



Law and Ethics in Engineering Practice

Lecture: Engineering Ethics & Code Of Conduct

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1. Ethics in Practice

- Ethics are based on **moral principles and societal values**.
 - Sometimes described as the **science of morals**.
 - Studies **right and wrong, obligations and rights, justice, and social/political ideas**.
 - **Laws** are based on written statutes or court decisions.
 - **Lawful actions are not always ethical or 'right'.**
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2. Ethical Theories (From Textbook)

Theory	Key Idea	Founder
Mill's Utilitarianism	Action is ethical if it produces greatest benefit for greatest number .	John Stuart Mill
Kant's Duty-Based Ethics	Duty to follow universal principles everyone should obey.	Immanuel Kant
Locke's Rights-Based Ethics	Individuals have rights to life, health, liberty, possessions, and labour products.	John Locke
Aristotle's Virtue Ethics	Happiness achieved by developing virtues through reason; good acts follow reason.	Aristotle

Note: These are primarily Western theories; other cultures have ethical theories (e.g., Confucianism).

3. Mill's Utilitarianism (1806–1873)

- The best ethical solution **maximizes benefit for the greatest number of people**.
- Democracy reflects utilitarianism by controlling government for majority benefit.
- Difficulty in **quantitatively calculating maximum benefit**.
- Three key factors:
 1. Number of people affected
 2. Intensity of benefit
 3. Duration of benefit (or pain avoided)

Examples: Seat belts, anti-smoking laws, taxation.

[More on Mill](#)

Utilitarianism Conflicts

- Conflicts may arise evaluating or distributing benefits equally.
 - Benefits must **not favor special groups or individuals for personal gain**.
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Utilitarianism Example: Metrolinx

- Spent ~\$500 million taxpayer money on Union-Pearson rail link.
 - **Pros:** Quick airport link, fewer cars on roads (~3.5 million rides).
 - **Cons:** Increased diesel rail traffic affecting Junction & Weston residents.
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4. Kant's Duty Ethics (Formalism) (1724–1804)

- Each person has a **fundamental duty** to act ethically.
- Based on the **categorical imperative**: act only on principles acceptable as universal laws.
- Universal principles include:
 - Don't lie
 - Keep promises
 - Be honest and fair
 - Obey laws
 - Don't harm others
- Pollution or activities endangering life are unethical regardless of purpose.
- Duty to **prevent harm to life** and prioritize society's welfare.

More on Kantian ethics

Duty Ethics Conflict

- Focus on **intention** rather than results.
 - Can be **inflexible**; categorical imperatives have no exceptions.
 - May not account for **complex human moral decision-making**.
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5. Locke's Rights-Based Ethics (1632–1704)

- Fundamental rights:

- Life
 - Maximum liberty
 - Human dignity
 - Other rights flow from these.
 - Influenced British political thought, French & American revolutions.
 - Embedded in Canadian Charter of Rights and Freedoms & U.S. Constitution.
 - People have duty **not to infringe on others' rights**.
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Workers' Rights

- Safe, healthy, and harassment-free workplace (e.g., smoke-free).
 - Rights are often protected by provincial labour laws.
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Rights-Based Ethics Conflict

- Difficult to balance **conflicting rights**.
- Example: Right to post anything on the internet versus others' rights.

[More on John Locke](#)

6. Aristotle's Virtue-Based Ethics (384–322 B.C.)

- Goal: Live a life guided by **reason, deduction, and virtues**.
- Virtues are **moderate compromises** between extremes (excess and deficiency).

- **Golden Mean:** The balanced middle ground between two extremes.

Examples:

- Generosity = between wastefulness & stinginess
 - Courage = between foolhardiness & cowardice
 - Modesty = between vanity & self-deprecation
 - Difficult to define golden mean for some virtues like honesty and fairness.
More on Aristotle
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Virtue Ethics Conflict

- Happiness achieved by virtue development through reason.
 - Ethical actions lie in finding the golden mean.
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7. Agreement and Contradictions in Ethical Theories

- Often, the four theories **agree** on ethical actions.
 - Sometimes they **contradict**, creating **ethical dilemmas** requiring a choice between conflicting actions.
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8. Example Ethical Dilemma

Scenario:

- You are a city engineer.
- Your colleague, Smith, drinks excessively and sometimes works hungover.

- You suspect mistakes that could affect public safety.
 - You have caught a work issue that could impact the public if not addressed.
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Applying the Four Theories:

Theory	Suggested Action
Utilitarianism	Intervene; benefits public safety outweigh harm to Smith's career.
Kant's Duty Ethics	Duty to both Smith and public safety; insist on help or report.
Locke's Rights	Respect Smith's privacy; no right to disclose without consent.
Aristotle's Virtue	Alcohol abuse undesirable; promote moderation.

Result: 3 out of 4 theories recommend intervention.

9. Engineering Code of Ethics

General Duties:

- Duty to Society
 - Duty to Employers
 - Duty to Clients
 - Duty to Colleagues
 - Duty to Employees and Subordinates
 - Duty to the Profession
 - Duty to Oneself
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Duty to Society

- Most important duty.
 - Protect safety, health, welfare of all affected by engineer's work.
 - Canadian engineers have **professional self-regulation**.
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Duty to Employers

- Act fairly and loyally.
 - Maintain confidentiality.
 - Disclose conflicts of interest.
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Duty to Clients

- Same obligations as to employers.
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Duty to Colleagues

- Act with courtesy and goodwill.
 - Inform colleagues when reviewing their work.
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Duty to Employees and Subordinates

- Recognize their rights and dignity.
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Duty to the Profession

- Maintain dignity and prestige.
 - Avoid unprofessional or disgraceful conduct.
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Duty to Oneself

- Insist on fair payment and safe work environment.
 - Maintain personal competence.
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10. PEO Code of Ethics – Section 77 Highlights

1. Duties of a Practitioner:

- Fairness and loyalty to associates, clients, employers, subordinates.
- Fidelity to public needs.
- Devotion to professional integrity and competence.

2. Practitioner's Responsibilities:

- Public welfare is paramount.
- Enhance public regard for profession.
- Avoid unsubstantiated public opinions.
- Display licence appropriately.

3. Confidentiality and Conflicts:

- Keep employer's information confidential.
- Disclose conflicts of interest immediately.

4. **Employee-Engineers:**

- Disclose status when contracting outside employer.

5. **Cooperation:**

- Work cooperatively with other professionals.

6. **Professional Courtesy:**

- Act with courtesy and good faith toward other practitioners.
- Avoid malicious injury to reputation.
- Do not pay or accept commissions for work.
- Credit others appropriately.

7. **Maintain Integrity:**

- Expose unprofessional, dishonest, or unethical conduct.

Full PEO Code

11. Engineering Discipline Resources

- PEO Discipline Complaints and Decisions Gazette:
<https://peo.on.ca/public-protection/discipline/complaints-decisions-gazette>
 - Engineering Dimensions (PEO Magazine):
<https://www.digitalityworks.com/Viewers/ViewIssue.aspx?IssueID=242&PageNo=38>
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12. Decision Process for Ethical Dilemmas

Step

Description

Recognize the Problem	Identify and gather info; ask Who, What, Where, When, Why, How?
Define the Ethical Problem	Determine root cause and ethical issues; check PEO Code & law.
Generate Alternative Solutions	Brainstorm possible solutions; apply ethical theories if needed.
Evaluate Alternative Solutions	Assess consequences; check legality and ethical codes.
Decision Making and Optimization	Choose best solution; consider fairness and optimize if possible.
Implementation	Act decisively, especially on safety or health issues.

13. Conflict of Interest

- Unethical and unprofessional.
 - Occurs when professional benefits or relationships interfere with duties.
 - Includes receiving benefits secretly from multiple parties.
 - Disclosure is mandatory but does **not** remove the conflict.
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14. Common Conflicts of Interest (Kernaghan & Langford, 1990)

Category	Description
Accepting Secret Commissions	Receiving under-the-table payments or gifts for favoritism.
Misusing Employer's Facilities	Using employer's resources for private use (theft).
Secret Employment ("Moonlighting")	Private business secret from employer, especially in same field.
Self-Serving Decisions	Using position for personal/family benefit.

Influence Peddling	Using position to support groups or parties not in employer's interest.
Abusing Confidential Information	Using confidential info for personal gain or at new job.
Arranging Future Employment	Competing with employer after leaving; non-compete clauses.

15. Example: Quebec's Charbonneau Commission

- Found systemic corruption linking political financing and public contracts.
 - Recommended whistleblower protections, political reforms, and stiffer penalties.
(Source: CBC News)
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16. Avoiding Conflicts of Interest

- Refuse gifts or bribes.
 - Do not misuse authority for personal gain.
 - Avoid favouring specific people.
 - Fully disclose any conflicts.
 - Resist favoured treatment temptations.
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17. Three Categories of Conflict of Interest

Type	Definition
Clear (Actual)	Service to client/employer is clearly compromised.
Potential	No present conflict but likely in future.
Perceived	No actual conflict but others believe one exists.

