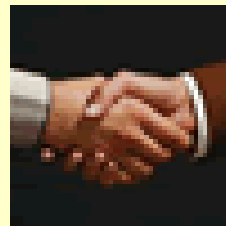


EGN 2030 ETHICS & LEGAL ISSUES

Dr. Berrin Tansel, P.E.



Course Description

This course covers:

- fundamental principles of responsible engineering conduct,
- codes of ethics,
- emerging ethical issues confronting the profession

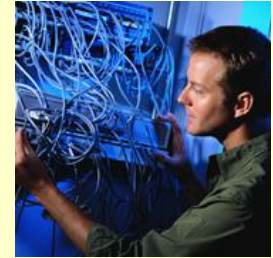
(i.e., professional and corporate responsibility, personal rights, whistle blowing, conflicts of interest, professional autonomy, environmental ethics, and ethical communication)





Focus areas

- A. Engineering codes of ethics
- B. Legal concepts
- C. Ethics and communication



Who's an Engineer?

- Neil Armstrong Astronaut
- Jimmy Carter Peanut Farmer, Humanitarian, U.S. President - Herbert Hoover U.S. President
- Alfred Hitchcock Movie Director
- Lee Iacocca Automotive Executive, Statue of Liberty Restoration
- Herbie Hancock Jazz Musician
- Paul MacCready Inventor, Designer GM EVI Electric Car
- Boris Yeltsin President of Russia
- William Hewlett Co-Founder, Hewlett Packard
- Bill Koch Yachtsman, Captain of America Cup Team
- W. Edwards Deming Father of Modern Management Practice
- Ming Tsai Restaurateur and Star of TV Cooking Show
- Montel Williams, Syndicated Talk Show Host
- Yasser Arafat Palistinian Leader
- Tom Landry Former Dallas Cowboy's Head Coach
- Shiela Widnall Former Secretary of the Air Force
- Robert A. Moog Father of Synthetic Music
- Chester Carlson Inventor of Xerox Process
- Arthur C. Nielsen Developer of Nielsen TV Ratings





Engineering Ethics - Themes

1) Engineering Professionalism and Individual Responsibility	Code- and Case-based reasoning. Determining a course of action in unclear or conflicting ethical scenarios.
2) Engineering and Society	Social responsibilities of engineers. Engineering and the law.
3) Technology and Society	Foster awareness of the impact of technology on individuals, society, and the environment.
4) Technology and Public Policy	Politics of technology assessment. Risk management. Technology management.



Project Ideas



- Code-based reasoning (Professional Codes of Conduct)
- Case-study reasoning
- Moral problem solving
- Social and political responsibilities of engineers
- Ethical cases (statistics) (Florida, national)
- Great Engineers – lives and accomplishments
- Ethics Cases



Disasters (professional): Examples

- **Code-based reasoning** Hyatt Regency Walkway Collapse - July 17, 1981 - Kansas City, Missouri



- **Case-based reasoning** Iran Flight 655 Shot Down by USS Vincennes - July 3, 1988



Disasters (professional): Examples

- **Code Based** Boston Tunnel Collapse – July 11, 2006



- **Code Based** Railway Tunnel Collapse (England)– June 30, 2005



Disasters (professional): Examples

- **Code Based Roof Collapse (Paris Airport)**
–May 23, 2004



- **Code Based Girder Collapse (Colorado)**
–May 15, 2004



Disasters (professional): Examples

- **Code Based Roof** Collapse (Moscow Water Park) (glass roof, due to snow) –Feb 14, 2002



- **Code Based Speedway** bridge collapsed (North Carolina)– May 20, 2000



Disasters (professional): Examples

- **Code Based** Pedestrian Tunnel Collapse –Nov 1, 2000



- **Code Based** 5-story Building collapsed (San Antonio, TX)– Dec 4, 2002



Disasters (professional): Examples

Failing infrastructure
August 1, 2007

[I-35W bridge collapse](#)
in Minneapolis



Failing infrastructure



Long commutes

Dirty Water

Delayed flights

Failing Dams



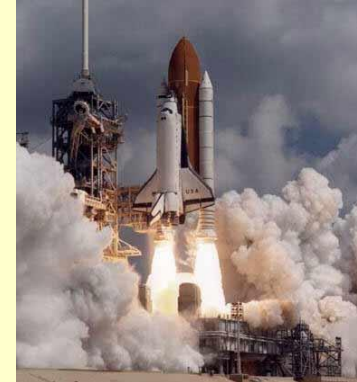
Disasters (professional): Examples

- **Moral problem solving**

Space Shuttle

Challenger Disaster -

January 27, 1986



- **Social and political responsibilities**

Chernobyl Nuclear

Reactor Explosion -

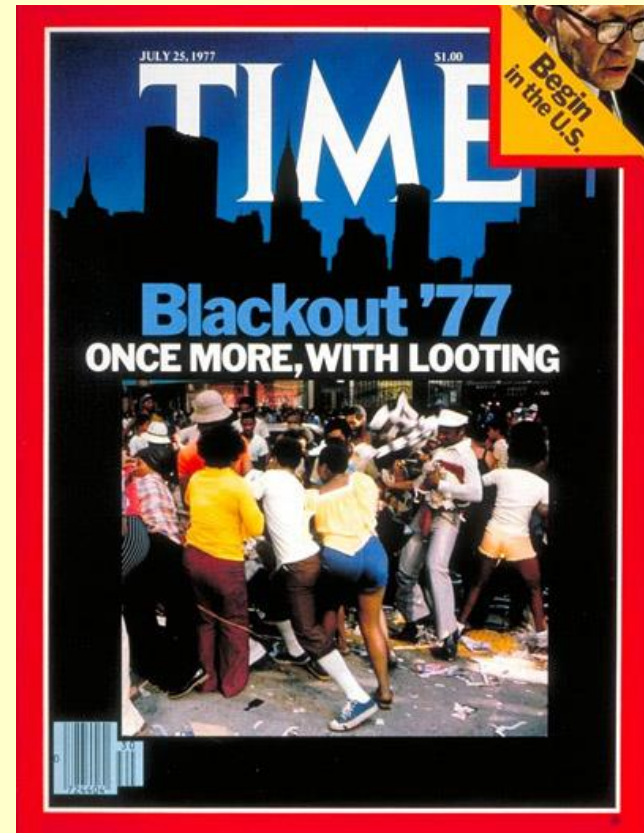
April 26, 1986 -

Chernobyl, Russia



Disasters (moral): Examples

- New York City
Blackout of 1977 July 13 - July 14, 1977.
looting and other disorder, including arson.



Disasters (natural and moral): Examples

- **Hurricane Katrina**
New Orleans – Aug
29, 2005



Terminology

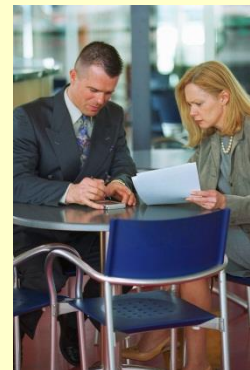
Honesty

- Honesty: is being forthcoming and truthful when we interact with others and ourselves. It ensures sincerity in our relationships both internally and externally.



Respect

- Respect is treating others with dignity and mutual consideration. It builds a community that encourages individuals and organizations to relate openly and fulfill their potentials.



Trust

- Trust is the result of promises kept. It yields the confident expectation that we can rely on each other and that our community can rely on us.



Excellence

- Excellence is the pursuit and achievement of exceptional quality. It inspires the integration of ethical practices within our community and ourselves.





US Army



- **Loyalty** . to bear true faith and allegiance to the U.S. Constitution, the Army, your unit, and other soldiers
- **Duty** . to fulfill your obligations .
- **Respect** . to treat people as they should be treated
- **Selfless-Service** . to put the welfare of the nation, the Army, and your subordinates before your own
- **Honor** . to always choose to live up to all the Army Values
- **Integrity** . to do what is right, legally and morally, even though you might be able to do otherwise without detection
- **Personal Courage** . to face fear, danger, or adversity, whether it is physical or moral, without considering any other option.



Leadership in Organizational Integrity

- *Purpose* — The ethical leader reasons and acts with organizational purposes firmly in mind. This provides focus and consistency.
- *Knowledge* — The ethical leader has the knowledge to judge and act prudently. This knowledge is found throughout the organization and its environment, but must be shared by those who hold it.
- *Authority* — The ethical leader has the power to make decisions and act, but also recognizes that all those involved and affected must have the authority to contribute what they have toward shared purposes.
- *Trust* — The ethical leader inspires — and is the beneficiary of — trust throughout the organization and its environment. Without trust and knowledge, people are afraid to exercise their authority.



HUMAN VALUES **RIGHTS & RESPONSIBILITIES**

- **Freedom**
- **Equality**
- **Honesty**
- **Integrity**
- **Honor**
- **Responsibility**
- **Hard Work**
- **Equity**
- **Knowledge**
- **Loyalty**
- **Pleasure**
- **Safety**
- **Security**
- **Trust**

ETHICAL VALUES

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



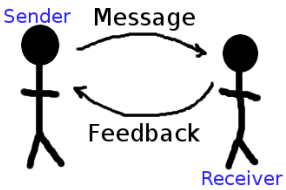


RULES OF BEHAVIOR

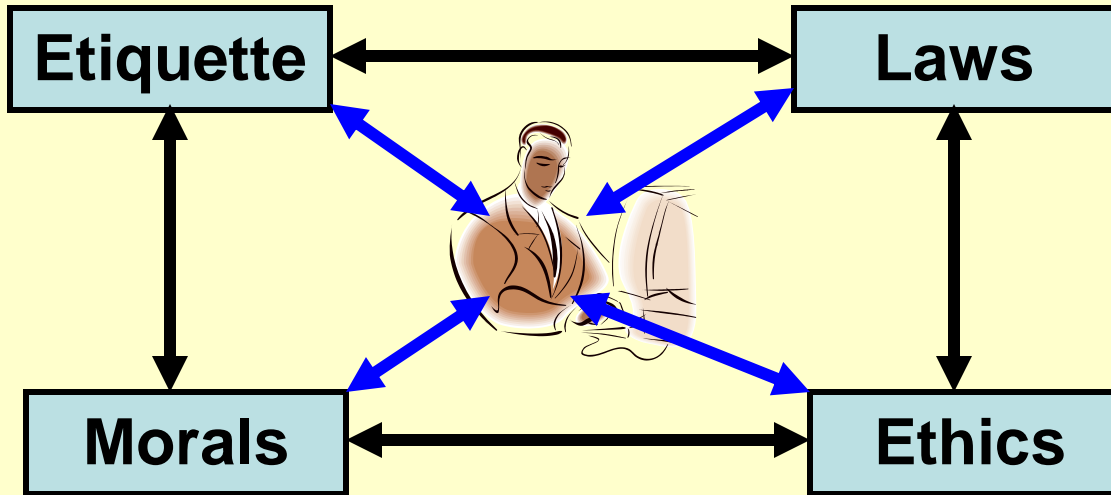


- **Etiquette** - rules of acceptable personal behavior and courtesy when interacting with others in a social setting.
- **Laws** - a system of rules and punishments clearly established by a society to maintain a safe and orderly social environment.
- **Morals** - personal rules of right and wrong behavior derived from a person's upbringing, religious beliefs, and societal influences.
- **Ethics** - a code of rules defining moral behavior for a particular society.

DRIVERS OF HUMAN BEHAVIOR (philosophical)



Social setting
Protocol
 Social setting
 Professional setting
Legal system



Social setting
 Professional setting
 Social setting
 Professional setting



The Tortoise and the Hare
Shame

Professional responsibility

PROFESSIONAL ETHICS/ ENGINEERING ETHICS

- **Ethics** is the study of the morality of human actions.
- **Professional ethics** guide the conduct of a professional.
- Most technical societies (**ASCE**, **ASME**, **IEEE**) have written **codes of ethics**.
- Engineers have a code of ethics: a set of behavioral standards that all engineers are expected to follow.

CODES OF ETHICS FOR ENGINEERS

ASME

The Fundamental Principles:

Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

- I. using their knowledge and skill for the **enhancement of human welfare**;
- II. being honest and impartial, and **serving with fidelity** their clients (including their employers) and the public; and
- III. striving to **increase the competence and prestige** of the engineering profession.

CODES OF ETHICS FOR ENGINEERS

ASME

The Fundamental Canons (standard):

1. Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.
2. Engineers shall perform services only in the areas of their competence; they shall build their professional reputation on the merit of their services and shall not compete unfairly with others.
3. Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional and ethical development of those engineers under their supervision.
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest or the appearance of conflicts of interest.
5. Engineers shall respect the proprietary information and intellectual property rights of others, including charitable organizations and professional societies in the engineering field.

CODES OF ETHICS FOR ENGINEERS

ASME

6. Engineers shall associate only with reputable persons or organizations.
7. Engineers shall issue public statements only in an objective and truthful manner and shall avoid any conduct which brings discredit upon the profession.
8. Engineers shall consider environmental impact and sustainable development in the performance of their professional duties.
9. Engineers shall not seek ethical sanction against another engineer unless there is good reason to do so under the relevant codes, policies and procedures governing that engineer's ethical conduct.
10. Engineers who are members of the Society shall endeavor to abide by the Constitution, By-Laws and Policies of the Society, and they shall disclose knowledge of any matter involving another member's alleged violation of this Code of Ethics or the Society's Conflicts of Interest Policy in a prompt, complete and truthful manner to the chair of the Ethics Committee.

ETHICS AND GLOBAL LEARNING COMPONENT IN SENIOR DESIGN

1. Be sure to follow the codes of ethics of the ASME, your morals and laws when you develop your product. **Write the material with your own words.**
2. Review the **conference and journal papers** on the subject – in US and **foreign countries**,
3. **Identify the companies** who makes the same and similar products – review their products and correspond with them if they respond. Consider the US and **foreign** companies.
4. Use **International Systems of Units (SI)** in addition to US customary units in the report for your calculations,
5. Put the necessary warning signs on the product you develop. Consider in which counties it may be used and write the warning in those **languages**.
6. You may put instructions of operations in foreign languages,
7. Select power supplies which will work in other countries and consider similar details to make them easy to operate anywhere in the globe.

SI units

Base quantity	Name	Symbol
	SI base unit	
length	meter	m
mass	kilogram	kg
time	second	s
electric current	ampere	A
thermodynamic temperature	kelvin	K
amount of substance	mole	mol
luminous intensity	candela	cd

<http://physics.nist.gov/cuu/Units/units.html>

CODES OF ETHICS FOR ENGINEERS

ASCE

“Do not lie, cheat or steal and always work with safety in mind.”
(general ideas)

- **Protect the public safety, health and welfare.**
- **Perform duties only in areas of competence.**
- **Be truthful and objective.**
- **Behave in an honorable and a dignified manner.**
- **Continue learning to sharpen technical skills.**
- **Provide honest hard work to both your employers and clients.**
- **Inform proper authorities of harmful, dangerous or illegal activities.**
- **Be involved with civic and community affairs.**
- **Protect the environment.**
- **Don't accept bribes/gifts that would interfere with eng. judgment.**
- **Protect confidential information of both your employer and client.**
- **Avoid conflicts of interest.**



CHECK POINTS

- **Is it legal? Will I be violating either civil law or company policy?**
- **Is it fair to all concerned in the short term as well as the long term? Does it promote win-win relationships?**
- **How will it make me feel about myself? Will it make me feel proud? Would I feel good if my decision were published in the newspaper? Would I feel good if my family knew about it? Will I be proud to tell my grandchildren about it?**