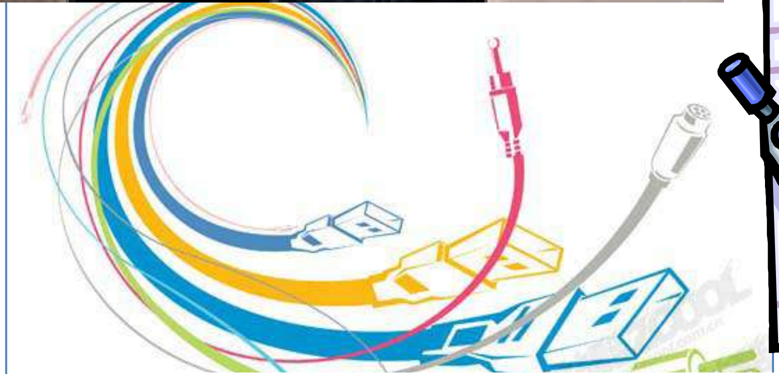
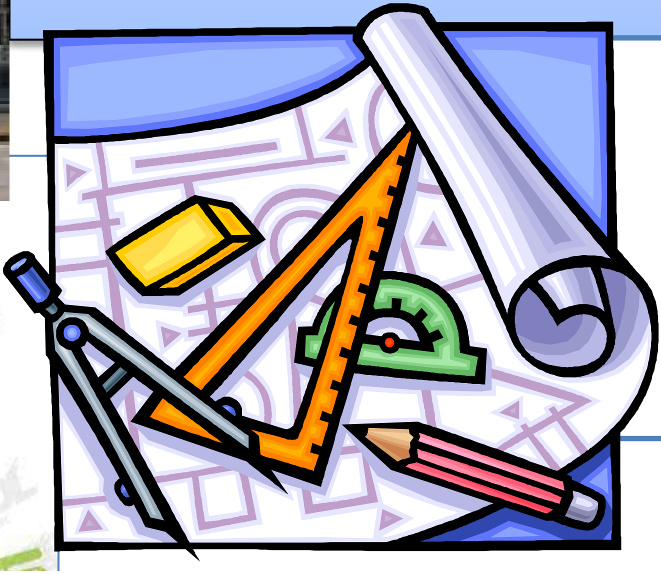
Welcome & Intro to ENGR 240: Technical Communication





Monika Smith©

Assistant Teaching Professor

Department of English I ATWP

University of Victoria | Humanities

Figuring out "How Things Work": 40:20:40

Engineers like to know how things work

In **Engr. 240**, you'll learn how **clear communication** works.

You'll use each **step** of the **writing process** in a conscious, **self-reflective** way to help **clarify** your thinking and writing

Being **clear** and **concise** will help you better communicate your plans, designs, and ideas, enabling readers to more easily follow, and thus **act**, on those ideas

The more effectively you **communicate your message**, the better readers can grasp what you're saying, follow your advice, implement your ideas, and make **informed decisions**

Learning Commitment: Reflect, Think, Learn

To achieve **clarity** as engineers, commit to the following:

- Learn, recognize, and practice relevant **rhetorical strategies** and **genres** used by professional engineers, which you can then apply to produce quality technical writing of your own
- Identify your **strengths as a writer** and capitalize on these: know what you're doing well and keep doing it!
- Become aware of any **"unconscious incompetencies"** as a writer: an important moment in any learning process. Recognize what you need to work on to improve—instead of unconsciously perpetuating bad habits. Numerous studies show **self-reflection** and **self-review** are key to success—in *all* your learning!

The Learning Commitment: Public Speaking

- **Giving Presentations**
- **Speaking with Clients**
- **Conferencing**
- **Skyping, Zooming**
- **Meeting with Supervisors**
- **Talking with Colleagues**

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The Learning Commitment: Collaboration

- **Group Projects**
- **Team Writing**

As engineers, what kinds of documents and genres will you write?

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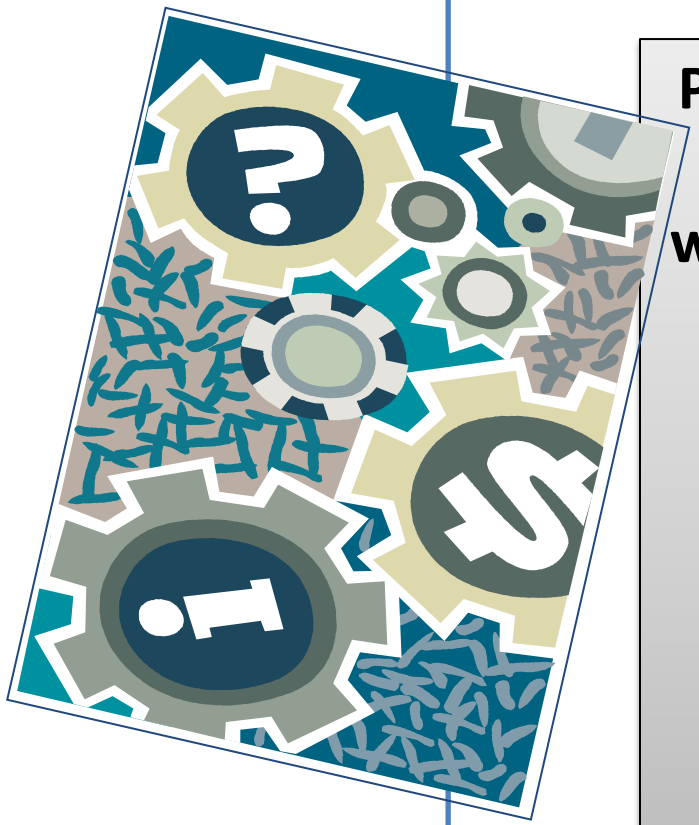
The Learning Commitment: Reader-Centered Writing

- Technical Descriptions
- Correspondence
  - ✓ Memos
  - ✓ Letters
  - ✓ Email
  - ✓ Texts
- Proposals
- Reports
- Worklogs, minutes

Instructions
Specifications



Pay attention to refining and honing your style, with a focus on the 4 C's:

- **Clear**
- **Correct**
- **Concise**
- **Courteous**

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Engineers Value Clear, Correct, Concise Language!

Engineers are the gate-keepers for clear, precise writing

"Engineers are key players in establishing, supporting, and advocating for clear, transparent, objective communication"

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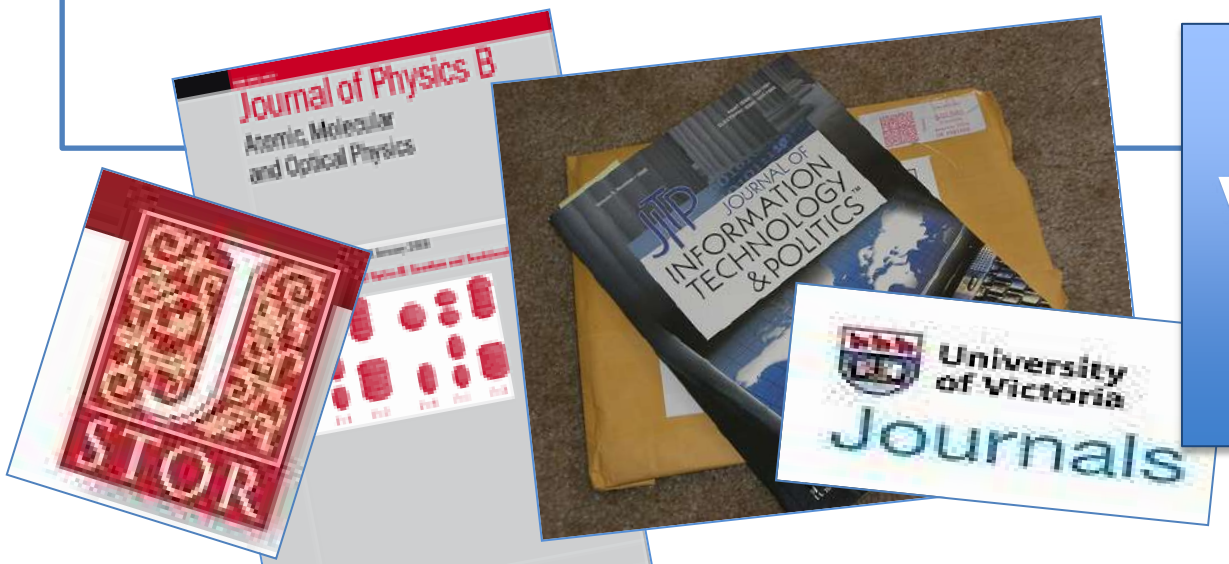
Engineers Must Write Carefully and Precisely

The "gold standard" for engineering writing, laid out in the engineering journal, **IEEE Transactions on Professional Communication**, is writing that comes across as

- **Straightforward** = Clear, precise, unambiguous, "transparent"
- **Honest** = Balanced, objective, unbiased, credible
- **Trustworthy** = Accurate; double-checked; clear & transparent



The standards of academic writing you learnt in ATWP 135 are the same standards that apply to technical writing!

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Engineers Insist – Engineers Must Write Clearly!

"Serious problems require a serious tool: **written reports**. Meetings should center on written reports on paper . . . A good model for the **technical report** is a **scientific paper** or commentary on a paper published in substantial scientific journals such as *Nature* or *Science*"

Dr. Edward Tufte, Professor Emeritus of Political Science, Statistics, and Computer Science, Yale University

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CEAB Requires you to Develop Communication Skills

"Accredited engineering programs must contain not only adequate mathematics, science, and engineering curriculum content but must also develop communication skills, an understanding of the environmental, cultural, economic, and social impacts of engineering on society, the concepts of sustainable development, and the capacity for life-long learning."

Canadian Engineering Accreditation Board, underwritten by *Engineers Canada*

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When Engineers Write . . .

. . . they need to do so clearly and unambiguously

BECAUSE . . . ?

When Engineers Write, they Impact the World!

Engineers occupy uniquely responsible positions that effect people's

- **Safety**
- **Health**
- **Livelihoods**

Writing produced by engineers is geared to practical applications, often in safety-critical industries

Medicine
Airplanes
Nuclear power
Banks

Automobiles
Traffic control
Bridges
Hospitals

Engineering Code of Ethics = Professionalism

What does professionalism mean to you?
What synonyms occur to you?

Professionalism

- Knowledge, expertise
- Responsibility
- Reliability
- Objectivity and Fairness
- Abiding by a Code of Ethics
- Being conscientious
- Being trustworthy

Source: Justaskpublications.com

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Be Objective
Be Honest
Give Credit
Don't Deceive
Be Factual
Be Legal
Be Honorable
Be Accurate
ETHICS

Avoid the Muddy Waters of Imprecision . . .

Engineers have a professional, **ETHICAL responsibility** to avoid writing that is

- **Ambiguous**
- **Unclear**
- **Vague**
- **Poorly structured**
- **Fragmented**
- **Overly-complicated**
- **Wordy**
- **Characterized by errors in language and meaning**

It may lead readers to misunderstand what you're saying . . .

Be Ethical = Be CLEAR

Misunderstandings can lead to disaster!

For engineers, communicating clearly is thus an ethical responsibility

Engineering Code of Ethics =

Do No Harm

Be Ethical = Be CLEAR

"The history of technology is littered with examples of failures brought about, at least partly, by inadequate communication among engineers, management, and others"

H. Hart, *Engineering Communication,* (2010)

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Early in 1986, NASA management looked at the information provided by MTI engineers, but failed to make the decision *not* to launch the Challenger Shuttle

WHY?

Chief Engineer, Roger Boisjoly, had written memos to NASA Management warning them not to launch—but used emotionally-charged language, rather than data

This appeal to pathos caused him to be viewed as over-wrought, as if he were exaggerating the situation, causing his message to lose credibility

Partly as a result of how Boisjoly framed his message (appealing to *pathos*), management was led to make the wrong decision. They ignored the warnings in Boisjoly's memo and launched the shuttle, with fatal consequences for all on board

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In Feb 2003, NASA Executives looked at reports on the Columbia Shuttle provided by Boeing engineers who understood the problems and risks. However, NASA executives made the wrong decision – namely, to do nothing

WHY?

According to Dr. Edward Tufte, computer science professor and data visualization expert (Yale; Stanford), reports prepared by Boeing engineers in the form of 28 choppy PowerPoint slides – rather than formal written reports—failed to clearly communicate the dangers to the shuttle and crew

The engineers had not turned their data into useful information — information that, properly communicated, could have enabled NASA managers *to make a different decision*

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Engineering Writing = Clear Writing = Ethical Writing

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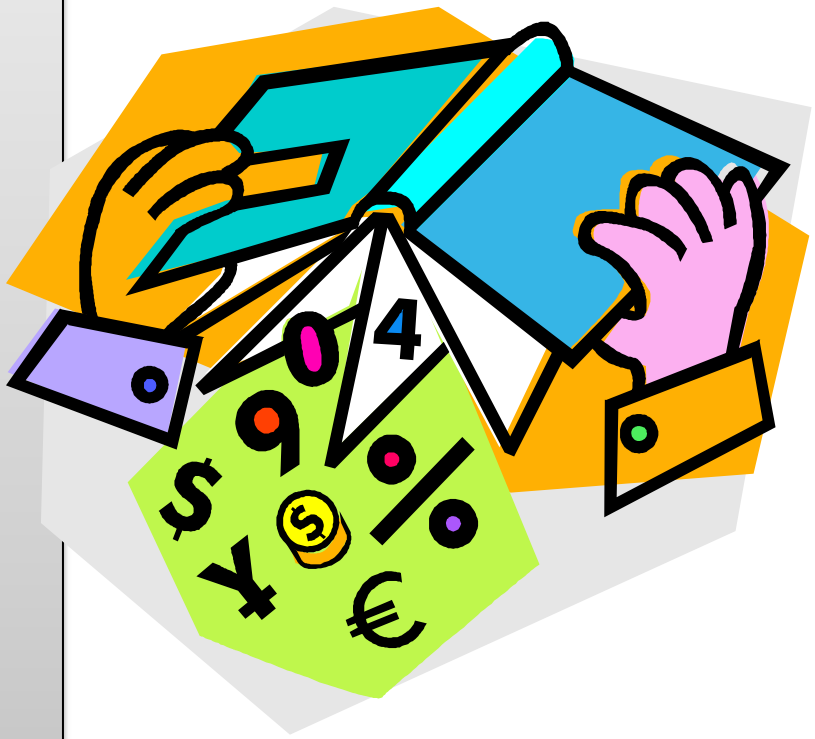
Engineering Writing = Clear Writing = Ethical Writing

- Clear, straightforward
- Objective, factual
- Accurate, precise
- Readable, accessible
- Well structured
- Audience-centered
- Planned and designed
- Purposeful
- Action oriented



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On top of its ETHICAL qualities, one of "the most fundamental characteristic of technical writing rests in the legal liability associated with workplace information"

Trebeaux and Dragga

Take Care to Protect Confidentiality

- Information about customers, clients, and colleagues
- Intellectual property produced by the company
- The knowledge companies produce for clients

Trebeaux and Dragga

Possible Security Leaks?

Conversations

Unsecured documents

Text messages

Cloud computing

E-mail

Cell phones

Blogs

Unencrypted programs

Surfing the Internet

Social media & Personal webpages

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What and Why Do Engineers Write?

The next slides cover . . .

- **The goals of technical writing**
- **How to best achieve those goals**
- **How to meet the persuasion challenge**

Technical Writing: Key Goal

"The art of preparing and publishing **specialized information** in a way that allows **non-specialists** to understand and **use** the information **to accomplish some task**"

-Graves & Graves

Engineering Communication is Action-Oriented

Technical professionals use effective communication in the workplace

To make things happen

To create positive change

For the most part, these changes are achieved through the medium of the written and spoken word

Clear Communication Gets the Job Done

Engineers are **problem-solvers**, and **clear communication** leads to **effective solutions**

- When you give people clear explanations, it becomes **useful information** that they can act on
- Hence, you need to develop strong communication skills: it shows off what you do best, namely **problem-solving**

"Studies show that getting a job in engineering, achieving success, and being promoted may be as dependent on your ability to communicate well, as on your technical skills . . ."

Norback, Leeds, & Forehand. (2009). "Engineering Communication: Executive Perspectives on the Necessary Skills for Students." *International Journal of Modern Engineering, 10.1, pp. 11-20*

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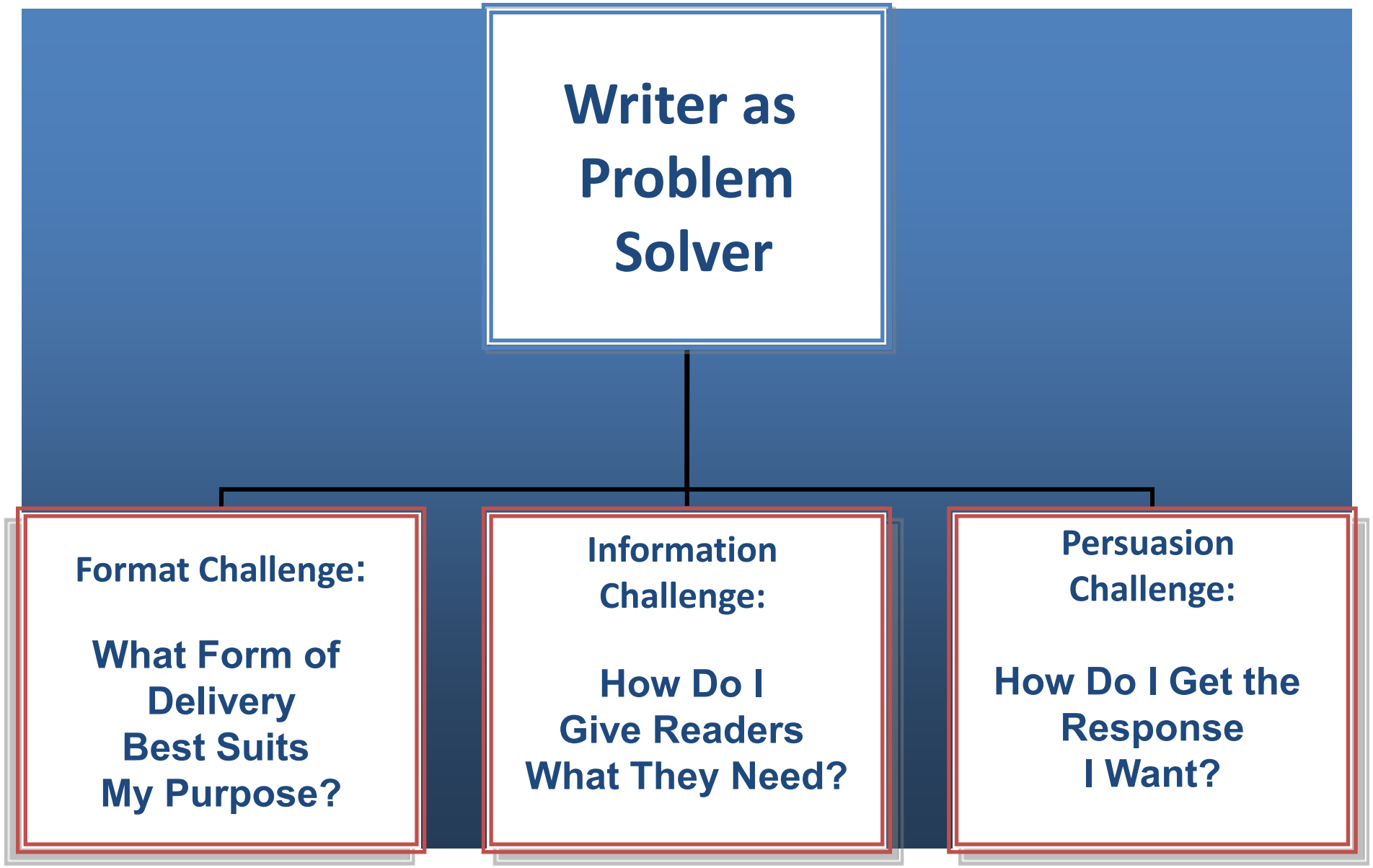

Writer as Problem Solver
Format Challenge:
What Form of Delivery Best Suits My Purpose?
Information Challenge:
How Do I Give Readers What They Need?
Persuasion Challenge:
How Do I Get the Response I Want?

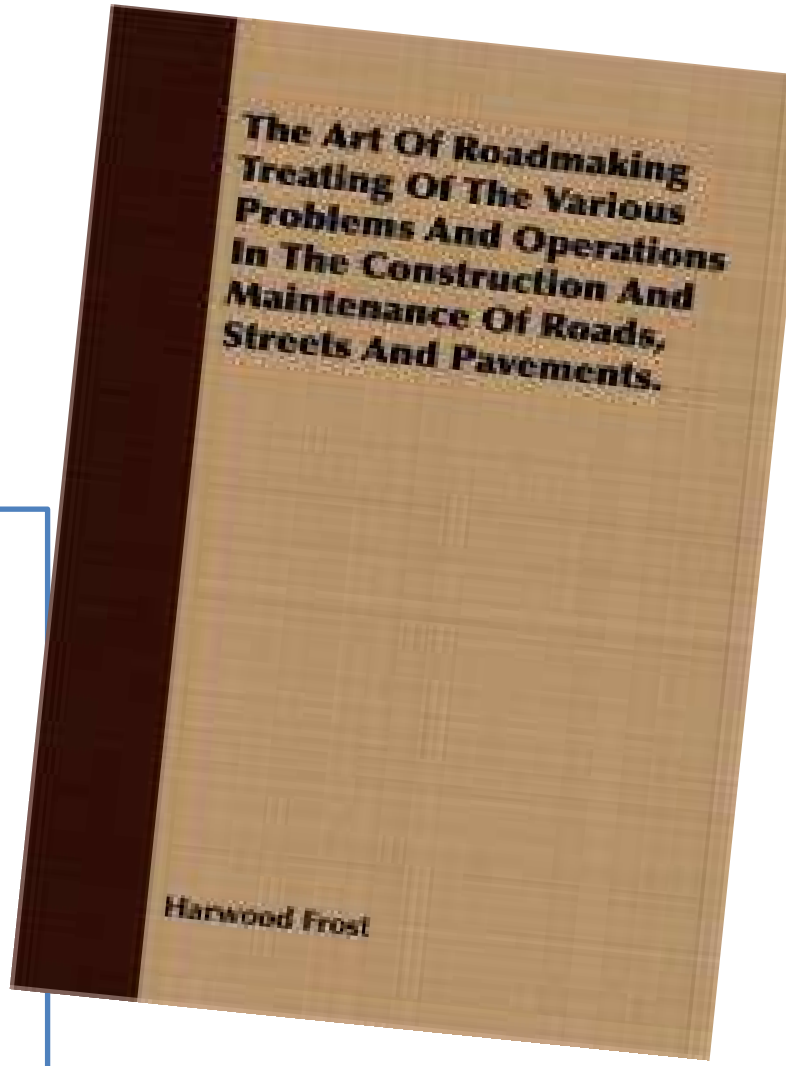
How do you meet the **persuasion challenge** to achieve your goals as a technical professional?

????

Apply your Problem-Solving Skills to Writing!

Engineers are responsible for writing in a way that's clear, unambiguous, accurate, precise, specific, and well-organized

This can be a challenge!



Engineer Harwood Frost wrote in 1911 that

"literary expression . . . should be considered one of the most practical problems with which the engineer has to deal"

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Learn and Practice Writing to Bolster Opportunities!

- Poorly written applications impact candidates' chances for employment
- 50 percent of private employers and 60 percent of state government employers say writing skills impact promotion decisions

Trebeaux and Dragga

Writing remediation costs American businesses as much as $3.1 billion annually!

Google Boss says 58% of Resumes get trashed because of Typos!

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Writing Well Takes Time, Training, & Effort!

U.S. OFFICE OF PERSONNEL MANAGEMENT

Ensuring the Federal Government has an effective civilian workforce

Go

Advanced Search

Great Leaders for Great Government

The Federal Executive Institute and the Management Development Centers

Effective Writing (formerly: Leading with the Written Word)

Formerly: Leading with the Written Word:

Overview

The ability to prepare clear, concise documents that advocate a position or advance a goal is an essential leadership skill. Whether you have to produce budget justifications, testimony or any number of other documents, each one requires a different style of writing, and your success depends on your ability to use them appropriately. In this seminar, experts will teach you how to create a document from concept to completed product, reviewing and critiquing your work and making concrete suggestions for improvement. You will learn the styles of writing required for different types of documents and audiences and the techniques to polish your writing skills when you return to the workplace.

How Will You Benefit

- Understand basic writing methods that stress the importance of outlines and orderly composition structure
- Learn to write more precisely with meaning and purpose
- Reinforce the key ingredients of effective communication techniques
- Develop greater confidence and productivity
- Enhance critical writing skills that will gain necessary support from your peers, team and boss

Competencies Emphasized

- Business Acumen
- Written Communication
- Influencing/Negotiating
- Political Savvy
- Strategic Thinking

Length

4 days.

Locations

- WMDC, Aurora, CO
- EMDC, Shepherdstown, WV

College Credits

N/A

In the US, the federal government considers enhanced writing skills so critical that it sponsors four-day writing seminars at an average cost of $3,000 per attendee!

Trebeaux and Dragga

At UVic, your Engineering Faculty, in compliance with the Canadian Engineering Accreditation Board, requires all engineering students to take a minimum of two writing courses: **ATWP 135** and **ENGR 240**

UVIC

Persuasion = Clarity, Precision, Design

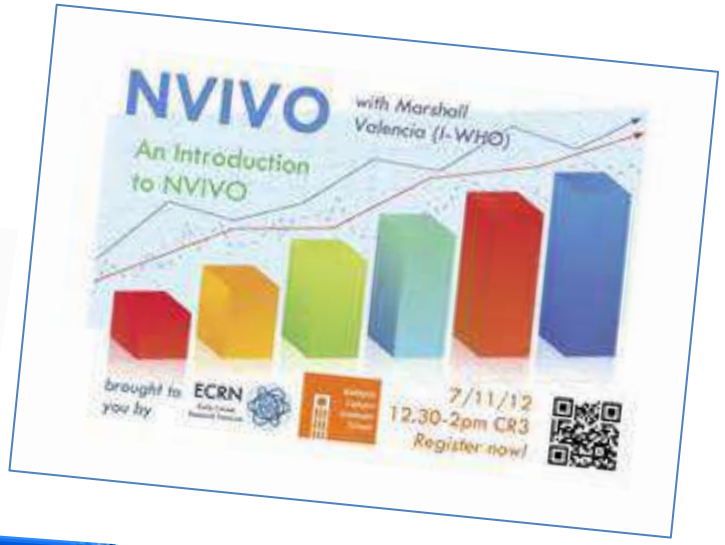
Pay attention to FOUR essential areas

1. Content
2. Visuals
3. Organization and Layout
4. Style

Persuasion = Supply Information-Rich Content

CONTENT: Be Informed, Be Accurate

- Find the right evidence: concrete, empirical "measurables"
- Take care of the details: ensure accuracy
- Be honest: remain balanced and objective in presenting information



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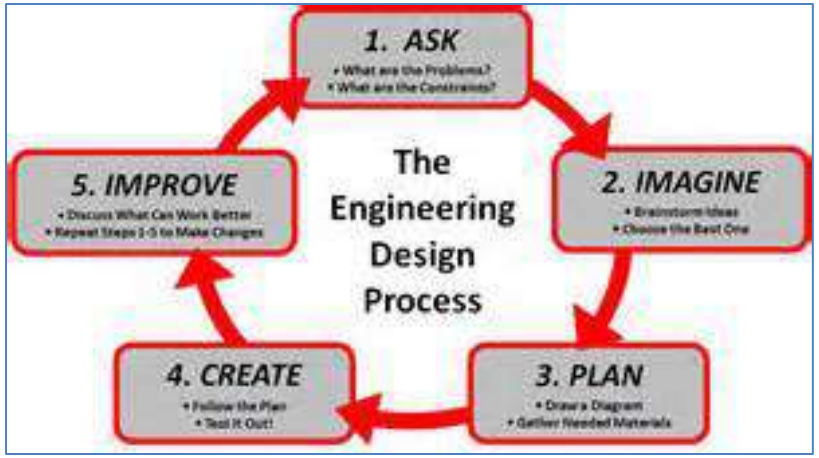
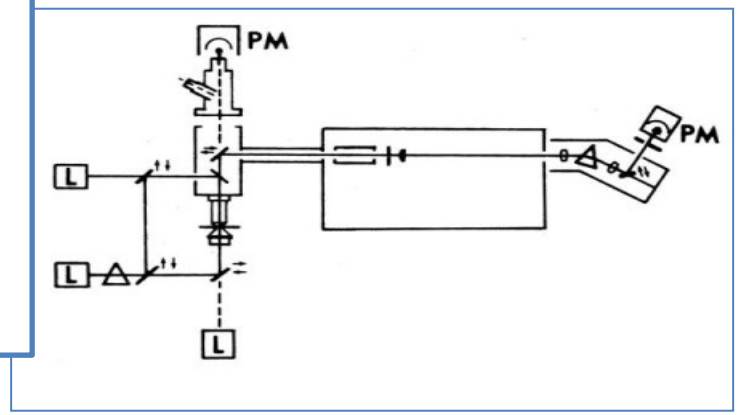
Persuasion = Provide Effective Visuals

GRAPHICS: Supply Pictures

Communicating clearly means using pictures to supplement (but never replace) words



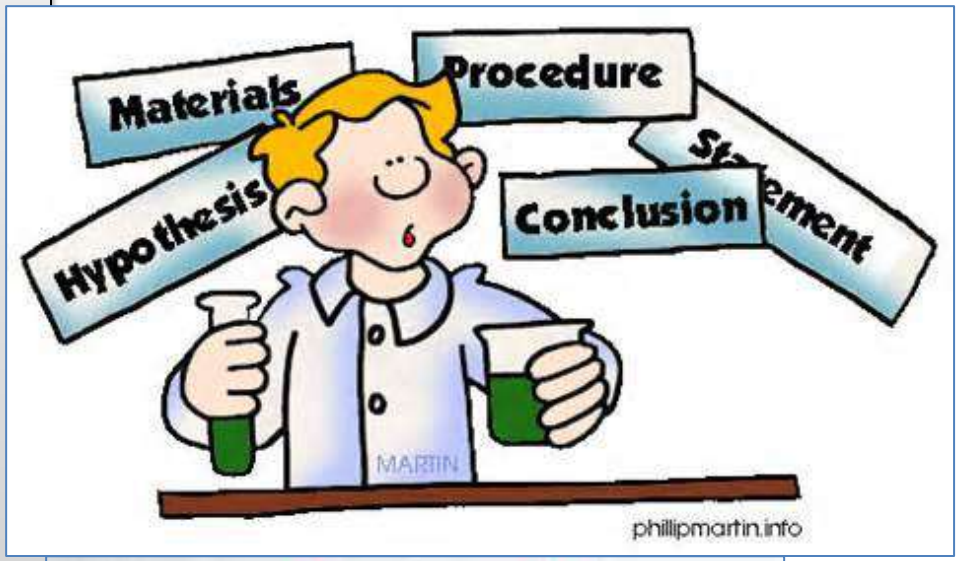


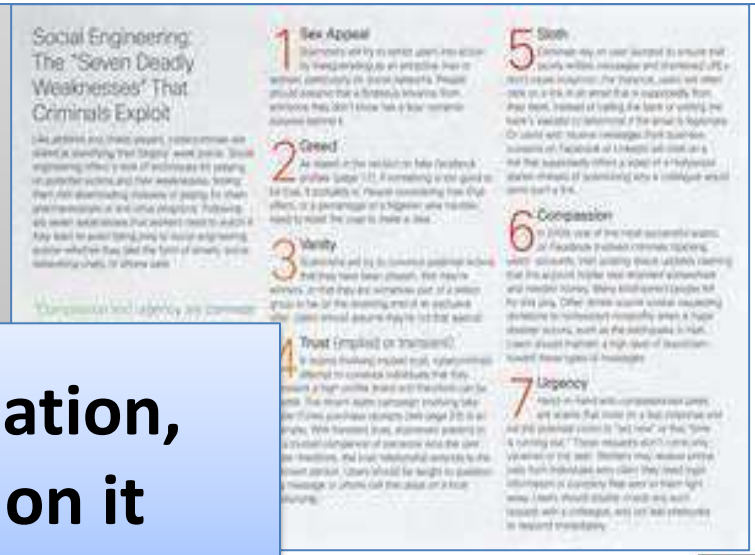
Use visuals as well as words to explain why your idea, design, or plan will work and why it should be implemented

Persuasion = Map Information for Readers

Use clear SIGNALS to help map the logic of your message:

- Include descriptive **headings**
- Supply **transitional** words
- Present clearly signalled **sections**
- Create an attractive, easy-to-follow **page design** and **layout**





Help your reader follow the information, so they can understand it—and act on it

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Persuasion = Use a Clear, Audience-Centered Style

Revise for a Clear, Concise, Courteous Style

- Use **Plain Language** = reader-centered prose
- Focus on **audience needs**

Always write from the audience's point of view

In a global workplace, this means remaining attentive to different cultural norms around communication

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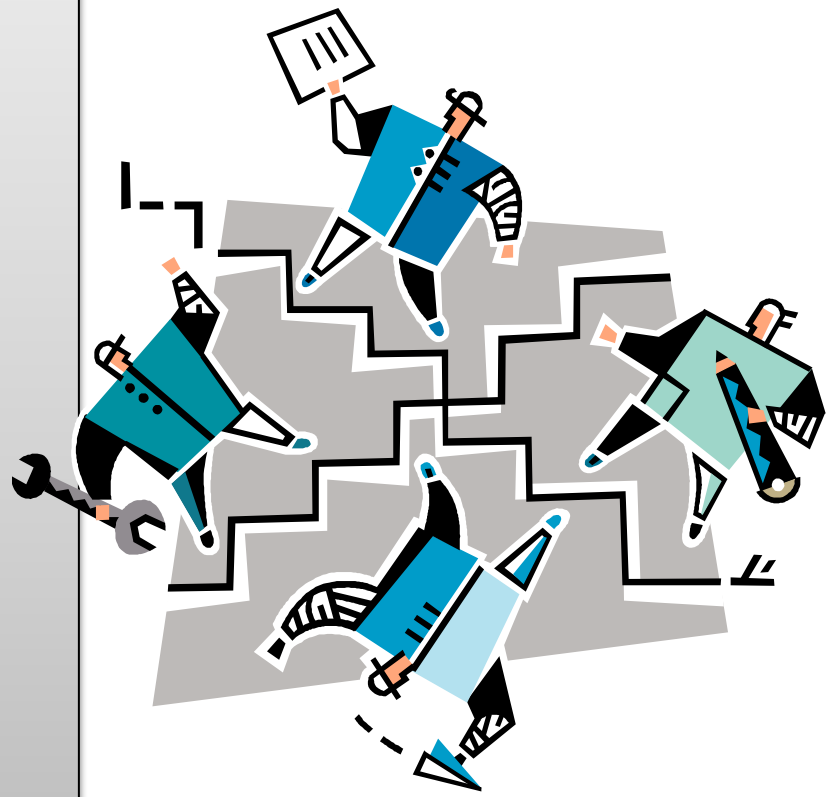
Team work = Shared Learning Community

- **Networking**
- **Exchange**
- **Co-operation**



Technical Communication = Cultivating Workplace Success

- **Learn to Write Like a Professional**
- **Develop Public Speaking Skills**
- **Practice Teamwork**

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Thanks for Going through these Slides!

Image Source: https://www.thesaurus.com/e/ways-to-say/how-to-say-thank-you-around-the-world/

Please bring any questions and/ or comments to class

This will add interesting discussion to your classes!

Image Source: https://www.facebook.com/photo/?fbid=304138887665073&set=a.131428611602769

Image Source: https://takelessons.com/blog/how-to-say-thank-you-in-sign-language-and-other-signs-of-gratitude

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