



Law and Ethics in Engineering Practice

Lecture: Introduction to Ethics, Law, and Engineering Decision-Making

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1. Decision-Making Process in Ethical Dilemmas

Step 1: Problem Identification

Identify the type and nature of the problem:

- Societal crisis
- Accident or disaster
- Political challenge
- Professionally-related issues
- Other

Step 2: Define Moral Dilemmas & Gather Information

- Clearly state the problem and ethical dilemma
- Collect all relevant details and context
- Consult legal and ethical codes
- Identify key stakeholders

Step 3: Define Alternative Ethical Strategies

Consider:

- Applicable moral theories (e.g., utilitarianism, deontology)
- Decision-making processes and criteria
- Predicted impact on each stakeholder group

Step 4: Comparative Evaluation of Strategies

- Weigh qualitative and quantitative impacts
- Assign indicators to evaluate strategy effectiveness
- Consider both direct and indirect consequences

Step 5: Make an Ethical Decision

- Make an informed and reflective decision
 - Seek professional guidance where necessary
 - Communicate decisions appropriately to all affected parties
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2. Comparative Analysis: Engineering Codes of Ethics

Organizations Compared

- **Professional Engineers Ontario (PEO):** Regulatory and licensing authority
- **Institute of Electrical and Electronics Engineers (IEEE):** Learned society and professional association

a. Duty to Society

PEO	IEEE
Duty to public, clients, employers, and self	Accept responsibility for decisions affecting public health, safety, welfare
Fairness, loyalty, and integrity	Promptly disclose risks or dangers

b. Duty to Colleagues and Co-workers

PEO	IEEE
Courtesy and good faith among professionals	Promote fair treatment and equal opportunity
Avoid malicious injury to professional reputations	Offer and seek constructive feedback
Do not use unethical competitive tactics	Assist in professional development of others

c. Duty to Employers and Clients

PEO	IEEE
Act as a faithful agent; disclose conflicts	Avoid and disclose conflicts of interest
Maintain confidentiality; ensure fair compensation	Be honest, reject bribery, improve public understanding
Inform employer of side work and ensure no conflict	Maintain competence and disclose limitations

d. Duty to Self and Profession

- **PEO:** Expose unprofessional or dishonest conduct without fear or favour.
 - **IEEE:** Support honesty, integrity, and accountability in the profession.
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3. Common Areas Where Ethical Dilemmas Arise

- Public safety and welfare
 - Conflicts of interest
 - Adherence to professional standards
 - Intellectual property rights
 - Research ethics
 - Environmental responsibility
 - International and cross-cultural contexts
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4. Legal vs. Ethical Action: A Case Example

Problem Definition:

A university seeks private funding due to financial constraints. A convicted entrepreneur (Mr. X) offers a \$1M donation in exchange for naming rights to a lab.

Ethical Dilemma:

Should the university accept a large donation from someone with a criminal record?

Strategic Choices:

1. Accept the full donation and naming rights – Mr. X has served his time.
 2. Accept a smaller donation without naming rights – Maintain academic naming standards.
 3. Reject the donation – Protect the institution's reputation.
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5. Real-World Ethical Conflict: Jim Balsillie & York University

- \$60M donation agreement granted CIGI influence over hiring and curriculum decisions
 - Raised academic freedom concerns
 - Criticized by the Canadian Association of University Teachers (CAUT)
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6. Real-Life Ethical Dilemma: Ford Motor Company

- Engineers recommended recall of trucks with faulty door latches (1997–2000)
- Ford declined recall despite internal memos acknowledging safety issues
- At least 16 lawsuits followed due to deaths and injuries
- Ford argued compliance with alternative safety standards

Engineering Lesson: Prioritizing financial cost over public safety can lead to legal consequences and loss of public trust.

7. Useful Resources for Engineering Ethics

- Professional Engineers Ontario – Engineering Dimensions Online:
[PEO Ethics Articles](#)
 - Online Ethics Center for Engineering and Science:
[Online Ethics Cases](#)
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8. Practice Questions

Example 1:

In most engineering codes of ethics, the duty of the engineer to supervised staff is:

- a. Equal to the engineer's duty to protect the public
- b. Not mentioned
- c. Of importance
- **d. (a) and (c) ✓**
- e. None of the above

Example 2:

PEO and IEEE Codes of Ethics are:

- a. Notably different
- b. Equally important
- **c. Virtually identical ✓**
- d. Unrelated to licensing
- e. None of the above