



KHALIFA
UNIVERSITY

ENGR110

Introduction to Professional Engineering

Professional Responsibilities of Engineers

Ethics, Intellectual Property, Product Liability

Defining Ethics:

- Application of a moral philosophy to standards of behavior
- Actions that are morally required
- Actions that are morally permissible
- Policies and laws that are desirable

Engineering Ethics:

- Study of decisions, policies, and values that are morally desirable in engineering practice and research
- Consists of responsibilities and rights that ought to be endorsed by those engaged in engineering and also of desirable ideals and personal commitments in engineering

Codes of Ethics:

- State moral responsibilities of engineers as seen by the profession and as represented by a professional society
- Important, not only in stressing engineers responsibilities but also the freedom to exercise them

Importance of Codes:

1. Serving and protecting public
2. Guidance
3. Inspiration
4. Shared standards
5. Support for responsible professionals
6. Education and mutual understanding
7. Deterrence and discipline
8. Contributing to profession's image

Limitations of Codes

1. Restricted to general wording
2. Different entries in codes come into conflict with each other
3. Ununified codes between various professional societies
4. ABET provides unifying codes for individuals who are registered PEs
5. Codes emphasize responsibilities but say nothing about rights of professionals to pursue their endeavors responsibly
6. Codes represent compromise between different judgments

IEEE CODES OF ETHICS

Approved by IEEE Board of Directors February

“We, the members of the *IEEE (Engineering Community)*, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

IEEE CODES OF ETHICS

1. to accept responsibility in making decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to be honest and realistic in stating claims or estimates based on available data;
4. to reject bribery in all its forms;

IEEE CODES OF ETHICS

- 5. to improve the understanding of technology, its appropriate application, and potential consequences;
- 6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
- 7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;

IEEE CODES OF ETHICS

- 8. to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
- 9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
- 10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.”

What is Intellectual Property (IP)?

- Product of human intellect
- Protected by law
- Has commercial value
- Many forms:
 - mechanical inventions,
 - processes,
 - chemical formulas,
 - software,
 - artwork...
- IP law described as "affirmative rights" as opposed to "protection" since it does not prevent unauthorized use of IP but gives owner right to file lawsuit
- Patents - most important category
- Copyright and trademarks are becoming increasingly important IP

What is a patent?

- Gives person who invents any new/useful process or product, exclusive use of invention for limited term
- A set of exclusive rights granted by government to inventor for limited period of time in exchange for public disclosure of an invention

What does Patent System do?

1. Stimulate research and development
2. Give fair chance to small as well as large companies to file patents
3. Encourages publication and dissemination of information
4. Storehouse for all patents

What is Invention?

- Device is not invention if it is obvious to "skilled in the art"
- Combination of old elements is not invention if no new result; combination is called *aggregation*
- Mere substitution of obvious equivalents, or substitution of materials, is not invention unless some surprising result is obtained

Trade Secret:

- Information that has commercial value *to* its owner and has been protected
- Many forms and may also qualify for copyright protection
- Examples:
 - Chemical, cosmetic, food formulas
 - Photographic processes
 - Computer software
 - Manufacturing processes
 - Customer lists/preference databases

Copyright:

- Copyright protects all types of original creative expression, generally for lifetime of author plus 50 years
- Items that are included under copyright protection are literary works, musical works, dramatic works, video games, computer programs, semiconductor chips

Trademarks:

- Trademarks provide commercial protection by preserving right to exclusive use of distinctive "mark" that identifies source of goods/ services and uniquely identifies business in marketplace
- Trademark law is not as important to engineering as patent and copyright law, but with Internet businesses the protection of domain names is likely be treated by the law

Invention Agreements:

Universal practice to require technical personnel to sign invention-assignment agreement as condition of employment

In agreement, employee agrees to:

1. disclose to employer all inventions that fall in employer's line of business
2. perform all acts necessary in applying for patents and in executing assignments
3. maintain secrecy on all knowledge gained during course of employment

Confidential Disclosure:

- There are hidden legal hazards in accepting ideas from outsiders
- If there is nothing to indicate otherwise, law has often taken position that disclosures are given in confidence and that ideas may not be used without permission and payment
- If corporation does not take appropriate protective steps, it could find itself paying for an idea it had already developed for itself

Engineering Liability

- liability - the state of being legally obliged and responsible
- Legal liability exposures may represent greatest threat to financial health of engineers and engineering firms
- New forms of legal responsibility and exposure have been created by innovative attorneys seeking financial remedies for clients who may have suffered an unanticipated financial loss
- In addition, government agencies have expanded rules and regulations with new responsibilities for engineers and engineering firms, creating new exposures to legal liability that can result in financial loss

Plan for not getting in trouble

1. “Understand the responsibilities and liabilities of engineers, owners and contractors”
2. Follow contract specifications
3. Documentation
4. Negotiation and settlement as alternatives to court