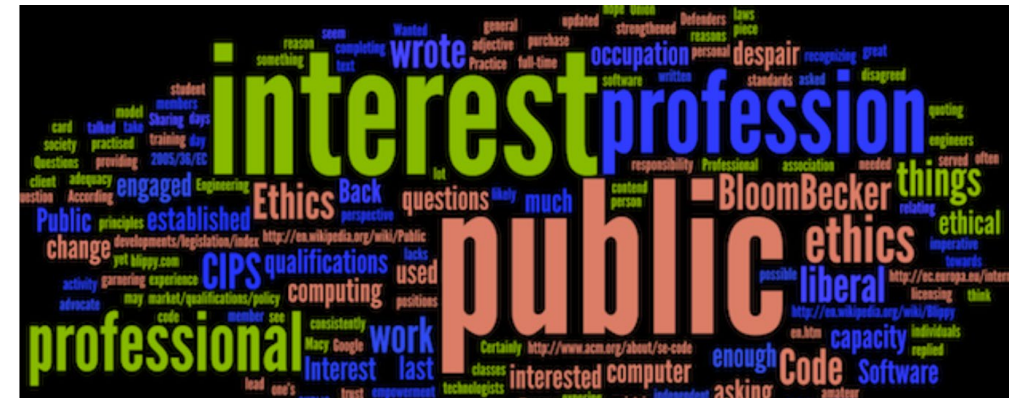




Course:  
**Technology /  
Engineering Ethics**  
Lecture 1: What are Ethics?

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# Lecture 1: Purpose & Outcomes

- **PURPOSE:**

- ✓ This module introduces the engineer to ethical responsibilities.
- ✓ Students will have the opportunity to discuss and debate values, ethical standards, the NSPE Standards, and thereby understand and be better equipped to address ethical issues.

- **LEARNING OUTCOMES:**

- ✓ Describe and define what is meant by the word “ethical”
- ✓ Explain the role of general ethical codes in good business practice
- ✓ Be fully conversant with The Code of Conduct in the national society of professional engineers

# Lecture 1: What are Ethics?

- Ethics is relevant to you in your everyday life since at some point in your professional or personal life, you will have to deal with an ethical question or problem
- For example, what is your level of responsibility towards protecting another person from threat, or whether or not you should tell the truth in a particular situation?
- In order for you to have “ethics” you must have a “Value-System”
- What’s your Value System? Is it **“ Do unto others.....then run” ?? – Benny Hill**



## EXAMPLES OF POOR ETHICS:

- Your fair share is whatever you can get away with
- Nobody expects you to be honest when they're not looking
- It's not stealing unless they catch you

# Lecture 1: Values and Value Systems

Values are the beliefs that form the foundation for ethical behavior, i.e. practices that are viewed by our society as correct behavior.

As an Engineer, you should acknowledge the fundamental importance of **following values** both for yourself and your profession:

1. **Quality of life** - people being satisfied with their whole life experience;

2. **Health, human potential, empowerment, growth and excellence** - people being healthy, aware of the fullness of their potential, recognizing their power to bring that potential into being, growing into it, living it, and, generally, doing the best they can with it, individually and collectively;

3. **Justice** - people living lives whose results are fair and right for everyone;

4. **Dignity, integrity, worth and fundamental rights of individuals, organizations, communities, societies, and other human systems;**

5. **Attitudes and Cooperation** - people caring about one another and about working together to achieve results that work for everyone, individually and collectively;

6. **Effectiveness & alignment** - people achieving the maximum of desired results, at minimum cost, in ways that coordinate their individual energies and purposes with those of the Public Interest and other Social and business taxonomies

7. **Holistic, systemic view and affected parties** - understanding human behaviour from the perspective of whole system(s) that influence and are influenced by that behaviour; recognizing the interests that different people have in the system's results and valuing those interests fairly and justly;

8. **Wide participation in system affairs:** confrontation of issues leading to effective problem solving, and democratic decision making.

# Lecture 1: Main Ideas of Ethics

- A person's profession is a part of his or her personal identity.
- According to several prominent sources, engineering is a profession, although the absence to require licensure order to practice engineering, weakens its professional status.
- Engineering codes and other canons from IEEE, ASME, ASCE, etc impose on engineers an obligation to **promote the public good, sometimes interpreted as well-being and also as welfare or quality of life.**

# Lecture 1. Main Ideas

- Promoting the well-being of the public includes avoiding professionally prohibited actions, **preventing harm to the public**, and actively promoting the **public's well-being**.
- In designing for well-being, engineers must keep in mind the social context of engineering and technology, and the need for a critical attitude toward technology.

# Lecture 1 Components of Professionalism

- Expertise in a certain area (accounting, law, medicine, engineering, and the like)
- Adherence to moral guidelines, usually laid out in a formal code of ethics.

**Failure in either of these two areas means one is deficient as a “professional.”**

# Lecture 1 Professional Identity

- **The Professional.** Rather than identifying professionalism with external expectations of one's peers, one has integrated his personal values with those of his profession. Professional values are a part of who one is.
- This stage is often not fully achieved until mid-life.



# Lecture 1: The need for Ethics, Codes of Conduct



“On the whole human beings want to be good, but not too good, and not quite all the time”

*George Orwell*



A 2005 global study of over 1100 managers and executives identified the top three factors most likely to cause business people to compromise ethical standards:

- Pressure to meet unrealistic objectives/deadlines
- Desire to further one’s career
- Desire to protect one’s livelihood

# Lecture 1: Ethics Definition

- Engineering ethics is....
- *The field of applied ethics which examines and sets standards for engineers' obligations to **the public, their clients, employers and the profession.***

# Lecture 1: Professional Ethics

- In life our behavior is governed by different “norm” systems. Norms dictate what we “ought” or “ought not” to do. The norm systems governing the behavior of a professional are:
  1. Individual morality- what you believe to be Right (depends on your values)
  2. Positive morality - what is considered “right” in society at a particular time.
  3. Law Public Law - criminal law: between the state and individual.
  4. Private Law - also referred to as contractual law
- Professionals are a group of people who earn a living by undertaking a common activity and who regulate most of this activity themselves, meaning they ultimately are responsible for the quality of services delivered to the client:  
*Dentist, Doctors, Lawyers, Engineers, Physical Therapists, Podiatrists, Architects, Message Therapists, Accountants, Nurses, Nutritionists, Psychologist, etc*

# Lecture 1: Engineering Ethics

- Engineering ethics is the field of applied ethics which examines and sets standards for engineers' obligations to **the public**, their **clients**, **employers** and **the profession as is** appropriate in all aspects of professional practice.

# Lecture 1: Key Concepts and Definitions

**Ethics:** The process of determining right and wrong conduct. The discipline dealing with what is good and bad and with moral duty and obligations

**Ethical Behavior:** Behavior that conforms to accepted standards of conduct

**Ethical Reasoning:** The process of sorting out the principles that help determine what is ethical when faced with an ethical dilemma

**Ethical System:** A specific formula for distinguishing right from wrong

**Unethical:** An action or conduct which violates the principles of one or more ethical systems, or which is counter to an accepted ethical value, such as honesty

**Non-ethical Considerations:** Powerful human motivations that are not based on right or wrong, but on considerations of survival and well-being, such as health, security, love, wealth, or self-esteem

**Ethical Dilemma or Conflict:** This is an ethical problem in which the ethical choice involves ignoring a powerful non-ethical consideration. Do the right thing, but lose your job, a friend, or an opportunity for advancement. A situation or problem facing an individual that involves complex and often conflicting principles of ethical behavior

# Lecture 1: Codes of Ethics

## Why are codes important?

- Serve and protect the public
- Guidance/support for engineers
- Inspiration, deterrence, discipline
- Shared standards, education, mutual understanding
- Profession's image

## Limitations of codes

- Too vague to be useful in every day ethical decisions
- Impossible to cover all eventualities



# **Lecture 1** Must Engineers be Registered to Practice Engineering?

## **NO. Registration Should Not Be Required to Practice Engineering.**

- Registration might increase the cost of engineering services, because the costs of registration would be passed on to clients and customers.
- Registration might make certain types of cooperation between engineers and nonengineers on the same project difficult, because registration would prohibit nonengineers from doing engineering work.
- Engineers already must be licensed in order to “sign off” on work that directly affects the public.

# **Lecture 1** Must Engineers be Registered to Practice Engineering?

## **YES. Registration Should Be Required to Practice Engineering.**

- Some countries already require registration to practice, and the types of problems described above have not appeared to be serious.
- The distinction between work that does and does not affect the public is not clear, since most engineering work affects the public in some way.



# Lecture 1: What is Public Good? (1/2)

- The Preamble to the NSPE code says that “engineering has a direct and vital impact on the quality of life for all people.”
- The code of the Association for Computing Machinery (ACM) obligates its members to “contribute to society and human well-being.”
- American Society of Civil Engineers (ASCE) affirms that engineers should utilize “their knowledge and skill for the enhancement of human welfare and the environment.”

# Lecture 1: What is Public Good? (2/2)

- The Institute of Electrical and Electronics Engineers (IEEE) states that its members recognize “the importance of our technologies in affecting the quality of life throughout the world.”

**Lets assume “ well-being” is our term of choice for promoting the well-being of the public and is the primary responsibility of the engineering profession.**

# Lecture 1: Examples of Prohibited Actions (NSPE)

- Do not reveal privileged information (II,1,c)
- Do not associate with dishonest professionals (II,1,d)
- Do not aid the unlawful practice of engineering (II,1,e)
- Do not accept compensation from two parties on the same project (II,4,b)
- Do not participate in governmental decisions related to your own work (II,4,d)
- Do not solicit work from a governmental body on which a member of your firm has a position (II,4,e)
- Do not falsify your qualifications (II,5,a)
- Do not give bribes (II,5,b)
- Do not be influenced by conflicting interests (III,5)
- Do not unjustly injure the reputation of another engineer (III,7)

# Lecture 1: Ethical Issues facing Engineers



- **“It is curious - curious that physical courage should be so common in the world, and moral courage so rare”**

**-Mark Twain**

# Lecture 1: Ethical Issues facing Engineers

- Whistle blowing is an ethical issue facing Licensed or unlicensed Engineers in that they are obliged to report the alleged wrongdoing on behalf of a client or employer who endangers others by failing to comply with the engineer's advice.
- This duty supersedes the duty to client and employer, and if the engineer does not bring such failure to the notice of NSPE, the engineers license maybe revoked.
- There are several other ethical issues that engineers may face. Some have to do with technical practice, but many others have to do with broader considerations of business conduct. These include:



1. Relationships with clients, consultants, competitors, and contractors
2. Ensuring legal compliance by clients, client's contractors, and others
3. Conflict of interest
4. Bribery and kickbacks, which might include:
5. Gifts, meals, services, entertainment and recreation opportunities
6. Treatment of confidential or proprietary information
7. Consideration of the employer's assets
8. Outside employment/activities (moonlighting)

# Lecture 1: Design for Well Being

- The primary way in which engineers improve well-being is through design.
- Technologies always function in a social context, and in this context, they have consequences for good or ill.
- Social forces also direct the development of technology.
- One way to understand this is acquainting ourselves with the rapidly growing field of *Science and Technology Studies* (STS), a discipline created by sociologists, historians, and philosophers
- Detailed investigations of technology have shown that there are usually several workable solutions to a technical problem and that social and value factors often determine which solution is adopted.
- Detailed investigations of technology have shown that there are usually several workable solutions to a technical problem and that social and value factors often determine which solution is adopted.



## Books:

### NSPE Code of Conduct: Page 1/2

For Reference Only

## Code of Ethics for Engineers

### Preamble

Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

### I. Fundamental Canons

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

1. Hold paramount the safety, health, and welfare of the public.
2. Perform services only in areas of their competence.
3. Issue public statements only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

### II. Rules of Practice

#### 1. Engineers shall hold paramount the safety, health, and welfare of the public.

- a. If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employer or client and such other authority as may be appropriate.
- b. Engineers shall approve only those engineering documents that are in conformity with applicable standards.
- c. Engineers shall not reveal facts, data, or information without the prior consent of the client or employer except as authorized or required by law or this Code.
- d. Engineers shall not permit the use of their name or associate in business ventures with any person or firm that they believe is engaged in fraudulent or dishonest enterprise.
- e. Engineers shall not aid or abet the unlawful practice of engineering by a person or firm.
- f. Engineers having knowledge of any alleged violation of this Code shall report thereon to appropriate professional bodies and, when relevant, also to public authorities, and cooperate with the proper authorities in furnishing such information or assistance as may be required.

#### 2. Engineers shall perform services only in the areas of their competence.

- a. Engineers shall undertake assignments only when qualified by education or experience in the specific technical fields involved.
- b. Engineers shall not affix their signatures to any plans or documents dealing with subject matter in which

they lack competence, nor to any plan or document not prepared under their direction and control.

- c. Engineers may accept assignments and assume responsibility for coordination of an entire project and sign and seal the engineering documents for the entire project, provided that each technical segment is signed and sealed only by the qualified engineers who prepared the segment.

#### 3. Engineers shall issue public statements only in an objective and truthful manner.

- a. Engineers shall be objective and truthful in professional reports, statements, or testimony. They shall include all relevant and pertinent information in such reports, statements, or testimony, which should bear the date indicating when it was current.
- b. Engineers may express publicly technical opinions that are founded upon knowledge of the facts and competence in the subject matter.
- c. Engineers shall issue no statements, criticisms, or arguments on technical matters that are inspired or paid for by interested parties, unless they have prefaced their comments by explicitly identifying the interested parties on whose behalf they are speaking, and by revealing the existence of any interest the engineers may have in the matters.

#### 4. Engineers shall act for each employer or client as faithful agents or trustees.

- a. Engineers shall disclose all known or potential conflicts of interest that could influence or appear to influence their judgment or the quality of their services.
- b. Engineers shall not accept compensation, financial or otherwise, from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed and agreed to by all interested parties.
- c. Engineers shall not solicit or accept financial or other valuable consideration, directly or indirectly, from outside agents in connection with the work for which they are responsible.
- d. Engineers in public service as members, advisors, or employees of a governmental or quasi-governmental body or department shall not participate in decisions with respect to services solicited or provided by them or their organizations in private or public engineering practice.
- e. Engineers shall not solicit or accept a contract from a governmental body on which a principal or officer of their organization serves as a member.

#### 5. Engineers shall avoid deceptive acts.

- a. Engineers shall not falsify their qualifications or permit misrepresentation of their or their associates' qualifications. They shall not misrepresent or exaggerate their responsibility in or for the subject matter of prior assignments. Brochures or other presentations incident

to the solicitation of employment shall not misrepresent pertinent facts concerning employers, employees, associates, joint venturers, or past accomplishments.

- b. Engineers shall not offer, give, solicit, or receive, either directly or indirectly, any contribution to influence the award of a contract by public authority, or which may be reasonably construed by the public as having the effect or intent of influencing the awarding of a contract. They shall not offer any gift or other valuable consideration in order to secure work. They shall not pay a commission, percentage, or brokerage fee in order to secure work, except to a bona fide employee or bona fide established commercial or marketing agencies retained by them.

### III. Professional Obligations

#### 1. Engineers shall be guided in all their relations by the highest standards of honesty and integrity.

- a. Engineers shall acknowledge their errors and shall not distort or alter the facts.
- b. Engineers shall advise their clients or employers when they believe a project will not be successful.
- c. Engineers shall not accept outside employment to the detriment of their regular work or interest. Before accepting any outside engineering employment, they will notify their employers.
- d. Engineers shall not attempt to attract an engineer from another employer by false or misleading pretenses.
- e. Engineers shall not promote their own interest at the expense of the dignity and integrity of the profession.
- f. Engineers shall treat all persons with dignity, respect, fairness, and without discrimination.

#### 2. Engineers shall at all times strive to serve the public interest.

- a. Engineers are encouraged to participate in civic affairs; career guidance for youths; and work for the advancement of the safety, health, and well-being of their community.
- b. Engineers shall not complete, sign, or seal plans and/or specifications that are not in conformity with applicable engineering standards. If the client or employer insists on such unprofessional conduct, they shall notify the proper authorities and withdraw from further service on the project.
- c. Engineers are encouraged to extend public knowledge and appreciation of engineering and its achievements.
- d. Engineers are encouraged to adhere to the principles of sustainable development<sup>1</sup> in order to protect the environment for future generations.
- e. Engineers shall continue their professional development throughout their careers and should keep current in their specialty fields by engaging in professional practice, participating in continuing education courses, reading in the technical literature, and attending professional meetings and seminar.



## Books:

### NSPE Code of Conduct: Page 2/2



**3. Engineers shall avoid all conduct or practice that deceives the public.**

- Engineers shall avoid the use of statements containing a material misrepresentation of fact or omitting a material fact.
- Consistent with the foregoing, engineers may advertise for recruitment of personnel.
- Consistent with the foregoing, engineers may prepare articles for the lay or technical press, but such articles shall not imply credit to the author for work performed by others.

**4. Engineers shall not disclose, without consent, confidential information concerning the business affairs or technical processes of any present or former client or employer, or public body on which they serve.**

- Engineers shall not, without the consent of all interested parties, promote or arrange for new employment or practice in connection with a specific project for which the engineer has gained particular and specialized knowledge.
- Engineers shall not, without the consent of all interested parties, participate in or represent an adversary interest in connection with a specific project or proceeding in which the engineer has gained particular specialized knowledge on behalf of a former client or employer.

**5. Engineers shall not be influenced in their professional duties by conflicting interests.**

- Engineers shall not accept financial or other considerations, including free engineering designs, from material or equipment suppliers for specifying their product.
- Engineers shall not accept commissions or allowances, directly or indirectly, from contractors or other parties dealing with clients or employers of the engineer in connection with work for which the engineer is responsible.

**6. Engineers shall not attempt to obtain employment or advancement or professional engagements by untruthfully criticizing other engineers, or by other improper or questionable methods.**

- Engineers shall not request, propose, or accept a commission on a contingent basis under circumstances in which their judgment may be compromised.
- Engineers in salaried positions shall accept part-time engineering work only to the extent consistent with policies of the employer and in accordance with ethical considerations.
- Engineers shall not, without consent, use equipment, supplies, laboratory, or office facilities of an employer to carry on outside private practice.

## For Reference Only

**7. Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice, or employment of other engineers. Engineers who believe others are guilty of unethical or illegal practice shall present such information to the proper authority for action.**

- Engineers in private practice shall not review the work of another engineer for the same client, except with the knowledge of such engineer, or unless the connection of such engineer with the work has been terminated.
- Engineers in governmental, industrial, or educational employ are entitled to review and evaluate the work of other engineers when so required by their employment duties.
- Engineers in sales or industrial employ are entitled to make engineering comparisons of represented products with products of other suppliers.

**8. Engineers shall accept personal responsibility for their professional activities, provided, however, that engineers may seek indemnification for services arising out of their practice for other than gross negligence, where the engineer's interests cannot otherwise be protected.**

- Engineers shall conform with state registration laws in the practice of engineering.
- Engineers shall not use association with a nonengineer, a corporation, or partnership as a "cloak" for unethical acts.

**9. Engineers shall give credit for engineering work to those to whom credit is due, and will recognize the proprietary interests of others.**

- Engineers shall, whenever possible, name the person or persons who may be individually responsible for designs, inventions, writings, or other accomplishments.
- Engineers using designs supplied by a client recognize that the designs remain the property of the client and may not be duplicated by the engineer for others without express permission.
- Engineers, before undertaking work for others in connection with which the engineer may make improvements, plans, designs, inventions, or other records that may justify copyrights or patents, should enter into a positive agreement regarding ownership.
- Engineers' designs, data, records, and notes referring exclusively to an employer's work are the employer's property. The employer should indemnify the engineer for use of the information for any purpose other than the original purpose.

Footnote 1 "Sustainable development" is the challenge of meeting human needs for natural resources, industrial products, energy, food, transportation, shelter, and effective waste management while conserving and protecting environmental quality and the natural resource base essential for future development.

"By order of the United States District Court for the District of Columbia, former Section 11(c) of the NSPE Code of Ethics prohibiting competitive bidding, and all policy statements, opinions, rulings or other guidelines interpreting its scope, have been rescinded as unlawfully interfering with the legal right of engineers, protected under the antitrust laws, to provide price information to prospective clients; accordingly, nothing contained in the NSPE Code of Ethics, policy statements, opinions, rulings or other guidelines prohibits the submission of price quotations or competitive bids for engineering services at any time or in any amount."

### Statement by NSPE Executive Committee

In order to correct misunderstandings which have been indicated in some instances since the issuance of the Supreme Court decision and the entry of the Final Judgment, it is noted that in its decision of April 25, 1978, the Supreme Court of the United States declared: "The Sherman Act does not require competitive bidding."

It is further noted that as made clear in the Supreme Court decision:

- Engineers and firms may individually refuse to bid for engineering services.
- Clients are not required to seek bids for engineering services.
- Federal, state, and local laws governing procedures to procure engineering services are not affected, and remain in full force and effect.
- State societies and local chapters are free to actively and aggressively seek legislation for professional selection and negotiation procedures by public agencies.
- State registration board rules of professional conduct, including rules prohibiting competitive bidding for engineering services, are not affected and remain in full force and effect. State registration boards with authority to adopt rules of professional conduct may adopt rules governing procedures to obtain engineering services.
- As noted by the Supreme Court, "nothing in the judgment prevents NSPE and its members from attempting to influence governmental action . . ."

Note: In regard to the question of application of the Code to corporations vis-a-vis real persons, business form or type should not negate nor influence conformance of individuals to the Code. The Code deals with professional services, which services must be performed by real persons. Real persons in turn establish and implement policies within business structures. The Code is clearly written to apply to the Engineer, and it is incumbent on members of NSPE to endeavor to live up to its provisions. This applies to all pertinent sections of the Code.



# End of Lecture 1 :



**Proceed to Assessment Tab**