FORM & STYLE

The Guide
to Writing a Technical Report
for All Students in the Faculty of Engineering and
Computer Science

1. INTRODUCTION

Proposals are specialized, technical documents that offer persuasive solutions to problems. Proposals are among the most important documents one can write. Persons and organizations that write effective proposals win grants, contracts, and jobs. Proposals are important because they, directly or indirectly, provide the income that keeps us warm, dry, and well fed! [1]

The format of a proposal must follow the convention established by the client, the company, or the organization for which the proposal is written. For any assignment requiring a project proposal in the Faculty of Engineering and Computer Science at Concordia University, the conventions which you must follow are set out in this document.

This report will help you to organize the elements of your proposal, format and lay out the document, and reference your sources. It also includes samples for the title pages, List of Figures, and reference page.

2. ORGANIZATION OF THE PROPOSAL

Front Matter:

       Letter of Transmittal
       Cover Page
       Abstract
       Table of Contents
       Executive Summary
       List of Figures

Main content:

       Body of Proposal
       Schedule of Work
       Budget
       Qualifications
       Press Release

End Matter:

       Appendices

2.1 LETTER OF TRANSMITTAL

November 02, 2014

Ms. Jane Student
1515 St. Catherine West
Montreal, Quebec
H3G 2W1

Dear Ms. Student,

To better prepare you for the project proposal assignment in ENCS 282, Technical Writing and Communication, I am sending you this template for the project proposal.

As you will recognize, I am writing this section of the report as a transmittal letter. I could also have chosen to write it as a memo. Regardless of the form, the purpose of this section is to make direct personal contact with the clients, informing them of the contents of the report. Although you do not say so explicitly, it signals to the clients that this is the final product, not a preliminary draft. The letter or memo informs them of the topic of the report, bearing in mind that this is only an overview, and that you will have the entire report to present the details.

I trust that you will end your letter with a pleasant concluding sentence, expressing hope that the report will meet with the clients' expectations.

Respectfully,

Deborah Dysart-Gale, Ph.D.

Encl.: Revised Form and Style Guide

2.2 COVER PAGE

Report
On
THE EXACT TITLE OF YOUR PROPOSAL

Submitted to
Receiver's name
and title
and address
complete address, of course
Date of completion

By
Your name and title
Institution or origin of report

ABSTRACT:
Here you will write an informative abstract for a technical audience. It will be a single paragraph that summarizes the problem, solution, and any major arguments in favour of your solution. It will be less than 150 words.

2.3 TABLE OF CONTENTS

TABLE OF CONTENTS

2.4 EXECUTIVE SUMMARY

The executive summary begins the report. The purpose of the executive summary is to persuade the readers that your project is interesting and useful. It condenses the full report, including all the technical, financial and other pertinent questions the reader may have. In keeping with its persuasive purpose, however, it highlights the recommendations and suggestions contained in the report. Readers frequently decide whether to read a proposal based on a reading of the executive summary.

Riodan suggests that the executive summary be written last [2]. It should, like the rest of the paper from here on, be written double-spaced.

2.5 LIST OF FIGURES

List of Figures

2.6 BODY OF PROPOSAL

1. INTRODUCTION

The introduction is the first main section of the report. It typically begins with some background information that will put your project into proper context. Tell the reader why you have written this document. The reader may not know or fully understand the purpose. So be specific. This will make it easier for your audience to appreciate the reasons for your solutions and recommendations.

Lannon and Klepp state that the main function of the introduction is to identify the report's purpose and "preview how that purpose will be achieved" [3]. This reflects the form of a thesis statement found in the first paragraph of a standard essay. The first paragraph of the introduction will typically outline the purpose and problem, while second paragraph focuses more upon the solution. This function can take as many paragraphs as necessary, breaking down each step of the problem and solution.

2. STATEMENT OF THE PROBLEM

The Statement of the Problem section defines more fully the problem and your solution. Be sure to explain the problem in terms of the needs of your audience. At the end of this section, your audience should understand why the problem needs to be fixed.

2.1 Second Level Headings

Typically, each new section will begin on a new page, and will be followed by the corresponding subsections. As you see above, the first level heading is written in capital letters. If there are no subheadings, the material that follows the heading will describe the entire section. If there are subheadings, then this material gives a general overview or serves some other purpose. As you note, the second level heading, "Second Level Headings", is centered and written with only the first letters capitalized. (See Section 3 of this guide for more detailed explanation on headings)

3. SOLUTION CRITERIA

The Solution Criteria section explains why your solution is the right solution for this particular problem, at this particular time, for this particular audience. Some criteria may include cost, time, availability of materials, seasonal changes, environmental or social impact.

4. PLAN OF ACTION

      The Plan of Action describes how you will implement your solution to the problem. If you have data that supports your solution, you show how/from where you got this data, and how you analysed it to make it support your proposal. This section must mention where you got your information (research in a lab? In a library? Field work? Interviews?) Give an overview of your problem solving method. Also, in this section, outline other proposed solutions to this problem and show why your proposal is better than the others.

5. SCHEDULE

The Schedule should be as realistic as possible. Assume you have two months to complete your investigation, analyze your data, evaluate possible solutions, and write your proposal. Be precise: nobody needs a sloppy engineer or computer scientist.

6. BUDGET

   For the Budget section, count on $100/hour for your time (consulting, researching, investigating, testing, etc.). Also include any other costs you think might arise in the course of completing the project. (Do you need to rent equipment? Will you need technicians on-site?). You may use a visual diagram for presenting your budget.

7. QUALIFICATIONS

The Qualifications section outlines the qualifications of the researcher doing the study: you. Think about what work you've done and what courses you've taken might qualify you to work on this project. Remember: You are the expert – tell your audience why they should trust you.

8. CONCLUSION

The conclusion restates your recommendations and your rationale for making them. The conclusion also assembles and reiterates the most significant points and data.

Perhaps this is a good point at which to raise the question of format and presentation. The purpose of this document before you is to act as a model for you to follow in formatting your report. Neat, consistent format is essential.

Do not introduce new material in the concluding section.

APPENDIX A:
INFORMATION SOURCES

[1] Leo Finkelstein, *Pocket Book of Technical Writing*, Toronto: McGraw Hill, 2000, p. 63.

[2] D. G. Riordan, *Technical Report Writing Today*, 9th ed. New York: Houghton Mifflin, 2005.

[3] J.M. Lannon and D. Klepp, *Technical Communication*, 3rd Canadian ed. Toronto: Pearson Longman, 2006, p. 422.

3. LAYOUT

Clear layout and presentation will make your report more accessible to your readers. Some key considerations in layout include headings, illustrations, and other strategies that could be classified, broadly, as the "mechanics" of report writing. These latter are not solely layout concerns, but are included in this portion of *Form & Style* for the sake of convenience.

3.1 Headings

Headings are the writer's direction signals to the reader. They form a major contribution to your report's readability. All headings should be followed by text, before the next subheading.

Headings should not be part of the text; the text should be able to stand alone. As a result, you should never refer back to the heading from the text, but rather write the text so that its meaning does not depend on the heading. Add headings to make the text more accessible. See the examples below:

GOOD: Headings

Headings are the writer's direction signals to the reader.

GOOD: Headings

Readers need headings to follow a text with ease and understanding.

POOR: Headings

They are the writer's direction signals to the reader.

Be sure that your headings reflect accurately the material that appears beneath them. Good headings aid immeasurably in making a document easy to read and understand. *Form & Style* requires the use of a decimal numbering system to number your headings.

First level (chapter):	Arabic numerals	1, 2, 3, etc.
Second level:	decimal subdivision of first level	2.1, 2.2, 2.3, etc.
Third level:	further subdivision	2.1.1, 2.1.2, 2.1.3, etc.
Fourth level:	more subdivision	2.1.1.1, 2.1.1.2, etc.

Headings should be placed on the page in the following manner.

First level

1. CENTERED BOLD CAPITALS

First-level (chapter) headings begin on a new page. Text follows two to four spaces beneath.

Second level

1.1 Centered Bold Initial Capitals

Second-level headings do not require a fresh page. There is a double space before text following a second-level heading.

Third level
1.1.1   Initial Bold Capitals at Margin

Third-level headings are also followed by a double-space before text.

Fourth level
1.1.1.1 Initial Bold Capitals, Indented. Fourth-level headings on the same line as text. They are followed by a period.

Fifth level
The fifth-level heading is rarely used, and is an exception to the rule that headings stand separately from the text. In this case, the fifth-level heading also forms the initial words of the paragraph which it "heads." It should be in bold print.

3.2 Graphics

Graphic elements of the report include all illustrations, graphs, charts and tables. Each graphic must be numbered and titled appropriately.

All *illustrations, drawings, maps, graphs* and *charts* are considered to be *figures*, and should be included in the list of figures. Place the number and caption at the figure's base.

However, for *tables*, the number and heading go above the table.

All tables and figures should be referred to in your text at the relevant point. The textual reference should precede the graphic. If a particular graphic is mentioned more than once, then the graphic should follow the first textual reference.

Figures and tables should be incorporated into the text. The only exceptions would be for material best suited for the appendix (see Section 2.8, Appendices).

Ensure that all images - figures and tables - are clear and legible. Do not include poorly photocopied images or images that have been downloaded from the World Wide Web in a low-resolution format. Finally, ensure that you give each graphic a comfortable amount of space on the page; graphics should not be crammed between text or squeezed into the margin.

All figures and tables should be referenced, unless they are your own original work. See Section 4.1.3, Referencing Graphics.

3.3 Mechanics

The mechanics of document layout include a range of considerations that contribute to the accessibility and readability of your report. These include pagination conventions, text spacing conventions, quotation marks and other punctuation conventions, guidelines for incorporating equations into your text, capitalization conventions, "widow" and "orphan" problems, typeface and style considerations, and finally, binding guidelines. Conventions governing how to write numbers, while also appropriate for this section, are fairly extensive and thus are placed in Appendix D. Conventions for using SI (metric) symbols are given in Appendix E.

3.3.1 Pagination

Pagination of the report can be divided into that for the main body and end matter, and that for the front matter.

3.3.1.1 Main Body Pagination. The pages of the body of the report are numbered 1, 2, 3, etc., starting with the first page of the introduction and including all subsequent pages, through the appendices to the topic approval. The number "1" of the first page of the body is centered at the bottom of the page; however, all subsequent numbers are placed at the upper right corner of the page.

3.3.1.2 Front Matter Pagination. For the front matter, a different numbering is used. The abstract is not included in the pagination at all. The title page counts as the first page of the report's front matter, but is not numbered. The Table of Contents is the second page of the front matter, and it receives a small roman numeral "ii" centered at the bottom of the page. The front-matter pages that follow are all numbered with small roman numerals: iii, iv, v, vi, etc. All front matter pagination is centered at the bottom of the page.

3.3.2 Spacing

The text of the report should be double-spaced, printed on one side of the page only. Entries on the Reference page should be single-spaced, but each entry should have a double-space before the next entry. See the sample Reference page in Appendix C.

In the text itself, you should leave one space after commas and other forms of internal punctuation (e.g., colons, semi-colons); leave two spaces after periods and other forms of end punctuation (e.g., question marks).

3.3.3 Quotation Marks and Other Punctuation

You should use quotation marks whenever you quote directly from a source.
Punctuation should be placed inside quotation marks; reference numbers, however, should be placed outside of quotation marks.

3.3.4 Equations in the Text

If you are including equations in your text, you should treat them as part of the sentence which leads into the equation. That is, you should incorporate equations smoothly into your sentence structure.

3.3.5 Capitalization of Words

As a general rule, you should capitalize only proper names of individuals and organizations. Words such as "kilograms" and "civil engineering" do not require capitals (although "department of Civil Engineering" does, as it refers to a specific organization).

3.3.6 "Widows" and "Orphans"

The terms "widow" and "orphan" refer to typographic l anomalies that can occur when you are preparing a final document for presentation.

An "orphan" is a word or short section of a line isolated at the bottom of a paragraph or a page. Occasionally reports will have orphan headings - that is, headings which are at the bottom of the page, with the text that follows them on the next page.

A "widow" is a word or sentence isolated at the top of a page (especially an otherwise blank page).

You should try to avoid these, as they disrupt your layout, are unattractive, and can be confusing.

4. DOCUMENTATION

Proper documentation involves referencing all of your sources clearly. Different professional organizations and corporations have developed their own formats for referencing sources, although most formats include the same information. As a result, you will see a number of different referencing styles in use professionally. *Form & Style* has adopted the IEEE Reference Style, as it is one of the most commonly used in the fields of engineering and computer science.

4.1 In-text Referencing

When you quote from or paraphrase a source in your text, or reproduce or adapt a graphic from another source, you must provide a reference. The reference should be indicated by a number in square brackets, such as [*n*]. This number is then keyed to an entry on the Reference page.

4.1.1 Referencing Quotations

If you quote from a source word-for-word, you must place the words within quotation marks.

Thus, "the quoted words go here" [the reference number goes here].

Note that the reference number is placed within the end punctuation; that is, the period comes after the reference number.

4.1.2 Referencing Paraphrases of Information

If you take ideas or information from a text and put it in your own words, you have paraphrased information. You should not place paraphrased information in quotation marks, but you must still reference your source.

Thus, if the words in this sentence were paraphrased from another source, you should include the reference number at the end of the sentence [the reference number goes here].

Sometimes people wonder how thorough their references should be. As a general rule, if material or information is considered to be in the public domain, you do not need to reference it. For instance, there is no need to reference a source of information for the assertion that water freezes at 0ºC; however, if you were taking information from a journal article about a particular experiment that discussed the freezing properties of certain liquids in porous materials, you should reference that information. It is not in the public domain, but rather comes from one source of information.

4.1.3 Referencing Graphics

Graphics need to be referenced just as quotations or paraphrases do. Use the same format: put the reference number in square brackets at the end of the caption (for figures) or the heading (for tables).

You should reference all graphics that you copy from another source; you should also provide references for those that you adapt from other sources, as this is considered a form of graphic paraphrasing.

4.2 Reference Page Layout

Your reference page is placed after your conclusion and before the appendices. It will show reference numbers on the left margin, with the entry on the page next to the number.

NOTE: If you refer to the same reference entry (e.g., if you refer to the same page or short range of pages in a journal article) more than once in your text, you do not need to give it a new number the second time. Instead, you should repeat the first reference number. If the first reference is [7], then the second reference to the same page(s) of the same source should also be [7]. Both textual references will be keyed to the single reference [7] in your List of References.

5. Plagiarism

"Plagiarism" refers to the unacknowledged use of other people's work, whether this work be in the form of ideas taken without acknowledgment, or sentences copied without documentation. Plagiarism is intellectual theft.

Plagiarism is an offence under the University's Code of Conduct (Academic). In the Faculty of Engineering and Computer Science, first offences have typically been sanctioned with a failing grade for the course and the requirement to take extra credits in ethics. For more information, see the *Undergraduate Calendar.*

6. Sexist Writing

If you write "An engineer's writing skills may determine the success of his career," you are implying that all engineers are male. If you advertise for a "draughtsman," you are implying that all persons who do draughting are male. The use of the pronouns "he" or "his" as generic terms to include both male and female pronouns is not professionally acceptable, and neither is the use of occupational terms which imply maleness exclusively.

The occasional use of "he or she" or "his or her" is acceptable, but their systematic use is awkward and hence should be avoided. Sentences can often be written to avoid the need for the singular male pronoun. Writing in the plural will often work, but you need to avoid creating new problems - remember that a singular subject requires a singular pronoun. For instance, writing "Everybody raised his hand" is sexist, but writing "everybody raised their hands," while not sexist, is ungrammatical, since "everybody" is a singular subject. "They all raised their hands" solves both problems.