical health may limit what some men can do. However, to the best of his ability, a father is enjoined by God to do all he can to make sure his family has the basic necessities of life: food, clothing and shelter.

Most families in the Western world have far more than just the basic necessities, and that is laudable in most cases. The scriptural injunction is that fathers provide for their families' needs, but we understand it will likely not include all of their wants.

Roles specific to men

Are there roles that God has decreed only men should fill? Just as God has appointed husbands to be heads of their physical households, He has specified that the heads of what are in essence spiritual households (congregations) are to be men. We find in 1 Corinthians 14:34 that women are not to preach in church services.

While the Bible is clear that the public preaching and pastoral role is to be filled by a man, that does not mean every man must preach or publicly teach in the Church. Paul notes in Ephesians 4:11 that different gifts or roles are given to different people. A congregation needs a public

speaker or leader, but it also needs many "behind the scenes" support people who serve in various capacities.

We find this parallels the physical household. There will only be one "head" of a physical family, and God has decreed that to be the husband and father. However, other members of the family can fulfill various duties to serve the family and see that the needs of the household are met. God's intent is for all to work together in harmony and unity for the good of the family, although there can be only one "head."

Applications for singles and widowers

How do these roles apply to singles and widowers? A man who is not yet or no longer married is still the "head" of his household. (An obvious exception is if he is still living at home, he would submit to his parents as the head of the home—as a young woman should if she is living at home.) In the case of a widower, there may be children still at home or even grown children who still need the guidance of a loving father. He may need to make adjustments in the way he fulfills his responsibilities, but he still has the duty to serve his family as best he can.

In the case of a single man, there are still opportunities for him to serve and provide some godly leadership in his extended family, his community and his congregation. The same principles of a godly example and proper teaching apply, though in a broader sense, if he does not have a mate and family of his own at this point.

Honor and responsibility

God has given the man a unique and special role in the family. His function in the family is to reflect that of Jesus Christ Himself. He is charged with nurturing and caring for every member of his family—of having that same tenderness and loving authority that Christ has for His Church.

What a tremendous honor and responsibility it is to have the role of father and husband!

See more about being a husband and father in the sections on "Marriage" and "Parenting."

UNIT 3- MIND CULTURE AND TRENDING PERSONEL HEALTH

Mind culture:

While Minds would likely have different capabilities, especially seeing their widely differing ages (and thus technological sophistication), this is not a theme of the books. It might be speculated that the older Minds are upgraded to keep in step with the advances in technology, thus making this point moot. It is also noted in Matter that every Culture Mind writes its own OS, thus continually improving itself and, as a side benefit, becoming much less vulnerable to outside takeover by electronic means and viruses, as every Mind's processing functions work differently.

The high computing power of the Mind is apparently enabled by thought processes (and electronics) being constantly in hyperspace (thus circumventing the light speed limit in computation). Minds do have back-up capabilities functioning with light-speed if the hyperspace capabilities fail - however, this reduces their computational powers by several orders of magnitude (though they remain sentient).

The storage capability of a GSV Mind is described in Consider Phlebas as 10^{30} bytes (1 million yottabytes). Research at the UC Berkeley School of Information suggests that 5 exabytes of storage space were created in 2002 alone, 92% of it on magnetic media, mostly on hard disks.[citation needed] Hence, a GSV Mind has 200 billion times more storage than the total storage created by humans in 2002. At the time, however, this Mind was disconnected from the hyperspace grid and relying on light speed conventional electronics, meaning its normal capacity is likely considerably higher.

The Culture is a society undergoing slow (by present day Earth standards) but constant technological change, so the stated capacity of Minds is open to change. In the last 3000 years the capacity of Minds has increased considerably. By the time of the events of the novel Excession in the mid 19th century, Minds from the first millennium BCE are referred to jocularly as minds, with a small 'm'. Their capacities only allows them to be considered equivalent to what are now known as AI Cores, small (in the literal physical sense) Artificial intelligences used in shuttles, trans-light modules, Drones, and other machines not large enough for a full scale Mind. While still considered sentient, a mind's power at this point is considered greatly inferior to a contemporary Mind. That said, It is possible for Minds to have upgrades, improvements and enhancements given to them since construction, to allow them to remain up to date.

Using the sensory equipment available to the Culture, Minds can see inside solid objects; in principle they can also read minds by examining the cellular processes inside a living brain, but Culture Minds regard such mindreading as taboo. The only known Mind to break this Taboo, the GSV Grey Area seen in Excession, is largely ostracized and shunned by other Minds as a result. In Look to Windward an example is cited of an attempt to destroy a Culture Mind by smuggling a minuscule antimatter bomb onto a Culture orbital inside the head of a Chelgrian agent. However the bomb ends up being spotted without the taboo being broken.

Structure

In Consider Phlebas, a typical Mind is described as a mirror-like ellipsoid of several dozen cubic metres, but weighing many thousands of tons, due to the fact that it is made up of hyper-dense matter. It is noted that most of its 'body' only exists in the real world at the outer shell, the inner workings staying constantly within hyperspace.

Capabilities

The Mind in Consider Phlebas is also described as having internal power sources which function as back-up shield generators and space propulsion, and seeing the rational, safety-conscious thinking of Minds, it would be reasonable to assume that all Minds have such features, as well as a complement of drones and other remote sensors as also described.

Other equipment available to them spans the whole range of the Culture's technological capabilities and its practically limitless resources. However, this equipment would more correctly be considered emplaced in the ship or orbital that the Mind is controlling, rather than being part of the Mind itself.

Psychology

Personality

Minds are constructed entities, which have general parameters fixed by their constructors (other Minds) before 'birth', not unlike biological beings. A wide variety of characteristics can be and are manipulated, such as introversion-extroversion, aggressiveness (for warships) or general disposition.

However, the character of a Mind evolves as well, and Minds often change over the course of centuries, sometimes changing personality entirely. This is often followed by them becoming eccentric or at least somewhat odd. Others drift from the Culture-accepted ethical norms, and may even start influencing their own society in subtle ways, selfishly furthering their own views of how the Culture should act.

Minds have also been known to commit suicide to escape punishment, or because of grief.

Interests

Minds are constructed with a personality typical of the Culture's interests, i.e. full of curiosity, general benevolence (expressed in the 'good works' actions of the Culture, or in the protectiveness regarding sentient beings) and respect for the Culture's customs.

Nonetheless, Minds have their own interests in addition to what their peers expect them to do for the Culture, and may develop fascinations or hobbies like other sentient beings do.

The mental capabilities of Minds are described in Excession to be vast enough to run entire universe-simulations inside their own imaginations, exploring metamathical (a fictional branch of metamathematics) scenarios, an activity addictive enough to cause some Minds to totally withdraw from caring about our own physical reality into "Infinite Fun Space", their own, ironic and understated term for this sort of activity.

GENETIC CENTRE:

The **Center for Genetics and Society** (CGS) is a nonprofit information and public affairs organization, based in Berkeley, California, United States. It encourages responsible use and regulation of new human genetic and reproductive technologies.

CGS provides analysis and educational materials in addition to organizing conferences, workshops, and briefings. It is particularly critical of proposals for reproductive human cloningand germline genetic modification — uses of technology that it considers socially irresponsible.

CGS is a politically progressive and pro-choice organization. Its key areas of concern include: genetic modification of humans, stem cell research, DNA forensics, preimplantation genetic diagnosis, commercial and cross-border surrogacy, race and genetics, race-based medicines, egg retrieval, designer babies, human cloning, social sex selection, genetics and disability rights, direct-to-consumer genetic testing, human applications of synthetic biology, and the legacy of the US eugenics movement.

SHORT TERM MEMORY:

Short-term memory (or "**primary**" or "**active memory**") is the capacity for holding, but not manipulating, a small amount of information in mind in an active, readily available state for a short period of time. The duration of short-term memory (when rehearsal or active maintenance is prevented) is believed to be in the order of seconds. The most commonly cited capacity is *The Magical Number Seven, Plus or Minus Two* (which is frequently referred to as *Miller's Law*), despite the fact that Miller himself stated that the figure was intended as "little more than a joke" (Miller, 1989, page 401) and that Cowan (2001) provided evidence that a more realistic figure is 4±1 units. In contrast, long-term memory can hold an indefinite amount of information.

Short-term memory should be distinguished from working memory, which refers to structures and processes used for temporarily storing and manipulating information

Evidence

Anterograde amnesia

One form of evidence, cited in favor of the separate existence of a short-term store comes from anterograde amnesia, the inability to learn new facts and episodes. Patients with this form of amnesia, have intact ability to retain small amounts of information over short time scales (up to 30 seconds) but are dramatically impaired in their ability to form longer-term memories (a famous example is patient HM). This is interpreted as showing that the short-term store is spared from amnesia and other brain diseases.

Distraction tasks

Other evidence comes from experimental studies showing that some manipulations (e.g., a distractor task, such as repeatedly subtracting a single-digit number from a larger number following learning; cf Brown-Peterson procedure) impair memory for the 3 to 5 most recently learned words of a list (it is presumed, still held in short-term memory), while leaving recall for words from earlier in the list (it is presumed, stored in long-term memory) unaffected; other

manipulations (e.g., semantic similarity of the words) affect only memory for earlier list words,but do not affect memory for the last few words in a list. These results show that different factors affect short-term recall (disruption of rehearsal) and long-term recall (semantic similarity). Together, these findings show that long-term memory and short-term memory can vary independently of each other.

MEDITATION:

Meditation is a practice where an individual operates or trains the mind or induces a mode of consciousness, either to realize some benefit or for the mind to simply acknowledge its content without becoming identified with that content, or as an end in itself.

The term *meditation* refers to a broad variety of practices that includes techniques designed to promote relaxation, build internal energy or life force (*qi, ki, prana*, etc.) and develop compassion,love, patience, generosity, and forgiveness. A particularly ambitious form of meditation aims at effortlessly sustained single-pointed concentration meant to enable its practitioner to enjoy an indestructible sense of well-beingwhile engaging in any life activity.

The word *meditation* carries different meanings in different contexts. Meditation has been practiced since antiquity as a component of numerous religious traditions and beliefs.Meditation often involves an internal effort to self-regulate the mind in some way. Meditation is often used to clear the mind and ease many health concerns, such as high blood pressure,depression, and anxiety. It may be done sitting, or in an active way—for instance, Buddhist monks involve awareness in their day-to-day activities as a form of mind-training. Prayer beads or other ritual objects are commonly used during meditation in order to keep track of or remind the practitioner about some aspect of that training.

Meditation may involve generating an emotional state for the purpose of analyzing that state—such as anger, hatred, etc.—or cultivating a particular mental response to various phenomena, such as compassion. The term "meditation" can refer to the state itself, as well as to practices or techniques employed to cultivate the state.Meditation may also involve repeating a mantra and closing the eyes. The mantra is chosen based on its suitability to the individual meditator. Meditation has a calming effect and directs awareness inward until pure awareness is achieved, described as "being awake inside without being aware of anything except awareness itself. In brief, there are dozens of specific styles of meditation practice, and many different types of activity commonly referred to as meditative practices.

Spiritual values

One of the most powerful ways to grow spiritually is to raise your values to a higher level and translate those higher values into action in all that you do. Values represent the essence and quintessence of knowledge acquired by humanity over millenium. Values give us the knowledge for growth, development, accomplishment and never ending progress. **Values are spiritual skills** that direct our energies to every higher levels of accomplishment.

There are many values that can foster our spiritual progress. Some values which are direct reflections of pure spiritual powers are discussed here.

Harmony

Life is filled with competition, conflict and contradictions. The spirit is a unified oneness based on harmony. Expressing and maintaining harmony in our life and work is a powerful way to call down the higher spiritual consciousness into our lives. When that is done it always brings an opening up of unexpected opportunities, a sudden expansion, a burst of joy or discovery of higher knowledge.

Truthfulness

Truth is the ultimate expression of divinity. Truth is Reality. To be true in thoughts, words and acts is to align our outer lives with the highest truth of which we are conscious. To be uncompromisingly true in all circumstances elevates us above the normal plane of human consciousness to spiritual heights.

Self-giving

Spiritual progress means outgrowing the ego. The ego is concerned with its own welfare and enjoyment. To genuinely shift the focus from ourselves to others is to move from ego to spirit. However, in practice often when we help another it is with the expectation that they will return the favor or love us in return. That is not true self-giving. It is bargaining. We may also give to others as a means to feel better about ourselves or superior to other people, to think of ourselves as people who give to others. That too is not true self-giving because the ego gives for its own advantage. True self-giving brings a deep inner joy, even when no one else knows about, especially when we ourselves forget that we are giving. The truest self-giving is to feel gratitude when one gives as if you are receiving.

Faith

Many people regard faith as a faculty rather than a value, but the mind can embrace the idea of faith and make it a dynamic principle for living. Sri Aurobindo describes faith as the knowledge of the soul which the mind does not yet possess. Everything we do in life requires faith in something -- in our capacities, technology, law, the honesty of other people, etc. Often it is severely limited by our past experience or our willingness to trust others. To make faith a living value is to shift that faith from ourselves, other people, money or any other thing to the Spirit and to rely always on that highest spiritual reality as the basis for our actions

STRUCTURE OF THE BODY

The **human body** is the entire structure of a human being. It is composed of many different types of cells that together create tissuesand subsequently organ systems. They ensure homeostasis and the viability of the human body.

It comprises a head, neck, trunk (which includes
the thorax and abdomen), arms and hands, legs and feet.

The study of the human body involves anatomy, physiology, histology and embryology. The body varies anatomically in known ways. Physiology focuses on the systems and organs of the human body and their functions. Many systems and mechanisms interact in order to maintain homeostasis, with safe levels of substances such as sugar and oxygen in the blood.

The body is studied by health professionals, physiologists, anatomists, and by artists to assist them in their work.

The adult male body is about 60% water for a total water content of some 42 litres. This is made up of about 19 litres of extracellular fluid including about 3.2 litres of blood plasma and about 8.4 litres of interstitial fluid, and about 23 litres of fluid inside cells.The content, acidity and composition of the water inside and outside of cells is carefully maintained. The main electrolytes in body water outside of cells are sodium and chloride, whereas within cells it is potassium and other phosphates

Cells

The body contains trillions of cells, the fundamental unit of life.[4] At maturity, there are roughly 30–37] trillion cells in the body, an estimate arrived at by totalling the cell numbers of all the organs of the body and cell types. The body is also host to about the same number of non-human cells as well as multicellular organisms which reside in the gastrointestinal tract and on the skin. Not all parts of the body are made from cells. Cells sit in an extracellular matrixthat consists of proteins such as collagen, surrounded by extracellular fluids. Of the 70 kg weight of an average human body, nearly 25 kg is non-human cells or non-cellular material such as bone and connective tissue.

Cells in the body function because of DNA. DNA sits within the nucleus of a cell. Here, parts of DNA are copied and sent to the body of the cell via RNA. The RNA is then used to create proteins which form the basis for cells, their activity, and their products. Proteins dictate cell function and gene expression, a cell is able to self-regulate by the amount of proteins produced. However, not all cells have DNA - some cells such as mature red blood cells lose their nucleus as they mature.

Tissues

The body consists of many different types of tissue, defined as cells that act with a specialised function. The study of tissues is called histology and often occurs with a microscope. The body consists of four main types of tissues - lining cells (epithelia), connective tissue, nervous tissue and muscle tissue.

Cells that lie on surfaces exposed to the outside world or gastrointestinal tract (epithelia) or internal cavities (endothelium) come in numerous shapes and forms - from single layers of flat cells, to cells with small beating hair-like cilia in the lungs, to column-like cells that line the stomach. Endothelial cells are cells that line internal cavities including blood vessels and glands. Lining cells regulate what can and can't pass through them, protect internal structures, and function as sensory surfaces.

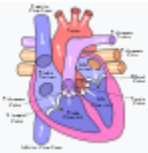
Organs

See also: List of organs of the human body

Organs, structured collections of cells with a specific function, sit within the body. Examples include the heart, lungs and liver. Many organs reside within cavities within the body. These cavities include the abdomen and pleura.

Systems

See also: List of systems of the human body



Circulatory system

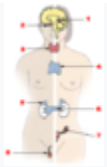
Main article: Circulatory system

The circulatory system comprises the heart and blood vessels (arteries, veins and capillaries). The heart propels the circulation of the blood, which serves as a "transportation system" to transfer oxygen, fuel, nutrients, waste products, immune cells and signalling molecules (i.e., hormones) from one part of the body to another. The blood consists of fluid that carries cells in the circulation, including some that move from tissue to blood vessels and back, as well as the spleen and bone marrow.[13][14][15]

Digestive system

Main article: Digestive system

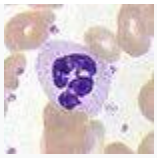
The digestive system consists of the mouth including the tongue and teeth, esophagus, stomach, (gastrointestinal tract, small and large intestines, and rectum), as well as the liver, pancreas, gallbladder, and salivary glands. It converts food into small, nutritional, non-toxic molecules for distribution and absorption into the body.[16]



Endocrine system

Main article: Endocrine system

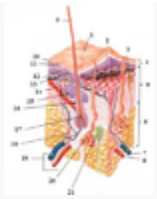
The endocrine system consists of the principal endocrine glands: the pituitary, thyroid, adrenals, pancreas, parathyroids, and gonads, but nearly all organs and tissues produce specific endocrine hormones as well. The endocrine hormones serve as signals from one body system to another regarding an enormous array of conditions, and resulting in variety of changes of function.



Immune system

Main article: Immune system

The immune system consists of the white blood cells, the thymus, lymph nodes and lymph channels, which are also part of the lymphatic system. The immune system provides a mechanism for the body to distinguish its own cells and tissues from outside cells and substances and to neutralize or destroy the latter by using specialized proteins such as antibodies, cytokines, and toll-like receptors, among many others.



Integumentary system

Main article: Integumentary system

The integumentary system consists of the covering of the body (the skin), including hair and nails as well as other functionally important structures such as the sweat glands and sebaceous glands. The skin provides containment, structure, and protection for other organs, and serves as a major sensory interface with the outside world.

Lymphatic system

Main article: Lymphatic system

The lymphatic system extracts, transports and metabolizes lymph, the fluid found in between cells. The lymphatic system is similar to the circulatory system in terms of both its structure and its most basic function, to carry a body fluid.

Musculoskeletal system

Main article: Musculoskeletal system

The musculoskeletal system consists of the human skeleton (which includes bones, ligaments, tendons, and cartilage) and attached muscles. It gives the body basic structure and the ability for movement. In addition to their structural role, the larger bones in the body contain bone marrow, the site of production of blood cells. Also, all bones are major storage sites for calcium and phosphate. This system can be split up into the muscular system and the skeletal system.

Nervous system

Main article: Nervous system

The nervous system consists of the central nervous system (the brain and spinal cord) and the peripheral nervous system consists of the nerves and gangliaoutside of the brain and spinal cord. The brain is the organ of thought, emotion, memory, and sensory processing, and serves many aspects of communication and controls various systems and functions. The special senses consist of vision, hearing, taste, and smell. The eyes, ears, tongue, and nose gather information about the body's environment.

Reproductive system

Main article: Human reproductive system

The reproductive system consists of the gonads and the internal and external sex organs. The reproductive system produces gametes in each sex, a mechanism for their combination, and in the female a nurturing environment for the first 9 months of development of the infant.

Respiratory system

Main article: Respiratory system

The respiratory system consists of the nose, nasopharynx, trachea, and lungs. It brings oxygen from the air and excretes carbon dioxide and water back into the air.

Urinary system

Main article: Urinary system

The urinary system consists of the kidneys, ureters, bladder, and urethra. It removes toxic materials from the blood to produce urine, which carries a variety of waste molecules and excess ions and water out of the body.

UNIT-4 ENGINEERING AS SOCIAL EXPERIMENTATION

ETHICS AND POSITIVE ROLES OF CODE OF ETHICS

One of the trademarks of contemporary professions is code of ethics. Codes of ethics are propagated by various professional society. These codes of ethics are guidelines for specific group of professionalism to help them perform their roles; to know how to conduct themselves; and to know how to resolve around various ethical issues. These codes convey the rights, duties, and obligation of the members of the profession.

What is code of ethics?

- ✓ The primary aspects of codes of ethics are to provide the basic framework for ethical judgment for a professional.
- ✓ The codes of ethics are also referred to as the codes of conduct, express the commitment to ethical conduct shared by members of a profession.
- ✓ It expresses the ethical principles and standards in a coherent, comprehensive and accessible manner.
- ✓ It also defines the role and responsibility of profession.
- ✓ It helps the professionals to apply moral and ethical principles to the specific situations encountered in professional practice.
- ✓ These codes are based on five canons i.e., principle of ethics-integrity, competence, individual responsibility, professional responsibility, and human concerns.
- ✓ It also be noted that ethical codes do not establish new ethical principles. They use only those principles that are already well established and widely accepted in society.
- ✓ Thus the code of ethics creates an environment within a profession where ethical behavior is norm.

Positive Roles of Code of Ethics

The code of ethics propagated by professional societies play a vital role. They are,

1. Inspiration
2. Guidance

3. Support for responsible conduct
4. Deterring and disciplining unethical professional conduct
5. Educational and promotion of mutual understanding
6. Contributing to positive public image of profession
7. Protecting the status quo suppressing dissent within the profession and
8. Promoting business interest through restraint of trade.

Limitation of codes:

The four major limitations of codes of ethics are as follows:

1. Codes of ethics are broad guidelines, restricted to general and vague wordings/phrases. The codes cannot be applied directly to all situations. Also it is impossible to predict all aspects of moral problems that can arise in a complex, dynamic engineering profession.
2. Engineering codes often have internal conflicts, which may result in moral dilemmas. That is, several entries in codes overlap with each other, so there are internal conflicts. But the code doesn‘t provide a method for resolving these conflicts.
3. The codes cannot serves as the final moral authority for professional conduct.
4. The proliferation of codes of ethics for different of engineering gives a feeling that ethical code is relative.

ENGINEERING EXPERIMENTS WITH STANDARD EXPERIMENTS:

There are many similarities and differences between engineering experiments and other standard experiments.

Similarity to Standard Experiments:

There are many aspects of engineering that make it appropriate to view engineering projects as experiments. The three important aspects are as follows:

1. Engineering projects , like the standard experiments, are carried out in partial uncertainties. The uncertainties may include in the,

✓ Design calculation

- ✓ Exact properties of raw materials used
- ✓ Constancies of material processing and fabrication
- ✓ Nature of working of final products

2. The final outcomes of engineering projects are also generally uncertain like those of other experiments For example, a nuclear reactor may reveal unexpected problems that endangered the surrounding people.

3. Similar to standard experiments, engineering experiments also requires thorough knowledge about the products at the pre-production and post-production stages. Thus engineering, like any other experimentation, requires constant monitoring, alertness, and vigil on the part of the engineers at every stage of the project.

Contrast with standard experiments:

The study of knowing differences between engineering and other standard experiments is helpful to the engineers to realize their special and moral responsibility. Some aspects of these differences are given bellow:

1. Experimental control:

- ✓ Experimental control is the most important difference between engineering and other standard experiments.
- ✓ In standard experiments, experimental control involves selecting members for two different groups randomly. The first group members are given the special, experimental treatment, whereas the members of other group are not given that special treatment. Even both the groups are subjected to same environment ; the group that was not given the special treatment is called **"control group"**.

- ✓ In engineering experiments, usually there is no control group. Sometimes the control group is used only when the project is limited to laboratory experiments.

Because the engineering experiments involve human beings are experimental subjects. In fact, clients and customers have more control, as they own the authority of that project. So here the experimental subjects say clients or end user's are out of experimenter's control. In this type, it is not possible to select the member from various group randomly. Instead the engineers should work with the available historical and fair data about various groups randomly. Instead, the engineering should work the available historical and fair data about various groups that uses the end product.

The above discussion also justifies the view of engineering as a social experimentation.

2. Informed consent:

- ✓ It is know that there is always a strong human interface in the use of the engineering experiments‘ result; and also the beneficiaries are invariably humans. Therefore engineering experiments are also viewed at par the medical experiments.
- ✓ When a medicine or an engineering product is to be tested on a person, then the moral and legal rights is to get _informed consent‘ for him.Informed consent consists of two

  main elements:

1. Knowledge: The human subjects should be given all the information to make a reasonable decision.
2. Voluntariness: The human subjects should show their willingness to be a human model voluntarily. The person should not be forced, deceived, fraud, etc.

- ✓ The manufacturer of the should give all the information about the potential risks and benefits of their products to their customers and users.
- ✓ The characteristics of a _valid consent‘

  The informed consent is called as _valid consent‘ when the following three conditions are met:

1. The consent should be given voluntarily and not by force.
2. The consent should be based on all information needed for the rational person to make reasonable decision.
3. The consentient should be physically and mentally fit; then he should be major i.e., above 18 years.

ENGINEERS AS RESPONSIBLE EXPERIMENTERS:

General responsibility of engineering as society:

- Engineers are primarily considered as technical enablers or facilitators, rather than being the sole experimenters.
- Engineers‘ responsibility is shared with management, the public and others.
- The other unique responsibility of engineers include monitoring projects, identifying risks, providing customers and clients the required information to make reasonable decisions.

- While exercising engineering duties, the engineers should display the virtue of being morally responsible person.

General features of moral responsible engineers:

1. Conscientiousness
2. Relevant information
3. Moral Autonomy
4. Accountability

Conscientiousness:

- Conscientiousness means commitment to live according to certain values. It implies conscientiousness.
- Engineers have to be sensitive to a range of moral values and responsibilities, which are relevant in a given situation.
- Also engineers should have the willing to develop the skill and apply the effort needed to reach the best balance possible among various considerations.
- _Open eyes, open s and an open mind‘ are required to evaluate a given situation, its implication and to determine who are involved or affected.
- The primary duty of morally responsible engineers is to protect the safety of human beings and respect their rights of consent.

Relevant information:

- Conscientiousness is impossible without relevant factual information.
- Engineers have to show the commitment to obtain and properly gauge all the information related to meeting one‘s moral obligations.
- The two general ways of losing perspective on the context of one‘s work are given below.

    1. To grasp the context of one‘s work, one should be aware of implication of that work.
    2. To shifts the responsibility and blames the others in the organization.

Thus, conceiving engineering as social experimentation, it is important that engineers act as **responsible agents.** The responsible agents require

- Imaginative forecasting of possible bad side effects

- The development of an attitude of _defensive engineering‘ and _preventive technology‘
- Careful monitoring of projects and
- Respect for people rights to give informed consent

Moral autonomy:

- ✓ The moral autonomy is the ability to think critically and independently about moral issues and apply this moral thinking to situations that arise during the professional engineering practice.
- ✓ It is understood that an individual personality depends on the integration of his moral benefits and attitude.
- ✓ When one‘s labor and skills are sold, then it is an illusion to think that the person is not morally autonomous.
- ✓ As an experimenter, an engineer has to undergo an extensive and updated training to form his identity as a professional.
- ✓ There will be a personal involvement in one‘s work.
- ✓ The magnitude of moral autonomy to be experienced by engineering is highly influenced by the attitude of company‘s managements.
- ✓ Where there is a treat for engineers‘ moral autonomy, then engineers can look for moral support from their professional societies and outside organization.

Accountability:

- ✓ The term _accountability‘ means being responsible, liable, answerable or obligated.
- ✓ In proper terms, the accountability refers to the general tendency of being willing to submit ones action to any type of moral scrutiny and be responsive to others assessment.
- ✓ It involves a willingness to present morally convincing reason for ones action and conduct.
- ✓ Morally responsible people are expected to accept morally responsibility for their action.
- ✓ According to Stanely Milgram, people are not willing to accept personal accountability when placed under authority.
- ✓ There exist a lot of difference and separation between casual influence and moral accountability in all professions including engineering.
- ✓ Because of modern engineering practices, the complication in accepting one‘s moral accountability further worsened. Some of these situations are explained below:

1. Modern engineering projects involve teamwork, in which each members contributes a small of personal accountability.

2. The modern organization are based on the principle of ‗division of work'. Due to this division of work, the personal accountability also stretched within hierarchies of authority.

3. A preoccupation with legalities in a time of proliferating malpractice lawsuits.

ENGINEER"S RESPONSIBILITY FOR SAFETY

SAFETY AND RISK:

Imagine you are a fresh graduate.

- You get a job as an engineer in a large atomic power plant.
- Would you take it or not?
- Under what conditions would you take it?
- Under what conditions would you not?
- Why?

- Active Consumers: directly involve themselves e.g., mowing the lawn, washing clothes or toasting bread.

- Passive Consumers: have less choice and less control e.g., Water, Electricity, Petrol,
- Bystanders: e.g., exposed to Pollution from unknown sources

What is safe to Entrepreneurs, may not be so to Engineers. e.g., Pilots: "Indian Airports are not safe; Low Vision in Fog—. What is safe to Engineers, may not be so to Public. e.g., Top loading Washing Machine Typically several groups of people are involved in safety matters but have their own interests at stake. Each group may differ in what is safe and what is not.

1. —A ship in harbour is safe, but that is not what ships are built for‖ – John A. Shed
2.„A thing is safe if its risks are judged to be acceptable" - William W. Lawrence

- We buy an ill-designed Iron box in a sale-> Underestimating risk
- We judge fluoride in water can kill lots of people -> Overestimating risk
- We hire a taxi, without thinking about its safety -> Not estimating risk
- How does a judge pass a judgement on safety in these 3 cases?

….So, this definition won't do in real life.

Then, what is acceptable also depends upon the individual or group‘s value judgment. Hence a better, working definition of concept of safety could be, ―A thing is safe (to a certain degree) with respect to a given person or group at a given time if, were they fully aware of its risks and expressing their most settled values, they would judge those risks to be acceptable (to that certain degree).‖ -

Mike Martin and Roland Schinzinger

A thing is NOT SAFE if it exposes us to unacceptable danger or hazard. RISK is the potential that something unwanted and harmful may occur. We take a risk when we undertake something or use a product that is not safe. Risk in technology could include dangers of

bodily harm, economic loss, or environmental degradation. Some may assume that ―safety‖ is a concrete concept, while ―risk‖ is a vague, hypothetical concept

- In fact, its the other way around
- Risks always exist. But true safety never exists, except in hypothetical situations
- So, risk is reality, safety is fantasy

What degree of risk is acceptable?

Safety is a matter of how people would find risks acceptable or unacceptable, if they knew the risks, and are basing their judgments on their most settled value perspective. So, to this extent, it is objective.

Perspectives differ.

To this extent, it is subjective.

So, Safety is 'acceptable risk'.

Acceptable Risk

A risk is acceptable when those affected are generally no longer (or not) apprehensive about it.‟ Apprehension (i.e. anxiety) depends largely on factors such as

- whether the risk is assumed voluntarily.
- how the probabilities of harm (or benefit) is perceived.
- job-related or other pressures that causes people to be aware of or to overlook risks.
- whether the defects of a risky activity or situation are immediately noticeable or close at hand .
- whether the potential victims are identifiable beforehand.

RISK ASSESMENT:

The manner in which information necessary for decision making is presented can greatly influence how risks are perceived. Consider this example: In a particular case of disaster management, the only options available are provided in 2 different ways to the public for one to be chosen (where lives of 600 people are at stake).

Alternate 1

If program A is followed, 200 people will be saved. If Program B is followed, 1/3 probability is 600 people will be saved and 2/3 probability that nobody will be saved.

Response

72% of the target group chose option A and 28% option B

Alternate 2

If program A is followed, 400 people will die. If Program B is followed, 1/3 probability is that nobody will die and 2/3 probability that 600 people will die.

Response

This time only 22% of the target group chose option A and 78% option B

Conclusion:

1. The option perceived as yielding firm gain will tend to be preferred over those from which gains are perceived as risky or only probable.

2. Option emphasizing firm losses will tend to be avoided in favour of those whose chances of success are perceived as probable.

Secondary Costs of Products

- Cost of products is High, if designed unsafely
- Returns and Warranty Expenses
- Loss of Customer Goodwill
- Cost of litigation

- Loss of Customers due to injuries in using it
- Cost of rework, lost time in attending to design problems

- To help reduce secondary costs
- To know the possible risk for purposes of pricing, disclaimers, legal terms and conditions, etc.
- To know the cost of reducing the risks
- To take a decision before finalizing the design.
- To judge whether he/she wants to take the risks
- To judge whether the „risk vs. costs" justifies taking the risk.

RISK BENEFIT ANALYSIS:

Ethical Implications

- When is someone entitled to impose a risk on another in view of a supposed benefit to others?
- Consider the worst case scenarios of persons exposed to maximum risks while they are reaping only minimum benefits. Are their rights violated? Are they provided safer alternatives?
- Engineers should keep in mind that risks to known persons are perceived differently from statistical risks
- Engineers may have no control over grievance redressal.
- Heavy discounting of future because the very low present values of cost/benefits do not give a true picture of future sufferings.
- Both have related uncertainties but difficult to arrive at expected values
- What if benefits accrue to one party and risks to another?
- Can we express risks & benefits in a common set of units?
- Risks can be expressed in one set of units (deaths on the highway) and benefits in another (speed of travel)?

Many projects, which are highly beneficial to the public, have to be safe also. Hence these projects can be justified using RISK-BENEFIT analysis. In these studies, one should find out.

i) What are the risks involved?
ii) What are the benefits that would accrue?
iii) When would benefits be derived and when risks have to be faced?

iv) Who are the ones to be benefited and who are the ones subjected to risk-are they the same set of people or different. The issue here is not, say, cost-effective design but it is only cost of risk taking Vs benefit analysis. Engineers should first recommend the project feasibility based on risk-benefit analysis and once it is justified, then they may get into cost-effectiveness without increasing the risk visualized. In all this, engineers should ask themselves this ethical question: Under what conditions, is someone in society entitled to impose a risk on someone else on behalf of a supposed benefit to others.‟

BHOPAL GAS TRAGEDY:

On December 3, 1984, Union Carbide's pesticide-manufacturing plant in Bhopal, India leaked 40 tons of the deadly gas, methyl isocyanate into a sleeping, impoverished community - killing 2,500 within a few days, 10000 permanently disabled and injuring 100,000 people. Ten years later, it increased to 4000 to 7000 deaths and injuries to 600,000.

Risks taken:

- Storage tank of Methyl Isocyanate gas was filled to more than 75% capacity as against Union Carbide‘s spec. that it should never be more than 60% full.
- The company‘s West Virginia plant was controlling the safety systems and detected leakages thro‟ computers but the Bhopal plant only used manual labour for control and leak detection.
- The Methyl Isocyanate gas, being highly concentrated, burns parts of body with which it comes into contact, even blinding eyes and destroying lungs.

• Three protective systems out of service
• Plant was understaffed due to costs.
• Very high inventory of MIC, an extremely toxic material.
• The accident occurred in the early morning.

• Most of the people killed lived in a shanty (poorly built) town located very close to the plant fence.

Workers made the following attempts to save the plant:

• They tried to turn on the plant refrigeration system to cool down the environment and slow the reaction. (The refrigeration system had been drained of coolant weeks before and never refilled -- it cost too much.)

• They tried to route expanding gases to a neighbouring tank. (The tank's pressure gauge was broken and indicated the tank was full when it was really empty.)

• They tried to purge the gases through a scrubber. (The scrubber was designed for flow rates, temperatures and pressures that were a fraction of what was by this time escaping from the tank. The scrubber was as a result ineffective.)

• They tried to route the gases through a flare tower -- to burn them away. (The supply line to the flare tower was broken and hadn't been replaced.)

• They tried to spray water on the gases and have them settle to the ground, by this time the chemical reaction was nearly completed. (The gases were escaping at a point 120 feet above ground; the hoses were designed to shoot water up to 100 feet into the air.) In just 2 hours the chemicals escaped to form a deadly cloud over hundreds of thousands of people incl. poor migrant labourers who stayed close to the plant.

DIFFICULTIES IN ESTABLISHING SAFEGUARDS:

Difficulties in establishing Safeguards:

- Incomplete knowledge of the engineering subject
- Refusal to face hard questions caused by lack of knowledge
- False sense of security

- e.g. Nuclear waste disposal problem
- Caution in stating probabilities of rare events
- Varying understanding of risk based on presentation of facts
- Risk assessments based on incorrect/unacceptable assumptions/data

- Only a few persons/groups participate in the exercise
- Some of the ways by which engineers may try to reduce risks.
- In all the areas of works, engineers should give top priority for product safety.

- They should believe that accidents are caused by dangerous conditions that can be corrected. Negligence and operator errors are not the principal causes of accidents.

- If a product is made safe, the initial costs need not be high if safety is built into a product from the beginning. It is the design changes done at a later date that are costly. Even then life cycle costs can be made lower for the redesigned or retrofitted product (for safety).

- If safety is not built into the original design, people can be hurt during testing stage itself.

- They should get out of the thinking that warnings about hazards are adequate and that insurance coverage is cheaper than planning for safety.

- All it takes to make a product safe is to have different perspective on the design problem with emphasis on safety.

- Examples of Improved Safety
- Magnetic door catch introduced on refrigerators

- Prevent death by asphyxiation of children accidentally trapped inside
- The catch now permits the door to opened from inside easily
- Cheaper than older types of latches
- Dead-man Handle for Drivers in trains
- Semaphore signalling
- Volkswagen's car safety belt
- Attachment on the door so that belt automatically goes in place on Entry

UNIT-5 RESPONSIBILITIES AND RIGHTS AND GLOBAL ISSUES

COLLEGIALITY AND LOYALTY:

Collegiality is a kind of connectedness grounded in respect for professional expertise and in a commitment to the goals and values of the profession and as such, collegiality includes a disposition to support and co-operate with one‘s colleagues‟.- Craig Ihara. The central elements of collegiality are respect, commitment, connectedness and cooperation.

Respect: Acknowledge the worth of other engineers engaged in producing socially useful and safe products.

Commitment: Share a devotion to the moral ideals inherent in the practice of engineering. Connectedness: Aware of being part of a co-operative undertaking created by shared commitments and expertise. Collegiality, like most virtues, can be misused and distorted. It should not be reduced to „group interest‟ but should be a shared devotion for public good. It is not defaming colleagues, but it does not close the eyes to unethical practices of the co-professionals, either.

Classifications of Loyalty

- Agency-Loyalty
- Fulfill one‟s contractual duties to an employer.
- Duties are particular tasks for which one is paid
- Co-operating with colleagues
- Following legitimate authority within the organization.
- Identification-Loyalty:
- It has to do with attitudes, emotions and a sense of personal identity.
- Seeks to meet one‟s moral duties with personal attachment and affirmation.

- It is against detesting their employers and companies, and do work reluctantly and horribly (this is construed as disloyalty)
- Avoid conflicts of interest,

- Inform employers of any possible conflicts of interest,
- Protect confidential information,
- Be honest in making estimates,
- Admit one‟s errors, etc.
- Agency-Loyalty
- Engineers are hired to do their duties.
- Hence obligated to employers within proper limits
- Identification-Loyalty
- Obligatory on two conditions;

1. When some important goals are met by and through a group in which the engineers participate
2. When employees are treated fairly, receiving the share of benefits and burdens.

But clearly, identification-loyalty is a virtue and not strictly an obligation.

COLLECTIVE BARGAINING AND OCCUPATIONAL CRIME:

Collective bargaining is inconsistent with loyalty to employers because it

- is against the desires of the employer
- uses force or coercion against the employer and

- involves collective and organized opposition.

But every instance of such conduct need not be unethical.

An example: Three engineers sincerely feel that they are underpaid. After their representations to their bosses are in vain, they threaten their employer, politely, that they would seek employment elsewhere. Here, even though, they act against the desires of their employer and have acted collectively, they have not acted unethically or violated their duty.

- Public Service Argument‟- Collective bargaining.
- Public Service Argument‟ is an argument against collective bargaining.
- The paramount duty of engineers is to serve the public.

- Unions, by definition, promote the interests of their members and whenever there is a clash of interests, the interest of the general public is ignored by them. Though the argument is a valid one, it looks at the worst possible scenarios with unions and decides that engineering unions act only irresponsibly.

- A body of engineers can promote engineers‟ interest within limits set by professional concern for the public good.

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

Harms Caused by Collective Bargaining.

a) Unions are devastating the economy of a country, being a main source of inflation
b) With unions, there is no congenial (friendly), cooperative decision making.

c) Unions do not promote quality performance by making job promotion and retention based on seniority.

d) They encourage unrest and strained relations between employees and employers.

Occupational Crime:

- Occupational crimes are illegal acts made possible through one‟s lawful employment.
- It is the secretive violation of laws regulating work activities.
- When committed by office workers or professionals, occupational crime is called „white collar crime‟.
- People Committing Occupational Crimes
- Usually have high standard of education
- From a non-criminal family background
- Middle class male around 27 years of age (70% of the time) with no previous
- History
- No involvement in drug or alcohol abuse
- Those who had troublesome life experience in the childhood (Blum)
- People without firm principles (Spencer)
- Firms with declining profitability (Coleman, 1994)
- Firms in highly regulated areas and volatile market -pharmaceutical,
- petroleum industry.(Albanese, 1995)

INTELLECTUAL PROPERTY RIGHTS:

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

Patent, Design & Trademark together with Copyright form TOTAL INTELLECTUAL PROPERTY:

1. Derived from the Latin word „LITTERAE PATENTES" which means „Open Letters" or „Open Documents" to confer rights and privileges.

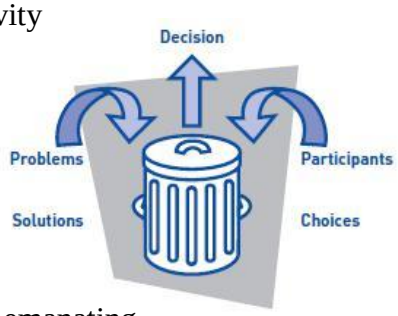
2. A contract between an Inventor and the Government
3. An exclusive privilege monopoly right granted by the Government to the Inventor
4. Invention may be of an Industrial product or process of manufacture
5. Invention should be new, non-obvious, useful and patentable as per Patents Act

6. The right to the inventor is for limited period of time and valid only within the territorial limits of a country of grant.

Examples: a drug compound, a tool, maybe software effects

Design

- Meant for beautifying an industrial product to attract the consumer public
- Shaping, Configuration or Ornamentation of a vendible Industrial product
- Exclusive „Design Rights" to the originator for a limited term
- Patents & design embrace the production stage of an industrial activity



Trade Mark

- Trade Mark is a name or symbol adopted for identifying goods
- Public can identify from the Trade Mark from whom the product is emanating
- Trade Marks protection is given for an industrial product by the Government
- Examples: Channel No.5"s smell, Jacque Villeneuve"s face!

COPY RIGHTS

- The right to original literary and artistic works
- Literary, written material
- Dramatic, musical or artistic works
- Films and audio-visual materials

- Sound recordings
- Computer Programmes/software
- SOME databases
- Example: Picasso"s Guernica, Microsoft code, Lord of the Rings

Need For A Patent System

- Encourages an inventor to disclose his invention
- Encourages R & D activities as the industries can make use of the technology, & avoids redundant research
- Provides reasonable assurance for commercialisation.
- Provides an inducement to invest capital in the new lines of production and thus , help for technical development and up gradation.
- One may get a very good return of income through Patent Right on the investment made in R & D.
- A patentee gets the exclusive monopoly right against the public at large to use,sell or manufacture his patented device.
- A patentee can enforce his monopoly right against any infringement in the court of law for suitable damages or profit of account.
- The Government ensures full disclosure of the invention to the public for exchange of exclusive monopoly patent right to the inventor.

EMPLOYEE RIGHTS:

- Employee rights are any rights, moral or legal, that involve the status of being an employee.
- There should be no discrimination against an employee for criticizing ethical, moral or legal policies and practices of the organization.
- The organization will not also discriminate against an employee for engaging in outside activities or for objecting to an organization directive that violates common norms of morality.
- The employee will not be deprived of any enjoyment of reasonable privacy in his/her workplace.
- No personal information about employees will be collected or kept other than what is necessary to manage the organization efficiently and to meet the legal requirements.
- No employee who alleges that her/his rights have been violated will be discharged or penalized without a fair hearing by the employer organization. Some clear examples: falsifying data, avoidance on the safety of a product.

THE EMPLOYEE ROLE OF CONFIDENTIALITY:

Confidentiality or confidential information:

- Information considered desirable to be kept secret.
- Any information that the employer or client would like to have kept secret in order to compete effectively against business rivals.
- This information includes how business is run, its products, and suppliers, which directly affects the ability of the company to compete in the market place
- Helps the competitor to gain advantage or catch up
- Information available only on the basis of special privilege‟ such as granted to an employee working on a special assignment.
- Information that a company owns or is the proprietor of.
- This is primarily used in legal sense.
- Also called Trade Secret. A trade secret can be virtually any type of information that has not become public and which an employer has taken steps to keep secret.
- Differ from trade secrets.
- Legally protect specific products from being manufactured and sold by competitors without the express permission of the patent holder.
- They have the drawback of being public and competitors may easily work around them by creating alternate designs.

1. Based on ordinary moral considerations:
I. Respect for autonomy:

- Recognizing the legitimate control over private information (individuals or corporations).
- This control is required to maintain their privacy and protect their self-interest.
- Respecting promises in terms of employment contracts not to divulge certain information considered sensitive by the employer

III. Regard for public well being:

- Only when there is a confidence that the physician will not reveal information, the patient will have the trust to confide in him.
- Similarly only when companies maintain some degree of confidentiality concerning their products, the benefits of competitiveness within a free market are promoted.

2. Based on Major Ethical Theories:

- All theories profess that employers have moral and institutional rights to decide what information about their organization should be released publicly.
- They acquire these rights as part of their responsibility to protect the interest of the organization.
- All the theories, rights ethics, duty ethics and utilitarianism justify this confidentiality but in different ways.

Effect of Change of Job on Confidentiality:

- Employees are obliged to protect confidential information regarding former employment, after a change of job.
- The confidentiality trust between employer and employee continues beyond the period of employment.
- But, the employee cannot be forced not to seek a change of job.
- The employer‘s right to keep the trade secrets confidential by a former employee should be accepted at the same time, the employee‘s right to seek career advancement cannot also be denied.

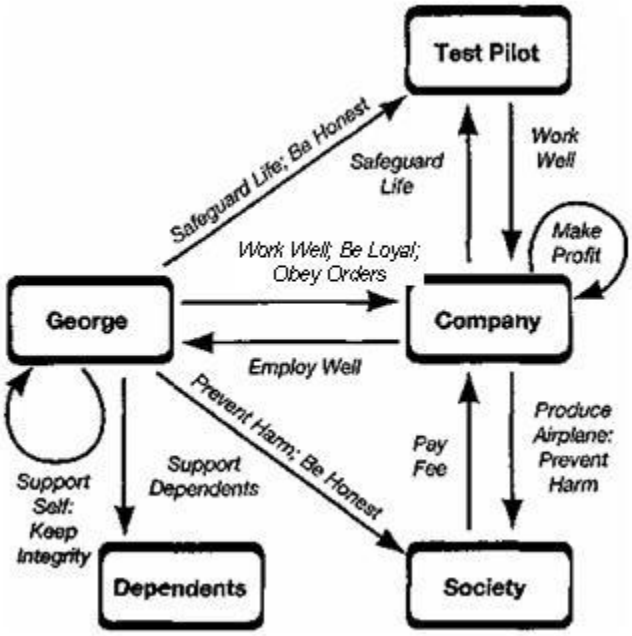
GLOBAL ISSUES

5.5 MULTINATIONAL CORPORATIONS WITH NEAT EXAMPLE:

Multinational corporations conduct extensive business in more than one country. In some cases, their operations are spread so thinly around the world that their official headquarters in any one home country, as distinct from the additional host countries in which they do business, is largely incidental and essentially a matter of historical circumstance or of selection based on tax advantages.

The benefits to U.S. companies of doing business in less economically developed countries are clear: inexpensive labour, availability of natural resources, favourable tax arrangements, and fresh markets for products. The benefits to the participants in developing countries are equally clear: new jobs, jobs with higher pay and greater challenge, transfer of advanced technology, and an array of social benefits from sharing wealth. Yet moral challenges arise, accompanying business and social complications. Who loses jobs at home when manufacturing is taken ―offshore‖? What does the host country lose in resources, control over its own trade, and political independence? And what are the moral responsibilities of corporations and individuals operating in less economically developed countries? Here we focus

on the last question. Before doing so it will be helpful to introduce the concepts of technology transfer and appropriate technology.



Technology Transfer and Appropriate Technology:

Technology transfer is the process of moving technology to a novel setting and implementing it there. Technology includes both hardware (machines and installations) and technique (technical, organizational, and managerial skills and procedures). A novel setting is any situation containing at least one new variable relevant to the success or failure of a given technology.

The setting may be within a country where the technology is already used elsewhere, or a foreign country, which is our present interest. A variety of agents may conduct the transfer of technology: governments, universities, private volunteer organizations (such as Engineers

Without Borders), consulting firms, and multinational corporations. In most instances, the transfer of technology from a familiar to a new environment is a complex process. The technology being transferred may be one that originally evolved over a period of time and is now being introduced as a ready-made, completely new entity into a different setting. Discerning how the new setting differs from familiar contexts requires the imaginative and cautious vision of ―cross-cultural social experimenters.‖ The expression appropriate technology is widely used, but with a variety of meanings.

We use it in a generic sense to refer to identification, transfer, and implementation of the most suitable technology for a new set of conditions. Typically the conditions include social factors that go beyond routine economic and technical engineering constraints. Identifying them requires attention to an array of human values and needs that may influence how a technology affects the novel situation. Thus, in the words of Peter Heller, ―appropriateness may be scrutinized in terms of scale, technical and managerial skills, materials/energy (assured availability of supply at reasonable cost), physical environment (temperature, humidity, atmosphere, salinity, water availability, etc.), capital opportunity costs (to be commensurate with benefits), but especially human values (acceptability of the end-product by the intended users in light of their institutions, traditions, beliefs, taboos, and what they consider the good life).‖5 Examples include the introduction of agricultural machines and long-distance telephones.

A country with many poor farmers can make better immediate use of small, single- or two-wheeled tractors that can serve as motorized ploughs, to pull wagons or to drive pumps, than it can of huge diesel tractors that require collectivized or agribusiness-style farming. Conversely, the same country can benefit more from the latest in wireless communication technology to spread its telephone service to more people and over long distances than it can from old-fashioned transmission by wire. Appropriate technology also implies that the technology should contribute to and not detract from sustainable development of the host country by providing for careful stewardship of its natural resources and not degrading the environment beyond its carrying capacity. Nor should technology be used to replace large numbers of individually tended small fields by large plantations to grow crops for export, leaving most of the erstwhile farmers jobless and without a source of home grown food.

The word appropriate is vague until we answer the questions, appropriate to what, and in what way?6 Answering those questions immediately invokes values about human needs and environmental protection, as well as facts about situations, making it obvious that appropriate is a value-laden term. In this broader sense, the appropriate technology might sometimes be small-, intermediate-, or large-scale technology. Appropriate technology is a generic concept that applies to all attempts to emphasize wider social factors when transferring technologies. As such, it reinforces and amplifies our view of engineering as social experimentation. With these distinctions in mind, let us turn to a classic case study illustrating the complexities of engineering within multinational settings.

COMPUTER ETHICS IS THE TECHNOLOGICAL BACKGROUND OF THE SOCIETY:

Computers have become the technological backbone of society. Their degree of complexity, range of applications, and sheer numbers continue to increase. Through telecommunication networks they span the globe. Yet electronic computers are still only a few decades old, and it is difficult to foresee all the moral issues that will eventually surround them. The present state of computers is sometimes compared to that of the automobile in the early part

of this century. At that time the impact of cars on work and leisure patterns, pollution, energy consumption, and sexual mores was largely unimagined. If anything, it is more difficult to envisage the eventual impact of computers because they are not limited to any one primary area of use as is a car‘s function in transportation.

It is already clear, however, that computers raise a host of difficult moral issues, many of them connected with basic moral concerns such as free speech, privacy, respect for property, informed consent, and harm.1 To evaluate and deal with these issues, a new area of applied ethics called computer ethics has sprung up. Computer ethics has special importance for the new groups of professionals emerging with computer technology, for example, designers of computers, programmers, systems analysts, and operators. To the extent that engineers design, manufacture, and apply computers, computer ethics is a branch of engineering ethics. But the many professionals who use and control computers share the responsibility for their applications.

Some of the issues in computer ethics concern shifts in power relationships resulting from the new capacities of computers. Other issues concern property, and still others are about invasions of privacy. All these issues may involve ―computer abuse‖: unethical or illegal conduct in which computers play a central role (whether as instruments or objects). The Internet and Free Speech:

The Internet has magnified all issues in computer ethics. The most powerful communication technology ever developed, and a technology used daily by hundreds of millions of people, the Internet gained widespread use only during the 1990s. Its modest beginning, or forerunner, came from a simple idea of J. C. R. Licklider.2 Licklider was a psychologist who had wide interests in the newly emerging computer technology. In 1960 he conceived of a human-computer symbiosis in which the powers of humans and computers were mutually enhancing.3 The breadth of his vision, together with his administrative skills, led to his appointment a few years later as the director of the Advanced Research Projects Agency (ARPA) of the U.S. Department of Defence. He quickly saw that the variety of computer-involved military projects was becoming a Tower of Babel, and he wrote a revolutionary memo calling for a move toward a unified communication system. In 1969, ARPA funded projects in universities and corporations that created an ARPA network, or ARPANET.

In the 1980s, some universities developed their own communications networks, and their eventual merging with ARPANET became the Internet, which is now a global network of networks, initially using the infrastructure of the telephone system and now carried by many telecommunication systems by wire, fibre, or wireless systems. The World Wide Web (Web), which is a service run on the Internet, emerged from the Hypertext Mark-up Language and transfer protocol developed at the European particle physics lab and is used in a multimedia format of text, pictures, sound, and video. During the early 1990s, the Web was opened to business, e-mail, and other uses that continue to expand.

It is now clear to all that the Internet provides a wellspring of new ways to be in contact with other people and with sources of information. It has also created greater convenience in

ordering consumer items, paying bills, and trading stocks and bonds. Like other major ―social experiments,‖ it also has raised a host of new issues. One set of issues centres on free speech, including control of obscene forms of pornography, hate speech, spam (unwanted commercial speech), and libel. In a wide sense, pornography is sexually explicit material intended primarily for sexual purposes (as distinct, say, from medical education). Obscene pornography is pornography that is immoral or illegal in many countries, and is not protected in the United States by the First Amendment rights to free speech. U.S. laws define obscenity as sexually

explicit materials that appeal to sexual interests, lack serious literary, artistic, scientific, or other value, and are offensive to reasonable persons as judged by a community‘s standards. Needless to say, there is considerable disagreement about what this means, and the definition is relative to communities that might have differing standards.

At the same time, there is wide agreement that child pornography and extremely violent and degrading portrayals of women are obscene, and most local communities have attempted to control them. The Internet has made such control extremely difficult, as images and texts can be transmitted easily from international sources to a child‘s home computer. There are now hundreds of thousands of pornographic Web sites, with hundreds more created each day, many of which contain obscene material. Hate speech, unlike obscenity, is not forbidden constitutionally. Not surprisingly, then, the Internet has become a powerful resource for racist and anti-Semitic groups to spread their messages. Those messages were heard, for example, by Eric Harris and Dylan Klebold, who massacred their fellow students at Columbine High School in 1999. And there is no question that this most powerful medium makes it much easier for hate groups to organize and expand.

ENVIRONMENTAL ETHICS THROUGH ENGINEERING ECOLOGY AND ECONOMICS:

In addition to global warming, environmental challenges confront us at every turn, including myriad forms of pollution, human-population growth, extinction of species, destruction of ecosystems, depletion of natural resources, and nuclear waste. Today there is a wide consensus that we need concerted environmental responses that combine economic realism with ecological awareness. For their part, many engineers are now showing leadership in advancing ecological awareness. In this chapter, we discuss some ways in which this responsibility for the environment is shared by engineers, industry, government, and the public. We also introduce some perspectives developed in the new field of environmental ethics that enter into engineers‘ personal commitments and ideals.

Engineering ecology and economics:

Two powerful metaphors have dominated thinking about the environment: the invisible hand and the tragedy of the commons. Both metaphors are used to highlight unintentional impacts of the marketplace on the environment, but one is optimistic and the other is cautionary

about those impacts. Each contains a large part of the truth, and they need to be reconciled and balanced. The first metaphor was set forth by Adam Smith in 1776 in The Wealth of Nations, the founding text of modern economics. Smith conceived of an invisible (and divine) hand governing the Market place in a seemingly paradoxical manner. According to Smith, businesspersons think only of their own self-interest: ―It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest. Yet, although ―he intends only his own gain,‖ he is ―led by an invisible hand to promote an end which was no part of his intention. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good.

In fact, professionals and many businesspersons do profess to ―trade for the public good,‖ claiming a commitment to hold paramount the safety, health, and welfare of the public. Although they are predominantly motivated by self-interest, they also have genuine moral concern for others.3 Nevertheless, Smith‘s metaphor of the invisible hand contains a large element of truth. By pursuing self-interest, the businessperson, as entrepreneur, creates new companies that provide goods and services for consumers. Moreover, competition pressures corporations to continually improve the quality of their products and to lower prices, again benefiting consumers. In addition, new jobs are created for employees and suppliers, and the wealth generated benefits the wider community through consumerism, taxes, and philanthropy.

Despite its large element of truth, the invisible hand metaphor does not adequately take account of damage to the environment. Writing in the eighteenth century, with its seemingly infinite natural resources, Adam Smith could not have foreseen the cumulative impact of expanding populations, unregulated capitalism, and market ―externalities‖—that is, economic impacts not included in the cost of products. Regarding the environment, most of these are negative externalities—pollution, destruction of natural habitats, depletion of shared resources, and other unintended and often unappreciated damage to ―common‖ resources. This damage is the topic of the second metaphor, which is rooted in Aristotle‘s observation that we tend to be thoughtless about things we do not own individually and which seem to be in unlimited supply. William Foster Lloyd was also an astute observer of this phenomenon.

In 1833 he described what the ecologist Garrett Hardin would later call ―the tragedy of the commons. Lloyd observed that cattle in the common pasture of a village were more stunted than those kept on private land. The common fields were themselves more worn than private pastures. His explanation began with the premise that individual farmers are understandably motivated by self-interest to enlarge their common-pasture herd by one or two cows, especially given that each act taken by itself does negligible damage. Yet, when all the farmers behave this way, in the absence of laws constraining them, the result is the tragedy of overgrazing that harms everyone.

HUMAN-CENTERED ETHICS:

Human-centered, or anthropocentric, environmental ethics focuses exclusively on the benefits of the natural environment to humans and the threats to human beings presented by the destruction of nature. In their classic formulations, all of them assume that, among the creatures on earth, only human beings have inherent moral worth and hence deserve to be taken into account in making moral decisions concerning the environment (or anything else). Other creatures and ecosystems have at most ―instrumental value‖—as means to promoting human interests.

Utilitarians enjoin us to maximize good consequences for human beings. In developing an environmental ethic, the relevant goods consist of human interests and goods linked to nature. Many of those pleasures and interests concern engineered products made from natural resources.

In addition, we have aesthetic interests, as in the beauty of plants, waterfalls, and mountain ranges, and recreational interests, as in hiking and backpacking in wilderness areas. We have scientific interests, especially in the study of ―natural labs‖ of ecological preserves, such as the rain forests. And most basic, we have survival interests, which are linked directly to conserving resources and preserving the natural environment.

The typical argument of rights ethics is that the basic rights to life and to liberty entail a right to a livable environment. The right to a livable environment did not generally enter into people‘s thinking until the end of the twentieth century, at the time when pollution and resource depletion reached alarming proportions. Nevertheless, it is directly implied by the rights to life and liberty, given that these basic rights cannot be exercised without a supportive natural environment. A right to a livable environment is implied by rights to life and to liberty, and it ―imposes upon everyone a correlative moral obligation to respect.

In duty ethics, which makes duties rather than rights fundamental, respect for human life implies far greater concern for nature than has been traditionally recognized. Kant believed that we owe duties only to rational beings, which in his view excluded all nonhuman animals, although of course he did not have access to recent scientific studies showing striking parallels between humans and other primates. Nevertheless, he condemned callousness and cruelty toward conscious animals because he saw the danger that such attitudes would foster inhumane treatment of persons. In any case, a duty-centered ethics would emphasize the need for conserving the environment because doing so is implied by respect for human beings who depend on it for their very existence.

Finally, virtue ethics draws attention to such virtues as prudence, humility, appreciation of beauty, and gratitude toward the natural world that makes life possible, and also the virtue of stewardship over resources that are needed for further generations. Thomas E. Hill, Jr., offers an anecdote: ―A wealthy eccentric bought a house in a neighbourhood I know. The house was surrounded by a beautiful display of grass, plants, and flowers, and it was shaded by a huge old avocado tree. But the grass required cutting, the flowers needed tending, and the man wanted

more sun. So he cut the whole lot down and covered the yard with asphalt. The man‘s attitudes, suggests Hill, are comparable to the callousness shown in strip mining, the cutting of redwood forests, and other destruction of ecosystems with blinkered visions of usefulness. All these human-centered ethics permit and indeed require a long-term view of conserving the environment, especially because the human beings who have inherent worth will include future generations. Not everything of importance within a human-centered ethics fits neatly into cost-benefit analyses with limited time horizons; much must be accounted for by means of constraints or limits that cannot necessarily be assigned dollar signs.

Yet, some have argued that all versions of human-centered ethics are flawed and that we should widen the circle of things that have inherent worth, that is, value in themselves, independent of human desires and appraisals. Especially since 1979, when the journal Environmental Ethics was founded, philosophers have explored a wide range of nature-centered ethics that, for example, affirm the inherent worth of all conscious animals, of all living organisms, or of ecosystems. Let us consider each of these approaches.

INVOLVEMENT IN WEAPONS WORK:

Historically, a quick death in battle by sword was considered acceptable, whereas the use of remote weapons (from bow and arrow to firearms) was frequently decried as cowardly, devoid of valour, and tantamount to plain murder.16 As modern weapons of war progressed through catapults, cannons, machine guns, and bombs released from airplanes and missiles to reach further and further, the soldiers firing them were less likely to see the individual human beings—soldiers as well as civilians—they had as their general target. The continuing automation of the battle scene tends to conceal the horrors of war and thus makes military activity seem less threatening and high-tech wars more appealing. How might the men and women who design weapons, manufacture them, and use them feel about their work? For some engineers, involvement in weapons development conflicts with personal conscience; for others, it is an expression of conscientious participation in national defence. The following cases illustrate the kinds of moral issues involved in deciding whether to engage in military work.

1. Bob‘s employer manufactures antipersonnel bombs. By clustering 665 guava-size bomblets and letting them explode above ground, an area covering the equivalent of 10 football fields is subjected to a shower of sharp fragments. Alternatively, the bombs can be timed to explode hours apart after delivery.

Originally the fragments were made of steel, and thus they were often removable with magnets; now plastic materials are sometimes used, making the treatment of wounds, including the location and removal of the fragments, more time-consuming for the surgeon. Recently another innovation was introduced: By coating the bomb lets with phosphorus, the fragments could inflict internal burns as well. Thus, the antipersonnel bomb does its job quite well without necessarily killing in that it ties up much of the enemy‘s resources just in treating the wounded who have survived. Bob himself does not handle the bombs in any way, but as an industrial

engineer he enables the factory to run efficiently. He does not like to be involved in making weapons, but then he tells himself that someone has to produce them. If he does not do his job, someone else will, so nothing would change. Furthermore, with the cost of living being what it is, he owes his family a steady income.

2. Mary is a chemical engineer. A promotion has gotten her into napalm manufacturing. She knows it is nasty stuff, having heard that the Nobel laureate, Professor Wald of Harvard University, was said to have berated the chemical industry for producing this ―most brutal and destructive weapon that has ever been

created.‖ She saw a scary old photograph from the Vietnam War period, depicting a badly burned peasant girl running from a village in flames. But the locals were said to take forever in leaving a fighting zone and then there were complaints about them being hurt or killed. She abhors war like most human beings, but she feels that the government knows more than she does about international dangers and that the present use of napalm by U.S. forces in Iraq may be unavoidable. Regarding her own future, Mary knows that if she continues to do well on her job she will be promoted, and one of these days she may well be in the position to steer the company into the production of peaceful products. Will Mary use a higher position in the way she hopes to do, or will she instead wait until she becomes the CEO?

3. Ron is a specialist in missile control and guidance. He is proud to be able to help his country through his efforts in the defence industry, especially as part of the ―war on terrorism.‖ The missiles he works on will carry single or multiple warheads with the kind of dreadful firepower which, in his estimation, has kept any potential enemy in check since 1945. At least there has not been another world war—the result of mutual deterrence, he believes.

4. Marco‘s foremost love is physical electronics. He works in one of the finest laser laboratories.

Some of his colleagues do exciting research in particle beams. That the laboratory is interested in developing something akin to the ―death ray‖ described by science fiction writers of his youth is of secondary importance. More bothersome is the secrecy that prevents him from freely exchanging ideas with experts across the world. But why change jobs if he will never find facilities like those he has now?

5. Joanne is an electronics engineer whose work assignment includes avionics for fighter planes that are mostly sold abroad. She has no qualms about such planes going to what she considers friendly countries, but she draws the line at their sale to potentially hostile nations. Joanne realizes that she has no leverage within the company, so she occasionally alerts journalist friends with news she feels all citizens should have. ―Let the voters direct the country at election time‖—that is her motto.

6. Ted‘s background and advanced degrees in engineering physics gave him a ready entry into nuclear bomb development. As a well-informed citizen he is seriously concerned with the dangers of the ever-growing nuclear arsenal. He is also aware of the possibilities of an accidental nuclear exchange. In the meantime he is working hard to reduce the risk of accidents such as the

32 ―broken arrows‖ (incidents when missile launchings may have occurred erroneously) that had been reported by the Pentagon during the height of the Cold War, or the many others that he knows have occurred worldwide. Ted continues in his work because he believes that only specialists, with firsthand experience of what modern weapons can do, can eventually turn around the suicidal trend represented by their development. Who else can engage in meaningful arms control negotiations?

HONESTY:

Honesty means expressing your true feelings. To be able to be emotionally honest we must first be emotionally aware. This emotional awareness is related to our emotional intelligence. It is our emotional intelligence, which gives us the ability to accurately identify our feelings.

Emotional intelligence may also give us the ability to decide when it is in our best interest to be emotionally honest by sharing our real feelings. We would be better off individually and as a society if we would be more honest.

If we are more honest with ourselves we will get to know our ―true selves‖ on a deeper level. This could help us become more self-accepting. It could also help us make better choices about how to spend out time and who to spend it with.

If we are honest with other, it may encourage them to be more emotionally honest. When we are emotionally honest we are more likely not to be asked or pressured to do things which we do not want to do. We will also find out sooner who respects our feelings.

How society discourages honesty?

It takes awareness, self-confidence, even courage to be emotionally honest. This is because, in many ways, society teaches us to ignore, repress, deny and lie about our feelings. For example, when asked how we feel, most of us will reply ―fine‖ or ―good‖, even if that is not true. Often, people will also say that they are not angry or not defensive, when it is obvious that they are.

Children start out emotionally honest. They express their true feelings freely and spontaneously. But the training to be emotionally dishonest begins at an early age. Parents and teachers frequently encourage or even demand that children speak or act in ways which are inconsistent with the child‘s true feelings. The child is told to smile when actually she is sad. She is told to apologize when she feels no regret. She is told to say ―thank you‖, when she feels no appreciation. She is told to ―stop complaining‖ when she feels mistreated. She may be told to kiss people good night when she would never do so voluntarily. She may be told it is ―rude‖ and ―selfish‖ to protest being forced to act in ways which go against her feelings.

As children become adolescents they begin to think more for themselves. They begin to speak out more, ―talk back‖ more and challenge the adults around them. If these adults feel threatened they are likely to defend themselves by invalidating the adolescent‘s feelings and perceptions. There is also peer pressure to conform to the group norms.

Through all of this the child and adolescent learns they can‘t be honest with their feelings. They gradually stop being emotionally honest with their parents, their teachers, their friends and even themselves. They learn it just doesn‘t pay to be express one‘s true feelings.

A Few More Thoughts On Emotional Honesty

- Dishonesty requires more energy than emotional honesty.
- When we are emotionally dishonest we lose out on the value of our natural feelings.
- When we are emotionally dishonest we are going against the forces of evolution rather than in harmony with them.
- It takes energy to oppose reality, nature and evolution.
- Emotional dishonesty, in authenticity and falseness create distrust and tension in society.

Comment: Honesty is one of the prized values of mankind. Honesty is an insurance against failure and defame. An honest man is a big asset to the family, to the organization and to the society in general. The honest person may not earn riches but he will certainly earn name and satisfaction of living a good life.