Background

- Graduated from U.S. Coast Guard Academy, New London, CT
  - The Coast Guard Academy's Honor Concept is exemplified by a person who will *neither lie, cheat, steal, nor attempt to deceive*
  - Annual Ethics Forum – 30+ years

- Served as an Officer in Coast Guard for 25+ years
  - Honor, Respect, Devotion to Duty

Professions with bad reputations

- What are some professions that are stereotyped in a way that implies that they are not ethical?

- Disclaimer – We are not saying that these professions are entirely unethical but rather calling attention to the stereotypes that are out there.

Professions with good reputations

- What are some professions that are stereotyped in a way that implies that they are very ethical?

- Disclaimer – We are not saying that these professions are entirely ethical but rather calling attention to the stereotypes that are out there.

Ethical Profession Recipe

- Program Accreditation
- Curriculum
- Professional Societies
  - Code of Ethics
- Licensing
- Ethics Committees/Review Boards

- Hold selves accountable

Why are ethics so important for engineers?

Why are ethics so important for engineers?

- Safety of people, property, and environment
- Public trust
- Technical skills

ABET Program Accreditation

- **ABET Criteria for Accrediting Engineering Programs, 2020 – 2021**

- Applicable to the UCCS Mechanical and Aerospace Engineering and Electrical and Computer Engineering Programs – https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2020-2021/

  - *Criterion 3. Student Outcomes*

    - ***4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.***

- **ABET Criteria for Accrediting Computing Programs, 2020 – 2021**

- Applicable to the UCCS Computer Science Program – https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-computing-programs-2020-2021/

  - *Criterion 3. Student Outcomes*

    - ***4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.***

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Ethics in EAS Curriculum

- Fall 2021
  - ECE 4890 – 15 Students
  - MAE 1502 – 80 Students
  - MAE 1503 – 56 Students
  - MAE 4510 – 87 Students
  - CS 3050 – 60 Students
  - CS 4950 – 32 Students
  - ENGR 3040 – 41 Students

371 Total Students

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Professional Society Code of Ethics

- American Society of Mechanical Engineers (ASME) Code of Ethics –
  https://www.asme.org/wwwasmeorg/media/resourcefiles/aboutasme/get%20involved/advocacy/policy-publications/p-15-7-ethics.pdf

- Institute of Electrical and Electronics Engineers (IEEE) Code of Ethics –
  https://www.ieee.org/about/corporate/governance/p7-8.html

- Association for Computing Machinery (ACM) Code of Ethics –
  https://www.acm.org/code-of-ethics

American Society of Mechanical Engineers (ASME)

CODE OF ETHICS OF ENGINEERS

The Fundamental Principles

Engineers uphold and advance the <mark>integrity, honor and dignity</mark> of the engineering profession by:

I.   using their knowledge and skill for the enhancement of human welfare;

II. being <mark>honest and impartial</mark>, and <mark>serving with fidelity</mark> their clients (including their employers) and the public; and

III. striving to increase the competence and prestige of the engineering profession.

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.
6. Engineers shall associate only with reputable persons or organizations. 2 P-15.7 2/1/12
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.

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PRINCIPLES

Integrity
Act with honesty in all situations

Trust
Build trust in all stakeholder relationships

Accountability
Accept responsibility for all decisions

Transparency
Maintain open and truthful communications

Fairness
Engage in fair competition and create equitable
and just relationships

Respect
Honor the rights, freedoms, views, and property of others

Rule of Law
Comply with the spirit and intent of laws and regulations

Viability
Create long-term value for all relevant stakeholders

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Colorado Springs

CU
University of Colorado
Boulder | Colorado Springs | Denver | Anschutz Medical Campus

What drives people to do unethical things?

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What drives people to do unethical things?

- Greed (Money or Success)
- Necessity/Pressure
- Considered acceptable by peers
- Can't see their actions causing harm
- Lack of ethical awareness
- To avoid getting in trouble
- Laziness

Case Study 1

- Volkswagen's Emission Violation - 2015
- VW purposefully altered emission lab results to meet emissions standards with the use of a "defeat device".
  - Software detected lab environment and adjusted power and performance
  - On road, 40x above EPA's permissible levels of dangerous gases
- Began using "defeat device" in 2008 when discovered that they couldn't meet pollution standards.

Case Study 1 (continued)

- CEO resigned

- VW pleaded guilty to criminal charges of defrauding U.S. government and obstructing federal investigation

- Paid $2.8 billion in civil penalties AND $15.3 billion settlement for criminal charges

- Largest settlement in the history of consumer class action cases in U.S. for automobile industry

Case Study 2

- In the news recently…
- Metallurgist faked steel test results for U.S. Navy Subs
  - Provided false positive readings for strength and toughness tests in 240+ cases between 1985 and 2017
- Company's management was not aware of the fraud until May 2017
- Company wrongfully suggested to Navy that it wasn't fraud
- Hindered Navy's investigation

Case Study 2 (continued)

- No reports of submarine hulls failing

- Navy incurred increased costs and maintenance to ensure submarines were seaworthy

- In 2020, company paid $10.9 million in settlement

- Metallurgist faces 10 years in prison and $1 million fine

https://www.miamiherald.com/news/business/article255656871.html

Other Ethics Cases

- **Ford Pinto** – 2.2 million sold, fuel tank, $11 fix, 180 deaths

- **Space Shuttle Challenger** – O-ring failure, 7 deaths

- **Deepwater Horizon** – Blow out preventer modified, 87 days of oil spill,134 million gallons, 43,000 square mile oil slick, 1300 miles of shore, 11 deaths, $4 billion fines/penalties

- **New Orleans Levee System** – poor design and construction, 1800 deaths, $100 billion damage, 80% of city flooded

- **Titanic** – bulkhead design issues, lifeboats limited to 20 (looked unsafe and packed deck), 1500 deaths