



ECE 3080

**Ethics in
Electrical and Computer Engineering**

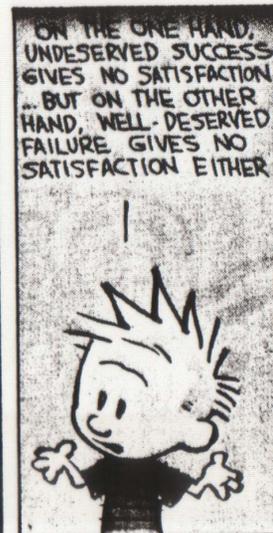
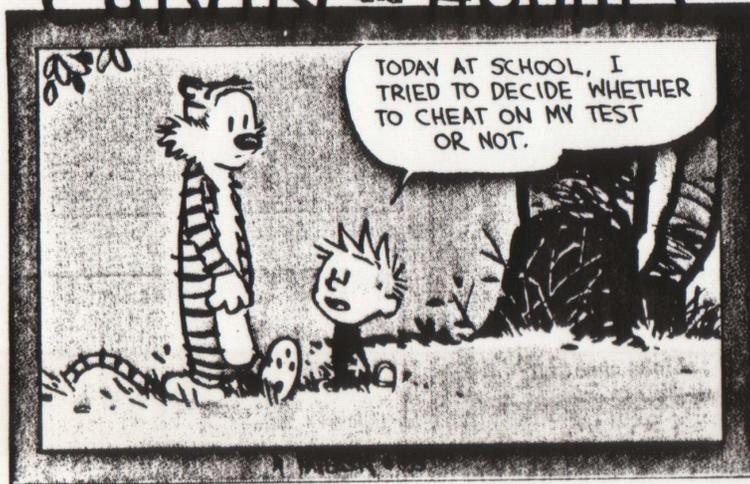
Lecture #11: Honesty

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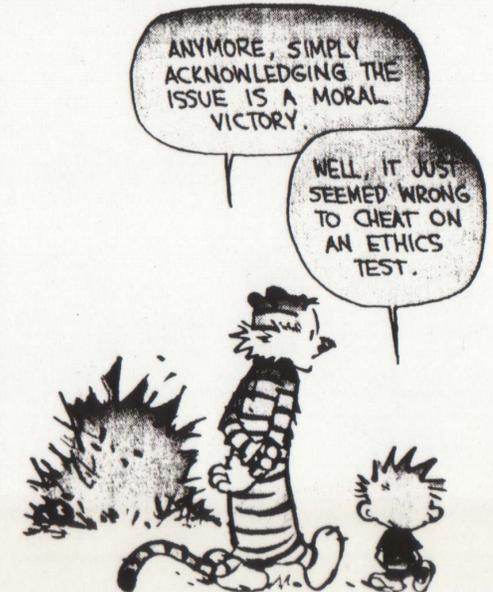
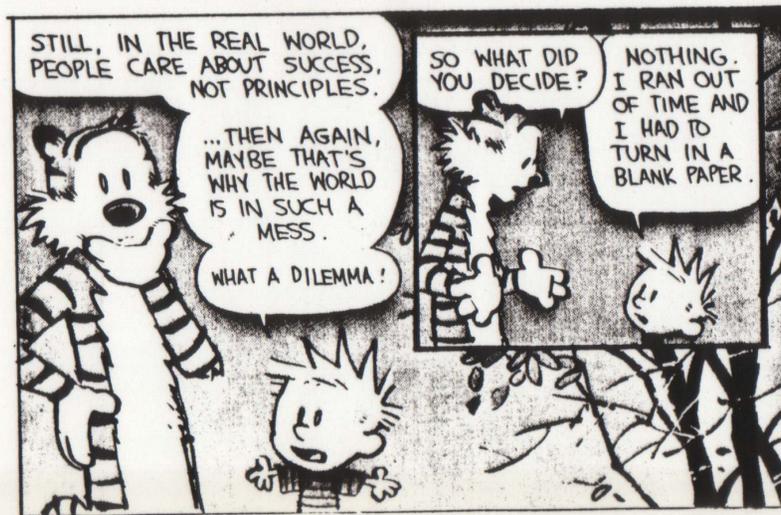
Department of Electrical and Computer Engineering

calvin and Hobbes



THEN I THOUGHT, LOOK, CHEATING ON ONE LITTLE TEST ISN'T SUCH A BIG DEAL. IT DOESN'T HURT ANYONE.

...BUT THEN I WONDERED IF I WAS JUST RATIONALIZING MY UNWILLINGNESS TO ACCEPT THE CONSEQUENCE OF NOT STUDYING.





Truthfulness and Trustworthiness

- Truthfulness:
 - Standard of truthfulness in engineering is very high, much higher than in everyday life
 - Ethicists feel that deception is sometimes a necessary evil, and, in moderation and prudence is a healthy part of living – e.g., to protect innocent lives, lie and say someone's clothes look nice, withholding truths in order to protect privacy rights



- Because so much is at stake in terms of human safety, health, and well-being, engineers are required and expected to seek and to speak the truth conscientiously and to avoid all acts of deception (in conduct of their professional duties)
- Two of the six Fundamental Canons in the NSPE Code of Ethics focus on honesty...



- Cannon 3 requires engineers to “Issue public statements only in an objective and truthful manner”
- Cannon 5 requires engineers to “Avoid deceptive acts”
- **IEEE Code of Ethics:** “to be honest and realistic in stating claims or estimates”, “to seek, accept, and offer honest criticism of technical work”



NSPE BER Case No. 90-4

- An engineer who is an expert in hydrology and a key associate with a medium-sized engineering consulting firm gives the firm her two-week notice, intending to change jobs. The senior engineer-manager at the consulting firm continues to distribute the firm's brochure, which lists her as an employee of the firm.
- Violates NSPE Code of Ethics



NSPE BER Case No. 89-2

- A city advertises a position for a city engineer/public works director, seeking to fill the position before the incumbent director retires in order to facilitate a smooth transition. The top candidate is selected after an extensive screening process, and on March 10 the engineer agrees to start April 10. By March 15 the engineer begins to express doubts about being able to start on April 10, and after negotiations the deadline is extended to April 24, based on the firm commitment by the engineer to start on that date. On April 23 the engineer says he has decided not to take the position.
- **Violates NSPE Code of Ethics**



NSPE BER Case No. 92-6

- An engineer working in an environmental engineering firm directs a field technician to sample the contents of storage drums on the premises of a client. The technician reports back that the drums most likely contain hazardous waste, and hence require removal according to state and federal regulations. Hoping to advance future business relationships with the client, the engineer merely tells the client the drums contain “questionable material” and recommends their removal, thereby giving the client greater leeway to dispose of the material inexpensively.
- [Violates NSPE Code of Ethics](#)



Engineer's truthfulness responsibility...

- Forbids lying
- Forbids intentional distortion and exaggeration
- Withholding relevant information (except for confidential information)
- Claiming undeserved credit
- Other misrepresentations designed to deceive



Trustworthiness

- Honesty:
 - Truthfulness
 - Trustworthiness: centers on meeting responsibilities about trust (so that the public, clients, etc. can trust in the expertise of the engineer)
- Engineering is based on exercising expertise within fiduciary (trust) relationships in order to provide safe and useful products



Academic Integrity, Students/ Faculty

- **Cheating:** Intentionally violating the rules of fair play in any academic exercise, for example, by using crib notes or copying from another student during a test.
- **Fabrication:** Intentionally falsifying or inventing information, for example by faking the results of an experiment.
- **Plagiarism:** Intentionally or negligently submitting others' work as one's own, for example, by quoting the words of others without using quotation marks and citing the source.
- **Facilitating academic dishonesty:** intentionally helping other students to engage in academic dishonesty, for example, by loaning them your work



Academic integrity, engineering integrity

- **Misrepresentation:** Intentionally giving false information to an instructor, for example, by lying about why one missed a test.
- **Failure to contribute to a collaborative project:** failing to do one's fair share on a joint project
- **Sabotage:** Intentionally preventing others from doing their work, for example, by disrupting their lab experiment
- **Theft:** Stealing, for example, stealing library books or other students' property
- **Faculty unethical behavior:** Failure to show up for class, failure to monitor exams/report unethical behavior, re-use of old exams?
- **Related to the engineering workplace?**
 - Give credit where credit is due (in IEEE Code of Ethics)
 - Misrepresentation of expertise
 - Setting up a professional environment



Research Integrity

- Research in engineering occurs in universities, government labs, corporations
- Truthfulness takes on heightened importance in research because research aims at discovering and promulgating truth.
- Sloppy research is fundamentally dishonest.
- Truthfulness in research:
 - Honesty in conducting/reporting experiments
 - No theft of others' results
 - No misuse of research funds



- National Science Foundation (NSF): defines misconduct in science and engineering as:
- Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF, or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith



Babbage's Four Types of Deception and Fraud in Research

- **Forging:** deception intended to establish one's reputation
- **Hoaxing:** deception intended to last only for a while and then to be uncovered or disclosed, typically to ridicule those who were taken in by it
- **Trimming:** selectively omitting bits of outlying data
- **Cooking:** selective reporting of results, falsifying data, massaging data in the direction that supports the result one prefers



Bias and Self-Deception

- Rush to report results before peer-review (e.g., cold fusion case) results in self-deception
- Conflicts of interest (cause bias)
 - Own large shares of stock in company doing research for
 - If promise of more research funding if results favor the products of the company
 - Fund research to show product is better than another (when it is not)



Protecting Research Subjects

- Human subjects in automotive research, biomedical research
- Experiments on humans only permissible after obtaining voluntary consent of the human subjects (they must have all information on risks, possible benefits)



Giving and Claiming Credit

- Plagiarism: intentionally or negligently submitting others' work as one's own
- Failure to give credit:
 - NSPE BER Case No. 92-1: A city hires an engineer to design a bridge, and the engineer in turn subcontracts some key design work to a second engineer. Months after the bridge is completed, the first engineer submits the design to a national design competition where it wins an award, but he fails to credit the work of the second engineer.



- Misrepresenting credentials: saying you have a degree that you do not have (perhaps you completed only part of the course work)
- Misleading listing of authorship:
 - Omitting a co-author
 - Order of authors in engineering is the greatest contributor to the least contributor
- Reporting misconduct: It is your responsibility to report misconduct you see



Consulting Engineers

- Deceptive advertising:
 - Outright lies
 - Half-truths (e.g., saying part of big projects that only had a minor role in)
 - Exaggeration (of the quality of past products)
 - False innuendos, suggestions, or implications
 - Obfuscation created by ambiguity, vagueness, or incoherence
- Competitive bidding: Used to not allow since then you would only rely on reputation and proven qualifications



Contingency Fees

- NSPE Code of Ethics: Engineers shall not request, propose, or accept a commission on a contingent basis under circumstances in which their judgement may be compromised.
- Contingency fee depends on a special condition beyond the performance of satisfactory work (e.g., that you will save the client money – this may lead to inferior design in use of low-cost materials)



Safety and Client Needs

- Consulting engineers have the option to accept “design-only” projects
- Problems:
 - No follow through with the client to monitor how the project is going
 - No monitoring of safety issues that unexpectedly arise



Expert Witnesses and Advisors

- Expert witnesses in the courts:
 - May be hired by plaintiff or defense
 - Give testimony on defective products, personal injury, property damage, traffic accidents, airplane crashes
 - Ok for engineers to follow how lawyers do and have an adversarial role on either side? (i.e. only try to argue for one side) Both sides then hire experts!
 - No. Engineer's primary responsibility is to be objective!



- The role of expert witnesses is to identify the truth about causes of accidents, not to directly serve attorney's clients.
- Attorneys hire and pay engineers for their services in impartially investigating the truth.
- Engineers should not become “hired guns” who engage in outright lies and distortions according to who pays their consulting fee.



- Abuses:
 - Hired guns
 - Financial biases: Being paid by one side can exert some bias (should never get hired based on a contingency fee – paid only if win the case)
 - Ego biases: Adversarial situations evoke competitive attitudes that influence judgement
 - Sympathy biases: Let judgement be influenced by victims



Advisers in Planning and Policy-Making

- Example: Engineers hired by pronuclear corporations or antinuclear groups invariably feel pressure to accent one side of the case
- Assumptions made matter (they can bias solutions)
- Studying only part of the problem can create a biased solution (unfairly so)



- **Hired guns:** Engineers should not do this
- **Value-neutral analysts:** Engineers are completely impartial. Avoid taint of bias, favoritism, and advocacy
- **Value-guided advocates:** May adopt partisan views in controversial issues but remain honest and independent in their professional judgement – make their responsibility to the public paramount



Attendance Question

- **Name what you feel is the most important thing for an engineer to be honest about in the engineering workplace.**
- **List only one thing.**

Please: Put your name on the sheet of paper and turn it in...