POP QUIZ!

What is the name of your instructional team members?
Ethics in the Real World (Price Fixing Example)

Mark Whitacre was a whistleblower in a massive price fixing scheme with ADM. While wearing an FBI wire, Mark made an unethical decision to commit fraud and ended up in prison himself. He lost his whistleblower immunity and served 8-1/2 years in federal prison. Quite an amazing story.
Today's Learning Objectives

- After today’s class, students will be able to:
  - Define the term ethics
  - Identify potential sources of a person’s code of ethics.
  - State why professions like engineering have their own code of ethics.
  - Explain how the codes are used.
  - Use a structured approach to evaluate an ethical dilemma that a student or professional engineer may encounter.
Ethics & Practicing Engineering
Defining Ethics

- What are some synonyms for ethics?
- Why is it often difficult to determine what is ethically correct?
Five Approaches to Determine Ethical Standards

- Utilitarian (most good, least harm)
- Rights (inalienable)
- Fairness/ Justice (treat everybody equally)
- Common Good (benefit to all, especially the vulnerable)
- Virtue (the highest potential of our character)

In your groups, find a rule or law that violates each of these ethical standards.
How Are Ethics & Law Related?
Illegal and Ethical:
Parking in A space with C sticker while taking roommate to ER

Legal and ethical:
Coming to class!

Illegal, but Unethical:
Stealing a bike

Legal, but Unethical:
Selling an outdated textbook to an unaware student
In-Class Ethics and Law Activity

- Each group should use their whiteboards to come up with an example for each quadrant.
- Pictures and drawings are highly encouraged!
Ethics for Engineering

- **Engineering ethics** is the study of the moral values, issues, and decisions involved in engineering practice.

- Why should ethics be important to you as an engineer?

- Your career as an engineer begins with your college education, not when you graduate.
Academic Integrity

Your pre-class assignments outlined student responsibilities in maintaining Academic Integrity.

As you look back at the pre-class reading, can you think of any ethical justification for Annie and Matthew’s behaviors?

- Utilitarian (most good, least harm)
- Rights (inalienable)
- Fairness/ Justice (treat everybody equally)
- Common Good (benefit to all, especially the vulnerable)
- Virtue (the highest potential of our character)
Academic Integrity

- Most problems in the First Year Engineering Program involve copied lab reports and homework problems.
- Individual assignment means you do it alone – and print out your own work!
- What you achieve/neglect here will have an effect on your future career path, as well as be a part of that path.
Academic Integrity

- Zero tolerance for academic misconduct
  - Any situation where misconduct is suspected must be submitted to The Ohio State University Committee on Academic Misconduct

- The person who shares their work is equally at fault/responsible.

- If someone comes to you for help, point them in the right direction or help them understand. **Do not just give them your work!**

- If you do share your work, don’t assume it won’t be copied.
Where Can We Find Help?

- Codes of Ethics - Professional organizations address complex moral issues in their fields by developing **codes of ethics**.
  - Example: NSPE Code in pre-reading
The Codes of Ethics and Its Role

- Shared Standards
- Positive Support to Act Ethically
- Guidance Concerning Obligations
- Motivation
- Education
- Deterrence and Discipline
- Professional Image
Engineering Code of Ethics

- Professional codes of ethics consist primarily of principles of responsibility that delineate how to promote the public good.

- A few examples are NSPE’s:
  - Fundamental Canons
  - Rules of Practice
  - Professional Obligations
NSPE Code of Ethics

- Engineers, in the fulfillment of their professional duties, shall:
  - Hold paramount the safety, health, and welfare of the public.
  - Perform services only in areas of their competence.
  - Issue public statements only in an objective and truthful manner.
  - Act for each employer or client as faithful agents or trustees.
  - Avoid deceptive acts.
  - Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.
Ethical Dilemmas

- Ethical dilemmas are situations in which two or more moral obligations, duties, rights, goods, or ideals come into conflict with one another.

- Multiple stakeholders can have conflicting interests.

- How does one decide whether a response is well-reasoned? What criteria apply? Can we reliably judge?
Approach to an Ethical Dilemma:

- Identify the **issues and points of ethical conflict**
- Who is the **Protagonist**? – think as if YOU are the protagonist
- Who are all of the other **Stakeholders (interested parties)**?
- What are all potential **Courses of Action** that you might take?
- What are the **Consequences** of each possible course of action?
  - There can be both **Negative** and **Positive** consequences.
- What are the **duties or obligations** of the **protagonist** to all interested parties?
- How do you determine the ‘best course of action?’
In Class Case Study
– Main Street Bridge
Case Study – Main Street Bridge

Companies Involved:

- Designed by:
  
  Bridge Designers, Inc.

- Steel components fabricated by:
  
  ABC Steel Co.

- Construction Company:
  
  Bridge Builders, Inc.

- Safety Consulting Company:
  
  SAFECON Co.
Yield stress for steel:
- Structural Steel ~200 MPa
- Structural Nickel Steel ~300 MPa
- For the Main Street Bridge design, the Stress under maximum load in the bridge connector plates was calculated to be 150 MPa.

- The required safety factor for the connector plates is 2.0.
- Structural nickel steel was chosen for the connector plates.
Connector Plate Design

- The original connector plates were specified to be 0.750" thick **Structural Nickel Steel**. The material was chosen because it could handle the stress needed to achieve a safety factor of 2.

- However, after some design changes, Bridge Designers changed the connector plate thickness to 1.00".

- The new 1.00" connector plates were fabricated and rushed to the construction site, where Bridge Construction removed the old plates and replaced them with the **new 1.00" plates**.

- The plates were installed in time according to the schedule.
Main Street Bridge Schedule

- SAFECON Co. is responsible for assembling and delivering the Final Inspection Documents to ODOT and the County Engineer.

- Final Inspection Documentation Package: Friday, August 30th

- Final Inspection by ODOT, County Engineer and City of Columbus: Friday, September 6th

- Opening Day: Friday, September 13th
SAFECON Co. Finds a Problem!

On Friday, August 16th, while assembling the Final Inspection Package, the engineer at SAFECON Co. discover an error in the Purchase Order for the new connector plates!

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**Purchase Order**

**TO:**
Bridge Builders, Inc.
1275 Kinnear Road
Columbus, Ohio 43212
Voice: 614.487.3643
Fax: 614.487.3704

**Vendor:**
ABC Steel Company, Inc.
1419 Illinois Ave.
Sheboygan, WI 53081
Phone: (920) 457-4891
Fax: (920) 451-4276

**Purchase Order No.:** 1010725
**Date:** 18 Feb 2012
**Vendor No.:** BB100782
**Terms:** Net 30
**Contact:** Keith Gordon
**Delivery:** 8 weeks
**Ship Via:** Freight Ground
**F.O.B.:** Sheboygan, WI

**Bill To/Ship To:**
Bridge Builders, Inc.
1275 Kinnear Road
Columbus, Ohio 43212
Voice: 614.487.3643
Fax: 614.487.3704

<table>
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<tr>
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<td>Connector Plates, Main Street Bridge, 1.00&quot; Thick, Structural Steel</td>
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<td>252,750.00</td>
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The Connector Plates Aren’t Correct!

The error is:

- The new 1.00" Connector Plates were fabricated from Structural Steel – **not** Structural Nickel Steel, as called for in the bridge design!

- So now the Safety Factor for the Main Street Bridge is 1.33, instead of 2.0 as required by building codes.
In Class Case Study Activity

- As a group, take time to review the previous slides
- Develop answers to the questions on next slide
- The instructor will go over possible answers and solutions to the moral dilemma
Ethical Case Study

- What is the ethical dilemma?
- Who are all of the interested parties (stakeholders)?
- Who is the protagonist?
- What are the obligations of the protagonist?
- What are the possible actions?
- For each course of action, what are the positive and negative consequences?
- What sections of the NSPE Code apply?
- What is your final opinion of the ‘best course of action?’
Ethics Case Assignment

- In this course - Ethics cases will be used as a basis for verbal presentations later in the semester.

Steps include:

  o Selection of Possible Ethics Cases
    • Team picks top 3 cases of interest to submit to GTA
    • GTA assigns case to Team
  o Analysis of Ethics Case
    • Teams will receive feedback from GTA prior to presentation due date
  o A draft of the PowerPoint and plan for oral presentation are submitted
  o Teams deliver an Oral Presentation on their Ethics Case
Important Takeaways

- Defined ethics and engineering ethics
- Completed an example approach to developing a well-reasoned response to a moral dilemma
- Introduced the NSPE Engineering Code of Ethics
- Completed an application activity of the Code of Ethics to an engineering case
Preview of Next Class

- Technical Communication 1:
  - Written and oral communication
  - All professionals, including engineers, must be able to communicate their knowledge to others with varying education levels and experiences.
What’s Next?

- Review Ethics Case Assignment
- Select an Ethics Case for your group and email GTA top 3 choices by midnight.
- Once case is assigned, you will complete an ethics evaluation for your case.
- Preview Technical Communications 1, complete the reading and take the Carmen quiz.