# Technical Writing

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Materials based on lecture given by Jeff Morris, Ph.D., CORE Engineering

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## IED Grading

<table>
<thead>
<tr>
<th>Major Element</th>
<th>Rubric</th>
<th>% Rubric Element</th>
<th>% Final Grade</th>
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</thead>
<tbody>
<tr>
<td>Mini Project 25% of final grade</td>
<td>Competition</td>
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<tr>
<td></td>
<td>Presentation</td>
<td>30%</td>
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<td></td>
<td>Memo</td>
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<td>Team Project 50% of final grade * ICF</td>
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<td>System Concept Memo</td>
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<td>Attendance 10% of final grade</td>
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<td>Quizzes 15% of final grade</td>
<td>On-line (LMS)</td>
<td>15.0%</td>
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*36%*
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I would rate my writing skills against my peers:

A. Elite (Top 1%)
B. Better Than Average (Top 30%)
C. Average (Middle 30%)
D. Lower 30%
E. If it’s over 160 characters, don’t ask me to write

Outline

1. Purpose of Technical Writing
2. Effective Technical Writing
   A. Context
   B. Organization
   C. Content
   D. Editing
General Purposes

1. To provide the reader with **factual information**
   - Technical Reports, System Descriptions, Service Instructions
   - Remain as **concise** as possible, but explain ideas in **enough detail** to make it understandable to your reader.
   - For each new piece of information, tie it in to knowledge the reader already has.

2. To convince the reader to **draw the desired conclusions** from the provided information
   - Proposals, Recommendations
   - Remain **objective, logical** and provide **rational evidence** to back up assertions.
   - Answer the question **“Why?” “Why is this important?” “Why is this beneficial?” “Why is this a problem?”**

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In a technical report, it is okay to write the information so that the reader can interpret it based on their own perspective.

A. True
B. False
**Context**

*Your goal*: ensure that the ideas you have when writing are the same ideas that your reader has when reading.

Who will read your writing?
What do they *already know* about your subject?
What do they *need to know* about your subject?
What relationship exists between you and the reader?

*Leave nothing open to interpretation!*
This is not poetry.

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**Vagueness**

- **Need specifics**: e.g., *"support load"* - what type of loading (point/distributed), how much force?

- How will you know what is too much or too little?
  - Is *"until it breaks or cracks"* acceptable?
  - *"very fast"* – 5 m/s or 100 mph?

- Which is it?
  - fast-sailing ship OR fast sailing ship
    - (any ship) (particular)
Organization

• One of the surest ways to confuse a reader is to have a poor organizational scheme

• Choose the organizational method based on the document being written and the information going into it

Chronological

• Usually used in describing processes or giving instructions.

© Summit Entertainment 2000
Inductive
• Starts with the smaller ideas and build the larger ideas out of these smaller ones.

Deductive
• Starts with the larger ideas and break them down into smaller parts [4].
Organization

• Pattern 1
  o Motor A
    • Price
    • Performance
    • Lead-Time
  o Motor B
    • Price
    • Performance
    • Lead-Time
  o Motor C
    • Price
    • Performance
    • Lead-Time

• Pattern 2
  o Price
    • Motor A
    • Motor B
    • Motor C
  o Performance
    • Motor A
    • Motor B
    • Motor C
  o Lead-Time
    • Motor A
    • Motor B
    • Motor C

No Blogging/Diary

“The wheels were glued on to the PVC followed by a cut across the threaded rod, and then we searched for a drill…”

“The team stayed up all night and worked real hard…”
Give an “Introduction”

• Do not start describing the design

• Purpose
  o Why are you writing? Be concise. Be powerful.

• Background/Problem
  o Enough detail
  o Identify the Problem, Potential Solutions, and Expected Benefits from your Proposed Approach

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Which of these methods is preferred in IED?

A. Deductive
B. Inductive
C. Chronological
Content

• Back up assertions with facts & evidence, and use logical reasoning

“The types of blade designs considered for the wind turbine system were the PVC pipe and the airfoil design. The PVC pipe would cost less and be easier to construct, however this material is heavy.”

• Check your facts & evidence first!
• Use graphics, figures, and tables

Signposts: Headings & Labels

• Use Headings/Sections to break up paper. You do not write novels, and you’re not Stephen King (see Fig. 1).

• Labels & Caption
  o Tables
  o Diagrams
  o Figures
  o Cite them in the body of text.
Two aluminum cylinders (0.8 inch diameter, 0.76 inch tall) are fastened at one end of the base as shown in Fig. 2. Four holes were drilled in the base to accommodate the flange bearing and cylinders. The cylinders account for the height of the compression system and the flange bearing so the two gears are on the same horizontal plane.

Fig. 2: Design of the base to accommodate the flange bearing and cylinders.

- Without referring to a diagram with labels, this description is useless to the reader!
Be Clear & Concise

How many words can you trim from the following sentence?

The following report outlines the different aspects relating to the current feasibility of constructing rotationally stressed reinforcement bar in Northern Maine. (21 words)

This report outlines the different aspects relating to the current feasibility of constructing rotationally stressed reinforcement bar in Northern Maine. (14)

Editing

“An important conclusion extracted from the result is that there is a correlation between shaft length and mass.” (18 words)

“The result is a correlation between shaft length and mass.” (10 words)

• Typos, poor grammar & wordiness are distractions from otherwise good content that may be well organized and in context.

• The Editor should NOT be the Writer!
### Grammar & Style

- Double space – Instructor Preference
- Comma usage
- Keep margins approximately 1” – 1.5”

- **AVOID** First Person “**We**” or “**I**”
- **AVOID** Contractions, e.g., “**doesn't**” or “**isn’t**”
- **AVOID** Starting a sentence with “**So**” or “**But**”

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#### iClicker Matching

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<td>2</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
Voicing

**Third Person**, Active Voice:

- Four repetitions of the test revealed structural failure occurring at or above 160°.

**Third Person**, Passive Voice:

- Structural failures occurring at or above 160° were revealed in each of four repetitions of the test.

Structural failure occurs at or above 160° as revealed in each of four repetitions of the test.

Vernacular, Idioms, & Colloquialisms

- My idea “came into light”
- This product will “tackle the problem”
- That idea was “thrown out”
- “taken out of the picture”
- This idea “leaves many doors open”
- to “be able to”
- “somewhere around” 5 pounds – use “approximately”
- “essentially”, “basically”, “actually”, “in essence”
Appendix: Data/Code

• Raw Data, e.g.,
  spreadsheet, charts, scaled drawing with dimensions, pictures, screenshots
• Construction/Assembly Process
• Analysis, e.g.,
  o Test Descriptions/Surveys
  o Projectile Motion Diagrams
  o Spring Force Calculations

References

• MS Word Reference Tool
• **Consistency** with YOUR Formatting Style
• **Use IEEE Style [1] (or APA Style [2]):**
  o Full list of author names, “Title of the article”, *Title of Journal using italic font*, vol. xx, pp. page number-page number, Abbrev. Month, year.
  o For example [3]
• More Information on reference styles:
  o [http://www.bibme.org/citation-guide](http://www.bibme.org/citation-guide)


[2] *APA Citation Style*. Retrieved on August 31, 2015, from [https://www.library.cornell.edu/research/citation/apa](https://www.library.cornell.edu/research/citation/apa)

References: Wrong


If a URL has to be cited, use the following formats:

Author(s), (Month Year). Title of document. Retrieved on Month day, year, from URL
OR
Title of document, Month Year. (Date Last Accessed, Month day, year). URL

E.g.,

Use Our Templates

- LMS > Technical Writing Resources
  - IED-PD1 Mini-Project Final Technical Memo Template
  - IED-PD1 Concept Memo Template (Milestone I)
  - IED-PD1 Final Report Template (Milestone III)
• **Write to EXPRESS, not IMPRESS.**

• **Write to COMMUNICATE, not CONFUSE.**

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**Checklist for Effective Technical Writing**

**A. Context**
1. Understand the goals of your readers
2. Use knowledge of readers’ goals to choose appropriate media, language, and content

**B. Organization**
3. Provide a clear organizational structure
4. Identify the main point and put work in context (i.e., provide a beginning and an end)

**C. Content**
5. Display a clear ethical sensibility
6. Use evidence and logical reasoning to back up assertions and claims
7. Address expected reader’s questions and/or topics
8. Apply effective principles of visual communication

**D. Editing:** Observe the conventions of
9. Standard English
10. a particular discipline or workplace

**E. Proof Reading** for style, consistency, logic/accuracy, professional and format
Citations


Thank You!

Questions?