PROFESSIONAL RESPONSIBILITY & PROFESSIONAL ETHICS
PROFESSIONAL RESPONSIBILITY

- Engineering profession is a complex subject matter.

- Layman cannot differentiate between competent and incompetent professionals.
Professionals have special skills: where to find a specific knowledge & examples methodologies, algorithms, equations and know where, when and how to apply them.
A professional differs from a technically competent person in his awareness of the society in which the skills are being used.

Therefore some of the educational background is devoted to cultural awareness.
CERTIFICATION OF COMPETENCE

Chartered Engineer

ABET

ISO 9000

TSE
TRUSTWORTHINESS

Society must rely on professionals’ awareness of his role in society and not being self serving

Profession educates its member to put society & client before self-interest.
Compensation (pay, income, profit) is important, but should not be the only driving force.

Professional takes on work primarily for moral satisfaction secondarily for compensation.
A practical way for professionals to govern themselves: an accepted code of ethics:

- reminder of moral standards
- a source of guidance in difficult moral dilemmas
- standard of evaluating cases of alleged misconduct
NORMS OF CONDUCT needed to regulate relationships between

- The engineer and the company
- The engineer and the society
- The engineer and other engineers
- The company and the society
- The company and other companies
- Engineer and the profession
- Company and the profession
All are actually based on the principle of obligation towards the society.
Two basic forms:

- legislation
- code of ethics
We analyze ethical problems, often using our beliefs.

Beliefs may be internally inconsistent & contradictory.

Different parts of the world have different moral values.
Must find a way to incorporate moral judgments into a consistent and systematic whole.

Socratic method: analyzing beliefs or opinions for their logical weakness by asking questions (Like American lawyers)
One must be aware of some pitfalls in ethical analysis; principles are usually rather vague:

Often engineers ignore moral dilemmas, and deal with physical problems.
Dilemmas are problems without a unique right solution.
Being sensitive to areas outside technical areas is an obligation.
Some aspects of life an engineer must recognize:

- Political implications
- Problems with no complete solutions
  only a minimization of bad solutions
Engineers often work as part of a design team.

Decisions:
- affect the whole
- are affected by the work of others
Engineers working for a company often face the conflict between

- loyalty to the society
- loyalty to the employer (company)
- loyalty to their conscience
- loyalty to the profession
Engineers must take into account the safety of the user. Manufacturer is responsible even if the product is used in an unintended way.
Engineers cannot foresee every circumstance in which a product can be used, but must try to assess how & where it can fail.
Company (not the engineer) is the liable (legally responsible) party:

- Company is (legally) responsible to the customer,
- Engineer is responsible to the company.
Product quality conflicts

- customers (society’s) satisfaction
- company’s profit
Government’s Role:

- Standards must be set by a neutral party.
- Improvement of standards may be costly and must be compensated for.
Examples

- DC-10 incident
- Space shuttle disaster
- Building at Mithatpasa and Z. Gokalp
With new technologies, engineers can:

- increase quality, at no additional cost,
- reduce cost, with no sacrifice from quality.

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Engineers often led the consumer protection efforts.

- There is a marked increase in the world in terms of product liability legislation.
- Companies become more responsible for their products & media stresses that too.
- Engineers must design their products to high standards, so that company stays in business.
Company may be held liable if:

↑ Product is defective

cannot be used for its intended purpose.

↑ Manufacturing process is faulty,

for example testing is not performed properly.

↑ Labeling is inadequate.

(regarding warnings for proper use)
Packaging is not proper, resulting in damage during shipment.

Records regarding consumer complaints, sales, manufacturing and distribution is not maintained properly.

Quality control & assurance in all phases of production (from design to distribution) is important.
ETHICAL PROBLEMS

Trying to decrease cost may create some ethical problems for the engineer. Quality and consumer safety on one side and company profits & job security on the other.
DILEMMA

arises when superiors request you
not to pay much attention to
obligations toward the customer.
If you insist on what you think is
right,
and let your opinion be known
outside the company,
you may lose your job
......to no benefit to society.
NSPE says:

- Do everything possible within the company, to correct the wrong action.
- If it does not work notify the customer (or the public),
- but let the company know of your intentions.

(This is not to be considered as a threat. It should not be bluffing either.)
Fight for your rights; otherwise you lose your honor and dignity together with your rights.
Case studies

Please read

- Being right is expensive (p.96)
- Holding the line (p.98)
DESIGN CHANGES

Often changes are made in the execution of design.
You must make sure that changes do not affect product integrity
Original design

5A fuses
Modified production

10A fuse
Note that:

- One 10A fuse instead of two 5A fuses is a deterioration in safety.
- First portion of the cable carries twice the current.
Sometimes a design may fail in spite of engineers’ best efforts, because existing state of the technology is not enough. Therefore, a continuing effort towards the advancement of technology is necessary. Safety margins must be observed (increasing the cost!)
Kobe earthquake

- The construction technologies which proved to be satisfactory so far, were not good enough in this case.

- Will be analyzed and precautions will be taken and technology will be improved.
Tacoma bridge disaster

- Strong winds cause vibrations on the bridge.
- At 42 mph, oscillation frequencies coincide with the resonance frequency of the bridge,
- Oscillation magnitude increases and the bridge collapses.
CODE OF ETHICS
CODE OF ETHICS
Rules of practice

- In the performance of professional duties, safety, health and welfare of public comes first.

- Perform services only in your area of competence.
While making public statements, be objective & truthful.

When you act for an employer or customer, be faithful.

Don’t try to get professional employment in improper ways.
CODE OF ETHICS
Professional obligations

Always be guided by the highest standards of integrity.
Always try to serve the public interest.
Always try to avoid doing things that may discredit the profession or deceive the public.
Do not disclose business secrets of present or past employers or clients without expressed consent.
Professional obligations (Cont’d)

Don’t be influenced by conflicts of interest.
Only appropriate and adequate compensation for performing professional duties.
Don’t compete with other engineers or companies using questionable or unfair methods.
Take the professional responsibility for all your professional actions.
Don’t attempt to hurt the reputation of other engineers or criticize their work without proper evidence.
If such evidence of unethical or illegal conduct exists, present it to the proper authority for action.
Professional obligations (Cont’d)

Give credit for engineering work only to whom it belongs and recognize proprietary interests.
Cooperate in extending the effectiveness of the profession by interchanging ideas, information and experience with others and provide opportunity for professional development of engineers under your supervision.
HOMEWORK:

(Due next meeting)

Read “NSPE Code of Ethics for Engineers” (Appendix one) and write each (numbered) item in one sentence, in your own words.