Ethics, ECE 445, and You
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Ethics, Morals, and Laws

- *Morals* stem from an individual's view of a situation. They are "personal beliefs and values that inform the many decisions that a person makes from day-to-day" (*Purtillo, 2005*; *Makela, 2009*).

- *Laws* are "the rules of conduct set forth by a controlling authority to facilitate harmonious living among groups of people" (*Makela, 2009*). Laws set a *minimum* standard of behavior.

- *Ethics* "involves systematic judgments of value regarding 'how people ought to act toward one another' as members of a particular societal group" (*Kitchener, 2000; Makela 2009*).

Ethics, Morals, and Laws

- Individual vs. collective standards
  - I feel *morally* bound to volunteer in my community.
  - I am *ethically* bound to properly credit others.
- Ethics vs. Morals vs. Law
  - Is it unethical or immoral to travel 60 mph in a 55 mph stretch of highway?
  - How about if you are rushing someone to a hospital?
  - How about 30 mph in a school zone?
- Ethics are group and context dependent
  - An MD has an ethical obligation to provide care in an emergency.
  - An engineer has an ethical obligation to acknowledge and correct errors in technical analysis.

The power of ethics

- External reference for ambiguous situations
- Fosters a healthy, productive work environment
- Protects employees who take a stand
- Promotes a "fair" working environment
  - In this course
  - In your career
  - In your life

Your behavior reflects back on the discipline

Ethical Engineering

- **Encapsulated in the IEEE Code of Ethics and ACM Code of Ethics**
  - Recognize the importance of your work and the products you build and commit to highest ethical standards

  - Make honest claims about your work and the safety of the products you design (*IEEE CoE* 3)

  - *Agree to accept responsibility in making decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment (IEEE CoE 1)*

  - *Agree to improve the understanding of technology, its appropriate application, and potential consequences (IEEE CoE 5)*

  - *Agree to maintain your technical competence and to undertake technical tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations (IEEE CoE 6)*

- Note how these codes of ethics apply to your project and document in your
  - Proposal, Design Document, Final Report

Ethics codes are **not** a replacement for human judgement

Honesty and record keeping

- Document **_EVERYTHING_** – even failures
  - Begin with **Lab notebooks!**
  - Protects your intellectual property
  - Include in written reports: proposal, design doc, progress report, final report
  - Supports your conclusions and allows reproduction of results
  - Allows your project idea to be further developed
- What not to do:
  - Forge data or throw out bad data points to make results look good
  - Leave out important details of your test setup or changes to the procedure
  - Commit fraud in engineering

Science and engineering are built on evidence

Reject stealing, cheating, and plagiarism
(Academic Integrity violations)

- You may use the work of others but
  - Give credit where it is due
  - Obey fair use and copyright laws
  - Good scholarship requires citation of related work and precedents, and provides a history of the evolution of an idea
- Don't pass off the work of others as your own
  - Reference circuits, open-source software, previous projects, peers, TAs, etc.
  - All project members must understand each other's work and what work is referenced to others.
- Properly cite your work
  - IEEE style, please
- *Agree to reject bribery in all it's forms (IEEE CoE 4)*

Honesty

- Beware the line between promoting your work and distorting the facts

- There is a difference between rejecting data which is discovered to be bad for a reason and committing lies of omission (omitting data that doesn't support your theory).

- Don't fake data!

- *Agree to be honest and realistic in stating claims or estimates based on available data (IEEE CoE 3)*

- *Agree to seek , accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others (IEEE CoE 7).*

- *Agree to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist (IEEE CoE 2)*

Ethical considerations come into play in many aspects of ECE 445

- Referencing of previous related work.

- During interactions between students and between staff and students.

- Project approval should not seem biased.

- Fair grading.

- Treating each other fairly while finding and conducting the project.
  - Team Contract documents procedures and expectations (Due 9/19)

- *Agree to treat fairly all persons (IEEE CoE 8).*

- *Agree to avoid injuring others, their property, reputation, or employment by false or malicious action (IEEE CoE 9)*

- *Agree to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others (IEEE CoE 7)*

Students' Quick Reference Guide to Academic Integrity (abstracted from the Student Code)

- **What is your responsibility?**
  - It is your responsibility to refrain from:
    - infractions of academic integrity
    - conduct that may lead to suspicion of such infractions
    - conduct that aids others in such infractions. "I did not know" is not an excuse.
- **What is an infraction of academic integrity?**
  - Cheating – using or attempting to use unauthorized materials
  - Plagiarism – representing the words, work, or ideas of another as your own
  - Fabrication – the falsification or invention of any information, including citations
  - Facilitating Infractions of Academic Integrity – helping or attempting to help another commit an infraction
  - Bribes, Favors, and Threats – actions intended to affect a grade or evaluation
  - Academic Interference – tampering, altering or destroying educational material or depriving someone else of access to that material

Faculty Academic Integrity Report (FAIR)
(Online System in use by most colleges)

- **What happens if you are accused of a violation of academic integrity?**
  - The instructor will notify you <u>in writing</u> of the allegation.
  - You may meet with the instructor but <u>your written response</u>, delivered to the instructor within ten (10) business days, <u>is your ONLY opportunity to respond to the allegation</u>.
  - Minor violations may result in warnings, zero on assignment, but not FAIR.
- **What happens after the instructor receives your response?**
  - The instructor, acting as fact finder, will make a decision and communicate it to you <u>in writing</u>. They have to decide whether it is <u>more probably true than not true</u>, that you have committed an infraction.
  - If it is determined that you did not commit an infraction the case is closed though you have choices regarding continued enrollment.
  - If it is determined that you committed an infraction the instructor shall impose a course sanction. Sanctions vary from a written agreement between you and the instructor to failure in the course.
  - A university sanction will also be imposed by the Senate Committee on Student Discipline.

- **What is the appeal process?**
  - If you intend to appeal, you must write to the EO (not the instructor or TA) and state your grounds for appeal <u>within five (5) days</u> of receiving the decision
  - A committee will be formed to hear the appeal. During the hearing, they will determine if the grounds for an appeal have been established, allow you and the instructor to present your case, and ask questions.
- **Can I be dismissed for academic integrity violations?**
  - Yes, but only by the Senate Committee on Student Discipline and normally only after multiple violations.
- **Are violations of academic integrity part of my records?**
  - Reported cases that result in a finding by the instructor that you did not commit a violation do not become part of your record.
  - Reported cases that result in a finding that you did commit a violation of academic integrity are recorded.
  - The consequences of such a notation in the official record may require explanation on graduate school applications, application for professional licensure, or some government jobs, etc.

Some thoughts about ethics and integrity

- Ethics codes are not a replacement for human judgment

- Ethics is not a static subject
    - New boundaries of possibility
    - Changing standards of acceptable risk

- The introduction of AI will lead to changes in how we maintain and enforce academic integrity

Beyond ECE 445

- Ethical choices show up everywhere
- There may be something to gain from making the ethical choice, even if it is not the easiest choice!

Relevant Resources:

- IEEE Code of Ethics
- ACM Code of Ethics
- University of Illinois Student Code (specifically sections in 1-302)
- ECE 445 Ethical Guidelines

A professional reputation takes time and effort to build, but it takes one poor decision to ruin!

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Final thoughts

- Would I be comfortable having my name widely attached to this project?
- Do I want to live in a society where this product is available or widely used?
- Would I be proud of a career dominated by the decision making demonstrated here?

The real test of your ethical standards will come when you can significantly benefit from unethical behavior and are confident you will not be caught.

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We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

1. to accept responsibility in making decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to be honest and realistic in stating claims or estimates based on available data;
4. to reject bribery in all its forms;
5. to improve the understanding of technology, its appropriate application, and potential consequences;
6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.
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