Communication in Engineering

- According to the Accreditation Board for Engineering and Technology (ABET):
  - Engineering programs must demonstrate that their graduates have:
    - an ability to communicate effectively
    - an ability to function on multi-disciplinary teams
- These criteria are driven by industry demand, not ivory-tower wish lists!

Integration in Engineering Curriculum

- The primary reasons technical writing is taught outside of engineering are efficiency and usual location of expertise.
- In real life, engineering cannot be separated from writing/speaking.
- You should develop the habit of engineering and communicating together.
- You can learn to communicate best by communicating about your own work.
Industry Perspective

- One survey of an EE industrial advisory board found the following deficiencies in EE grads:
  - inability to clearly present ideas
  - inability to describe reason for a communication
  - inability to write a logical paragraph
  - production of long, rambling, unorganized reports
  - excessive use of jargon, buzz words, and acronyms

Are Engineers Really That Bad?

- Definitely not. Engineers are some of the best communicators!
- Compare English ACT scores at AU:
  - Engineers -- 24.92 (2nd highest college)
  - All other majors -- 23.23
Whence the Stereotype?

- The information engineers must communicate is *hard to understand*.
- Engineers are required to communicate a great deal on top of their technical work; *i.e.*, *no one complains about the writing skills of burger flippers*!
- Engineers tend to lack confidence and motivation in communication and prefer to stick to technical material.

Communication in Engineering

- In a survey of recent engineering graduates, the respondents estimated that they spent *38% of their time* in writing tasks.

  “Here at [my company], engineers who can effectively communicate across a broad range of topics typically move faster up the corporate ladder than those who communicate poorly.”
What Do They Do with that 38%?!

- Typical examples are:
  » memos
  » reports
  » email
  » documentation
  » proposals
  » technical articles
- An engineer’s output is more typically a document rather than a device.

Why Should We Care -- Really?

- Clear communication is closely related to clear thinking.
  » Thinking through preliminary report
  » Presenting technical material to a class or project group
- Form (grammar, style, structure) can distract or enhance.
  » You want your audience to focus on your point.
  » Poor grammar & style reflect unprofessionally.
Technical Writing Style

- Engineers don’t write expositarily.
  » The goal of expository writing is to demonstrate understanding.
  » Audience is the paper grader.
- Engineers write technically.
  » The goal is to communicate the ideas themselves.
  » Audience is manager/colleague/customer.

Audience, Audience, Audience

- Consider your audience.
- Consider your audience.
- Consider your audience.
- Consider your audience.
- Consider your audience.
- Consider your audience.
Audience Issues

Put yourself in their shoes --

- What do I want them to know?
- Why will they care?
- How much time will they invest?
- Can I find a way to bridge the gap between what I want them to know and what they want to know?
- Why am I writing this?

Purpose for Writing

- An effective technical writer will always be aware of the purpose of the communication.
  - Report progress on a project
  - Document results of prototype design
  - Provide a manufacturing specification
  - Instruct users about operating your software
  - Persuade others to buy your product or hire your services
Choice of Material -- Two Errors

- Leaving out important background material (assuming too much)
  
  "We found that adding a capacitor into the circuit didn’t improve the performance enough to justify the penalty."

- Giving needless details
  
  "We had trouble finding the capacitor we wanted. After searching for it at several stores, we ordered it over the Internet for $0.79 and received a free laser pointer as a bonus."

Leaving Out Background Info

- Intimidates your audience.
- Loses your audience.
- Offends your audience.

Result: You fail to communicate.
Giving Needless Details

- Obscures the main point
- Bores the audience
- Wastes audience time
- Wastes writer time

Result: You fail to communicate effectively.

Choice of Material

- Define uncommon acronyms and buzz words.
- Provide short summary at the beginning to hedge your bets with the impatient.
- Provide appendices at the end to hedge your bets with the inquisitive.
- Do your best to say it all but no more.