

# SCIENTIFIC AND TECHNICAL WRITING WORKSHOP

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## Course Overview

The course will focus on the analysis of a document's intended audience in order to translate technical concepts, regulations and standards into concise, non-ambiguous and persuasive letters, narratives and responses to formal requests. Topics include: appropriate tone to project professionalism and credibility, integration of highly technical information, development of concise and descriptive responses that withstand time and legal challenges, use of persuasion to convince readers, and basic grammar review.

## Course Objectives

- To apply the six Cs of good technical communication to written media for non-specialist audiences.
- To understand and manipulate the structure of selected technical documents.
- To recognize and use the rhetorical and stylistic elements necessary for good technical writing;
- To understand the role of graphics in technical communication to support or to augment written technical materials.

## Course Outline

Time	Module
8:45 – 9:00	Introduction to the course and review of course objectives
9:00 – 10:30	Introduction to the six Cs of technical communication
10:30 – 10:45	Break
10:45 – 12:00	Applying rhetorical and stylistic strategies to technical writing
12:00 – 1:00	Lunch
1:00 – 2:30	Rethinking the technical document: Writing with the audience in mind
2:30 – 2:45	Break
2:45 – 4:00	Designing and editing graphics to augment written materials

# Module One – Six Cs of Good Technical Communication

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**Objective:** To identify and apply the six Cs of good technical communication to written media for non-specialist audiences.

- **The 6s of Technical Communication**
- Clear: Be distinct so that understanding is made easy
- Concise: Be brief or to the point, without losing the intent of your message
- Concrete: Be definite, not abstract
- Coherent: Be easily understood through consistency
- Complete: Represent all relevant information
- Correct: Be appropriate to your audience, be error free

## a. Clarity

**Structural clarity** can be achieved at the document level through:

- Abstracts
- Introductions (Scope and Objectives)
- Table of contents
- Appropriate graphics
- Descriptive titles
- Subject headings

**Stylistic clarity** can be achieved by:

- Using simple, direct language
- Not overloading sentences
- Using precise, specific word choices

**Grammatical clarity** can be achieved by:

- Considering syntax
- Being aware of punctuation
- Making appropriate choices between passive/active voice

**Contextual clarity** can be achieved by:

- Using reporter questions: who, what, why, where, how, when, which
- Considering your audience/environment
- Spelling out abbreviations and acronyms
- Avoiding jargon

## **b. Conciseness**

**Document-level conciseness** can be achieved by:

- Narrowing your focus/scope – clear introduction, and develop a detailed outline
- Using graphics – tables, graphs, photographs, diagrams, flowcharts etc.
- Revising your writing

**Paragraph/sentence-level conciseness** can be achieved by:

- Avoiding wordy expressions
- Avoiding camouflaged words
- Avoiding repetition

## **c. Concreteness**

**Concreteness** can be achieved by:

- Ensuring content is technically accurate
- Ensuring that word choices are technically accurate
- Being precise

## **d. Coherence**

**Document-level coherence** can be achieved by:

- Providing a road map that links your ideas – abstract, introduction, problem statements etc.

**Paragraph-level coherence** can be achieved by:

- Using a topic sentence and supporting sentences
- Repeating terms that link ideas logically
- Using transitional words to establish links between ideas
- Using logical paragraph development patterns or informational structures:
  - Definitions
  - Analysis
  - Exemplification
  - Comparison and contrast
  - Description
  - Process discussion
  - Causal discussion
  - Classification

#### **e. Completeness**

**Document-level completeness** can be achieved by:

- Ensuring all parts of the document are included: abstract, TOC etc.

**Paragraph-level completeness** can be achieved by:

- Ensuring all relevant information required for the audience is included: contact names, dates, locations, and so on.
- Ensuring that your audience is clear on what you want them to do by providing a call to action.

#### **f. Correctness**

**Paragraph-level correctness** can be achieved by:

- Ensuring that the technical terms used, fit the audience's level of education or knowledge
- Checking the writing for grammatical errors
- Ensuring that all names, places and titles are spelled correctly



## Exercises in Clarity and Conciseness

Re-write the following sentences to improve issues of clarity and conciseness. Look for these common pitfalls:

- Unneeded prepositional phrases
  - Filler words
  - Repetitious wordings
  - Overly precise wording
1. In your letter, you also requested a signed copy of the final version of the revised SWCO, including all amendments and modifications, as well as a status report on the District's review of its MJS, which was also a requirement of the Audit. For your records, a copy of the final version of the revised SWCO is enclosed. Please be advised that the final version will soon be made available on the District's website at xxx.xxx
  
  2. The Monitoring and Research Department (MSLR) has reviewed your memorandum dated February 13, 2013, and attachments thereto, regarding a request by XXXXX (US.) Inc. xxx) for permission to enter District property adjacent to the xxx Reservoir (PIN 00-00-000-000-0000) for the purpose of conducting civil engineering and. environmental surveys to determine the location of subsurface structures, utilities and property boundaries.

3. Accordingly, it is respectfully submitted that the Acting Executive Director request the Board to determine if it will entertain the instant request for appeal by [insert company name here] and if it elects to do so, then with respect to the hearing therefore...

# Module Two: Rhetorical and Stylistic Elements

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**Objective:** To recognize and use the rhetorical and stylistic elements necessary for good technical writing.

**Style and Tone: Here are some things to consider:**

- a. Consider using lists to enumerate points and establish relationships:
  - i. First level heading
  - ii. First level heading
    1. second level heading
    2. second level headings
  - iii. first level heading
- b. Always present information using parallel structures. This means that elements in the same series have the same grammatical forms (same parts of speech, same suffix etc.)
- c. Choose carefully between active and passive forms and be consistent in its use.

<b>Voice</b>	<b>Example</b>	<b>When to use</b>
<b>Active</b>	I made an error	When conciseness is needed; When you wish to focus on the agent or actor
<b>Passive</b>	Errors were made	When you want to de-emphasize the actor; When you wish to describe generalizable actions or results.



- d. Revise for appropriate word choice. Look out for:
  - a. Connotations
  - b. Jargon
  - c. Slang and idiomatic expressions
  - d. Confusing word pairs
  
- e. Revise to appropriate tone:
  - a. When possible, use plain language
  - b. Make the reader the subject of positive messages
  - c. Avoid making the reader the subject of negative messages
  - d. Make the reader the subject, if action is required by the reader
  - e. Always address the reader's needs, concerns or interests
  - f. Explain negative messages
  - g. Assess the appropriate level of directness<sup>1</sup> and use an appropriate strategy:

<b>Strategy</b>	<b>Example</b>
<b>Use a deference marker</b>	Please submit your report by Friday
<b>Phrase your request as a question</b>	Could you submit your report by Friday?
<b>Add an uncertainty marker</b>	If possible, I need your report by Friday
<b>Generalize your request</b>	All reports are due by Friday
<b>Nominalize your request</b>	The deadline for report submission is Friday
<b>Incur a debt</b>	I would appreciate having your report by Friday
<b>Apologize for the request</b>	Sorry for the short notice, but I need your report by Friday

<sup>1</sup> Table reproduced from *Revising Professional Writing in Science and Technology, Business and the Social Sciences*, by Riley, Campbell, Manning and Parker. 2<sup>nd</sup> Edition. Parlay Press © 2007 pg. 103.



**Exercise for rhetorical and stylistic review of technical documents**

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# Module Three: Rethinking the technical document: Keeping the audience in mind

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**Objective:** To understand and manipulate the structure of selected technical documents.

**Organization: Here are some things to consider:**

- a. Every paragraph should have a central controlling idea with sufficient support for the idea. Too much information makes the paragraph unmanageable for the reader; too little information may be unconvincing. When there's just enough information, we can say that the paragraph is unified.
- b. Group details into manageable units: look to see if there are details in a paragraph that support more than one idea. They are usually relatively long paragraphs.
- c. Consider the placement of "the bottom line". The bottom line refers to that central theme or thesis. You can use either deductive or inductive organization for the placement of the bottom line.

<b>Method</b>	<b>Definition</b>	<b>When to use</b>
<b>Deductive</b>	The writer moves from the statement of the bottom line to the details supporting it.	When the reader is not likely to be sensitive to the main point.
<b>Inductive</b>	The writer moves from supporting ideas and then states the bottom line	When the reader is likely to be sensitive to the main point.

d. Carefully consider the relationships that transitions can demonstrate<sup>2</sup>:

	Use to coordinate equal ideas		Used to subordinate one idea to another
	Coordinating conjunction	Conjunctive adverbs	Subordinating conjunction
<b>Adding</b>	and	also, furthermore, in addition, moreover	
<b>Cause –Effect</b>	for, so	as a result, because of this, consequently, therefore, thus	because, if, since
<b>Chronological</b>	and, then	first, second, third..., in closing, in conclusion, in short, in summary, next	after, as long as, as soon as, before, once, until, when
<b>Illustrating</b>		as an example, for example, for instance, in other words, in particular, specifically	
<b>Comparing</b>	and	along the same lines, in the same way, likewise, similarly	as, just as
<b>Contrasting</b>	but, or, yet	however, instead, nevertheless, on the one hand, on the other hand, rather, unfortunately	although, despite the fact that, even though, in spite of the fact that, thought

<sup>2</sup> Table reproduced from *Revising Professional Writing in Science and Technology, Business and the Social Sciences*, by Riley, Campbell, Manning and Parker. 2<sup>nd</sup> Edition. Parlay Press © 2007 pg. 56.



## **Exercise for structuring technical documents**

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# Module Four – Designing and Editing Graphics

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**Objective:** To understand the role of graphics in technical communication to support or to augment written technical materials.

## What are Graphics?

Graphics are numerical or pictorial representations which are set apart from your text.

## When should you a graphic?

1. If the reader has to process complex data or large amounts of data.
2. If you require the reader to visualize the shape of the data
3. If they reader will be bored or intimidated by large amounts of data
4. If the reader will be trying to learn from or use your text, while reading it.

## What is the best graphic<sup>3</sup> to use?

Reader's need	Graphic
To see the surface detail or texture of an object	Photograph
To see the outline and essential parts of an object	Line drawing
To see percentages	Pie chart
To see lines of authority and responsibility	Organizational chart
To see steps in a process	Flow chart
To see values at discrete points in time	Bar graph
To see a continuous trend over time or some other independent variable	Line graph
To see the internal structure of something	Cross-section
To see how the parts of an object fit together	Exploded diagram
To locate precise values	Table

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<sup>3</sup> Table reproduced from *Revising Professional Writing in Science and Technology, Business and the Social Sciences*, by Riley, Campbell, Manning and Parker. 2<sup>nd</sup> Edition. Parlay Press © 2007 pg. 25.







**Exercises for developing graphics**

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