ETHICS IN DESIGN

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What is ethic?

- Fairness, justice, equity, honesty, trustworthiness & equality
- Engineering Ethics: The rules and standards which govern the conduct of engineers in their role as professionals
- Requested by ABET (Accreditation Board for Engineering and Technology).
- Most of the engineering societies have their own code of ethics: IEEE, ASME, …

How Ethics Fits into Engineering?

- Engineers . . .
  - Build products such as cell phones, home appliances, heart valves, bridges, & cars. In general they advance society by building new technology.
  - Develop processes, such as the process to convert salt water into fresh water or the process to recycle bottles. These processes change how we live and what we can accomplish.

Products and processes have consequences for society:

- If the bridge has an inadequate support, it will fail.
- If the gas tank is positioned too close to the bumper, it might explode from a small accident.
- If a medical instrument isn't accurate, improper doses of medication can be given.
- If the process for refining gas produces too much toxins, it harms the local community.

Law vs. Ethics

- LAW
  - Creates rules to guide conduct
  - Balances competing values
  - Punishes conduct that is “illegal” through formal structures
- ETHICS
  - Offers guidance on conduct
  - Addresses situations in which competing values clash
  - Incentives and disincentives may be created by “group” (formal or informal)

Ethical Values

- Integrity
- Honesty
- Fidelity
- Responsibility

Obligation to Society

- Broad context of responsibility
  - "While performing services, the engineer's foremost responsibility is to the public welfare"
  - "Engineers shall approve only those designs that safeguard the life, health, welfare, and property of the public while conforming to accepted engineering standards"

- Whistle blowing
  - "If an engineer's professional judgment is overruled resulting in danger to the life, health, welfare, or property of the public, the engineer shall notify his/her employer or client and any appropriate authority"

Obligation to Society

- Truth in duties
  - "Engineers shall be objective and truthful in professional reports, statements, or testimonies and shall provide all pertinent supporting information relating to such items"
  - "Engineers shall not express a professional opinion publicly unless it is based upon knowledge of the facts and a competent evaluation of the subject matter"
- The Duty of Full Disclosure
  - "Engineers shall not express professional opinion on subject matters for which they are motivated or paid, unless they explicitly identify the parties on whose behalf they are expressing the opinion and reveal the parties' interest in the matters"

Obligation to Society

- "Clean Hands" Rule
  - "Engineers shall not enter business ventures or permit their names or their firm's names to be used by any persons or firm which is engaging in dishonest, fraudulent, or illegal business practice"
- Final Obligation to Society
  - "Engineers who have knowledge of possible violation of any of the rules listed in this and the following two parts shall provide pertinent information and assist the state board in reaching final determination of the possible violation"

Engineer's Obligation to Employers and Clients

- Professional competence
  - "Engineers shall not undertake technical assignments for which they are not qualified"
  - "Engineers shall approve or seal only those plans or designs that deal with subjects in which they are competent and which have been prepared under their direct control and supervision"
- The Validity of Approvals
  - "Engineers may coordinate an entire project provided that each design component is signed or sealed by the engineer responsible for that design component"

Engineer's Obligation to Employers and Clients

- Confidentiality Requirement
  - "Engineers shall not reveal professional information without the employer's or client's prior consent except as authorized or required by law"
- Conflict of Interest
  - "Engineers shall not solicit or accept direct or indirect considerations, financial or otherwise, from contractors, their agents, or other parties while performing work for employers or clients"
  - "Engineers shall disclose to their employers or clients potential conflicts of interest or any other circumstances that could influence or appear to influence their professional judgment or their service quality"

Engineer's Obligation to Employers and Clients

- Full Disclosure
  - "An engineer shall not accept financial or other compensation from more than one party for services rendered on one project unless the details are fully disclosed and agreed by all parties"

- Government Conflicts of Interest
  - "To avoid conflicts of interest, engineers shall not solicit or accept a professional contract from a governmental body on which a principal or officer of their firm serves as a member. An engineer who is a principal or employee of a private firm and who serves as a member of a governmental body shall not participate in decisions relating to the professional services solicited or provided by the firm to the governmental body"

Engineer's Obligations to Other Engineers

- Obligation to Potential Employers
  - "Engineers shall not misrepresent or permit misrepresentation of their or any of their associate's academic or professional qualifications. They shall not misrepresent their level of responsibility or the complexity of prior assignments. Pertinent facts relating to employers, employees, associates, joint ventures, or past accomplishments shall not be misrepresented when soliciting employment or business"

- Conflicts of Interest
  - "Engineers shall not directly or indirectly give, solicit, or receive any gift or commission, or other valuable consideration, in order to obtain work, and shall not make contribution to any political body with intent of influencing the award of contract by governmental body"

Engineer's Obligations to Other Engineers

- Reputations of Other Engineers
  - "Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputations, prospects, practice or employment of other engineers, nor indiscriminately criticize the work of other engineers"
  - Criticize cautiously and objectively with respect to the person's professional status

ASME Code of Ethics of Engineers – Fundamental Principles

- Engineers uphold and advance the integrity, honor, and dignity of the Engineering profession by:
  - using their knowledge and skill for the enhancement of human welfare;
  - being honest and impartial, and serving with fidelity the public, their employers and clients,
  - striving to increase the competence and prestige of the engineering profession.

ASME Code of Ethics of Engineers – Fundamental Canons

- Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.
- Engineers shall perform services only in the areas of their competence.
- Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional development of those engineers under their supervision.
- Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.
- Engineers shall build their professional reputations on the merit of their services and shall not compete unfairly with others.
- Engineers shall associate only with reputable persons or organizations.
- Engineers shall issue public statements only in an objective and truthful manner.