

# Engineering Ethics

CENG 124

## Issues in different technical disciplines

- **Civil Engineering**
  - Safety/reliability of buildings, bridges,...
- **Computers**
  - Software & code piracy, peer-to-peer sharing, virus, ...
- **Mechanical Engineering**
  - Safety/reliability of equipment, machines,...
- **Medical Sciences/Practices**
  - Human cloning, drug efficacy,...
- **Nuclear Engineering**
  - Radioactive waste & exposure,...
- **Chemistry/Chemical Engineering**
  - Toxic chemicals & waste/pollution,...

## Case studies, sample 1

- *Situation:* Your company had a contract to build a walkway (or some civil structure). The walkway was built to code according to the original design specs in the contract. But the traffic now is much higher than anticipated and exceeds the load in the design specs.

*Question:* Should you alarm the management or the client about the potential risk?

You can find examples in books and from NSPE/Board of Ethical Review

## Case studies, sample 2

- *Situation:* Your (environmental consulting) firm detected dangerously high levels of a pollutant (*E. coli* or arsenic or whatever) in the drinking water (or well water) in a small, rural municipality. But that was from one sampling location. The town would not have the money to do extensive testing. Your firm had forwarded the limited data and concern to the local Utilities Commission (or whatever agency). The agency had no response.

*Question:* Should you warn the residents of the potential risk?

### Case studies, sample 3

- *Situation:* You signed off some design for manufacturing. Manufacturing messed up and drove up the cost. Management wants to modify the design to bring down the cost. You have analyzed the recommendations and found that they would reduce the reliability of the product. But the management wants you to sign off on the new changes anyway.

*Question:* What can and should you do?

### Case studies, sample 4

- *Situation:* Your R&D team had come up with a new dye (or whatever product) that could command a larger share of the market for your company. But the dye is made of a sulfated alpha-naphthol (or whatever chemical) that is known to be in a class of chemicals that are associated with high rates of bladder cancer (or whatever health risk). You raised the public health issue, but your manager was not concerned. His position was that a chemical is "innocent until proven guilty," and that it is up to EPA to do the assessment. (The dye is for materials, not food. Under TSCA, EPA has 90 days to evaluate data provided by the company.) Meanwhile, employees of your company may be exposed to the chemical as the dye moves from development to production.

*Question:* What can and should you do?

## Situations that may involve ethical decisions

- Whistle blowing
- Cheating/data forgery
- Intellectual property
- Conflict of interest
- Bribery/gifts

## AIChE, Code of Ethics

- ... shall uphold and advance the integrity, honor and dignity of the engineering profession by...  
... members shall
  - Hold paramount the safety, health and welfare of the public and protect the environment...
  - Formally advise their employers or clients (and consider further disclosure, if warranted) if they perceive that a consequence of their duties will adversely affect the ... health or safety of ... the public.
  - Accept responsibility for their actions, ...

Similar messages in the ACS and NSPE codes...

## AIChE,... (continued)

- Issue statements ... only in an **objective and truthful** manner.
- ... **never breaching confidentiality**.
- ... **recognizing** [co-workers'] unique **contributions** and capabilities.
- Perform professional services only in areas of their competence.
- Build their professional reputations on the merits of their services.
- Continue their professional development...
- Never tolerate **harassment**.
- Conduct themselves in a fair, honorable and respectful manner.