

CH2- Profession and Ethics

- 2.1 Profession: Definition and Characteristics
- 2.2 Professional Institutions
- 2.3 Relation of an Engineer with Client, Contractor and Fellow Engineers
- 2.4 Ethics, Code of Ethics and Engineering Ethics
- 2.5 Moral Dilemma and Ethical Decision Making
- 2.6 Detailed Duties of an Engineer and Architect
- 2.7 Liability and Negligence

society



Ethics



Professionalism



A "professional" is someone who gets paid for a type of work; whereas "professionalism" depends upon **competence** in doing that work..."*the key to quality and efficiency*". I have noticed recently that there are too many professionals who aren't very professional, including people in the media who rely on the English language to do their work. According to the New Oxford American Dictionary...:

professional

adjective

1 [attrib.] of, relating to, or connected with a profession : *young professional people | the professional schools of Yale and Harvard.*

2 (of a person) engaged in a specified activity as one's main paid occupation rather than as a pastime : *a professional boxer.*

- having or showing the skill appropriate to a professional person; competent or skillful : *their music is both memorable and professional.*

- worthy of or appropriate to a professional person : *his professional expertise.*



noun

a person engaged or qualified in a profession : *professionals such as lawyers and surveyors.*

- a person engaged in a specified activity, esp. a sport or branch of the performing arts, as a main paid occupation rather than as a pastime.

- a person competent or skilled in a particular activity : *she was a real professional on stage.*

professionalism

noun

the competence or skill expected of a professional : *the key to quality and efficiency is professionalism.*

- the practicing of an activity, esp. a sport, by professional rather than amateur players : *the trend toward professionalism.*



- Professionalism is the skill or qualities required or expected of members of profession.
- A profession can be defined as the systematic knowledge acquired through specialized training or education or practicing.
- use synonymous of job, occupation, career, post, work, trade and business etc.
- profession is not limited simply as occupation, which perform for livelihood or to earn ones living through it.
- Profession provides specialized type of services for any needy person or community.
- The content of profession with moral and ethical behavioral is professionalism.

Feature of profession

1. Systematic knowledge and skills.
2. A professional exercises the knowledge and enhance skill ethically as an expert occupational or professional. (Authenticity of Knowledge)
3. The services or work as an expertise's of a professional is evaluated by the public. (public property)
4. Professional follows code of conduct to keep moral of the profession high. (bond by code)
5. Professional has own cultures. (professional culture)
6. Professionals are regarded as deserving prestige, high pay and as well as more social benefits.

Ordinary person has to surrender before a profession. Professionals are competent to provide services to the needy person or community.

Factor affecting the morale of profession;

1. **Salary:** If the salary and fee provided to a professional is far low to meet their reasonable requirement, they may have difficulty in maintaining professional service to public so that s/he may try other way.
2. **Social norms/ values:** in the society the dignity of labour is equivalent to nil : money has got a high value irrespective of the source, professionals are not able to show high moral standard
3. **Low morale:** moral level of society and organisation.
4. **Non regularities of law and regulation** (non penalty): The rules and regulation are not effective and
5. **Lack of commitment of society (state/ politics):** absence of good governance, political commitment,

Who is a professional?

J. Richard Cottingham, P.E., P.L.S., National Society of Professional Engineers, USA

- The terms *profession* and *professional* have many uses in the public vernacular.
- A fundamental distinction in our society is *professional* versus *amateur*.
- A *professional* is one who performs for pay - athletics provides the best example.
- Another meaning is doing full-time what others do part-time-photography for example.
- *Professional* also relates to a standard of workmanship.
- Craftspeople perform professional-quality work; for example, an electrician might install light fixtures in a professional as opposed to an unprofessional, or shoddy, manner.
- With respect to engineering and other learned professions, however, the term professional takes on a higher significance than merely earning a living or performing quality work.
- In general, learned professions have the following identifying characteristics:

professions have the following identifying characteristics:

- ✘ High Academic Standards—Having knowledge and skill not possessed by the general public (for example, high levels of technical competence)**
- ✘ Continual Renewal of Knowledge—Staying abreast of developments through journals, publications, conferences, and seminars**
- ✘ Service for Society—Performing services that affect the public health, safety, and welfare (beneficial application of technical competence)**

professions have the following identifying characteristics:

- **Personal Responsibility for Work—Continually looking for own mistakes and opportunities/methods for improvement**
- **Display of Self-Confidence—Who wants a nervous dentist, unsure of which tooth to drill?**
- **Exercise of Judgment and Discretion—Having flexibility/authority to make decisions based upon a defined body of knowledge**
-

professions have the following identifying characteristics:

-
- **Predominantly Intellectual Work—Generally white-collar and not readily subject to productivity measurement**
-
- **Regulated/ Registration required —Quality of work is subject to established standards. Members of the profession risk loss of right to practice for misconduct, incompetence, or gross negligence**
-
- **Dedication Beyond financial and Personal Considerations—Commitment to the "calling" with ethics and quality of work transcending any other issues**

- Professional engineering:
 - ▶ any act of designing, composing, evaluating, advising, reporting, directing or supervising
 - ▶ safeguarding of life, health property or the public welfare
 - ▶ that application of engineering principles.
 - ▶ (Natural scientist's practice is not included)
 - ▶ **Nepal engineering council Act 2054 defines the engineering profession as the occupation which is done by the engineers. And an engineer has been defined as a person having graduate degree in engineering from the institute recognise by the council**

Code of ethics:

Code provides a positive stimulus (make some body more active or alert) for ethical conduct and a set of guidelines with fundamental cannon (hit something with force).

Code gives a positive support to those seeking to act ethically and in taking stands on moral issues when a professional in under pressure to act unethically.

Moreover, code serves as legal support for professional.

Codes also serve the formal basis for investigating unethical conduct.

The current codes are by no means perfect, but they are steps in the right direction.

- The public interest
- Quality of truth, honesty, and fairness
- Professional performance
- Limitation of code
- Codes are not straight forwardly applicable to all situation. More problems can arise in a complex profession like engineering.
- It is easy for different entries in codes to come in to conflict with each other that may create moral dilemmas.
- A code can not serve as the final moral authority for professional conduct.
- A code of ethics governs the conduct of all practitioners within their area of expertise so in a fair and ethical manner, and they place the good of society above their personal gain.

Chapter II

● 2.2 Professional institutions

- Regulation of the practice of the profession,
- licensing,
- guidance for training new entrants into the profession,
- advice and assistance to engineering colleges,
- upgrading and maintaining the professional and technical competence of members,
- providing technical expertise as requested for the guidance and assistance of legislators,
- seeing to the matter of safety and general welfare of the public in engineering works.

Chapter II

- professional engineering is any act of designing, composing, evaluating, advising, reporting, directing or supervising where in the safeguard of life, health, property or the public welfare is concerned and that requires the application of engineering principles,
- but does not include practicing as a natural scientist.
- Engineering Profession means the profession to be practiced by the engineers who have acquired the technical knowledge and skills in the subjects. (NEC 2054)

Chapter II

Professional Body:

- The professional Engineering body is an independent body that regulates the practice of professional engineering and governs its members in accordance with the statute of the body and rules, regulation and bylaws of the country in order to serve and protect the public interest.
- NEA<SOPHEN, SONA< MONA< SOMEN etc.

Role of professional association

1. Regulation of the practice of the profession
2. Licensing
3. Guidance for training new entrants into the profession
4. Set Norms and standards
5. To grant permission / approval
6. monitoring
7. Advice, assistance and monitoring to engineering colleges
8. Upgrading and monitoring the professional and technical competence of member
9. Providing technical expertise as requested for the guidance and assistance of legislators.
10. Seeing to the matter of safety and general welfare of the public in engineering works

Chapter II

Regulation of the practice of the profession

- **Constitution of civil service:**
- Government shall constitute the civil services as follows:
- (a) Nepal Economic Planning and Statistics Service;
- (b) Nepal Engineering Service;
- (c) Nepal Agricultural Service;
- (d) Nepal Judicial Service;
- •(d1) Nepal Foreign Service;
- (e) Nepal Administration Service;
- •(e1) Nepal Audit Service;
- (f) Nepal Forestry Service;
- (g) Nepal Miscellaneous Service;
- (h) Nepal Education Service;
- (i) ♦-----
- (j) ♥-----

Engineering Professional Practice Sectors in Nepal

1. Public sectors (organisation that are run with the budget sanctioned by government).
2. Private sector (organisation that are run with the budget sanctioned by private).
3. NGO./CBO sector (organisation that are run with the budget sanctioned by Mon government .

Public sectors

- Government organisation (ministries) Department, Regional , district office,
- Board, project,
- Constitutional body
- commission, parliament, court, CIAA, Office of attorney general, Centre for national vigilance,
- Corporation ,Municipalities, DDC, VDC
- Universities, institute etc
- Ministries enlisted

Engineering Professional Practice Sectors in Nepal

- Private sector (organisation that are run with the budget sanctioned by private).
- NGO./CBO sector (organisation that are run with the budget sanctioned by non government .

General Job description of engineers

- An engineer has following responsibilities

1. Vision
2. Mission
3. Program
4. Implement
5. Supervision
6. Monitoring
7. Training
8. Enhance profession
9. An engineer involve one of
10. Private sector
11. Public sector
12. Free consultant

An engineer assign one of

1. Consultant
2. Contractors
3. An engineer serve as
4. Designer
5. Programmer
6. execution
7. Surveyor
8. Supervisor/ monitoring
9. Administrative
10. Researcher/ analyzer
11. Academician
(teacher/professor/trainer)
12. Preliminary survey, prefeasibility, feasibility, detail design , estimate

Typical TOR of a private sector Engineers

1. To coordinate works between stake holders
2. To layout, survey, estimate,
3. Supervisory work, schedule , monitor, time, quality, cost control
4. Reporting to concern agency
5. Quantity survey and bill preparation
6. To plan project and progress report
7. Technical report and claims
8. Training and guide for new entrants and worker
9. Overall management, (site in charge)

Public Service commission provide job description of engineer

3rd Class

1. Preliminary survey, prefeasibility, feasibility, detail design , estimate
2. Execution of project works
3. Reporting
4. Pre activities
5. Interim progress
6. Monitoring
7. Evaluation
8. Post implementation report
9. Job assigned by immediate boss (superiors)
10. To facilitate donor agency
11. Job specific for engineers

2nd class

1. Planning, programming, and execution of works
2. Research on technology, cases, various skill upgrade
3. Monitoring and evaluation
4. Supervision of project
5. Administrative works
6. Financial planning and administration

Chapter II

Regulation of the practice of the profession

[..\epp pdf\The Nepal Engineering Council Act.pdf](#)

[..\epp pdf\Bye-laws NEC.pdf](#)

[..\epp pdf\Civil Service Act.pdf](#)

[..\epp\Civil Servis Act English 2062,8,10.doc](#)

[Licensing](#)

Chapter-2

Provisions Regarding the Registration of Name

11. Prohibition to Practice Engineering Profession without Getting Registered name :

After one year from the date of commencement of this Act, no person shall practice the engineering profession without getting his name registered in the Council.

OBJECTIVE OF PROFESSIONAL ASSOCIATION

- purpose of the association should be to regulate the practice of professional engineering and to govern its member, holders of certificate of authorization, holders of temporary licenses and holders of limited licenses in accordance with the act of the country or provinces in order that the public interest can be served and protected.
-
- The principal objective:
- Centre of learning; library, network
- Provider of professional status with responsibility for the ethics of the engineering profession
- Voice of profession;
- lobbying government,
- promoting engineering
- A facilitator of best practice;
- providing training, requirement
-

OBJECTIVE OF PROFESSIONAL ASSOCIATION

-
- **Additional objective:**
- To establish, maintain and develop standards of knowledge and skill among its member
- To establish, maintain and develop standards qualification and standards of practice for the practice of professional engineering
- To establish, maintain and develop standards of professional ethics to the members
- To promote public awareness of the role of the association
- To perform such other duties and exercise such other powers as are imposed or conferred the association by or under rule

General Requirements for membership of professional body

1. Citizenship (nationality)
2. Educational qualification
3. Experience
4. Character
5. Knowledge of law and ethics
6. Language and competency

- Nepal Engineers' Association is an independent nonprofit organization of Nepalese engineers. It was established in 1968.
- NEA is governed by an executive body of 15 members
- elected by members of the association.
- Executive Council, supported by its various 17 committees decides major policy issues and NEA's overall direction.
- Members are encouraged to participate in the affairs of the association.
- The noble aim of developing engineering professionals to promote the development process by application of engineering sciences and technologies and at the same time increasing the interaction, goodwill and cooperation among engineers in Nepal and protect their professional rights.

NEA

1. It is the generic national apex body of Nepalese Engineers of various disciplines.
2. It is independent and nonprofit organisation
3. It attempts to regulate effectively the practice of professional engineering in the national development
4. It governs its member in accordance with the statute of the body and law of the country in order to serve and protect the public interest
5. It safeguards the rights and strengthens the professional capacity of engineer

The Nepal engineer's Association Preamble: - (from its constitution)

-
- Where, it is expedient to make timely amendments to the Statute prepared in the year 2024 B.S. (1967) under which the Nepal Engineers Association, established in the year 2025 B.S. (1968) with the objects to establish an Association to make the role of the engineer community of the professional interest and progress of the Community, has carried out its business, this third amendment having been adopted by the Extra-ordinary. General Assembly held on 051/01/31 (14 May 1994) is brought into force since 051/03/20 (4 July 1994).
-

objectives of Nepal engineer's Association

1. To help in proper development and mobilization of the engineering science and technology in Nepal.
2. To increase mutual consultation, good faith and assistance among the Nepalese engineers and safeguard their rights and interests.
3. By utilizing, to the highest extent possible, the participation of the engineering manpower of the country in the national development activities of Nepal, to make effort to put an end on foreign dependency in this regard.
4. To continuously enhance the highest professional ideals among the members and make it wider.
5. To make relations, mutual help and good –faith with international Engineering Association, institutions.

major activities of NEA.

1. Publish journals, Manuals, articles and newsletters on various fields of Engineering.
2. Organize conferences, workshop and paper presentation programs to foster interaction of engineers of various fields.
3. Conduct major talk programs form highly acclaimed professionals on engineering issues.
4. Recognize and award distinguished professionals for their contribution.
5. Enhance safeguard of professional right of engineers
6. Cooperate and organize joint activities with foreign and domestic professional organizations.

Benefit of membership

There are numerous benefits to the member by association

Benefit of professional nature

1. Provides a focus for the profession maintaining professional standards and complying with international rules of professional conduct.
2. Offers worldwide recognised qualifications and support and advice required to achieve them (such as : Establish routes to membership to suit EMF)
3. Allocates fund local activities
4. Gives training, advises and conduct generic training courses
5. Arranges regular meetings and visit to centers and chapters to hear local views
6. Proceeding, Information share, journal publication, newsletter etc
7. Offers library as a room of learning
8. Offers national/ international level conference, seminar, workshop, lecture, and movement of awareness
9. Arbitration, conciliation services

Benefit of personnel nature:

1. Participate in a comprehensive technical program of your field of interest
2. Enjoy a wide range of technical visits and social functions
3. Contribute to the future of your profession
4. Have your views included in major responses to draft policy
5. Have comprehensive guidance to become professional engineer
6. Have a basis for continue professional development
7. Have access in the international recognition, status and networking opportunities through overseas partnership and reciprocal agreements
8. Give views on professional issues to the politician, governments, and civil society
9. Participate in short term and long term training
10. Meet professional colleagues at all level

Benefit of personnel nature:

11. Keep up to date with what is happening in the profession
12. Initiate technical papers or articles about projects you are working on
13. Maintain good contact with the media and promote wide; image with public
14. Assist in the training of other engineers
15. Support school, college and university visits
16. Benefit from excellent awards
17. Utilizing the services and facilities of association
18. Get member benefits from the discounts and other services from different sectors in the society
19. Have wider range of linkage , opening a new horizon for career advice and employment opportunities
20. Be proud of your profession

Nepal engineering Council

Nepal engineering council is an autonomous body formed under government act (NEC act 2054). It regulates engineering profession effectively and scientifically. It also undertakes licensing of engineering accordance with their qualification.

NEC

- Nepal Engineering Council Rules, 2057 has also been prepared and approved by Nepal Government as per the provision of Clause 37 of the Act.
- registration of engineers into three categories as well as the formats for application:
 - a) General Registered Engineer
 - b) Professional Engineer
 - c) non - Nepali Registered Engineer
- NEC Rules 2057 also lays down the professional code of conduct for engineers registered with the Council.

Objectives of NEC

- The objective of Nepal Engineering Council is to make the engineering profession effective by mobilizing it in a more systematic and scientific and also to register the engineers as per their qualifications. Its duties and responsibilities are:
 - 1) To prepare policies, plans and programs for the smooth functioning of the engineering profession and to execute them
 - 2) To set norms and standards for engineering education in Nepal

Objectives of NEC

- 3) To grant permission and approval to carry out engineering education to those engineering colleges and institutions that meet the required norms and standards and to honor their degrees and certificates
- 4) To monitor and inspect the quality of engineering education provided by the engineering colleges and institutions
- 5) To fix the qualification necessary in order to practice engineering profession and to register their name in the Council
- 6) To remove their name from the registration of the engineering council if found to violate the code of ethics.

Jurisdiction of NEC

Licensing of engineers

1. Accreditation of certificates of academic qualification
2. Recognition of the academic institution
3. Professional code of conduct

Disciplinary

Registration categories

- | | |
|--------------------------|---|
| 1. General engineer | A |
| 2. professional engineer | B |
| 3. Foreign engineer | C |

Registration requirement

1. Application in approved format
2. Copies of certificate of academic qualification
3. Enclosed registration fee as lat
4. Other relevant document

Disciplinary Action

1. With the aim of uphold high professional standards
2. and deal with situation,
3. in which the public safety or welfare may be endangered, a disciplinary action process is formed.
4. This process is not an alternative to civil court.
5. It deals solely with professional and ethical practice.
6. Anyone with concern about the conduct of a member of the association is encouraged to contact the association.
7. Complaints provide facts and written summary of the allegations (claim).

Disciplinary Action

The process of disciplinary action

1. Gathering evidence of complaint
2. Investigation of the complaint
3. Disciplinary hearing
4. If professionals found not doing wrong during practice, the complaint is dismissed and no further action is taken. But if proved professional misconduct or misbehaviors, than she/he has to undergo following action
5. Is asked for further clarification
6. Right to practice is suspended for certain period
7. Right to practice is cancelled completely
8. Subject to fine
9. May be ordered to pass professional standards examination,
10. Complete a course of study obtain experience in particular field

Code of ethics for engineer

Professional code of conduct

- The professional code of conduct to be followed by the registered engineers of the council, subject to the provision of Nepal Engineering Council Act, 2055 (1998) and Nepal Engineering Council Regulation, 2057 (2000),

NINE POINT CODE OF CONDUCT

NEA Adopted code of ethics for its fellow since 2025 as per NEA

1. Fundamental principle of professional engineering ethics
2. Upholding and advancing engineering profession
3. Keeping high standard of ethical conduct
4. Quality of engineer
5. Will be honest and fair and serve employer, clients and public
6. Will dedicated to the advancement of competence of engineering profession and to disseminate engineering knowledge
7. Will use his knowledge and skill in the service of humanity

Quality of engineer

1. Knowledge of technology
2. Social understanding
3. Economical realities
4. Legal awareness
5. Environmental skills
6. Management skills
7. Leadership and innovation

Relation with public

- The Engineer,
 1. Will have proper regard for the for the health, safety, and welfare of public
 2. Will endeavor to extend public knowledge and appreciation of engineering profession and to dissemination engineering knowledge
 3. Will be dignified and modest in explaining his work and merit and refrain from misrepresentative self-laudatory advertisement
 4. Will express an opinion on an engineering subject

Relation with public

- Relation with client, with employer

1. Will act as faithful agent or trustee for employee or client.
2. Will not accept compensation or remuneration from more than one party for same services or service pertaining same work, without the consent of all interested parties.
3. Will inform his employer or client of his financial interest in any vendor or contractor and this should not affect to his services.
4. Will indicate employer the adverse consequences if his judgment is overruled.
5. Will undertake only those engineering assignments for which he is qualified.
6. Will not disclose information concerning business affairs or technical process.
7. Will not divulge any confidential findings of studies or action of any commission or board in which he is member.
8. Will not exert undue influence or offer solicit or accept compensation for the purpose of affairs negotiations for an engineering engagement.

Relation with engineers

1. Will take care that credit for engineering works is given to those directly responsible for.
2. Will provide complete information on working conditions and status of employment.
3. Will uphold the principle of appropriate and adequate compensation for those engaged in engineering works.
4. Will endeavor opportunity for professional development and advancement of fellow engineer under his supervision.
5. Will not attempt to injure falsely or maliciously professional reputation, prospects or practice of other engineer
6. However, he has proof that engineer has been unethical, illegal or unfair in his practice, he should so advise to proper authority.
7. Will not use the advantage of salaried position to compete unfair with other engineer.
8. Should give due regards to all professional aspects of the engagement.
9. Will not attempt to supplant other engineer in a particular engagement.
10. Will not review the work of other engineer for the same client except with the knowledge of such engineer.
11. Will cooperate in advancing the engineering profession by interchanging information and experience with other engineers by contributing to public communication media.

Perspective on Morals, Ethics, and Professionalism

Morals: Concerned with goodness and badness of human characters, free from action of nature or animal. Moral measures the standard of good behaviour by which people are judged. (Distinction between right and wrongs, conforming to accepted standards and rules).

Perspective on Morals, Ethics, and Professionalism

Engineering morals means the standard of good behaviour of engineering people by which they are judged.

Moral means the standards of behaviour accepted by the culture and religion of the society.

Non- moral is means devoid of moral quality.

The actions of animal or nature are neither moral nor non-moral.

- Perspective on Morals, Ethics, and Professionalism
- **Ethics:** Greek word (ethos) means location or space where people lived together
- Later it covered meaning
- Customs, usages and habit
- The association of professional Engineers, Geologist, and Geophysicists of Alberta define standard of study of right and wrong,
- Science and philosophy deals
- Moral conduct , duty, and judgments

Perspective on Morals, Ethics, and Professionalism

Ethics: Ethics is the branch of philosophy concerned with the nature of ultimate value and the standards by which human action can be judged right or wrong.

It is also applied to any system or theory of moral values or principle.

Ethics is a system of belief that supports the view of morality.

.

- Perspective on Morals, Ethics, and Professionalism
- Ethics is an activity of understanding moral values, resolving moral issues, and justifying moral judgment. It refers to moral principles or rules of behavior.
- Ethics may be defined as the science of rightness or wrong of conduct. Some times ethics is used to refer to the particular set of belief, attitudes, and habits that a person or groups displays concerning morality.

- Perspective on Morals, Ethics, and Professionalism
- Morality is complex and not easily expressed in a simple definition.
- Moral reasons require us to respect other people as well as us to care for their good as well as our own.
- When we speak about ethics, we refer to peoples outlooks on the morals issues.
- When we speak of ethical problem issues and controversies, we mean to distinguish them from non-moral problems.

- Perspective on Morals, Ethics, and Professionalism
- **Ethics** seeks to teach us how we can pass correct moral judgment upon human conduct and consider it as right or wrong with reference to supreme ideal of human life.
- TRUTH, BEAUTY, GOOD ARE IDEAL OF HUMAN LIFE.
- Thus ethics is the science of human character as expressed in right or wrong conduct.
- DO UNTO OTHERS AS YOU WOULD HAVE OTHERS DO UNTO YOU.

- Perspective on Morals, Ethics, and Professionalism
-
- Ethics is traditionally subdivided as
 - Normative ethics
 - Meta ethics and
 - Applied ethics

- Perspective on Morals, Ethics, and Professionalism
- **Normative ethics** : seeks to establish norms or standards of conduct, a crucial questions in this field is whether action are to be judged right or wrong based on their consequence (result or effect something) or based on their conformity to some moral rule , such as “ do not tell a lie”. Normative inquires or questions are about what ought to be and what is good (concern with moral value)
- **Meta ethics**: is concerned with the nature of ethical judgment and theories. Meta ethics has focused on logical and semantic aspects of moral language. Some major meta ethical theories are naturalism. Conceptual inquiries are directed toward clarifying the meaning of concept, principles, and issues.
- **Applied ethics**: as the name implies, consists of the application of the normative ethical theories to practical moral problems. Among the major fields of applied ethics are bioethics business ethics, legal ethics, medical ethics and engineering ethics. Factual inquires (also called descriptive inquires) seek to uncover practical moral problems.

- Perspective on Morals, Ethics, and Professionalism
- Engineering ethics: firstly it is the applied the study of moral issues and decision confronting individuals and organisation engaged in engineering, and secondly the study of related questions about the moral ideals, character, policies, and relationship of people and cooperation in technologies activity.
- Engineering ethics refers to the accepted codes and standards of conduct. Engineering ethics accordingly is the activity and discipline aimed at understanding the normal values that ought to guide engineering practice, resolving moral problems and issues, and justifying morals judgment concerning engineering safety, health and public welfare.
- Ethics are set of principles that have been created through reflection and discussion to guide our behavior. Ethics is the science of morality.
- Morality concern what ought or ought not to be done in a given situation, what is right or wrong about the handling of it , what is morally good or bad.

Perspective on Morals, Ethics, and Professionalism

Distinction between moral and non moral action

Engineering ethics refers to the study of morality.

There is difference between morality and ethics.

Ethics is a system of belief that supports a view of morality.

word moral means the principle of right or wrong behavior and standards of behavior.

Morality is the standards of behavior by which people are judged or assessed.

The word non use deviated by way of, means devoid of moral quality (without something or lacking something).

Moral judgments are about what ought or ought not to be done, what is morally right or wrong and what is morally good or bad.

On the basis of moral value society can distinguish the good and bad things.

Actions neither moral nor immoral

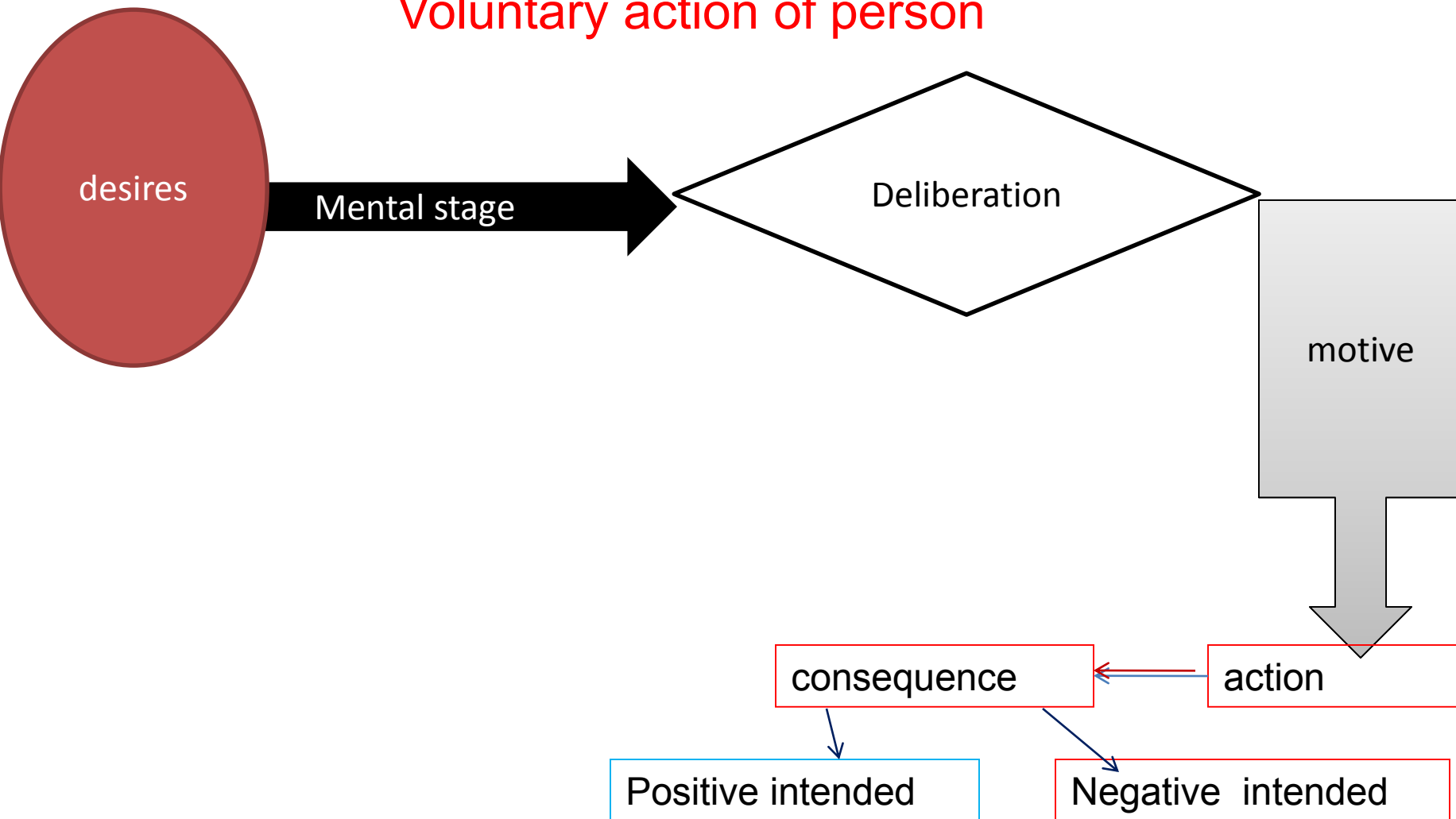
Calamities'

Animal action

Children action, mad action, idiot action

Action under compulsion

Voluntary action of person



- Various laws of ethics
 - Eternal law of ethics
 - Utilitarian law of ethics
 - Universalism law of ethics
 - Distributive justice law of ethics
 - Personal liberty law of ethics
-

Eternal law of ethics

The eternal law of moral is the set of standards of good behaviour on the nature and the scriptures (religious). Every one should act in accordance with the common set of standards

Utilitarian law of ethics

It is based upon Teleology theory means result out come theory. The professional or individual should act in the way to creating the greatest benefit for the largest numbers of people.

Universalism law of ethics

The professionals must have good motives behind their doing. It is based on Deontological theory means duty and obligation.

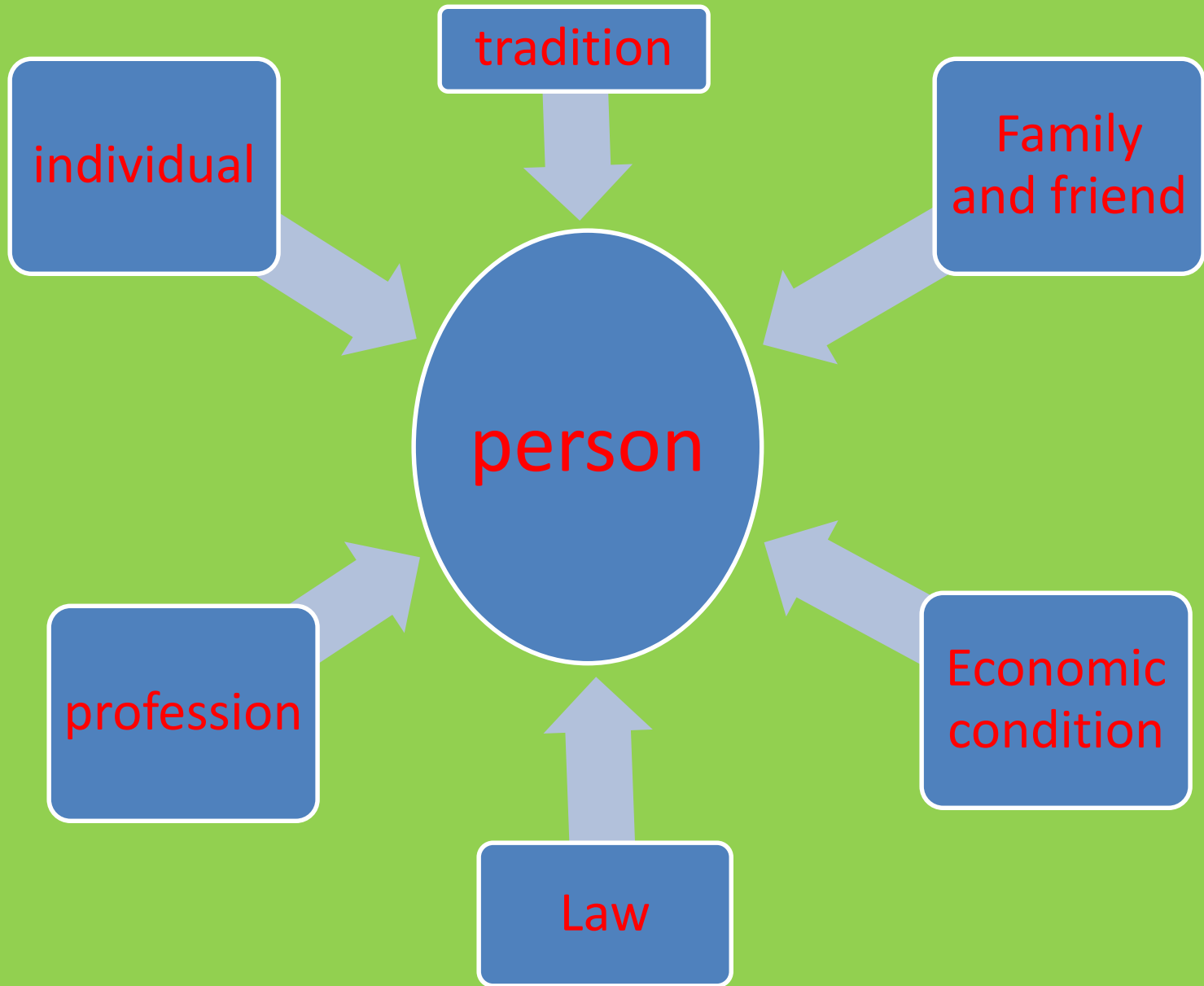
Distributive justice law of ethics

Based upon rules and law apply equally to all people. **Raja Dekhi Ranka Shamma**

Personal liberty law of ethics

This law states that any act that violates any body personal liberty even if the act creates greater benefit for the larger number of people is not accepted

Ethical system	Nature of ethical belief	Problems in ethical system
1. External law	Moral standards are given in an eternal (existing for ever) law; which is revealed in scripture (bed, Koran bible) or apparent in nature and the belief is that every one should act in accordance with interpretation.	There is multiple interpretation of the law, but no method to choose among them beyond human rationality needs an absolute principle or value as the basis for choice.
2. Utilitarian theory	Moral standards are applied to the outcome an action or decision. A decision is right and proper and good only if it generates greatest benefits for the largest number of people	Immoral acts can be justified if they provide substantial benefit for the majority, even at an unbearable cost or harm to the minority. Principle or value is needed to balance the cost benefit equation.
3. Universalism theory	Moral standards are applied to the intent (showing eager interest and attention) of an action or decision. Decision or action is right and proper, and good only if we could will that everyone, faced with the same set of circumstances, should be expected to the same decision or take the same action. Everyone should act to ensure that similar decisions would be taken by others in similar circumstances.	Immoral acts can be justified by people who are prone to self deception or self importance; there is no scale to judge between wills. Additionally principal or value needed to refine the categorical imperative concept
4. Distributive Justice	Moral standards are based upon the justice. Decision or action is right and proper, and only if least advantages members of the society enjoys a better standard of living after the decision or act, than they did before. Taking more tax from rich and subsidized to the poorer.	The primacy of the value of justice is dependent upon acceptance of the proposition that an equitable distribution of benefits social cooperation.
5. Personal Liberty	Moral standards are based upon the liberty. Decision or action is right and proper, and good only if all members of our society some how enjoy a greater freedom to develop their own lives after the decision or act than they did before	The value of liberty is dependent upon acceptance of the proposition that a market system ensures social productivity.



Discussion on moral dilemma on decision making taking reference of laws of ethics

In every pace of life, ethical dilemma happens on decision making process. Ethical dilemma happens on decision making process happens due to economic and social reasons for an institution and want or desire and duties for an individual.

Disposal of industrial waste to the river basin may fulfill industries desire or wants due to economic reasons but it harm the environment and society.

An individual do something to fulfill his wants or desire what he is not supposed to do.

Asphalt lay during rainy seasons and day after broken out almost.

Software model using crack version and cannot run properly.

Discussion on moral dilemma on decision making taking reference of laws of ethics

On the basis of moral value, society can distinguish the good and bad things. aim of manager need to create an ethically healthy climate for his or her employees, where they can do their work productively and confront a minimal degree or ambiguity regarding what constitutes right wrong behaviour.

The aim of ethics is to define the nature of the highest good of a man as a member of society.

Problems faced by a manager was examined in great detail to consider in detail the actual nature of the ethical dilemma in management and from that examination five conclusions were drawn concerning the complexity of managerial ethics.

Ethical problems in management are complex and ethical decisions have:

- Extended consequence
- Multiple alternative
- Mixed outcomes
- Uncertain consequences
- Personal implications

- Extended consequence:
- most ethical decision have extended consequences.
- The decisions of manager have an impact upon others; both within the organisaion and within society;
- that is beyond their control and therefore should be considered when the decisions are made.
- For example bribe (backhander) change governmental process, pollution affects environmental health, unsafe products destroy individual lives.

- Multiple alternatives:
- **Most ethical decision decisions have multiple alternatives.**
- **Should a manager pay a bribe or not?**
- **Should a factory pollute the air or not?**
- **Should a company manufacture unsafe product or not?**
- **As has been seen in the simple illustration of bribery payments for import clearances.**
- **Multiple alternatives have to be considered in making ethical choices.**

Mixed outcomes: most ethical decisions have mixed outcomes.

Ethical issues in management are considered antithetical (negating).

Pay an indirect bribe, but maintain the sales volume of imported goods through prompt delivery.

Cause some air or water pollution, but avoid the cost of installing and operating pollution control equipment.

Design a slightly unsafe product, but reduce the material and labour costs of manufacture.

Social benefits and costs as well as financial revenues and expenses are associated with almost all of the alternatives in ethical choices

- Uncertain consequences:
- **Most ethical decisions have uncertain consequences.**
- **It is commonly thought that ethical issues in management are free of risk or doubt, with a known outcome for an alternative.**
- **Pay the bribe, and receive the imported goods promptly.**
- **Investment in pollution control equipment, and the emission will be reduced X% at Y costs of operation.**
- **Produce an absolutely safe product at an additional costs Z dollars per unit. It is not all clear what consequence will follow from most ethical choices.**

✘ **Personal implications:** Most ethical decisions have personal implication. It is commonly thought that ethical issues in management are largely impersonal. Many people believe that prima facie ethical decision in a given operation may reduce the profits of the company but not the executive's salaries or their opportunities for promotion. Maintain the sales of imported goods at expected levels, and despite slightly increased expenses for bribes, the quarterly review will be pleasant. Delay installation of pollution control equipment, and the rate of return will be close to the planned percentage. Redesign the product to reduce the material and labour cost, profit margin and chances of promotion will increase. Individual benefits and costs as well as financial social benefits and costs associated with most of the alternatives in ethical decisions

10. Could the decision become habit forming?

If so, don't do it.

9. Is it legal?

If it isn't, don't do it.

8. Is it safe?

If it isn't, don't do it.

7. Is it the right thing to do?

If it isn't, don't do it.

6. Will this stand the test of public scrutiny?

If it won't, don't do it.

5. If something terrible were to happen, could I defend my actions?

If you can't, don't do it.

YOURSELF WHEN MAKING AN ETHICAL DECISION

4. Is it just, balanced, and fair?

If it isn't, don't do it.

3. How will it make me feel about myself?

If it's lousy, don't do it.

2. Does this choice lead to the greatest good for the greatest number?

If it doesn't, don't do it.

And the #1 question you should ask yourself when making an ethical decision:

1. Would I do this in front of my mother?

If you wouldn't, don't do it.

- Seven sins by Mahatma Gandhi

1. Wealth Without Work
2. Pleasure Without Conscience
3. Knowledge Without Character
4. Commerce (Business) Without Morality (Ethics)
5. Science Without Humanity
6. Religion Without Sacrifice
7. Politics Without Principle

सात पाप

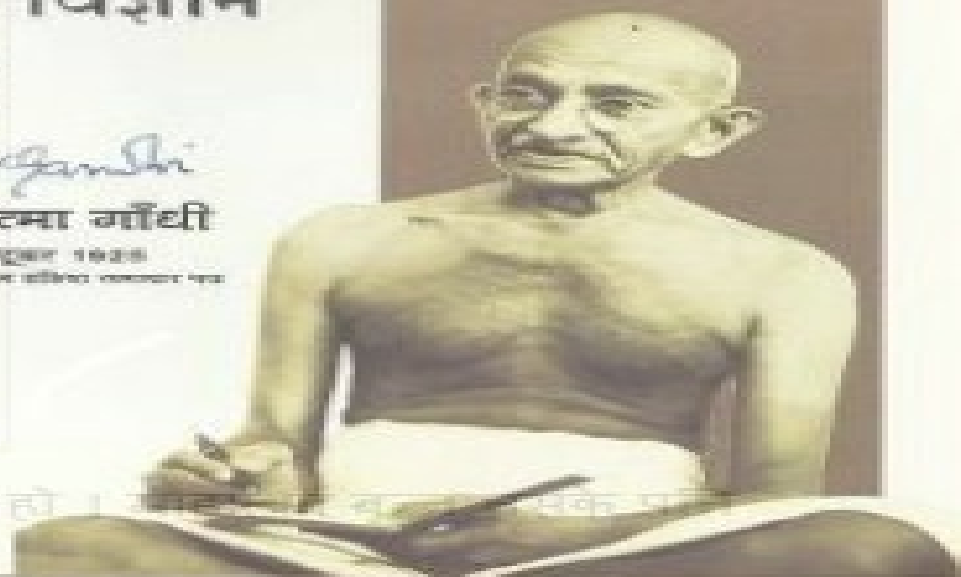
सिद्धान्त विहीन राजनीति
श्रम विहीन सम्पत्ति
विवेक विहीन भोग विलास
चरित्र विहीन शिक्षा
नैतिकता विहीन व्यापार
मानवीयता विहीन विज्ञान
त्याग विहीन पूजा

M. K. Gandhi

महात्मा गाँधी

२२ अक्टूबर १९३९

राजकोट, गुजरात, भारत



1. **Right View.** The right way to think about life is to see the world through the eyes of the Buddha--with wisdom and compassion.
2. **Right Thought.** We are what we think. Clear and kind thoughts build good, strong characters.
3. **Right Speech.** By speaking kind and helpful words, we are respected and trusted by everyone.
4. **Right Conduct.** No matter what we say, others know us from the way we behave. Before we criticize others, we should first see what we do ourselves.

5. Right Livelihood. This means choosing a job that does not hurt others. The Buddha said, "Do not earn your living by harming others. Do not seek happiness by making others unhappy."

6. Right Effort. A worthwhile life means doing our best at all times and having good will toward others. This also means not wasting effort on things that harm ourselves and others.

7. Right Mindfulness. This means being aware of our thoughts, words, and deeds.

8. Right Concentration. Focus on one thought or object at a time. By doing this, we can be quiet and attain true peace of mind.

Four Truth of Buddha

- What's wrong with me?
- Why am I sick?
- What will cure me?
- What do I have to do get well?

History of code

- The history can be traced out from the code of conduct of Hammurabi , the king of Babylon **1792-1750 BC**
- "An eye for an eye, and a tooth for a tooth."
- The builder shall be put to death , if the house he builds collapse and causes death of the house owner
- The builders son shall be put to death, if the houses the builder built causes the death of the son of the house owner
- The builder shall compensate the house owner with the slave of equal value , if the house the builder has built causes the death of a slave of the house owner
- The builder shall restore at his own expense, if the house the builder has built destroys the property of the house owner
- In Nepal, NEA has approved and adopted the code first time March 1969.

- Objective:
- any professional conduct needs codes of ethics and guidelines to maintain high level of standard of good behavior or conduct in the public.
- Engineers create facilities and services by any or all of the acts and do so by applying engineering principles and the experiences gained.
- Fundamental of ethics:
- The national society of professional Engineers NSPE US approved by the board of directors on 5th Oct 1977 has set the following principles for engineers to support and advance the integrity, honor and dignity of engineering profession by
- Using their knowledge and skill for the advancement of human welfare
- Being honest and impartial and serving with loyalty the public, their employers and clients.
- Striving to increase the competencies and prestige of engineering profession
- Supporting the professional and technical societies of their disciplines.

- Five fundamental ethical values for codes

 **Protection of life and safeguarding people**

 **Sustainable management and care for the environment**

 **Community well being**

 **Professionalism, integrity and competence**

 **Sustaining engineering knowledge**

- Some other basic norm for professional engineers as below
 - 🌸 Welfare of public
 - 🌸 Serve in area of competences
 - 🌸 Issue public statement in an objective and truthful manner
 - 🌸 Shall act as faithful or trustee
 - 🌸 Should build their reputation, unfairness to others
 - 🌸 Enhance honor, integrity and dignity of the profession
 - 🌸 Professional career development
 - 🌸 Advertise on factual representation
 - 🌸 Do not offer or accept the hidden payment
 - 🌸 Do not disclose confidential matter(information)
 - 🌸 Do not engage in conflicting services
 - 🌸 Sign those documents which are prepared under his direct involvement
 - 🌸 Report if any unethical matter in your knowledge etc.

Professional ethics concerns the moral issues that arise because of the specialist knowledge that professionals attain, and how the use of this knowledge should be governed when providing a service to the public.

Nepal Engineering Council

Professional Code of Conduct

The professional code of conduct to be followed by the registered engineers of the council, subject to the provision of Nepal Engineering Council Act, 2055 (1998) and Nepal Engineering Council Regulation, 2057 (2000), has been published as the following:

**A Conflict of Interest Policy
Incorporates an Organization's
Ethics, Values and Integrity**



If you Salute your Duty,
You no need to Salute
Anybody,
But
If you pollute your
Duty, You have to
Salute Everybody
-Kalam



Preamble: Whereas, it is expedient to make the provision of Nepal Engineering Council in order to make the engineering profession effective in the State of Nepal and mobilize it in a systematic and scientific manner as well as to provide for, among other matters, the registration of the names of engineers as per their qualifications;

Now, therefore, be it enacted by Parliament in the twenty-seventh year of the reign of late King Birendra.

1. Discipline and honesty:
2. Politeness and secrecy:
3. Non-discrimination:
4. Shall have to do only the concerned professional work:
5. Not to do such works, which may cause harm to engineering profession:
6. Personal responsibility:
7. State name, designation, registration no:
8. No publicity or advertisement shall be made which cause unnecessary effect:

Oath

I having been registered with the Nepal Engineering Council agree to be governed by the memorandum, rules regulations and byelaws of the council, as they now stand or as they may hereafter be altered or added to according to law and I undertake to observe the ethics of the profession and to promote objects and interest of the council in so far as it lies in power.

Other code of ethics

- Other professional association has also provide the code of ethics
- NEA (Nepal Engineering Association), SOMEN , etc.
- SCAFF (Society of consulting Architecture and engineer's)
- FCAN (Federation of Contractors Association of Nepal)
- APEGGA (the association of Professional Engineers Geologists, and geophysicists of Alberta)
- ACM (Association for Computing Machinery)

Responsibilities of engineers

- Will be honest and fair, will serve the client and the public with devotion
- Will dedicate himself to the advancement of the competence of the engineering profession
- Will use the knowledge and skill in the favor of humanity
- **RESPONSIBILITY TOWARDS THE NATION**
- **MORAL RESPONSIBILITY**
- **INVOLVEMENT IN COMMUNITY DEVELOPMENT**
- **REFRAIN FROM WORKS WHICH ARE AGAINST NATIONAL INTEREST**

Responsibilities of engineers

- **RESPONSIBILITY TOWARDS THE CLIENT**
 - TO GAIN AND MAINTAIN CLIENT CONFIDENCE
 - TO BE LOYAL TO THE CLIENTS
 - TO PROTECT INTEREST OF CLIENT
 - TO SAFEGUARD CLIENT CONFIDENTIAL INFORMATION
 - TO DISCLOSE THE CONFLICT OF INTEREST

Responsibilities of engineers

- **RESPONSIBILITY TOWARDS THE PROFESSION**
- THE NECESSITY OF FORMER QUALIFICATION
- REFRAIN FROM CLAIMING SKILL NOT IN HIS/HER PROFESSION
- THE NEED TO EXERCISE GREATER SKILL IN SPECIALISED JOBS
- THE NEED FOR HIGH QUALITY OF SKILL
- ELIGIBILITY FOR agreed remuneration only
- Refrain from holding position where there is conflict of interest
- The need for professional development

Relationship of engineering profession to basic science and technology; relationship to other professions

- Engineering itself is an application of knowledge and skills acquired through a specialized training, education and experiences and practicing the same as an occupation in the areas of public safety, health and property protection. In short it is a systematic application of knowledge and skill.
- The basic science teaches us the law of nature, properties of matters and sources of power that are available around us. Technology teaches us the best application of those laws of nature and utilization of the properties of matters and sources of power by which, engineer can make new facilities and create new services.

Engineering Professional Practice Sectors in Nepal

1. Public sectors (organisation that are run with the budget sanctioned by government).
2. Private sector (organisation that are run with the budget sanctioned by private).
3. NGO./CBO sector (organisation that are run with the budget sanctioned by Mon government .

Public sectors

- Government organisation (ministries) Department, Regional , district office,
- Board, project,
- Constitutional body
- commission, parliament, court, CIAA, Office of attorney general, Centre for national vigilance,
- Corporation ,Municipalities, DDC, VDC
- Universities, institute etc
- Ministries enlisted

Engineering Professional Practice Sectors in Nepal

- Private sector (organisation that are run with the budget sanctioned by private).
- NGO./CBO sector (organisation that are run with the budget sanctioned by non government .

General Job description of engineers

- An engineer has following responsibilities

1. Vision
2. Mission
3. Program
4. Implement
5. Supervision
6. Monitoring
7. Training
8. Enhance profession
9. An engineer involve one of
10. Private sector
11. Public sector
12. Free consultant

An engineer assign one of

1. Consultant
2. Contractors
3. An engineer serve as
4. Designer
5. Programmer
6. execution
7. Surveyor
8. Supervisor/ monitoring
9. Administrative
10. Researcher/ analyzer
11. Academician
(teacher/professor/trainer)
12. Preliminary survey, prefeasibility, feasibility, detail design , estimate

Typical TOR of a private sector Engineers

1. To coordinate works between stake holders
2. To layout, survey, estimate,
3. Supervisory work, schedule , monitor, time, quality, cost control
4. Reporting to concern agency
5. Quantity survey and bill preparation
6. To plan project and progress report
7. Technical report and claims
8. Training and guide for new entrants and worker
9. Overall management, (site in charge)

Public Service commission provide job description of engineer

3rd Class

1. Preliminary survey, prefeasibility, feasibility, detail design , estimate
2. Execution of project works
3. Reporting
4. Pre activities
5. Interim progress
6. Monitoring
7. Evaluation
8. Post implementation report
9. Job assigned by immediate boss (superiors)
10. To facilitate donor agency
11. Job specific for engineers

2nd class

1. Planning, programming, and execution of works
2. Research on technology, cases, various skill upgrade
3. Monitoring and evaluation
4. Supervision of project
5. Administrative works
6. Financial planning a and administration

Relationship of engineering profession to basic science and technology; relationship to other professions

- **Science: A system of data and relationship covering vast areas of information derived from observation analysis and manipulation of natural phenomenon.**
- **Technology: how things are commonly done or made, what things are done or made.**
- **A study of the technical means undertaken in all cultures (a universal) which involves the systematic application of organised knowledge (synthesis) and tangible (tools and material) for the extension of human faculties that are restricted as a result of the evolutionary process. Evident, knowledge based, accumulative, humanity, survival alters cutlery and society, future oriented, observable, harmony to human life and nature, etc**

Relationship of engineering profession to basic science and technology; relationship to other professions

- Basically the basic science and technology used in an integrated form as a separate profession for the welfare of people is engineering. So we concluded engineering knowledge is not possible without basic science and technology.
- Basic science and technology includes physics, chemistry, mathematics and technology includes those in which the process or method of applying those describes how to become or how to make. Combining both of these subjects forms engineering subjects.

Relationship of engineering profession to basic science and technology; relationship to other professions

- Basically the basic science and technology used in an integrated form as a separate profession for the welfare of people is engineering. So we concluded engineering knowledge is not possible without basic science and technology.
- Basic science and technology includes physics, chemistry, mathematics and technology includes those in which the process or method of applying those describes how to become or how to make. Combining both of these subjects forms engineering subjects.

Relationship of engineering profession to basic science and technology; relationship to other professions

- Engineering works involve large funds for creating facilities and services for the people. As the project involves budget and the people the engineer in charge and staff need to have good procedure of keeping record and rapport with stakeholders. Therefore engineering profession involves mainly the following profession, accountant, lawyers, medicals and managers.
- Engineering profession has a deep relation with law, account, medicine, and management profession. Auditing, budgeting, managing, conflicts and maintaining harmonies in work sphere.

engineering Ethics

- ✚ The importance of engineers in today's society is great and obvious.
- ✚ Therefore, the ethical issues they are dealing with and the decisions they make can influence the whole society and the discussion on ethics in engineering education is thus of big importance
- ✚ Ethics is something everybody learns to a certain level while growing up, during his/her whole education, at home etc. So when a person enters the higher level of education he/she already has some knowledge about ethics.
- ✚ The discussions on this Symposium were whether that knowledge is enough for young engineers.

Ethics in general,
presenting the current situation of courses on Ethics in
their universities, talked about necessity of Ethics in
Engineering education and the ways it should be
implemented in educational system.
the discussions there have also been talks about
cheating at school as an ethical issue.

General Knowledge on Ethics

In today's life, people learn about ethics all the time, being aware of it or not. The society, the religion, the family, the culture, the media, the traditions, everything has its influence. The awareness of ethics is on a very high level, but the level of knowledge of every person and every society is not the same. Also, common ethics are learned because of the factors mentioned above, but professional ethics are not.

It's needed to take into account the distinction between morals and ethics, ethics being the practical reflection of some morals. Morals are unconsciously learnt during childhood, but ethics are learnt at the time of confrontation with problems in life. Ethics as a field of study is universal, but the perception of ethical correctness differs in different cultures. Ethics are changing during the years because society is changing. Distinctions between personal and professional ethics also exist.

Ethics in Current Engineering Education

- Talking about the ethics in current university education there are different situations:
 - ● Complete specific course on ethics.
 - ● Integrated in some other courses – based on the will of the teachers or part of the program of the course.
 - ● The students are not taught ethics at all.
- Even if ethics is taught in some universities, like in the first two cases, it can be problematic in some situations:
 - ● The course is elective and not all the students are taking part because of the big number of courses they can choose.
 - ● The material is extensively theoretical.
 - ● Professors have no proper approach and make the course not attractive and tedious
 - ● The methods that are used are inappropriate

Ethics in Engineering Education: is it necessary and why?

- The necessity of ethics in the engineering education was corroborated by the problems faced by engineers. They will be critical about all the information they will receive. Also they will be more confident when standing up for their own opinion, resisting outer pressure if needed. The critical thinking will be raised with a background on ethics that the engineers will have with this kind of courses. Thus, in every day situations, the dilemmas will be solved in a better way and the long-term consequences of engineering discoveries will be more carefully evaluated.
- Ethics also have an important role on the gaps that there are inevitably in laws and involve the
- responsibility of communicating with the society, of presenting, objectively, one person's own work.

Implementation of Ethics in Engineering Education

The idea of having a course on ethics as compulsory. More ideas on how the course should look like were presented:

- The course should give a direction of thinking that would make people more aware of their actions. By introducing a certain level of criticism, automatic behaviour would be excluded from decision making.
- Students generally would like to have interaction among all the students that enrolled the course and the teacher. It is a way through which more ideas could come up and more sharing could exist.
- The course should include: case studies, examples from real life, problem-solving methods.
- Although theory and definitions are not so attractive to students, they should exist.
- Optionally: the first contact with ethics should be before university, and it should be about general ethics and latter on professional ethics should be given at university.

Implementation of Ethics in Engineering Education

- Dynamic course: as the time is changing the material should also change. The technologies are changing, so the courses should take it into account.
- The course should represent a lot of examples from real life.
- About the person(s) who will give the course there were more ideas:
 - The person should have not just theoretical knowledge but also a practical background, the person should have experience as working as an engineer or as an option, special training on ethics.
 - Cooperation among two persons: engineer who will be practical and philosopher who will be theoretical.
- Having and not having grading:
 - The grading will be a reason for bigger interest and motivation during the course. The grade should not be based on classical exam, but on the activities during the time the course is rolling and a final project.
- There was not agreement if the course should be in the beginning or in the end of the studies:
 - In the beginning: The students will learn to act even in the beginning of their studies.
 - In the end: the course would be based on the final preparation of the engineer for his/her professional work.

Conclusions

There is a distinction between moral and ethics, as moral is something learned unconsciously and ethics is something learned by reflecting moral stands in a real world.

- Big need exist for engineers to understand ethical issues that will occur during their carrier, especially as engineers are the ones making the discoveries and they need to stimulate the consequences of those.
- Engineers have to stand up for their positions in ethically questionable cases.
- In different universities the way ethics is taught varies from specific ethical courses, ethics being part
- in some technical courses to not having any ethics taught to the students. In cases where ethics is taught
- there are some problems concerning competitiveness of teachers, and lack of practical examples.

Conclusions

- The goal of Ethical courses should be to promote critical thinking.
- They should be compulsory, dynamic and interactive (real cases, case studies and so on).
- The teachers should have theoretical knowledge but also practical and technical experience as engineers. there was no conclusion reached concerning when the ethical courses should be implemented (at the beginning of studies or at their end)
- Unethical behaviour during studies can effect future behaviour.
- However in many universities system of exams seems to promote or at least doesn't try to stop that kind of behaviour.
- So the system should change in order to make it unworthy to even try.



DUTIES/ LIABILITIES/ of designers or professional

1. Negligent, misstatement.
2. Statutes, bylaws, and standards
3. Examination of site above or below ground surface
4. Public and private rights
5. Plans. drawings/ specification
6. Suitability of materials
7. Suitability of Method of execution
8. Novel/ risky design and employers interference in design
9. Revision of design during execution

Introduction – Sustainable Development

- Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It is often referred as a way to ensure survival of the mankind taking into account, economy, environment and society.
- Sustainable Development is already very much part of curricula in some fields of engineering education (environmental engineering) but the question is concerning all other fields which are not directly connected to the concept of sustainable development.
- sustainable development in engineering, importance of it in engineering education, current situation and ways to improve it in future.

- engineers should be able to understand other professionals, such as lawyers, social scientist, other kinds of engineers and
- Sustainable Development in Engineering Education: if it is necessary,
- how should we implement it?
- The answer on this question is not evident and the opinions were not always the same.
- we would like to list several general accepted ideas that came up during the discussions together with the questions that are still open or there was no agreement for.
- the discussions did not agree whether that course should be theoretical or practical.
- At the end of the studies, applied courses are necessary and they should be different depending of the field of study.
- ●



**“If You Salute Your Duty,
You Need Not Salute Anybody.
But If You Pollute Your Duty?
You Have To Salute Everybody”**

Dr APJ Abdul Kalam

Copyright © 2000, Dr. APJ Abdul Kalam, New Delhi, India

■ गृहमन्त्रीको जेब्राक्रस



■ बाटो काट्ने सिकाउँदै बालबालिका हाल उठाउँछन्



■ तर, गृहमन्त्री होरी नाम खुट्टो उठाउँछन्

कानूनका संरक्षक !