

# Ethics in Engineering: Ethical Problems and Solving Them

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## Overview

- Case Studies
- Core Ethical Values
- Why Ethics?
- Codes of Ethics
- Ethics in the Law
- Solving Ethical Problems
- Conclusions

**Case 1- Project Behind Schedule** - You are the engineer of record on a project which is behind schedule and urgently needed by the client. Your boss wants you to certify that a particular aspect of the project was properly completed even though you know some questionable techniques were used.

- A. Certify it, and negotiate a raise from your boss as your price for doing so.
- B. Refuse to certify it.
- C. Tell the clients about the problem, saying that you'll certify it if they want you to.
- D. Certify it, but keep a close watch on the project in the future in case any problems develop with it.

## Case 2 Kelly's Dilemma

- Kelly is an engineer who subsequently became a lawyer.
- She was hired by an environmental firm as their lawyer representing them with state and federal regulatory agencies.
- Her firm bought an old factory that releases harmful Cr VI, which is toxic
- According to present regulations, the factory is not in violation of the limits due to a technicality
- What should Kelly do?

## Case 3 – State Inspector

You are a young engineer employed by the State Transportation Department. You have been placed in charge of inspecting a highway bridge project which is being built by a private contractor. Because of your education and extensive field engineering experience, you are able to suggest techniques and procedures that save the contractor both time and money. The work, however, is done strictly according to the plans and specifications.

It is quitting time on a hot summer Friday afternoon. The contractor comes to the site and offers a can of soda to each of his employees. He also offers you a can of soda.

- a. May you accept the soda?
- b. Assume he hands every worker a case of soda. It is ethical to accept a case of soda?
- c. What if he hands every worker a can of beer? Accept?
- d. What if he hands every worker a bottle of bourbon? Accept?
- e. How about a case of bourbon? Accept?

- f. What if he hands every worker a pen with the company name on it? Accept?
- g. What about a hat and jacket with the company name and logo on it? Accept?
- h. What if the contractor buys you a new car because of the thousands of dollars you have saved him. Do you accept?
- i. You and the contractor meet at lunch to discuss the progress of the work. He offers to pay the bill. Can you ethically accept his offer?
- j. You like to play golf. The contractor knows this but he himself does not play golf. A local charity golf tournament committee has persuaded the contractor to purchase several entrance tickets to the tournament. Since he does not play golf, he offers one of the tickets to you. Can you ethically accept his offer?

## Accepting/Giving Gifts, Meals, etc.

- Find out policy when you start work with a company or agency
- Keep in mind that as a professional, you are an agent for the owner, state, contractor, etc.
- The appearance of impropriety can cause the same damage as doing it.
- There is no such thing as a “free lunch”

## Code of Ethics Examination (Good practice for FE Exam)

<http://www.nspe.org/Ethics/EthicsResources/EthicsExam/index.html> How well did you do?

## A professional is one who:

- Has extensive tertiary education
- Practices an art that requires significant intellectual development
- Provides an important service to the public
- Is certified or licensed by the state
- Has an organization that practices self regulation
- Has power from the state in return for a commitment to the public good
- Belongs to an organization that has a code of ethics

## Steps to Professional Licensure

- Graduation from program in engineering acceptable to the Board (ABET accredited)  
Passing the Fundamentals of Engineering (FE) Exam
  - Starting in 2014, a 6-hour computer based exam
- Four years of engineering practice experience
  - One year credit for completing an M.S. degree in engineering
  - Two years credit for completing the Ph.D. degree in engineering
- Passing the Principles and Practice (PE) Exam

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## Engineering Codes of Ethics

“Ethics is the process of:

- careful deliberation of the right and wrong thing to do in a given circumstance” (involving a value laden decision)
- “A better title for Codes of Ethics might be guides to responsible conduct”

Ethics are based on Core Ethical Values; .. What are they?

- Integrity
- Honesty
- Fidelity
- Charity
- Responsibility
- Self Discipline

## Why Ethics?

Aim of all ethical decision making - happiness/ contentment/ fulfillment

- Lowest stage - decision making focuses on the individual
- Intermediate stages – decision making guided by Codes, Rules and the Law
- Highest stage on all parties and over all time.

## Ethical behavior

Contract among affected parties

- Unwritten understanding...
  - Agreed behavior among individuals
  - Taught by our upbringing
  - “Gentlemen’s Agreement”
- Written Contract – defined focus
  - Professional Code of Ethics
  - Established and administered by a profession
- The Law
  - Federal, state, and local Statutes and Rules
  - Administered and enforced by officials: fines and penalties

**Codes of Ethics** - Established by membership of professional societies

- Standard Format (especially among engineering organizations)
  - Preamble
  - Fundamental Canons
  - Rules of Practice
  - Professional Obligations

## NSPE Code of Ethics

<http://www.nspe.org/Ethics/CodeofEthics/index.html>

Additional Rules of Practice for other Canons

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.

## Indiana Law Associated with the Practice of Engineering

- Established by the Legislature – Indiana Code (IC 25-31)  
<http://www.in.gov/legislative/ic/code/title25/ar31/>
- Implemented by Rules established by the State Board of Registration for Professional Engineers – Administrative Code (864 IAC)  
[http://www.in.gov/legislative/iac/iac\\_title?iact=864](http://www.in.gov/legislative/iac/iac_title?iact=864)
- A compilation of Statutes and Rules for engineering is available at:  
[http://www.in.gov/pla/files/SBRPE\\_2012\\_Compilation.pdf](http://www.in.gov/pla/files/SBRPE_2012_Compilation.pdf)

**IC 25-1-11-5 - Practitioner compliance with professional standards; findings meriting disciplinary sanctions; fraud or material deception** (Applies to all professions in Indiana)

**864 IAC Rule 11 – Professional Conduct** (Applies to engineering practice by licensed engineers)

**IC 25-1-11-5 – Indiana law that applies to all professions in Indiana**

Professional Standards - A practitioner shall comply with the standards established by the board regulating a profession.

A practitioner is subject to the exercise of the disciplinary sanctions under section 12 of this chapter if, after a hearing, the board finds that:

(1) a practitioner has:

- (A) engaged in or knowingly cooperated in fraud or material deception in order to obtain a license to practice, including cheating on a licensing examination;
- (B) engaged in fraud or material deception in the course of professional services or activities;
- (C) advertised services or goods in a false or misleading manner; or
- (D) been convicted of a crime or assessed a civil penalty involving fraudulent billing practices;

(2) a practitioner has been convicted of a crime that:

- (A) has a direct bearing on the practitioner's ability to continue to practice competently; or
- (B) is harmful to the public;

(3) a practitioner has knowingly violated a state statute or rule or federal statute or regulation regulating the profession for which the practitioner is licensed;

(4) a practitioner has continued to practice although the practitioner has become unfit to practice due to:

- (A) professional incompetence, including undertaking professional activities that the practitioner is not qualified by training or experience to undertake;
- (B) failure to keep abreast of current professional theory or practice;
- (C) physical or mental disability; or
- (D) addiction to, abuse of, or severe dependency on alcohol or other drugs that endanger the public by impairing a practitioner's ability to practice safely;

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(5) a practitioner has engaged in a course of lewd or immoral conduct in connection with the delivery of services to the public;

(6) a practitioner has allowed the practitioner's name or a license issued under this chapter to be used in connection with an individual or business who renders services beyond the scope of that individual's or business's training, experience, or competence;

(7) a practitioner has had disciplinary action taken against the practitioner or the practitioner's license to practice in any state or jurisdiction on grounds similar to those under this chapter;

(8) a practitioner has assisted another person in committing an act that would constitute a ground for disciplinary sanction under this chapter;

(9) a practitioner has allowed a license issued by a board to be:

(A) used by another person; or

(B) displayed to the public when the license has expired, is inactive, or has been revoked or suspended; or

(10) a practitioner has failed to comply with an order imposing a sanction under section 12 of this chapter

## Rule 11 – Professional Conduct

(Rules of the Board that apply to the practice of engineering)

- Establishes requirements concerning ethical, economic, and legal principles and unprofessional conduct in the practice of engineering.
- Requires agreement to abide by act and rules
- Is knowledgeable of the Act and Rules of the board
- Understanding that the practice of engineering is a privilege
- Primary obligation to protect the safety, health, and welfare of the public
- Perform engineering assignments only when qualified by education and experience in the specific technical field
- The engineer shall not affix the engineer's signature and/or seal to any engineering plan or document dealing with subject matter in which the engineer lacks competence
- The engineer shall be completely objective and truthful in all professional reports, statements, or testimony.
- The engineer, when serving as an expert or technical witness before any court, commission, or other tribunal, shall express an opinion only when it is founded upon adequate knowledge of the facts in issue, upon a background of technical competence in the subject matter, and upon honest conviction of the accuracy and propriety of the engineer's testimony.
- The engineer will issue no statement, criticisms, or arguments on engineering matters connected with

public policy which are inspired or paid for by an interested party, or parties, unless the engineer has prefaced the comment by:

- explicitly identifying himself or herself;
- disclosing the identities of the party, or parties, on whose behalf the engineer is speaking; and
- revealing the existence of any pecuniary interest the engineer may have in the instant matters.
- Conflicts of interest
  - An engineer must avoid conflicts of interest with employer or employer's clients
  - When unavoidable, disclose the circumstances to the engineer's employer or client
  - Disclosure of conflict of interest must be made to an employer.. Compensation from more than one party for same project
  - The engineer shall not solicit or accept gratuities, directly or indirectly, from contractors, their agents, or other parties dealing with the engineer's client or employer in connection with work for which the engineer is responsible.
  - The engineer shall not solicit or accept financial or other valuable considerations from material or equipment suppliers for specifying their products.
  - When in public service as a member, advisor, or employee of a governmental body or department, the engineer shall not participate in considerations or actions with respect to services provided by the engineer or the engineer's organizations in private engineering practices.
  - The engineer shall not solicit or accept an engineering contract from a governmental body on which a principal, officer, or employee of the engineer's organization serves as a member.
- Payment of consideration to secure work prohibited; exception
  - The engineer shall not offer to pay, either directly or indirectly, any commission, political contribution, gift, or other consideration in order to secure work, exclusive of securing a salaried position through employment agencies.
- The engineer shall seek professional employment on the basis of qualification and competence in the proper accomplishment of similar work.
- The engineer shall not falsify or permit misrepresentation of the engineer's or the engineer's associates' academic or professional qualifications.

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- Use of name in fraudulent or dishonest venture

## Recognizing Ethical Problems

- We have an ethical problem when we
  - Have “that feeling in the pit of our stomach”
  - Start rationalizing about a decision
  - Use the phrases:
    - “everyone does it”
    - “its not that important”
    - “that could hurt his/her feelings

## Guide for Solving Ethical Problems

Generated by the CE394 class on October 29, 1998

1. Realize that we have a problem
2. Define the problem (Who - stakeholders, What, When, Where, Why, Evidence)
3. Options available - Possible solutions
4. Weigh the consequences (Pros. vs. Cons.)
5. Compare to others - Code of Ethics
6. Compare to the law
7. Does it feel right? (NY Times rule. What does your gut tell you? The Golden Rule.)
8. Ask someone else
9. Choose what to do
10. Act on it
11. Learn from experience

## Ethical Decisions are Tough!

- Not always “black” or “white”, but most often shades of “gray”
- Personal loyalties/feelings involved
- No-win situations
- Job or livelihood at stake
- Conflicting guidelines

## Ethics References

- Purdue University

[http://www.purdue.edu/purdue/about/integrity\\_statement.html](http://www.purdue.edu/purdue/about/integrity_statement.html)

- The National Institute for Engineering Ethics (NIEE)

<http://www.niee.org/murdoughCenter/>

- NSPE Board of Ethical Review

<http://www.nspe.org/Ethics/EthicsResources/BER/index.html>

- The National Society of Professional Engineers

<http://www.nspe.org/ethics/>

- Indiana Code (IC 25-31)

<http://www.in.gov/legislative/ic/code/title25/ar31/>

- State Board of Registration for Professional Engineers – Administrative Code (864 IAC)

[http://www.in.gov/legislative/iac/iac\\_title?iact=864](http://www.in.gov/legislative/iac/iac_title?iact=864)

## Summary

- Ethical dilemmas occur for everyone
- Ethical decision making is based on happiness, contentment, fulfillment
- Good ethical behavior benefits everyone
- Significant Resources are available
- Codes of Ethics
- Past case studies
- Professional societies
- State Laws and Rules of the Board of Registration
- Use Guide for Solving Ethical Problems

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