



# Written Communication in Technical Fields

*A brief overview*

*Learning to writing in the engineering environment*



# Technical Writing: What is it?

**There are six major components to technical writing...**

## Basic Literacy

Grammar, spelling, organization  
Does your writing make sense?

## Rhetorical Literacy

Are you addressing your audience(s)?  
Do you understand your viewpoint  
relative to the audience?

## Technological Literacy

Are you using the correct formatting?  
Are you using figures and tables  
effectively?

## Ethical Literacy

Can you explain your choices for this  
term paper topic/thesis?  
Have you considered all who are  
invested in the term paper?

## Critical Literacy

Do you understand the power structures  
involved in your application and have an  
idea how to help those in need within the  
constraints of these structures?

## Social Literacy

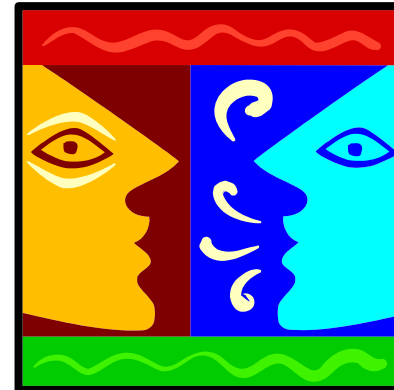
Direct (coauthoring) -- the executive  
summary  
Indirect -- brainstorming, discussion, etc

# How do I make technical writing easier?

## Start with the Five-Minute Miracle Conversation ...

*It is a conversation in your mind between you and your reader*

What are you trying to tell  
your reader?



*If you have to struggle to find the significance of your information for that reader, you are probably choosing the wrong main message.*

You could  
**UNDERWHELM** or **OVERWHELM**  
your reader



# Now, let the “reader” ask you two critical questions



**Think:** What are the questions?

Example questions...

- Why did you do this?
- What is the significance of the results?

**Pair:** How are you going to answer the questions in your paper?

- Formulate rationale
- Identify key figures & tables
- Highlight significance

**Evaluation of Thermal Resistance Matrix Method for an Embedded Power Electronics Module**

**Abstract:** Thermal characteristics provide data on the performance of electronic components under various operating conditions. The thermal resistance matrix method is a powerful tool for analyzing the thermal behavior of complex systems. This paper presents a method for evaluating the thermal resistance matrix of an embedded power electronics module. The method involves the use of a finite element analysis (FEA) to model the thermal behavior of the module. The results of the FEA are used to calculate the thermal resistance matrix, which is then used to predict the temperature distribution of the module under various operating conditions. The results show that the thermal resistance matrix method is a powerful tool for analyzing the thermal behavior of complex systems.

**Introduction:** The thermal characteristics of electronic components are critical to their performance and reliability. The thermal resistance matrix method is a powerful tool for analyzing the thermal behavior of complex systems. This paper presents a method for evaluating the thermal resistance matrix of an embedded power electronics module. The method involves the use of a finite element analysis (FEA) to model the thermal behavior of the module. The results of the FEA are used to calculate the thermal resistance matrix, which is then used to predict the temperature distribution of the module under various operating conditions. The results show that the thermal resistance matrix method is a powerful tool for analyzing the thermal behavior of complex systems.

| Case | R <sub>th11</sub> [K/W] | R <sub>th12</sub> [K/W] | R <sub>th21</sub> [K/W] | R <sub>th22</sub> [K/W] | R <sub>th13</sub> [K/W] | R <sub>th14</sub> [K/W] | R <sub>th15</sub> [K/W] |
|------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 1    | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  |
| 2    | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  |
| 3    | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  |
| 4    | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  |
| 5    | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  |
| 6    | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  | 11.111                  |

**Equations:**

$$T_{node} = T_{amb} + R_{th} \cdot P_{node}$$

$$T_{node} = T_{amb} + R_{th} \cdot P_{node} + R_{th} \cdot P_{node}$$

$$T_{node} = T_{amb} + R_{th} \cdot P_{node} + R_{th} \cdot P_{node}$$

**Figure:** A graph showing the relationship between temperature and power for different cases. The x-axis represents power (W) and the y-axis represents temperature (K). The data points show a linear increase in temperature with increasing power, with a slope that varies depending on the case.

**Share:** Ask colleagues to review – did you answer the questions?

# So, you are still having problems getting started – some helpful hints...

You started writing and have no direction

- ALWAYS START WITH AN OUTLINE!
- Write down primary ideas and sub-ideas for each primary idea
- Convert this informal list to an outline

You are bored with your topic

- CHANGE IT!
- Talk to someone about how to make your topic more interesting

You don't want to write

- GET OVER IT! (Fix your motivation)
- Use some anxiety reduction strategies

# So, you are still having problems getting started – some helpful hints...

You are  
anxious

- Use known strategies to reduce your anxiety (music, breathing exercises, etc.)
- Consciously stop non-productive comments in your head
- Focus your energy on rehearsing what the writing will feel/look like in your head once you get started
- Reward yourself for small steps

You are so  
stressed  
out, you  
can't  
generate a  
single word

- Stretch, exercise, do something different (for a little while)
- Breathe deeply, focus on relaxing
- Use calming images, any known technique for relaxing yourself
- Reduce distractions