

# Communication Skills:

Oral presentation skills & technical writing



## Why are technical communication skills important for engineers?

- Engineers must document and communicate ideas, results, and designs in both written and oral forms
- In the "real world", most engineers spend a considerable fraction of their time engaging in technical communication
  - Studies show that a "typical" engineer spends approximately 25% of her/his time writing
- Good communication skills are VERY important to employers



## Simple Fact:

You cannot be a good engineer (or be successful in college) without developing good technical communication skills



## Examples of Technical Writing Tasks:

- Project Proposals
- Project Reports
  - Progress reviews
  - Design specifications
  - Final project documentation
- Memos-both written and e-mail



## What is different about Technical Writing as compared to "ordinary" writing?

- Specific, rather than general, targeted audience
- Intent is to convey factual information, not to entertain
- Need to be precise (unambiguous) and complete
- Objective rather than subjective

### Poem: Suicide

#### ABSTRACT:-

This poem is about a boy who commits a suicide because of his failure in the engineering exams. He finds it easy to commit a suicide rather than to work hard against the failure. His act of committing a suicide is a substantial disaster because it not only represents his situation but it also depicts the problems of depressed students.

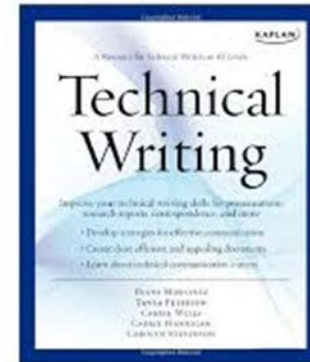


# The Key to Effective Technical Writing

- Organization

## Three More Keys to Effective Technical Writing

- Clarity
- Precision
- Completeness
  - But not lots of extra meaningless detail
  - The trick is to convey the right amount of information, without burying the reader with unnecessary trivia



## Generic Report Format

- Title page
- Abstract
- Table of contents
- Introduction
- Body
- Recommendations
- Summary
- References
- Appendices

## However

- Format be tailored for various types of reports
- Typical Project Report Format
  - Title page
  - Abstract (Executive Summary):  
Understandable by a non expert
  - Introduction
  - Background and Methodology
  - Results and Discussion
  - Conclusions & Recommendations
  - Summary
  - Appendices

## Example: Clarity, Precision, Completeness

- Consider the following fragment from a technical report:

The objective of the project is to design and construct a device to handle rock specimens within a magnetically clean environment. To accomplish this task, the device must take a rock sample from a staging area, insert it into the chuck of the transport arm, remove the sample once testing is complete, and then sit it back down

- What is clear about this project?
- What is unclear?





## Example-A Better Attempt

The purpose of the project is to design and construct a device to handle rock specimens within a magnetically clean environment. To accomplish this task, the device must take a rock sample from a staging area, insert it into the chuck of the transport arm, remove the sample once testing is complete, and then sit it back down. The chuck is located on the end of the transport arm and holds the rock specimens. The transport arm moves the sample into and out of the magnetometer, a scientific instrument that measures the magnetic fields of the rock sample. The basic magnetometer system is shown in Figure 1.

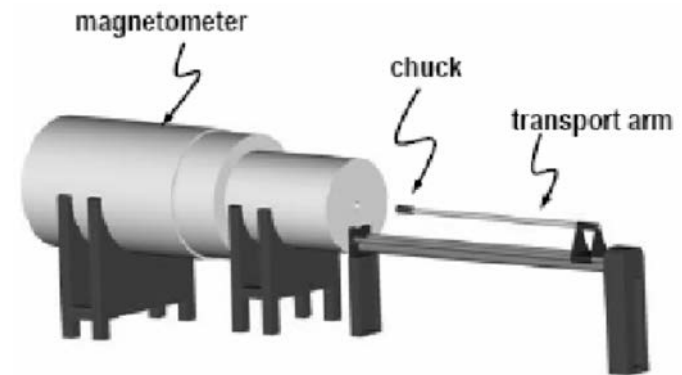


Figure 1 -- Magnetometer System

## Another Example:

In this project, a spreadsheet is used to analyze solar oven designs and determine which design has the maximum performance index. Based on the results, the team decided to use four reflectors with an M/L ratio of three and two layers of glazing.

Audience: Students in another class who are unfamiliar with the technical issues & terms.



## Another Attempt:

The objective of this project is to design a solar oven that will reach a high temperature at a low cost. The ratio of temperature/cost is the performance index used to evaluate the solar oven.

The basic design selected consists of a cardboard box with a window to an interior chamber. Reflectors wrapped with aluminum foil are used to reflect sunlight into the window, which allows light into the cooking chamber as shown in Fig. 1.

A spreadsheet is used to analyze the temperature generated by different solar oven designs. Among the factors to select are the number of reflectors, the height of the reflectors relative to the window width (called M/L ratio), and the number of layers of glazing used to form the window.

Based on the spreadsheet, the final solar oven uses four reflectors with an M/L ratio of three and two layers of window glazing. The analysis spreadsheet indicates that this design will maximize the temperature in the oven at a low cost. Results from the analysis are shown in Figure 2. This design gives rise the maximum performance index.

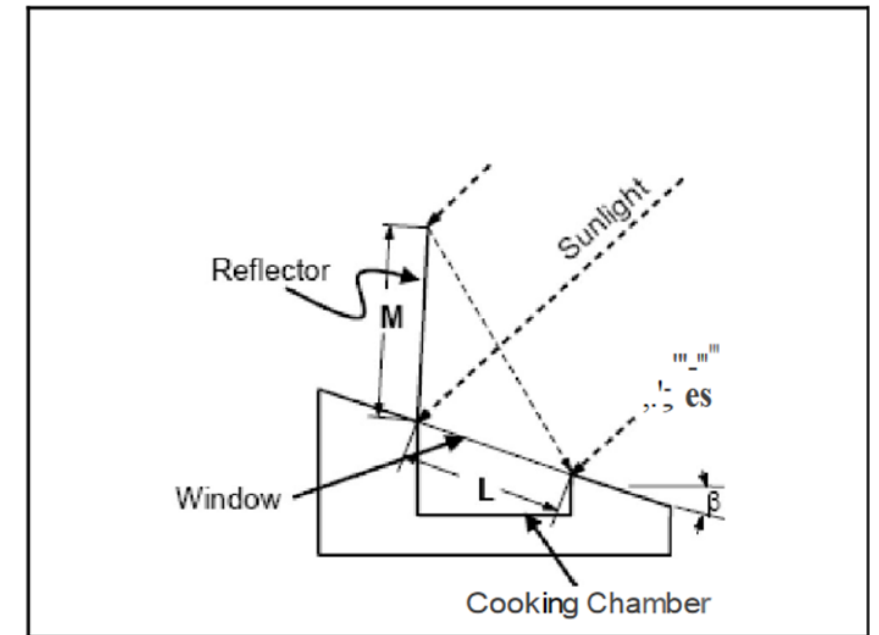


Figure 1

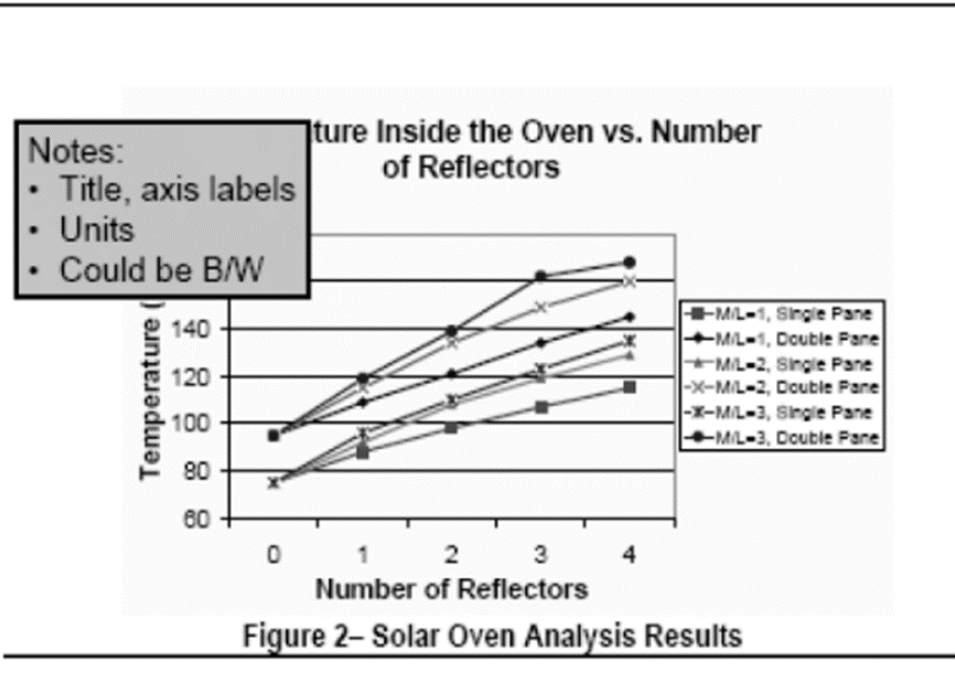


Figure 2- Solar Oven Analysis Results

## Why oral presentations are important?

- Engineers must make many oral presentations
- Must be able to communicate information accurately and effectively
- Must be able to sell your ideas
- Others will view your oral presentations as a reflection of your competence



## A more pragmatic reason to focus on oral presentation skills

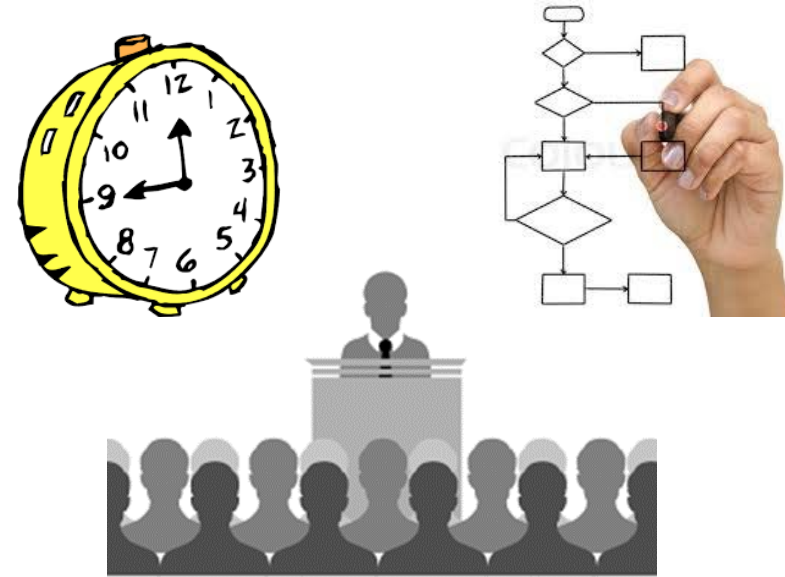
- In this class, each team will do 2 oral presentations
- These will be graded and will count toward your overall course grade
- The entire team will receive the “same” grade for the presentation



## Preparing an Oral Presentation

Points to consider:

- Audience
  - Interaction
  
- Time and focus
  
- Organization
  
- Practice



A. Oral Communication

## Points to Consider: Audience

- Who is your target audience?
  - What do they know?
  - What is their level of expertise/sophistication?
  - What will interest them?
- Connecting with the audience:
  - Present your topic as an interesting problem or question
  - Provide some context: Why is this presentation worth listening to?
  - Try to engage the audience - e.g. ask them a question



## Points to Consider: Time and Focus

- How much time do you have?
- What is the essential information that must be conveyed
  - Central point
  - How much detail is necessary/appropriate
- Biggest problem is trying to cram too much information into a presentation





## Points to Consider: Organization

- Introduction
- Body
- Conclusion

## ORGANIZATION STRUCTURE



## Chapter 13

# What you're going to tell them

## Introduction

- Clear & prompt interest
- Provide an overview of the talk
- Clearly express the purpose of the talk (and the project)

## Body of the talk:

- Follow the order established in the introduction
- Provide clear "road signs"
- Stay focused and on-message

## Conclusion

- Briefly summarize important points/results
- Provide a concise "take-away" message



## Practice:

- Rehearse the presentation thoroughly
  - Get feedback from teammates
  - Consider using the Hanson CTC as a resource
- Don't read from a script or simply recite the content off of your slides
- Pay special attention to time
  - Revise the talk as necessary to stay comfortably within the time limit
  - A good rule of thumb is one to two minutes per slide

## Delivery:

- Space-know the room and facilities
  - Physical presence-engage the audience
  - Vocal Presence
- Speak slowly and clearly
- Avoid monotone
- Avoid words such as: "um", "uh", "ah", "like"
- Don't use slang or overly informal style



## Making Effective Visuals

- Clear Concise Message
- Simple content and format
- Good contrast
  - Avoid dark or busy backgrounds
  - Don't use more than three colors
- Avoid font sizes smaller than 20 pt
- Avoid pictures, diagrams, or text that are not readable by the audience



## In Summary-Keys to an Effective Presentation:

- ❑ Preparation
  - Consider the audience
  - Know the time limit and intended focus of the talk
  - Organize the talk clearly: introduction, Body, Conclusion
  
- ❑ Presentation
  - Familiarize yourself with the room and facilities
  - Have a confident physical presence
  - Maintain a clear and professional vocal presence
  - Use effective visual aids

