STYLE MANUAL FOR THE DEPARTMENT OF GEODESY AND GEOMATICS ENGINEERING

WENDY WELLS

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STYLE MANUAL FOR THE DEPARTMENT OF GEODESY AND GEOMATICS ENGINEERING

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PREFACE

In order to make our extensive series of lecture notes more readily available, we have scanned the old master copies and produced electronic versions in Portable Document Format. The quality of the images varies depending on the quality of the originals. The images have not been converted to searchable text.

ABSTRACT

Although the 'technological revolution' has pushed the humanities into the background, there still remains a need for people to communicate with each other. Just as a computer language must be correct and precise if the program is to function properly, so must the English language be used as clearly, precisely, and correctly as possible if new ideas, inventions, techniques, methods, and results are to be read and accepted into the universal body of human knowledge.

In an endeavour to provide a little help in making undergraduate report and assignment and graduate report, paper, and thesis writing less of an ordeal, this style manual has been compiled with the geomatician specifically in mind. As geodesy and geomatics engineering are not large enough fields to demand their own form and format, those of mathematics, physics, and law, the basic underpinnings of geodesy and geomatics, have been adapted for use here.

These lecture notes outline the basic mechanics of a report and provide a detailed breakdown of a typical undergraduate report or laboratory exercise, and graduate report, thesis, or dissertation. The more common pitfalls in punctuation and quotations are examined and examples of correct usage are given. Two areas fraught with confusion are capitalization and abbreviations, and these have been dealt with in some detail. Words and phrases frequently misused are reviewed, and hints to help eliminate the problems are offered. Proposals from the perspective of an undergraduate exercise and as standard business practice are discussed. Finally, and perhaps most importantly, a chapter has been devoted to referencing and footnoting because plagiarism is a sin that must be avoided at all costs.

PREFACE

This fifth edition of the departmental style manual is a consequence of a number of requests for updated information. It is also one more attempt to clarify some foggy language and confusing examples.

I would like to thank Chris Adams of Owl and Pen Editing for his comments and suggestions. He found a number of flaws in the manual and provided corrections; caught typos that have slipped through four editions; and has clarified and improved some of the examples .

With this edition, a pdf version will be put on our Web site <www.unb.ca/GGE/> for students who wish to use an electronic version rather than a hard copy version.

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1. MECHANICS

What is written without effort
is in general read without pleasure.

Samuel Johnson 1709-1784
[The Concise Oxford Dictionary of Quotations, 1964].

1.1 General

The arrangement of an undergraduate paper or report or graduate report, thesis, or dissertation is set out below.

Preliminary pages

Cover (if the product is to be bound. Graduate reports, theses, and dissertations have a unique binding and thus do not require a cover.)
Title page : undergraduates use Figures 2.3 or 2.4; (graduates use special format —see www.unb.ca/GGE/StudyThesisTitlePage/ThesisTitlePage.html)
Abstract (or Executive Summary for a business or organizational report)
Preface (usually reserved for contract reports, graduate reports, theses, dissertations, and proceedings)
Acknowledgements
Table of Contents
List of Tables
List of Figures
List of Symbols, Nomenclature, or Abbreviations

Main body of text

Body of the work (to include an introductory chapter and a conclusions and recommendations, or summary, chapter)
References
Bibliography (if applicable)
Appendices (if applicable)
Vita (for graduate reports, theses, and dissertations only)
Back cover.

Each of these elements will be discussed in detail in Chapter 2.

Reference warning

A reference must be supplied in the text whenever a concept, idea, opinion, proof, or quotation is used in your written material, unless it originates from your own brain, or unless it is common knowledge.

See Chapter 6 for a complete explanation of referencing. Failure to comply with this warning could result in a charge of plagiarism (see §6.2).

1.2 Page Numbering

consecutive numbers for ALL pages

For undergraduate reports and graduate reports, theses, and dissertations, preliminary pages must carry lkower-case roman numerals (i, ii, iii) and **all** subsequent pages must have arabic page number (1, 2, 3), starting the first chapter with page number one (1). For the main body, page numbers must be in consecutive order from the first page of the first chapter to the last page of any appendices.

Under-graduate reports

For everything **except** graduate theses, reports, and dissertations (see below), preliminary pages (title page, abstract, table of contents, list of figures, list of tables, acknowledgments, preface) are numbered in the centre of the bottom margin with lower-case roman numerals. The title page carries no number but is assumed to be page 'i', thus the abstract will be page 'ii'. The first page of each chapter of the text starts on a new page and carries the arabic page number in the centre of the bottom margin. Continuous page numbering, in the bottom margin, is carried through to the last page of the product, which would include any appendices.

title page

appendices

Running headers and/or footers

Running headers and footers can be set up in the same manner as these lecture notes. If alternating headers and footers (as displayed in these lectures notes) are not used, then the header would simply contain the abbreviated title of the report, centred, and the footer would contain the page number, also centred.

Graduate reports, theses, dissertations

For graduate reports, theses, and dissertations, page numbers are considered to be part of the text and must appear ***inside*** any of the margins. Although the School of Graduate Studies allows page numbers to appear in the upper right-hand corner, the Department of Geodesy and Geomatics Engineering would prefer that the page number appear in the centre, 2.5 cm (1 inch) from the bottom edge of the page. Any student opting to follow the Graduate School guidelines, must ensure that the page number appears 2.5 cm (1 inch) from both the top and the side edges of the page.

number placement

To accomplish the page number placement, the margin containing the page number should be about 4 cm (1.5 inches) to accommodate the page number beyond 2.5 cm (1 inch) from the edge of the page. In all cases, lower-case roman numerals are centred at the bottom of the preliminary pages. Continuous and consecutive page numbering is carried through to the last page of the product, including any appendices.

preliminary pages

appendices

incomplete page numbering

If for some reason the page numbering is not consecutive and complete from the first page of the first chapter to the last page of the curriculum vitae, a covering letter explaining the pagination error must accompany the copy of the report, thesis, or dissertation being submitted for microfilming. The National Library will then film a reader advisory concerning the pagination error. If there is no explanation accompanying the thesis, the National Library will reject the thesis and return it to the university where it will sit on a shelf for three months and then be put in dead storage.

Running headers and footers

If running headers and footers are used in the graduate report, thesis, or dissertation there is one proviso: Running headers and footers must not violate the margins required by the National Library of Canada. As with page numbers, headers and footers cannot appear below or above the 2.5 cm (1 inch) bottom or top margin.

1.3 Margins, Spacing, Paper, and Machines

Margins

Unless otherwise stated, the standard left-hand margin is 4 cm (1.5 inches) and the other three margins are 2.5 cm (1 inch). These margins must be maintained for **all** the pages of either an undergraduate report or a graduate report, thesis, or dissertation, including figures, tables, appendices, and computer printout.

undergraduate reports
running headers and footers

If you choose to use running headers and footers, they will be accepted in undergraduate reports. These headers and footers should be of a smaller font size (10 point) to make a clear distinction between them and the text. It is suggested that the page number always appear either centred on the page or placed at the outer edge of the page.

double-sided copying

If the paper or report is to be copied double-sided, a gutter of 0.5 inches should be added. This provides an extra half inch at the binding margin of each page, thus shifting the text to the right on right-hand (or odd numbered) pages and to the left on left-hand (or even numbered) pages.

graduate reports, theses, and dissertations

The margins mentioned in this section are particularly necessary for graduate reports, theses, and dissertations for two reasons. The first reason is that the microfilming company will not change the setup of its equipment for theses with odd margins. A thesis with nonstandard margins will be rejected for microfilming and returned to the university to be corrected. The second reason is that during the binding process some trimming of the pages is done, and material could disappear onto the cutting room floor or into the binding.

Graduate reports, theses, and dissertations are copied one-sided, therefore, a gutter should not be added. Remember, for graduate reports, theses, and dissertations, the margin containing the page number and any running headers and footers should be about 4 cm (1.5 inches) to accommodate the page number beyond 2.5 cm (1 inch) from the edge of the page.

graduate reports, theses and dissertations running headers and footers

As already mentioned in §1.2, running headers and footers in graduate reports, theses, or dissertations cannot violate the margins required by the National Library of Canada. As with page numbers, headers and footers cannot appear below or above the 2.5 cm (1 inch) bottom or top margin.

Paragraph formats

There are two paragraph formats acceptable to the Department. In the first format (used for these Lecture Notes), the first line of every paragraph is indented 5 spaces (1/4 inch or 6 mm) from the left-hand margin. The second format, leaves the first paragraph flush with the left-hand margin, but all subsequent paragraphs are indented the 5 spaces (1/4 inch or 6 mm).

no indentation

The current trend of no indentation for paragraphs has two drawbacks. The major problem is that after a quotation or equation it is impossible for the reader to tell whether the next line of text is to be considered part of the preceding paragraph or the start of a new paragraph and, thus, a new thought, idea, or argument. This confusion also occurs at the top of a new page when the last paragraph on the preceding page happens to end flush with the right-hand margin. Using a 5-space indentation is a clear signal to the reader that a new

paragraph, and thus a new thought, has been started.

Line spacing

quotations

new pages

The main body of the text should be double spaced, with two double spaces before a heading. Quotations of more than three lines (which are set aside from the main text and indented), footnotes, tables, and references / bibliography, should be single spaced. Start each chapter on a new page; start each appendix on a new page; sections do not require a new page. In some instances, you may be required to start each new chapter on a right-hand (odd numbered) page. In such a case, generate a blank even-numbered page at the end of a chapter to maintain continuous page numbering.

Paper

Preliminary or draft versions for supervisors of an undergraduate report or a graduate report, thesis, or dissertation may be submitted on a lower grade of bond paper than that required for the final edition. The master and all copies of the final edition of any document must be submitted on the paper supplied by Graphic Services for laser printers and photocopies. Home computers should use as good a quality of paper as the printer will accept.

Printouts

For undergraduate reports, dot matrix printers can be used for drafts, but laser or ink-jet printers must be used for the final copy. Only laser or ink-jet printers may be used for graduate reports, theses, and dissertations.

Font size and style

Unless absolutely necessary, a font size of no less than 12 points should be used for the complete document, including figures, graphs, charts, tables, and appendices. Occasionally, a smaller font size (10 point) may be used in figures, graphs, charts, and tables, but only when the size of the font makes the difference between fitting the information on one page and having to use two pages.

graduate report
thesis,
dissertation

For graduate theses, reports, and dissertations, however, failure to use a readable font size for all the material in the product could result in the document being rejected. If a font size of less than 12 points has to be used, it is best to have a sample checked by the School of Graduate Studies before your work, is completed.

style

Just as the same font size must be used, so must the same font style (Times, Times New Roman) must be used throughout your document, including, if possible, all appendices, figures, and tables.

Word Processing

Word processing packages vary, but something along the lines of Microsoft Word or Corel WordPerfect should be available on any Macintosh or PC found in Computing Services or in the Department. Any of these packages will produce a report, thesis, or dissertation meeting most of the requirements of the Department..

Although word processing packages can automatically produce tables of contents and headings, the form of these may be unacceptable to the Department. Tables of contents and headings may have to be inserted by the writer, rather than using the automatic formatting of the word processing package.

1.4 Headings

For the reader

Headings serve two basic functions: They help the reader, and they help the writer. For the reader, headings reveal the structure or framework of the report. They should provide an excellent outline when read without any text. Headings are an easy-to-find reference point for a change of topic or subject. It is much simpler to be referred to section 4.3 for more information than it is to be referred to Chapter 4, which may have 50 pages to search through to find that additional information.

For the writer

For the writer, headings act as an outline to keep the writer's discourse flowing logically. Headings provide transitions or connectors to give a smooth unified flow to the communication. Headings provide specific identification. For example, in your text it is far easier to simply state "see section 4.3 for additional details" than it is to try to explain in words where to find more information in a 200-page report.

Heading examples

Three examples of heading systems are given here. Figure 1.1 illustrates the most basic use of headings without changing font size and style (see Figure 1.3 for an example of changed font size for headings). This heading system is used for short reports (5 to 10 pages) involving a very narrow topic. The undergraduate report requested in the Technical Communications course should not use this format.

¶

TITLE OF THE PAPER

¶
¶

Use this format if the paper is short (5 to 10 pages), and your breakdown is very simple. If your topic is a very narrow one, you may not need numbered headings. If the topic is slightly less narrow, and there is the possibility of your having to refer to previous or subsequent sections, use the numbering system for headings found here.

¶
¶

1. In the Beginning

¶

After your introduction to the topic, begin your first section title at the left-hand margin ***after two double-spaced lines.*** The title should be underlined and the first letter of all words except articles, prepositions, and conjunctions should be capitalized. Insert one double-spaced line before starting the text.

¶
¶

2. In the Middle

¶

Insert, ***two double-spaced lines*** after the end of section 1 and before the heading for section 2. The second section uses the same format as the first section.

If subsections are required, only the first word and any proper nouns are capitalized in the title. There should be no further breakdowns in such a short paper.

Figure 1.1
Heading system for a very narrow topic.
NOTE: This format is to be used ONLY with software incapable of changing font size or style.

graduate reports, theses, and dissertations

Figure 1.2 shows a numbering system that is appropriate for undergraduate reports, and graduate theses, reports, and dissertations where chapters are required to accommodate a much broader topic. Again, Figure 1.2 illustrates a style if software is used that is incapable of changing font size and style. This style can be used by students taking GGE2701 Technical Communications.

Figure 1.3 illustrates what changing font size and style can do to make a report more readable. It is extremely easy to produce these heading and font changes. This style can be used by students taking GGE2701 Technical Communications.

NOTE

In the following figures:

- The margins are not accurately portrayed (see section 1.3 for the format).
- Where underlined type has been used, boldface type may be employed.
- The ¶ symbol indicates the number of blank double spaced lines.
- Read the content of the figure for an explanation of the system being used.

1.5 Visual Aids

Visual aids can do two things. They can complement an undergraduate report or a graduate thesis, report, or dissertation; The can enhance an oral presentation.

1.5.1 Report, thesis, or dissertation

Figures, tables, graphs, and charts can be very effective ways to get your written message across to your reader. They can also be total disasters that only clutter up your writing.

Before adding a figure or a table, make sure that it is a legitimate aid to your argument. Well-chosen and clearly drawn figures can often portray what it might take five pages of text to reveal. Tables with pertinent information often can simplify and summarize a whole chapter of words. There are a number of rules to remember when using visual aids in your written material.

CHAPTER 1
TITLE OF THE CHAPTER

Provide an introduction to the chapter. This should include a paragraph introducing by chapter number the subsequent information. For example: *in section 1.1 the topic will be introduced. Section 1.2 will provide an overview of the development of the world. The rest of the report will beintroduced in section 1.3.* Then the following section and subsection breakdown can then be used.

1.1 In the Beginning

The first section title after the introduction is centred ***after two double-spaced lines*** (the title is on the third double spaced line) and is followed by one double-spaced line. The title should be underlined or in boldface letters, and the first letter of all words except articles, prepositions, and conjunctions should be capitalized.

1.1.1 The Size of the Dust Cloud

Insert, ***two double spaced lines*** after the end of the text in the first section. Start the subsection left justified and underlined or in boldface letters, with a double-spaced line following the title. The first letter of all words except articles, prepositions, and conjunctions is capitalized.

1.1.1.1 How to measure the size of the cloud

This sub-subsection heading is left justified after ***two double-spaced lines*** and underlined or in boldface letters, with a double-spaced line following the title. Only the first word and proper nouns are capitalized. This should be the extent of sub-subsections.

(a) Equipment used. This heading is left justified and underlined. The first word and proper nouns are capitalized, and the text starts on the same line as the title. It is the only title concluded with a period.

Figure 1.2
Heading system for an undergraduate report or graduate report, thesis, or dissertation. ***NOTE***: To be used ONLY with software incapable of changing font size or style.

CHAPTER 1
TITLE OF THE CHAPTER

Provide the usual introduction to the chapter (see Figure 1.2). The lettering size of the chapter number and title can be 14 point, boldface type.

1.1 In the Beginning

The first section heading can be 14 point, boldface type, with the first letter of all words except articles, prepositions, and conjunctions capitalized.

1.1.1 The Size of the Dust Cloud

This subsection heading is left justified, 14 point, boldface, with the first letter of all words except articles, prepositions, and conjunctions capitalized.

1.1.1.1 How to Measure the Size of the Cloud

This sub-subsection heading is left justified, 12 point, boldface, with the first letter of all words except articles, prepositions, and conjunctions capitalized.

1.1.1.1.1 Equipment used

This sub-sub-subsection heading is left justified, 12 point, not boldface, with only the first word and proper nouns capitalized.

(a) **The sound system.** This sub-sub-sub-subsection heading is left justified, 12 point, and boldface. The first word and proper nouns are capitalized, and the text starts on the same line as the title. It is the only heading concluded with a period.

Figure 1.3
Heading system employing a six-level breakdown and varying font size and style.

Ensure that the figure or table clarifies and does not obscure your text. Rule #1:

The visual aid must help the reader to understand the narrative; the narrative must NEVER have to explain the visual aid. Any map being presented must have North indicated to orient the reader. Any symbols used must be explained in a legend at the side or bottom of the figure.

All the lettering should be of uniform size — and readable! Rule #2:

The size of lettering used for the visual aid should be the same as that used for the text. Often, photocopied material contains lettering that cannot be read. In this case, newly lettered labels should be applied by you. Uniform sized lettering is a particular requirement for graduate theses and dissertations.

All visual aids must conform to the margin specifications for the text. Rule #3:

Unless a visual aid is a map sheet, it should fit on a standard 8.5" x 11" sheet of paper with the margins as specified in section 1.3. If legal size (8.5" x 14) or ledger size (11" x 17") paper is used, it must be folded in such a way that it can be fully extended after binding.

All visual aids should be positioned on the page in portrait format. Rule #4:

If at all possible, endeavor to place your aids in the same reading position (portrait format) as the main text. Because microfiche readers do not permit the rotation of images (to facilitate landscape format), the illustrations can be difficult to read once they have been through the microfilming process. It is also more convenient to the reader of the paper copy to have all the pages in the same portrait format.

Oversize pages containing charts, graphs, maps, and tables should be avoided unless absolutely necessary. Rule #5:

Charts, graphs, maps, and tables larger than legal size (8 1/5" x 14"; 21.5 cm x 35.5 cm) paper will have to be microfilmed in sections, with the sections numbered and arranged so that they read from left to right, top to bottom.

The National Library really dislikes oversize pages. If possible, reduce charts, graphs, and figures to the standard 8 1/2" x 11" (21.5 cm x 28 cm) page. Ensure that the lettering on the reduced product is the same size as that used in the text. To accomplish this, a font that is larger than 12 points will have to be used prior to the reduction exercise.

Rule #6: **A visual aid must appear as soon as it is mentioned in the text.**

If a figure is inserted in a page of text, it must follow the paragraph in which it is first mentioned. If the visual aid is larger than half a page, it should go on a separate page. In this case, the visual aid must immediately follow the page on which it is first mentioned.

Rule #7: **All visual aids must be mentioned in the text.**

If a visual aid is used, its purpose must be to clarify the text, therefore it must be mentioned in the text otherwise it makes no sense to include it. Such mention could be formatted as ... "See Figure 2.3 for a visual representation of this description." "As shown in Figure 2.3, lines A and B do not meet." "Lines A and B do not meet (see Figure 2.3)." This applies as well to any aids appearing in the appendices.

When the aid number (e.g., Figure 3.1; Table 2.3) is included in the mention, you are *naming* the aid, therefore a capital "F" or "T" must be used. If you are merely stating the existence of an aid (e.g., "A figure will be used to illustrate this point."), no capital is used.

Rule #8: **Every visual aid must have a label.**

Figure numbers and captions are placed at the **bottom** of the figures; table numbers and captions are placed at the **top** of tables. If chapters are not used, number the visual aids consecutively through the text by category, i.e., Figure 1, Figure 2, Table 1, Table 2. Maps, charts, graphs, drawings, and photographs are all referred to as figures; tables are tables. If chapters are used, number the figures and tables consecutively WITHIN each chapter, e.g., Figure 1.1, Figure 6.1, Table 2.1, Table 2.2.

Punctuate the captions as you would a sentence, ending with a period. This also means that only the first word and proper nouns are capitalized in the caption.

Rule #9:

For coloured illustrations in graduate theses and dissertations, both the text and the coloured illustrations must contain labels and symbols to denote the colours rather than a reference to the actual colour.

If all the copies of your thesis contain coloured illustrations, there may be a problem with microfilming unless all the colours are fully labelled and explained. The microfilming process will change the colours to shades of grey. Therefore, labels and symbols should be used rather than referring to the colours to identify the lines of a graph or the shaded area of a figure.

It is recommended that the copy of your thesis you submit for microfilming include black and white figures. Even in this case, because only shades of grey will be available to the reader, labels and symbols explaining these shades must be used on both the illustration and in the text.

1.5.2 Oral presentations

There are a number of devices that can be used to project to your audience the message of a visual aid during an oral presentation. These devices include an overhead projector with transparencies or view graphs, a PowerPoint presentation, a slide projector with colour slides, a display panel, a video tape, drawings on a chalkboard, a motion picture, etc. Only transparencies, Power Point presentations, and slides will be discussed here.

Rule #1:

A PowerPoint slide or a transparency must be simple enough to be grasped by your audience in *less than three seconds*.

A visual aid for a written report can be quite complicated because the reader has time to browse through it and reread it. A visual aid for an oral presentation, however, must be simple enough to be grasped in three seconds. If the aid cannot be understood in three seconds, then the audience is going to have to make the choice of either listening to what is coming out of your mouth, or reading what is on the screen. Your audience cannot do both things at once; it is unfair to require them to make that choice.

Rule #2: **The content of the PowerPoint slide or transparency must not occupy more than one minute of speaking time during your presentation.**

If the topic of a visual aid is so involved that it takes more than one minute to discuss, it is too complicated to be included in an oral presentation. An audience's attention span for a topic is approximately two minutes; exceed that on any one topic and you begin to send your audience into a coma.

Rule #3: **The lettering and lines on a PowerPoint slide or transparency must be large enough and thick enough to be read at the back of any room.**

Any writing or line work on a visual aid is useless unless it can be seen clearly and read quickly. A minimum of lettering should be used; the more there is to read, the longer it takes to grasp the contents of the aid. Lines (as in a graph) should be thick enough to be easily comprehended.

Emphasis

Usually there is one aspect of a slide or view graph that is important. Not only should this be immediately apparent because of its size, but it should be highlighted in some fashion. Shading, colouring, and hatching, are methods to add emphasis. Just make sure that the contrast is sharp and apparent.

1.6 Equations

Placement

Equations should be separated from the text. They should be either indented to match the paragraph indents or centred on their own line. In both cases, the equation number is placed in parentheses at the right-hand margin. In a report without chapters, equations can be consecutively numbered throughout the report (e.g., (1)). If chapters are being used, number the equation by chapter (e.g., (3.1)).

Punctuation

An equation is usually an independent clause and should be punctuated as such. If a sentence ends with an equation, add the period at the conclusion of the equation and before the equation number. If the equation is an independent clause in the middle of a complex sentence, add either a colon, a semi-colon, or a comma before the equation and a comma after the equation.

Example:

Denoting A as a design matrix of unknown parameters X, and W as a misclosure vector, then the least-squares solution is given by the well-known formulas for parametric adjustment:

$$X = -(A'PA)^{-1}A'PW \quad , \qquad (5.1)$$

where the weight matrix P is replaced by $(\overline{C})^{-1}$ [Moritz, 1973, eqn. (16.5)].

When referring to an equation in the text, the citation can be one of:

Example:

"eqn. (5.1);" "eq. (5.1);" or "equation (5.1)."

In all cases, when reference is made to an equation at the beginning of a sentence, the full word "Equation" must be written out.

Example:

"Equation (5.1) explains this statement."

1.7 Lists

In almost every piece of technical writing you will do, a list of something will have to be compiled and put down on paper.

Numbering

A list can be used within a sentence, in which case put parentheses around the number. If the sentence is already part of an enumerated sentence, letters are used for the list rather than numbers.

Example:

We needed the following information to complete our data records: (1) the serial number of the equipment, (2) the number of days it was in the field, and (3) the number of people making up the crew.

(7) We needed the following information to complete our data records: (a) the serial number of the equipment, (b) the number of days it was in the field, and (3) the number of people making up the crew.

Parallel construction

All segments of the list must have parallel construction. This means that adjectives should be paralleled by adjectives, nouns by nouns, infinitives by infinitives, and subordinate clauses by subordinate clauses.

Example:

(wrong)	Our new job is challenging and an inspiration.
(right)	Our new job is challenging and inspiring.
(wrong)	This computer is inexpensive, user friendly, and it is easily installed.
(right)	This computer is inexpensive, user friendly, and easily installed.

First; second

Related ideas should be formatted in parallel style. If you have a "first" you must have a "second." If you have "on the one hand" you must have "on the other hand." Never used "firstly," "secondly," "thirdly," and so on.

Example:

(wrong)	First, you push a button. Then you feed in paper.
(right)	First, you push a button. Second, you feed in paper.

Complete sentences

parallel construction

Similar to lists within sentences, lists on separate lines must have **parallel construction**. Each item in the list, when read with the opening statement, must make grammatical sense. Each verb must be of the same construction (same "*ing*" ending, same "*ed*" ending, etc.)

Example:

(wrong) The duties of the crew chief are:
1. To organize the crew.
2. Ordering equipment the night before it is needed.
3. Arrangement of transportation.

(right) The duties of the crew chief are to:
1. Organize the crew.
2. Order equipment the night before it is needed.
3. Arrange for transportation.

Punctuation

Use periods after independent clauses, dependent clauses, or long phrases that are displayed on separate lines in a list. Capitalize the first word after a colon when the material starts on a new line.

Example:

Capitalize the first word of:
a. Every sentence.
b. Direct quotations.
c. Lines of poetry.
d. Items displayed in a list.

As follows, etc.

When a clause leading to a list contains an anticipatory word, such as *the following*, *as follows*, or *thus*, use a colon between the clause and the series.

Example:

The following rules should be observed in the field:

1. Hard-toed shoes should be worn at all times.
2. Rain gear should be carried for all personnel.
3. Protective coverings should be available for the equipment.

Format

When the list has long sentences that occupy more than one line, the text of each item should line up with the text, not with the number.

Example:

In this case, there are four figures of the earth that we must take into account:

1. The *terrain* is the actual surface of the earth, that is the seabed or, on land, the ground upon which we stand.
2. The *sea level* is the actual surface of the sea, which is subject to both temporal and spatial variations. Mean Sea Level is the long term average (typically 20-year average) of sea level at some location.
3. A *global geoid* is that equipotential surface of the earth's gravity field that most closely approximates mean sea level, averaged over the globe.
4. The geocentric reference *ellipsoid* is a mathematical figure that most closely approximates the global geoid, averaged over the globe.

1.8 Spelling

Be consistent. Do not use American spelling for certain words and Canadian spelling for others. Choose one spelling system and one dictionary, preferably a Canadian one (e.g., *Gage Canadian Dictionary*), and use it!

WARNING
metre vs. meter

If you choose American spelling, there is one word that will <u>not</u> be accepted by the Department. That word is *meter* when distance is implied (meter for a measuring device is acceptable, of course). This word, in all its forms (centimetre, kilometre, etc.), must be spelled ***metre***, according to the International System of Units (SI).

1.9 Gender Neutral Language

It is the policy of the University to promote gender neutral language so that bias toward any group is avoided. The objective is to ensure equal treatment in writing of all groups (e.g., women, minority groups, ethnic, or language groups) and to eliminate preconceived ideas about the function or attributes of any group

Generic "man"

Words containing "man" are inaccurate when applied to all humanity. The English language is rich in alternative choices without having to specify either man or woman. For example:

Example:

(Wrong)	(Right)
businessman/woman	business executive; business people
chairman/woman	chair; head; chairperson; coordinator; moderator
mailman	mail carrier, postal worker
mankind	humans; humankind; humanity; human beings; people
man-made	manufactured; machine-made; synthetic; artificial
manpower	labour force; work force; personnel; staff
salesman/woman	salesperson; salesclerk; clerk
to man	to operate; to staff
workman	worker; labourer

Personal pronouns

Non-specific personal pronouns have traditionally been masculine. Although the use of he/she, her/him, his/her, hers/his, himself/herself is acceptable, these should be used sparingly to replace the "he". Following are a few suggestions to avoid gender specific pronouns.

use "the"

Replace the gender specific pronoun (he, she) with a definite article (a, the, it).

Example:

(wrong)	The supervisor consults with his crew.
(right)	The supervisor consults with the crew.
(wrong)	His crew chief will be ready soon.
(right)	The crew chief will be ready soon.
(wrong)	The surveyor checked his field notes for errors.
(right)	The surveyor checked the field notes for errors.

use plurals

Pluralize the sentence with indefinite pronouns, which refer to no specific person or thing (any, all, something, no one, several). The plural pronouns (they, them, their, theirs, themselves) can be used to circumvent using "she or he," "she/he," etc.

Example:

(wrong)	Each student must prepare his own report.
(right)	All students must prepare their own reports.
(wrong)	The surveyor must past certain exams before he can practice.
(right)	Surveyors must past certain exams before they can practice.

reword the sentence

The sentence can be recast to avoid personal pronouns.

Example:

(wrong)	A person should be able to make decisions himself.
(right)	A person should be able to make decisions alone.

neutral words

Neutral words such as "one," "individual," or "incumbent" can be used in place of a specific pronoun.

Example:

(wrong)	his duties
(right)	the incumbent's duties

both pronouns

Use both feminine and masculine pronouns equally throughout the piece of writing or the oral presentation.

1.10 Graduate Studies Miscellaneous Reminders

The information that formerly was found in this section now can be found in the Department's *Graduate Student Handbook*. This *Handbook* can be obtained from the Department's Graduate Studies Secretary (room E-54). All students should obtain a copy of this *Handbook*. In addition, all students should have the *Regulations and Guidelines for the Preparation and Submission of Graduate Theses and Reports*, which is obtainable from the School of Graduate Studies.

Finally, Lecture Notes 54, *Style Manual of the Department of Geodesy and Geomatics Engineering*, available from the Department's publications room, must be used for formatting and style of any report, thesis, or dissertation.

responsibilities

IT IS THE RESPONSIBILITY OF THE GRADUATE STUDENT TO PROVIDE A REPORT, THESIS, OR DISSERTATION THAT MEETS ALL THE REGULATIONS CONTAINED IN THE VARIOUS PUBLICATIONS MENTIONED IN THIS SECTION. IT IS ALSO THE RESPONSIBILITY OF THE STUDENT TO PROVIDE A REPORT, THESIS, OR DISSERTATION THAT MEETS THE STANDARDS OF ENGLISH LANGUAGE USAGE EXPECTED OF A STUDENT ATTENDING AN ENGLISH LANGUAGE UNIVERSITY.

2. FORMAT OF A REPORT OR THESIS

The format of both a report (undergraduate or graduate) and a thesis (dissertation) is almost identical. The differences are so minor that they need only two sentences of explanation:

1. A graduate report or thesis usually has a preface or dedication; an undergraduate report does not.

2. The very last page of a graduate report or thesis contains a vita prepared by the student; an undergraduate report does not have a vita page.

Just to refresh your memory, here is the arrangement of a report or thesis as already set out in Chapter 1.

Cover	**Preliminary pages**
Title page	
Abstract (or Executive Summary)	
Preface (if required)	
Acknowledgements	
Table of Contents	
List of Tables	
List of Figures	
List of Plates	
List of Symbols, Nomenclature, or Abbreviations	
Body of the work (to have three chapters beginning with an introductory chapter and ending with a conclusions and recommendations, or summary, chapter)	**Text**
References	
Bibliography	
Appendices	
Vita	
Back cover.	

Each of these elements will be explained in detail in the following sections. Also discussed in this chapter are some hints on style, a check list for a report, a letter of submittal, and instructions on completing a laboratory exercise.

2.1 Covers

graduate report, thesis, dissertation

The cover is the first thing a reader sees and, to instill a good first impression, it should be notable rather than inane. Covers are usually used only when the written product is going outside the Department, and they can take several forms. In most cases, the title, author, and date are the only items required on a cover, although contract and grant report covers would contain additional information. Departmental covers are not required for graduate reports, theses, and dissertations, as these are bound outside the University.

Technical Reports

The cover required for the Technical Communication course and the Report course is depicted in Figure 2.1. Blank covers for these reports can be obtained from the Department office.

2.2 Title Pages

assignment; lab report

For an assignment or lab report, the title page should contain the following information (see Figure 2.2):

- title of the assignment or lab report
- name of the author
- course number
- instructor's name
- date.

Technical Communications outside distribution

For the Technical Communications course and for pieces of writing that could be distributed outside the university, the title page should include the name and address of the Department and the University (see Figure 2.3).

Technical Report

For reports in the Report course (GGE4711), use the title page shown in Figure 2.4. This version of a title page is appropriate because the material you are submitting is considered to be an individual part of the requirements for your degree. This title page is very similar to that required for graduate reports, theses, and dissertations, graduate students, however, should consult the *Regulations and Guidelines for the Preparation and Submission of Graduate Theses and Reports*, by the School of Graduate Studies, for the exact wording. A title page layout for graduate studies can be found at www.unb.ca/GGE/Study/Graduate/ThesisTitlePage/ThesisTitlePage.html

graduate report, thesis, dissertation

title

The title should accurately reflect the contents of the piece of writing, and both the cover title and the title page title must be identical. The title should be broad enough to cover the complete topic, but specific enough to warn the reader of what the report contains.

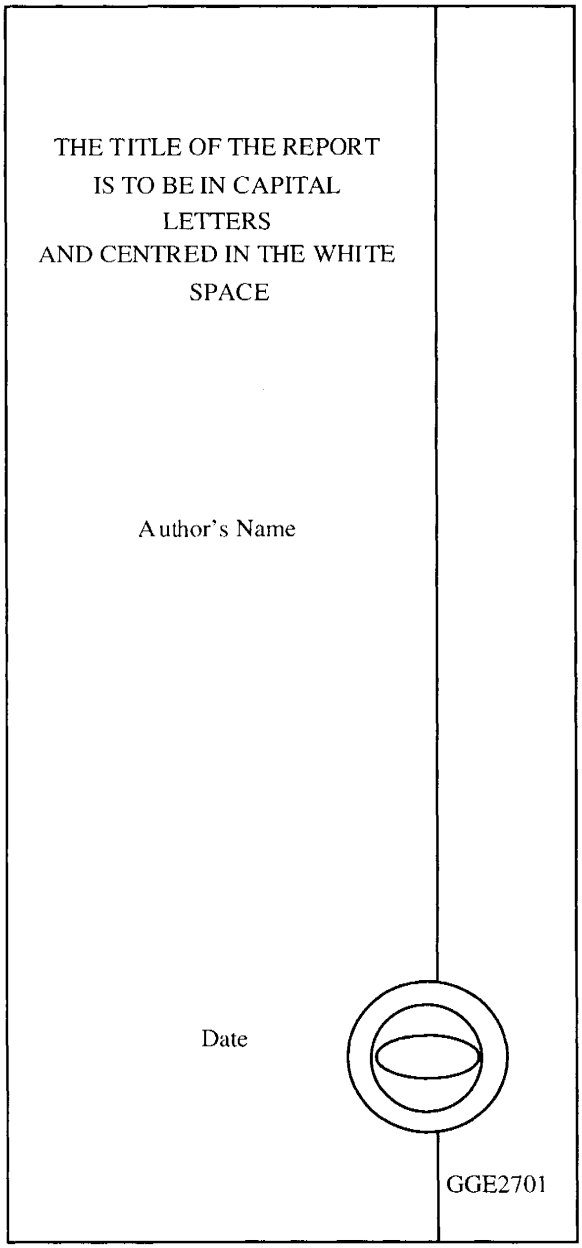

Figure 2.1
Cover for Technical Communication (GGE2701) and Report (GGE4711) courses

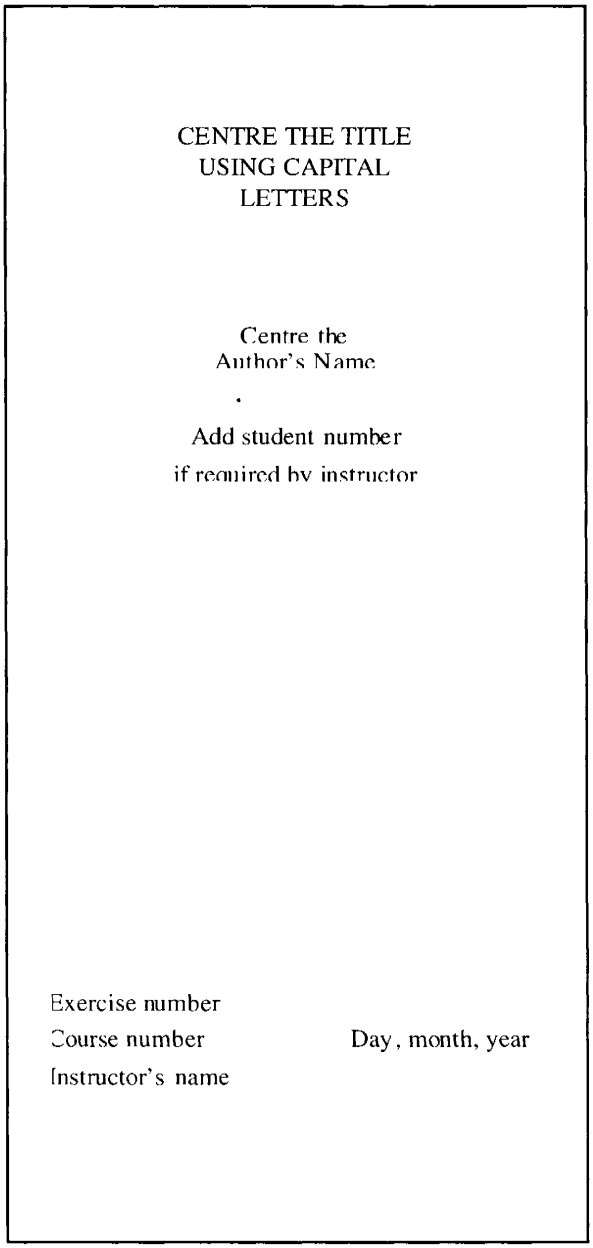

Figure 2.2
Title page for assignments or lab reports.

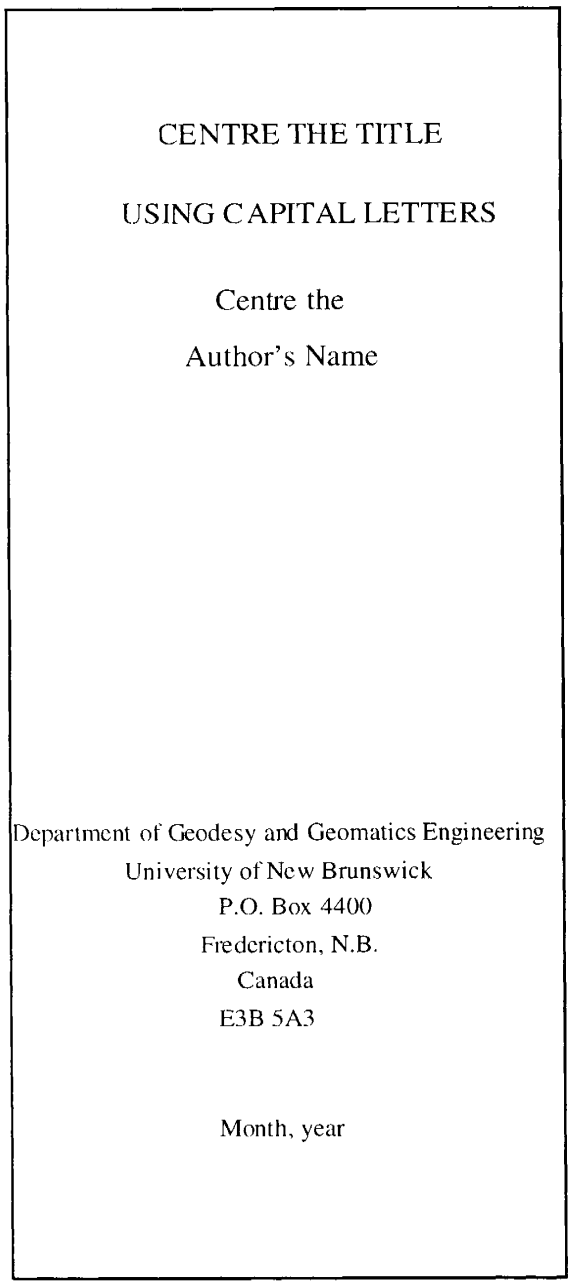

Figure 2.3
Title page for the Technical Communications course (GGE2701) and for material to be distributed outside the University.

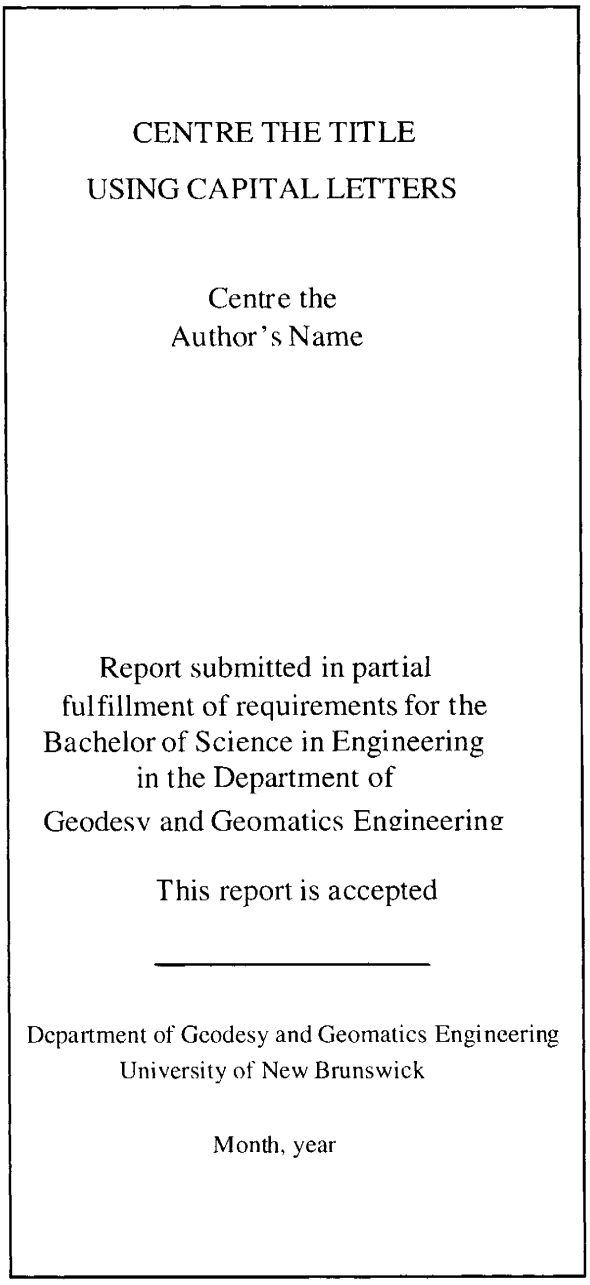

Figure 2.4
Title page for GGE4711 Report.

2.3 Abstract

One of the most important elements of any paper, report, thesis, or dissertation is the abstract, and it is usually the most difficult section to write. It should be written last, once you are certain of the highlights, main conclusions, and recommendations of what you have written. The abstract gives the gist or essence of what you have written. It includes the most significant material. It is the report in miniature. It is a brief synopsis. It tells the reader quickly what the work is about in as few words as possible. An abstract will use technical language and be divided into three parts (purpose or objective; methodology; and findings or conclusion).

thesis statement

The first sentence of the abstract should be the thesis statement, or a reflection of the thesis statement (see section 2.8.1). The abstract should have a **beginning** (why the project was carried out and the report written), a **middle** (the methodology or the most important features of the report are highlighted), and an **end** (results are summarized, conclusions are stated, and any recommendations are made). It should contain:

- the problem or purpose (what you are trying to do, and, if not obvious, why you did it);
- the scope of your work — how you did it — and any methods used;
- the significant findings or results — how it turned out;
- any major conclusions;
- any major recommendations.

do not include

The abstract should **not** contain any references, abbreviations, figures, tables, or formulae. Such details are to appear only in the main body of the text. The abstract should not make use of "I" statements. It should be impersonal and written as though by someone else.

The abstract must be:

- informative but brief (for a 30-page report, less than one double-spaced page is needed);
- able to attract the reader's attention but be written in as simple and non-technical terms as possible;
- directed to the technical reader yet readily understood by almost any reader;
- able to stand alone as a completely independent unit capable of telling the whole story.

2.4 Executive Summary

Abstract vs. summary

An abstract is placed at the beginning of a technical report, thesis, or dissertation. It is meant for an expert or technical audience. An abstract will use technical language and be divided into three parts (purpose or objective; methodology, and findings or conclusion).

Executive Summary

An executive summary is placed at the beginning of a business or organizational report, such as a proposal, feasibility report, or contract report, when the primary readers of those items will be executives (managers, supervisors, administrators, and decision makers). How technological developments will affect their company is of prime interest to executives. How will their decisions affect the company's profits and employees; how will the social, economic, and environmental decisions affect the community; what are the aesthetic, public health and safety, and conservation factors to be taken into consideration.

An executive summary will use nontechnical language to emphasize the material that executives need in their decision-making process. It can present detailed information that the writer knows will be of particular concern to the senior executives. The summary could include information on size of the project, time to completion, future costs in upkeep and replacement, effects on productivity and profits, staffing requirements, any competition, and potential problems.

An executive summary can be presented in two ways. It can be in the form of a letter and merely clipped to the cover of the report; or it can be an integral part of the report, in which case it takes the place of the abstract (immediately following the title page).

The format of the executive summary is similar to that of an abstract, however, it should have four parts, rather than three. These parts are:

- Purpose — objectives of the report
- Necessary background (who, what, when, where, why, and how)
- Major findings
- Major recommendations

In executive decision making, such things as markets, risks, rewards, costs, and people are taken into consideration. The executives may also look at the legal, political, or financial aspects of their decision making. Following are some questions that the executives may want answered by the summary.

questions

For a new project or product:

Potential?	Risks?
Scope of application?	Commercial implications?
Competition?	Importance to the company?
Proposed schedule?	Target date?
Staffing, facilities, equipment required?	
Importance relative to other projects or products?	

For tests and experiments:

What was tested or investigated?	How? Why?
What did it show?	Are there better ways?
Implications to the company?	

For materials and processes:

Properties, characteristics, capabilities?	Limitations?
Use requirements and environment?	Cost factors?
Availability and sources?	What else will do it?
Problems in using?	
Significance of application to company?	

For field troubles and special design problems:

Specific equipment involved?	What trouble developed?
Any trouble history?	How much involved?
Responsibility?	What is needed?
Special requirements and environment?	Who does it?
Time factors?	Most practical solution?
Recommended action?	Suggested product design changes?

For general problems

What is it?	Why undertaken?
Magnitude and importance?	What is being done?
By whom?	Approaches used?
Thorough and complete?	Suggested solution?
Best?	What now?
Who does it?	Time factors?

length

An executive summary should reflect the length of the report, but in no case should it be longer than five pages. A good rule of thumb to use is one page of a summary for 50 pages of a report. If the report is double spaced, the summary should be double spaced.

2.5 Table of Contents

The table of contents lists everything in your report, thesis, or dissertation except the title page, vita, and front and back covers. All the preliminary pages (abstract, preface, acknowledgements, table of contents, list of tables, list of figures, list of symbols) are itemized. All the chapter headings, subheadings, list of references, bibliography, and appendices are also listed, following the example of the table of contents of these Lecture Notes. The headings appearing in the table of contents must match **exactly** those used in the main body of the report.

letter of submittal

The letter of submittal (see section 2.14) is the only piece of writing you do for a report that is not listed in the table of contents. This letter is meant to ACCOMPANY the report, and is not an integral part of the report!

2.6 List of Tables and List of Figures

If you have used figures and tables in your undergraduate or graduate report, thesis, or dissertation, you will need two separate lists on two separate pages (unless there are so few of each as to get lost on a separate page, in which case combine both lists on one page). Figures and tables that appear in appendices must be included in these lists. The figure or table number, title, and page number are given, following the example of these Lecture Notes. The figure or table captions appearing in these lists must match exactly the figure or table caption used in the main body of the report. The only exception would be when a caption in the text is more than two sentences long; in this case include only the first sentence in the list.

appendices

caption match

On your lists of tables and figures, do NOT preface every table number with the word "Table" or every figure number with the word "Figure." You have labelled the page so you do not have to put a label in front of every number.

2.7 Acknowledgments

Any financial support, advice, or help you received should be mentioned with appropriate thanks. Help from fellow students or professors has been freely given, and their only reward is to see their names in print. Most graduate reports, theses, and dissertations are financed by institutional funding in some form, and these institutions like to see the use of their money acknowledged.

graduate report, thesis, dissertation

In the case of a report, these expressions of appreciation in the "real world" would first appear in the letter written to accompany the report done for your boss, a government, a company, or an individual (see section 2.14). As this letter usually becomes detached from the report, it is good public relations to include your "thank yous" in the report as well. The acknowledgments can be a direct copy from the letter of submittal (see Figure 2.5 in section 2.14 for the complete letter). You do not need to formulate two separate professions of gratitude.

letter of submittal

Example:

> I wish to thank Mr. John Q. Smith, Director of Navigational Services, for giving me the opportunity to gain valuable experience in hydrographic surveying. I would also like to express my gratitude to Mr. George Brown and Mr. Ralph Graham who contributed towards making my summer program a most memorable experience.

2.8 Body of the Work

The single most important element of any piece of writing is the ***paragraph***.

Paragraph

> A paragraph is a group of sentences relating to the same idea or topic and forming a distinct part of a chapter.

There should be only one topic or central idea in each paragraph, and that idea is made up of a ***topic sentence*** that is developed using supporting sentences.

Topic Sentence

> A topic sentence sets the scene for the paragraph and, hopefully, creates interest in the reader to continue reading. It states the controlling idea of a paragraph and informs the reader of the subject matter of the paragraph.

Until you are a proficient writer, the topic sentence should remain the first sentence in the paragraph. Once you have experience, the topic sentence does not always have to come first; there are even occasions when it never appears and its presence is only implied.

one sentence paragraphs

As the definition of a paragraph states "a group of sentences..." and as few ideas or topics can be expressed in one sentence, there should be no one-sentence paragraphs in your document. The length of a paragraph is determined by how much space you need to cover a particular topic for a particular reader. Varying the length of paragraphs produces a lively visual effect, but generally, a paragraph should be no longer than 10 typewritten lines. Paragraphs that are clearly shorter or longer than their neighbours attract the reader's attention and imply that the information contained in them might be more important.

body parts

The main body of your undergraduate report, or graduate report, thesis, or dissertation, has three parts. These should be:

- a beginning — an introduction;
- a middle — a description of the work done, the results of that work, a discussion of the results; and
- an ending — the conclusions and recommendations, or summary if no conclusions can be drawn.

2.8.1 The beginning

introduction chapter

The beginning is usually a separate chapter entitled "Introduction." Its purpose is to introduce your topic and to orient your reader. To do this, enough background information must be supplied to the reader to make the rest of the material understandable.

Try answering the questions:

Who — has worked in the field before you; is responsible for doing the groundwork on the problem.

What — has gone on prior to your taking up your investigation.

When — did things take place; did others examine the problem.

Where — is the centre of expertise; did other work occur.

Why — is this important to you or to the world.

How — did you go about your research.

Explain why the work was done, why the subject matter is important to you, what you did, and how it fits into a broader, overall picture. If appropriate, you can also discuss the significant results and conclusions that were reached.

first sentence

In the beginning, a ***thesis statement*** should appear as the first sentence of the first paragraph.

Thesis statement

> A thesis statement is a statement of the main idea that you intend to develop in your report, thesis, or dissertation. This statement provides you with a goal that you can work toward as you create your written product. It reveals the main argument, and it directly relates to the conclusions at the end. It should catch the reader's attention and imagination and encourage further reading.

From the second paragraph on, each paragraph will begin with a topic sentence.

Concluding paragraph of introduction

The final paragraph of the introduction contains information about the rest of the document. The topic of each subsequent chapter or section should be mentioned explicitly. If appropriate, a short description of the material in that chapter or section can also be included. For busy executives, this provides a nice summary of what the main body contains, and may allow them to read only those parts of immediate particular interest. Once you have introduced your reader to the topic and provided the background information required for a good understanding of your work, the next part of the main body of the text is the middle portion.

2.8.2 The middle

The middle portion of the main body of a piece of writing is the longest section and can be organized in many different patterns. It should have the following parts.

- An introduction containing the purpose of the topic; how it fits into the overall picture.
- A description of what you did and how you did it; or what you researched and what you found out. These are the procedures and methods used.
- A description of your results.
- A discussion, analysis, and interpretation of your results. Point out any qualifications or limitations, any source of errors found, and try to account for any unexpected results.

conclusions

This middle section should progress logically through to a conclusion or to a number of conclusions. If no conclusions can be drawn, there should be major points clearly evident in the discussion that can be gathered together for a summary at the end.

sections

The middle is broken down into as many sections as are necessary for your particular audience to understand your report, thesis, or dissertation. Sections should start with a broad outline (introduction) of what you are going to discuss. The details then can be revealed.

all material revealed in the middle

Be sure that this middle portion contains all the information needed to draw your conclusions, make any recommendation, or provide a summary for the reader. NO NEW MATERIAL IS PERMITTED IN THE ENDING, so you had better make sure you have said it all in the middle.

2.8.3 The ending

The ending is usually a separate chapter entitled "Conclusions and Recommendations" or simply "Conclusions" if you have no recommendations to make. If no conclusions were reached, the chapter should be called a "Summary" and the major points you discussed in the main body of the text should be reviewed or summarized. In all cases, there should be **no new material** presented. In all cases, the order in which you present the material should be the same as the order in which it appeared in the main body of the text.

no new material

order of material

Conclusions

Conclusions restate the major inferences (findings through reasoning) that you have made in the main body. They must be based entirely on information that you have previously discussed, and must never include new material or evidence to support your reasoning. Most graduate reports, theses, and dissertations will have conclusions; undergraduate reports frequently do not have conclusions.

graduate report, thesis, dissertation

Example:

> The operational life of a Macintosh can be increased 30% by installing a surge protector. This will save $1000.00 to repair a machine that has its power source ruined as a result of a power surge.

Summary

undergraduate report

In the case of undergraduate reports, when no conclusions can be reached, the ending becomes a **summary**. This summary should discuss the main points brought up in the middle portion of the report, in the same order in which they were presented in the text. The first sentence should restate the thesis statement. The rest of the chapter then supports this statement with the arguments used in the main body.

graduate report, thesis, dissertation

In graduate reports, theses, and dissertations, the final chapter should be more than a summary, because original research calls for conclusions to be drawn. Thus, for graduate work, the final chapter should be entitled "Conclusions," or "Conclusions and Recommendations."

Recommendations

graduate report, thesis, dissertation

Recommendations are included in the ending when your findings indicate that further research should be undertaken. They are also included when a specific solution to a specific problem has been reached through your investigations. These situations arise most frequently in graduate reports, theses, and dissertations, although some undergraduate reports do produce recommendations. The recommendations must be formulated from the results, discussion, and conclusions; they cannot be formulated from new material. They should be written in strong, definite terms so that the reader is convinced that the solution you present is valid. This is one area of the report when the first person should be used.

Example:

> I recommend that we provide every Macintosh computer in the department with a high quality surge protector.

no new material

In the case of both conclusions and a summary, the points you make must be based on facts that you presented in the middle of the main body; they cannot be formulated from new material. You can also include forecasts of trends or innovations you foresee.

The purpose of an ending is to bring together the various points you have made or the subjects you have discussed to show their relationship with each other and with the broad overall picture. The ending brings the discourse to a logical and obvious termination. It wraps everything up in a nice neat bundle.

final paragraph

The final paragraph should directly relate to the thesis statement made at the very beginning of the main body. When the thesis statement and the final paragraph are in obvious agreement, you have proven your point and brought your argument full circle.

2.9 List of References and/or Bibliography

A reference must be given in the text of your report, thesis, or dissertation when any fact, opinion, or idea that is not common knowledge or your own opinion, analysis, or interpretation is used. All these references are gathered together at the end of the document into a list of references that is arranged in alphabetical order, by date. This list appears immediately after the last chapter and before any appendices. It is usually not given a chapter number, although some journals or companies may require it to be sequentially numbered with the rest of the report. It should NOT be numbered for GGE2701 or GGE4711.

no chapter number

bibliography

Occasionally in the case of an undergraduate report, or frequently in the case of a graduate report, thesis, or dissertation, a bibliography is also provided by the author. A bibliography lists in alphabetical order all the sources consulted BUT NOT USED in the text. This provides readers with an additional source of information if they wish to pursue your argument further.

separate lists
separate pages

For GGE2701 and GGE4711, you DO NOT combine both reference sources and bibliographical sources in the same list. Use two separate lists on two separate pages.

cadastral topics

Students writing the Report (GGE4711) may use a slightly different format for their list of references. If the topic is in the cadastral surveying field, in which legal cases, legislation, or regulations are extensively cited, then a separate list of "Cases Cited" and a list of "Legislation Cited' is **added** to the list of references after your final chapter (see section 6.8 on legal referencing).

in text citation

The most important thing to remember in referencing is that the source of your information must be supplied at the time you provide that information in the text. It must appear immediately after any borrowed remark, quotation, fact, idea, figure, table, graph, and so on. Simply listing your reading material at the end of the paper in a bibliography is not acceptable. Once you become an expert in your field, you may be able to produce a paper without using references to authoritative sources, in which case you might get away with only a bibliography. But while you are at university, almost every piece of writing you produce should have a list of references.

A full chapter (Chapter 6) in these lecture notes has been devoted to referencing and footnoting, so only the format of an in-text citation will be mentioned here.

Example:

For a single author, the citation is	[Smith, 1989].
For two authors it is	[Smith and Brown, 1989].
For more than two authors, it is	[Smith et al., 1989].

brackets

Note that the earth sciences use square brackets for the citation. Other disciplines use round parentheses.

2.10 Appendices

The appendix (or appendices), if any, is the final element of the undergraduate report. The appendix is where you place computer printout or any extra material that is not necessary to the argument of your report. For instance, if you submit large plans to supplement your discussion, these should be folded to an 8 1/2" x 11" size and include as an appendix.

numbering

Each appendix must be numbered using large roman numerals (Appendix I, Appendix II, etc.) and each should have its own title page. It is the number of this title page that appears in the Table of Contents. The page numbering from the main body of the text is continued throughout the appendices.

margins

Any appendix you use must conform to the standard margins and must be mentioned in numerical order somewhere in the main body of your report. This means that the first appendix mentioned in the text will be Appendix I; the second mentioned in the text will be Appendix II, and so on.

consecutive mention

figures, tables

Figures and tables that appear in the appendices must be numbered consecutively throughout each appendix (e.g., Table I.1; Figure II.3) and must be mentioned in the text of the appendix. These tables and figures should be listed in the List of Figures and List of Tables in the preliminary pages of the report (undergraduate and graduate), thesis, or dissertation.

2.11 Vita

graduate report, thesis, dissertation

Graduate reports, theses, and dissertations do not end with the references, bibliography, or appendices. The final element is the Vita. Consult the *Regulations and Guidelines for the Preparation and Submission of Graduate Theses and Reports* for the exact format. This final page of the report, thesis, or dissertation DOES NOT contain a page number.

page number

The information required in the vita is as follows:

- candidate's full name
- place and date of birth
- permanent address
- schools attended (with dates)
- universities attended (with dates and degrees obtained)
- publications

This detailed explanation of what a report, thesis, or dissertation contains should help in the preparation of an acceptable, well-organized piece of writing. Once that product is ready for submission, the check list in section 2.13 should be consulted to ensure that a positive answer can be given to all the questions.

2.12 Hints on Style

Tense

The **tense** of your report should, in most cases, be the past tense. You are reporting what has already taken place. There may be occasions where the future tense is needed to let the reader know that something may take place after the report has been written. The only time the present tense should be used is in something like a user's manual when you are leading the user through the steps of a procedure. Generally though, anything that has already occurred must be reported in the past tense.

Transitional words and sentences

Two aids to interesting writing are ***transitional words*** and ***sentences***. These are used between sentences to provide a smooth transition and between paragraphs to maintain an even flow in the logical progression of your argument.

Transitional words

Transitional words are a means of achieving a smooth flow of ideas from one sentence to the next. For example, words such as

for example	therefore
moreover	thus
meanwhile	as a result
first	on the other hand
second	nevertheless.

Transitional sentences

One technique is to use an opening sentence that summarizes the preceding paragraph and then moves ahead to the business of the new paragraph. Another technique is to ask a question at the end of one paragraph and answer it at the beginning of the next.

Short, concise sentences

A **short, concise sentence** leaves a much greater impact on a reader than something that rambles on for half a page. There should be variety in their length, just as there should be in the length of a paragraph. There should be variety in their construction as well. Sentences of the same construction and length tend to make for boring reading. Short or very long sentences can convey to the reader a sense of importance. Generally, though, a sentence of more than 25 words is probably too long.

Important sentences

In constructing your most important sentences, the **nugget** should be at the end.

Example:

(wrong)	The Space Shuttle crashed after 10 days orbiting Earth. *The nugget is the crash. Who cares how long it had been in space.*
(right)	After 10 days in orbit, the Space Shuttle crashed. *This is much more effective.*

The main point you are trying to communicate is the last thing read and thus it will be retained better by the reader.

Active voice

Try to construct your sentences in the **active** (rather than the passive) **voice.** The active voice means the subject of the verb is the doer of the action; the passive voice means the subject of the verb is acted upon.

Example:

(active)	Frank wrote the report.
(passive)	The report was written by Frank.

Be direct, be bold, and be concise. This is not always possible, but when feasible, the active voice makes for forcible writing.

Example:

(passive)	It was not very long before he came to realize that what he had done was very wrong.
(active)	He soon repented his actions.
(passive)	The temperature was taken every three hours.
(active)	Every three hours I measured the temperature.
(passive)	It was suggested that meter readings be recorded hourly.
(active)	I suggest you record meter readings hourly.
(passive)	Elapsed time was indicated by a pointer.
(active)	A pointer indicated elapsed time.

I vs. We

Using the active voice sometimes means employing the words "I" and "we" when expressing the actions. The use of these **personal pronouns** should be treated with **caution**. To have every sentence in your report contain a personal pronoun will make that report sound pompous, arrogant, and boring. Judicious use of both the active and passive voice is advisable.

One final comment about the personal pronouns "I" and "we." It is preferable to write a report that reflects an impersonal, or passive, view which means that personal pronouns are seldom used. In some cases, however, you may not be able to eliminate them entirely. Before writing your report you will have to decide **who did the action**. If you were the only person involved in what you are writing about, use "I" and stick to it throughout. A few "we's" may be used when a group action took place. If you were a member of a group doing the actions, use "we" throughout your report, with a few "I's" thrown in when you were the lone doer. The main point is to be as consistent as possible in the use of one personal pronoun, yet use that personal pronoun **sparingly**!

Positive statements

Make **positive** (rather than negative) **statements**. Try to avoid tame, colourless, hesitating, non-committal, wishy-washy language.

Example:

(negative)	He did not think that studying history was a sensible way to use his time.
(positive)	He thought the study of history was a waste of time.
(negative)	He did not have much confidence in the results.
(positive)	He distrusted the results.

Definite language

Use **definite, specific,** and **concrete** language. Construct your sentences to be specific rather than general, definite rather than vague, and concrete rather than abstract .

Example:

(vague)	A period of unfavourable atmospheric conditions set in during the second week of the experiment.
(definite)	Unfavourable atmospheric conditions occurred during the second week of the experiment.
(vague)	As well as growing rapidly hot and humid, the day was overcast and gloomy.
(positive)	The day was overcast, hot, and humid.

Needless words

Omit needless words. Be concise. Let every word count. A sentence should contain no unnecessary words; a paragraph no unnecessary sentences. A word can frequently replace a phrase.

Example:

the question as to whether	(whether)
there is not doubt but that	(no doubt/doubtless)
used for computing purposes	(used for computing)
he is a person who	(he)
in the near future	(soon)
This is a topic that	(this topic)
Call your attention to the fact that	(remind/notify you)
unaware of the fact that	(unaware that)
at this point in time	(now)

2.13 Check List

Once you think that your report is in final form, you should go through this check list. If you can answer every question in the affirmative, chances are fairly good that you have a well constructed and thought out report. If there are a number of negative answers, you would do well to expend additional effort on those areas.

1. **Abstract:**

Does it correspond to the report, thesis, or dissertation?
Are the important facts, results, and conclusions there?
Is all material in the abstract also in the body of the report?
Are there no references to source material, no equations, and no figures, tables, or graphs?
Can the abstract stand alone and adequately explain the contents of the piece of writing?

2. **Introduction:**

Are you sure you have provided the reader with what he wants to know or must know in order to understand your report (background information)?
Have you adequately explained the purpose of the report and identified the basic methods and procedures?
Is there a good opening thesis statement that corresponds to your conclusions?
Have you concluded this section with a paragraph stating what you will be discussing in each subsequent chapter?

Is your report broken down into a sufficient number of sections and subsections so that a feel for the logical progression of the report can be gained simply by reading the headings? Are the headings and subject matter of the sections in agreement? Does the title of your report clearly explain the contents of your report, or is it too narrow or too broad?	3. **Headings and titles:**
Is there only one topic per paragraph? Is that topic reflected in the title of the section? Have you eliminated all one-sentence paragraphs? Does the paragraph have a topic sentence and an introduction sentence to the next paragraph?	4. **Paragraphs**:
Have you assisted the reader by providing, listing, and numbering steps; by providing emphasis with underlining, spacing, etc.? Are all the lists in the same format?	5. **Listings and tabulations:**
Have you adopted one style and one attitude and stuck to it, that is, have you eliminated all wishy-washy sentences? Have you used the active voice as much as possible, yet kept the use of "I/WE" statements to a minimum? Have you stated your ideas positively, not negatively? Have you used only one tense in each paragraph?	6. **Point of view:**
Is each figure and table on a separate page? Are they numbered correctly? Are they clearly labelled and referenced? Are the figures labelled at the bottom and the tables at the top? Are all figures and tables essential? Have they been adequately explained in the text? Has specific reference to each table and figure been made in the text?	7. **Figures and tables**:
Has every idea, fact, method, procedure, and word not your own been acknowledged and the source given in the proper format both in the text and in the list of references?	8. **References**:
Are your conclusions directly related to your results or discussion? If no conclusions can be drawn, have you provided a summary of the major points of your discourse? Are you sure everything stated here has already been discussed in the main body of the report? Have you provided a concluding sentence that directly relates to your thesis statement?	9. **Conclusions and recommendations**:
Is it interesting enough to be read? Is the organization clear and logical? Do the important facts stand out? Are the appendices necessary, and if so, have they been numbered correctly?	10. **Overall:**
Are you absolutely sure you know how to spell every word?	11. **Spelling**:

2.14 Letter of Submittal

For reports produced in GGE4711, a letter of submittal may be required (see Figure 2.5). This letter is a practice exercise for what you will encounter in the real world. Once you have a completed report, you will be submitting it to someone usually within your company — your boss, or your group leader —

17 September 2001

Dr. Elmo Fire, Chair
Department of Geodesy and Geomatics Engineering
University of New Brunswick
P.O. Box 4400
Fredericton, N.B.
E3B 5A3

Dear Dr. Fire:

The attached report has been prepared as part of the cooperative education requirements of the Department of Geodesy and Geomatics Engineering.

The report is based on knowledge gained while I was employed with the Bedford Institute of Oceanography during the summer of 2000. Part of my cooperative work term was spent at the Institute in Dartmouth, Nova Scotia, comparing Rho-Rho Loran C and hyperbolic Decca fixes. A month was spent at the Little Burnt Bay monitoring station in Newfoundland, and two weeks were spent on board the C.S.S. Hudson.

I wish to thank Mr. John Q. Smith, Director of Navigational Services, for giving me the opportunity to gain this valuable experience in hydrographic surveying. I would also like to express my gratitude to Mr. George Brown and Mr. Ralph Graham who contributed towards making my summer program a most memorable experience.

Respectfully,

Jane P. Student

Figure 2.5
Example of a letter of submittal.

who has requested that report. If the report is going outside your company, a letter of transmittal would be used, transmitting the report to your client. Letters of transmittal are usually bound into the report after the title page.

transmittal letters

The letter of submittal is usually inserted, UNBOUND, immediately in front of the title page. It does NOT contain a page number. It is NOT counted as a page. It does NOT appear on the Table of Contents. It is NOT labelled "letter of submittal." For those of you who have written about summer employment, a transmittal letter will be written by the Department, sending the report to your employer, when your report is in acceptable enough form to cause little or no embarrassment to the Department.

2.15 Instructions for the Execution of an Assignment or Laboratory Exercise (by J. Secord)

In order to ensure consistency in the execution and reporting of an assignment or laboratory exercise and to aid in its assessment, these instructions are to be followed by every undergraduate when taking a course in the surveying engineering programme. For each assignment or laboratory exercise, regarded generally below as an "exercise," the following steps will be executed.

1. **Review** of material relevant to the exercise.
2. **Familiarization** with what is to be expected during the scheduled laboratory period.
3. Drawing of necessary **equipment** from the stores (H:125).
4. **Execution** of the exercise during the scheduled period and arrangement for equipment required during any additional time. Acquisition and appropriate recording of data with necessary field computations to check the acquisition process.
5. **Reporting** on the exercise.
6. **Submission** of the report.

2.15.1 Review

The course lecturer, prior to the assignment, or the teaching assistant, at the assignment, will provide whatever background is required for performing the exercise and whatever references are available. It would be prudent to review all possible material prior to attempting the exercise. This would enable you to ask any questions of the lecturer or assistant early in the attempt of the exercise.

Outside of the scheduled laboratory session, teaching assistants will be available during times specified by them for their particular courses. Assistants have their own studies to pursue and possibly other courses to instruct. It would be courteous to honour the hours scheduled for the particular course.

2.15.2 Familiarization

Although this would likely be possible only after being assigned the exercise, execution would be facilitated if each member of the group were familiar with the concepts involved and aware of the requirements of the exercise. This would expedite execution and allow everyone in the group to benefit from the exercise by sharing in its performance.

2.15.3 Equipment

Each group will be responsible for its own equipment and will be expected to return it to the stores (H125) in the same condition as when it was borrowed from the stores. Any equipment that is found to be in poor adjustment or that meets with some mishap should be returned to the stores for adjustment or repair as soon as possible.

2.15.4 Execution

Most laboratory exercises, as opposed to assignments, will require execution by a group of two or more students. This is to facilitate the gathering of data and to provide each member of the group with the opportunity to operate the instrumentation. Unless otherwise specified, students are responsible for their own processing and interpretation of the data and preparation and submission of a report. Therefore, it is up to every student to ensure that they have a full copy of the raw field notes or other data associated with the exercise.

2.15.5 Reporting

No amount of field work or experimenting or computation is of any value unless the results can be communicated in a concise and acceptable manner. This communication generally entails two different components — the field notes, and the report. The field notes or, in the generic sense, the laboratory

observation notes, should reflect the methods followed as well as the data recorded. There is variety in the form of field notes, which are specific to the type and method of the survey or measurement process. Further guidance is given in a supplement to these instructions, handed out during class.

For any type of exercise, the report is to be presented in a legible, neat, and professional manner. The report is the same as the communication by professional engineers to their clients. Remuneration is justified by what the client sees in the report, which is often the final product of the engineer's endeavours; so too, with the assessment of an exercise. The report is the only indication of what the student has done and how well the subject matter of the exercise has been understood. Any difficulties in comprehension of the exercise or doubts in its reporting should be discussed with the teaching assistant, the course lecturer, or the instructor.

The report format will follow these lecture notes as closely as possible. Lettering will be done neatly by printing using pen (black ink) of suitable line weight and text line spacing to ensure legibility. The use of mechanical pencil (0.5 mm diameter) is acceptable provided that the lead is soft enough to provide sufficient contrast for legibility without being susceptible to smearing (usually HB or H).

Especially for assignments using given or gathered data, the report on conducting the assignment takes a general form and has the following subdivisions:

1. Title page
2. Table of Contents
3. Introduction
4. Equipment
5. Method
6. Computations
7. Results
8. Conclusions and Recommendations
9. References
10. Appendices
    a. Field notes
    b. Pre-processing
    c. Computer program source listing
    d. Computer input file image
    e. Computer output

Exceptions to this structure will be made by the teaching assistant when appropriate.

Use the margins, paper (section 1.3), title page (Figure 2.2), Table of Contents (section 2.5), and suggestions for correct English usage as found in these lecture notes. The title page is assumed to be page "i," so subsequent pages will be numbered in the upper right-hand corner as "i of n" in which the total number of pages is "n."

Introduction

In order to show that the student realizes the concepts behind the assignment, a short introduction outlining the theory and leading into the exercise will be given. This is not to be a regurgitation of the exercise handout but it is to be in the student's own words. If the exercise does not require field work but is an assignment of questions, then the Introduction, Method, Computations, and Results will be combined as answers to the questions.

Equipment

The make (manufacturer), model, and serial number or other means of identifying each piece of instrumentation used in an exercise is to be tabulated in this section of the report. If any field notes were made, this information would have originated in them and the tabulation in the report would be a summary from the notes.

Method

Whether successful or otherwise, the methods of attacking the problems associated with the exercise would be concisely summarized here. The procedures followed should be presented in chronological order and, if an attempt were inappropriate, reasoning for adopting an alternative would be given to lead into the subsequent steps.

Computations

Since most computations would be done by computer or at least by programmable calculator, this section would contain a summary sample of calculations. Full coding would be appended as source code listing (computer) or tabulated coding (calculators).

Results

The results of computations would be summarized in this section as tables with diagrams or plots as appropriate to the exercise. Any tabulation, diagram, or plot should be planned to fit in the format of the report with a minimal

amount of folding but still following acceptable scale for the diagram or plot. Sheets of the same size as the report pages or as multiples, e.g., 432 mm by 279 mm, would be the most appropriate with the same widths of margin as for single pages of the report. Any labelling or other information should be visible from the bottom or right-hand side of the sheet. Whenever possible, measures of accuracy and any appropriate statistics should be included.

Conclusions and Recommendations

Based on the theory given in the Introduction, guided by the observations made during the execution of the exercise, and substantiated by the results, whatever was learned or experienced during the exercise should be discussed. The intention is that, if the same or a similar problem would arise, the conclusions and recommendations would serve as guidance toward an expedient solution. This is especially important since many of the exercises early in the surveying engineering programme serve as bases for further work. Prudent organization and structure of computer programs will allow their utilization in later courses. This is always easier if suitable documentation is prepared at the time of the original exercise.

References

Any formula or constant or procedure that is not generally accepted as known should be substantiated by appropriate referencing following Chapter 6 of these notes.

Appendices

In order that the report remain as concise as possible, the details of data gathering and processing are appended to the main body of the report. These details consist of

- the actual gathered data (field notes or proper full copies of them, readable from the bottom or right-hand side);
- all of the pre-processing or manual "reductions" done to the gathered data;
- a full listing of the computer source code, embedded with appropriate comments, or calculator key sequence;
- a full listing of the input data, an echo of which should be generated in the programme output; and
- the full program output indicating the date of execution.

Other appendices would contain any additional support material such as instruction sheets and other handout or research information, germane to the

exercise, to which there is more than casual reference. All appendices must be numbered, labelled, and referred to in the text.

2.15.6 Field notes

This subsection is comprised of extracts from Brinker et al. [1981] and from Pafford [1962].

Every surveyor and engineer must be able to prepare accurate, clear, legible, and complete notes and sketches as a standard means of communication with other surveyors, engineers, draughtspeople, computers, and the public.

Organizations and practicing surveyors develop individual styles and types of notes so no single particular form is universally accepted or can be called a "standard." Each new project may bring novel problems requiring a different arrangement and method of recording and compiling data.

Surveying field notes are the direct and permanent record of work done in the field. The information in a field book is the only written evidence of the field survey and is the source of data for preparing plots and, often, designing construction or structures. Thus, the notes are at least as valuable as the cost of the field work itself.

Notes taken at the time of measurement are original. All other sets are copies and must be so marked. Copied notes (redrawn or re-entered by hand) are always held in doubt because of the possibility of errors and omissions. The value of a distance or angle placed in the field book from memory, some time after the observation was made, is definitely unreliable. Notes scribbled on scrap paper and later transferred may look neat but they do not provide an original. In actual practice, this transferring of notes is not permitted.

The erasure of a measured value is not to be done. If a number has been recorded incorrectly, a single line is run through the value without destroying its readability and the correct figures are noted above or below. If an entire page is to be deleted, diagonal lines are drawn from opposite corners of the sheet and "VOID" is lettered prominently, but not so as to obscure a number or any part of the sketch

Proper field notes exhibit accuracy, integrity, legibility, arrangement, and clarity.

Accuracy

Accuracy is as important in the keeping of notes as in the measurement procedures and other surveying activities.

Integrity

Integrity means that single omitted measurement or detail may nullify use of the notes for subsequent computing or plotting. It is often time-consuming and expensive to obtain missing data. Notes should be checked carefully for completeness before leaving the survey site. This checking is facilitated by the neat arrangement and planned layout of the notes.

Legibility

Notes can be used, especially by others such as draughtspeople and computer operators, only if they are legible. The appearance of the notes reflects the professional quality of the survey.

Arrangement

Noteforms appropriate to the particular survey and suitably organized contribute to accuracy, integrity, and legibility.

Clarity

Advance planning and proper field procedures are necessary to ensure clarity of sketches and tabulations and to make errors and omissions more evident. Ambiguous notes lead to mistakes in computing and draughting, which can sometimes be expensive to rectify.

The four types of notes can be generically described as sketches, tabulations, descriptions, and a combination of these. The most common type is the combination, but an experienced recorder selects the version best suited to the task at hand.

The arrangement of notes depends on organizational standards and individual preference. Highway departments, mapping agencies, many surveying firms, and others engaged in surveying or geomatics, furnish sample noteforms to aid recorders in preparing uniform and complete notes, which can be checked quickly and efficiently.

Paper is relatively inexpensive and should not be spared if time can be saved for field and office personnel in recording and interpreting the notes.

In bound books, the left and right pages are commonly used in pairs and may carry the same number or be numbered consecutively serially. The top of the left page would carry the project's full title, location, and type of work. Succeeding pages of the same project would carry an abbreviated title. Every right page would be dated with the weather, identity of the crew, and equipment.

Date

Year month day (as numerals), starting and finishing times (24 hour clock, i.e., 15h00 AST = 3 p.m. Atlantic Standard Time). These entries are necessary to document the notes and to aid in correlating different surveys. Precision, troubles encountered, and other facts may be determined from the time of, and time taken for, the survey.

Weather

Wind velocity, temperature, and other conditions, e.g., rain, snow, sunshine, and fog, have a decided effect on accuracy. These details become important when reviewing the notes.

Crew

Identity and duties of the members of the crew are required for documentation and future reference.

Equipment

The type of instrument and its adjustment affect the accuracy of a survey. In some cases, the isolation of errors is aided by knowing which instrument was used and when.

Each field book must have a Table of Contents, conventionally the first few pages of the book. This permits ready location of desired data.

The following points, in addition to the above, should be observed in notekeeping to eliminate the more common mistakes.

1. Letter the name, address, and telephone number of the owner on the cover and inside the field book.
2. Use the Reinhardt style of lettering for clarity and speed. Do not mix upper case and lower case letters.
3. Use a hardness of pencil lead that will impress damp paper but still provide enough contrast for readability (H or 2H).
4. Begin new work and a new day of work on a new page.
5. Always record directly in the field book.
6. Record what is read, without any mental arithmetic.

7. Be orderly. Use a standard form to aid others, as well as yourself later, in interpreting the notes.

8. Use sketches when in doubt about interpretation. Make them legible so that a user does not have to guess.

9. Make extra entries, even redundant ones, for checks and assurance of completeness. This means extra field measurements, which are important for field as well as office personnel.

10. Exaggerate details on sketches if clarity is improved.

11. Use a small straightedge, protractor, and scale.

12. Make sketches to general proportion, rather than exactly to scale, or unplanned.

13. Avoid crowding.

14. Use explanatory notes when they are pertinent.

15. Employ conventional symbols and signs for compactness and facility in interpretation.

16. Place north at the top or left side of the page for each sketch. Lettering and numbers should be readable from the bottom or right.

17. Keep tabulated figures inside the column rulings, with the decimal points and figures in line vertically.

18. Repeat aloud the values given for recording. Verify after recording, e.g., "137.59" by replying "one three seven point five nine."

19. Place a zero before the decimal point for numbers less than one, e.g., "0.65" is recorded rather than ".65."

20. Show the precision of measurement by recording significant zeros, e.g., "2.60" indicates that the measurement was done to the hundredths decimal place.

21. Do not write one figure through another.

22. Make all possible arithmetic checks on the notes before leaving the site and show them in the notes.

23. Record essential computations made in the field so that they can be checked later.

24. Compute all closures and ratios of error before leaving the site.

25. In student work, there may be several originals, although in practice there would be only the one. A student should record only in his own book. Letter "COPY" on copied notes and ensure that the sketch and figures are not obscured.

3. PUNCTUATION AND QUOTATIONS

Punctuation is a much abused aid to comprehension. In technical writing, the intention of punctuation is to provide clear communication and to enable the reader to quickly understand your message. The common practice of ignoring punctuation when in doubt will only add confusion to any piece of writing.

Quotations, which are the exact words used by a speaker or an author, are set off from the main text by quotation marks. A quotation may consist of one word, part of a sentence, a complete sentence, part of a paragraph, or complete paragraphs. Every word must be reproduced exactly, including errors, spelling, and punctuation.

3.1 Punctuation

Punctuation can be broken down into two categories: major marks, and minor marks. A word of warning might be appropriate here: the result of too much punctuation is confusion; the result of too little punctuation is incomprehensibility. Try to strike a happy medium.

3.1.1 Major marks

The major marks are the period, the question mark, the comma, the semicolon, and the colon. Each of these will be discussed below, with examples to illustrate their use.

PERIOD

end of sentence

Place a period at the end of a sentence. If the sentence ends with an abbreviation, use only one period.

Example:

He packed his shoes, shirts, socks, etc.

polite questions

Requests, suggestions, and commands are often phrased as questions out of politeness. End this kind of sentence with a period if you expect your reader to respond by acting rather than by giving you a yes-or-no answer.

Example:

Will you please let us have your answer now.
May I suggest that you call in advance.

If your reader might think your request presumptuous when presented as a statement, use a question mark instead. This offers your reader a chance to say no to your request and preserves the politeness of the situation.

Example:

May I make a suggestion?

indirect question

Use a period to mark the end of an indirect question.

Example:

The problem is unclear; the question is how to solve it.
The only question I have is whether the exam will be completed before the next class.

enumeration

Use periods after numbers or letters that enumerate items in an outline or a list (unless the numbers or letters are enclosed in parentheses). In the first example, the items enumerated are not complete sentences and do not take periods. In the second example, the items are complete sentences and take periods.

Example:

The following items were used:

1. Three Apple computers
2. Two TV monitors
3. Six floppy diskettes.

1. Compile a list of:
   a. The people who wrote the programs to be used in this project.
   b. The names of all magnetic tapes that are full.
   c. The location of all magnetic tapes that are empty.

abbreviations

Use a period in abbreviations that take lower case letters, ***except*** with metric abbreviations.

Example:

	ibid.*	(*ibidem* meaning **in the same place** [used in a footnote to refer to the book, article, etc., mentioned in the immediately preceding footnote]
	i.e.	(*id est* meaning **that is**)
	e.g.	(*exempli gratia* meaning **for example**)
	etc.	(*et cetera* meaning **and other things, and so forth**)
	Fig.	(Figure)
BUT	idem*	(meaning **the same; as previously given or mentioned**)
	cm	(centimetre)
	m	(metre)
	km	(kilometre)

*No longer in common use. The modern usage is to give a shortened form of the already cited reference.

table, figure caption

DO NOT use a period after headings in text, or titles of tables and figures. Do use a period after the table or figure caption.

Example:

TABLE 2

OR

FIGURE 3
The explanation of the table or figure will end with a period.

paragraph title

Use a period at the end of the title of a paragraph only if text follows immediately after the title. Do NOT use a period after the paragraph number!

Example:

1.1.1.1 The end of the world. The end of the world came about... .

OR

(a) The end of the world. The end of the world came about... .

QUESTION MARK

Use a question mark at the end of a direct question.

Example:

Why not see the student today?

placement

Make sure the question mark is at the end of the question.

Example:

(wrong)	Have you read my latest article? which appears in *GPS World.*
(right)	Have you read my latest article, which appears in *GPS World*?

query tone

Use a question mark at the end of a sentence that is phrased like a statement but spoken with the rising intonation of a question.

Example:

> These figures are correct?

other punctuation

When an independent question comes at the end of a sentence, the question starts with a capital letter and is preceded by a comma or a colon.

Example:

> The important question is, Can we afford it?
> This is the important question: Can we afford it?
>
> A colon is used in the second example above because the introductory matter is an independent clause. The first example above does not have an introductory independent clause, thus a comma is used.
>
> Consider the following questions: Who will fund the project? Who will do the research? Who will write the report?

uncertain date

Use a question mark to express a doubtful or approximate date, but only when absolutely unable to confirm the date or statement.

Example:

> The paper was written in 1984(?) and appeared in print early in 1985.

If no date for the reference can be found, use the abbreviation: "n.d."

Example:

> The paper by Smith et al. [n.d.] shows interesting results.

COMMA

The comma has two main functions:

- It separates elements within a sentence whose relationship to one another would otherwise be unclear.
- It sets off parenthetical elements that interrupt the flow of thought from subject to object or complement.

separate vs. set off

It takes one comma to separate, but it usually requires two commas to set off elements.

The comma is the most frequently misused punctuation mark. With so many rules and exceptions to those rules, writers often must resort to a concern for clarity as their only guide. The following rules and examples cover only the most common uses of the comma. For a more detailed commentary on this punctuation mark, any of the style manuals mentioned in the bibliography at the end of these lecture notes can be consulted.

Comma with coordinating conjunctions

Use a comma to separate two independent clauses joined by a coordinating conjunction (*and, but, or, nor*).

Example:

> John passed the exam in April, and then he joined the graduating class in May.
> Not only must the computer be inexpensive, but it must also have a large memory.

one subject

DO NOT use a comma before the coordinating conjunction when there is only one subject.

Example:

> John passed the exam and graduated with first class honours.
> The professor not only criticized the report but also recommended that it be revised.
> That make of computer was used not only because it was inexpensive but also because of its large memory.

short clauses

DO NOT use a comma before the coordinating conjunction if the clauses are short.

Example:

> John passed the exam and then he graduated.

with coordinating conjunction

DO NOT use a comma between two independent clauses that are not joined by a coordinating conjunction. In other words, there has to be a coordinating conjunction. If *and, but, or,* or *nor* is not used, punctuate with a semicolon, a colon, a dash, or a period.

Example:

> (wrong) They ran through the field, they ran into the woods.
> (right) They ran through the field. They ran into the woods.

Comma in complex sentences

Use a comma to separate dependent clauses from independent clauses.

Example:

Before we can settle the land claim, we must have all the facts.
Whenever possible, give him the benefit of your expertise.

dependent clauses

DO NOT set off an essential dependent clause from the other dependent clauses and the independent clause (essential dependent clause in italics).

Example:

Political leaders w*ho are responsive to the wishes of their constituents* will support the bill.

dependent clause

A dependent clause that interrupts the flow of the sentence must be set off by commas (dependent clause in italics).

Example:

He is the kind of dog who, *if you are not careful*, will bite you.

non-essential clause

A non-essential clause provides descriptive or explanatory detail. Because it can be omitted without changing the meaning of the sentence, it should be set off by commas (non-essential clause in italics).

Example:

The author's first book, *which sold a thousand copies*, is now out of print.
The map on the wall includes rural areas only, *whereas the map on the desk includes large cities as well.* (Clause of contrast.)

Comma with phrases

Use a comma to set off a participial, an infinitive, or a prepositional phrase at the beginning of the sentence.

Example:

(participial) Speaking in a loud voice, the professor called the class to order.
(infinitive) To obtain the best results from the equipment, follow the directions when doing the initial set-up.
(prepositional) In response to the many questions from students, the professor wrote a sample exam.

prepositional phrase

If the introductory prepositional phrase is short, no comma is required.

Example:

> In 1984 the author produced his second book.

Comma with expressions

Use commas to set off introductory, parenthetical, or transitional expressions. Following are a few expressions used to provide a transition from one thought to the next:
accordingly, after all, also, as a result, consequently, for example, hence, however, in other words, in the first place, in the second place, meanwhile, namely, nevertheless, no doubt, respectively, that is, then, therefore, thus.

Example:

> After all, you have done more for him than anyone else.
> It should be understood, however, that he cannot expect much improvement.
> There are three things to remember to pack, namely, pants, socks, and shirts.
> In the first place, I think the project is feasible, and in the second place, the money to complete it is available.
>
> BUT There is no doubt he expects more.
>
> In the above sentence, *no doubt* does not function as a transitional expression.
>
> I have never been introduced to him; however, his reputation has preceded him.
> Put the disc on the table; then get the computer.
>
> In the above two sentences, the semicolon is used because there are two independent clauses but no coordinating conjunction. **And**, **but**, **or**, or **nor** must be present before a comma can be used between independent clauses.
>
> I have never been introduced to him, but his reputation, no doubt, has preceded him.

introductory expressions

Use commas to set off the introductory expressions *first*, *second*, *third*, and so on. (Do not use firstly, secondly, thirdly, etc., as that sounds too pretentious.)

Example:

> First, the class decided that the annual field trip would be to the Bedford Institute of Oceanography. Second, the class president ensured that the Institute would welcome a visit. Finally, the class treasurer made airline reservations to Halifax.

Comma in a series

When the last member of a series of **three or more** items is preceded by *and*, *or*, or *nor*, place a comma before the conjunction as well as between the other items.

Example:

She did her research on the land claims of the Indians, the Metis, and the Dene of northern Manitoba.

She decided to do her research on either the Indians, the Metis, or the Dene of northern Manitoba.

He decided to go to the store, buy six pencils, and walk home.

etc.

When *etc.* ends the series, a comma precedes and follows *etc.*, except at the end of the sentence where only one period is used.

Example:

His lecture tour to Brazil, Venezuela, Argentina, etc., was a success.

In May he left on his lecture tour to Brazil, Venezuela, Argentina, etc. [NOT etc..]

end of series

DO NOT insert a comma after the last item in a series unless the sentence structure demands a comma at that point.

Example:

The CIG, CGU, and CHS, all Canadian institutions, met in Halifax this year.
The CIG, CGU, and CHS all met in Halifax this year.

Comma with adjectives

Use a comma to separate two or more consecutive adjectives that modify the same noun. Do not use a comma between the final adjective and the following noun (adjective and noun in italics). A good test to ensure that the comma is required is to replace the comma with the word *and*. If this can be done successfully, the comma is required; otherwise eliminate the comma.

Example:

The lawyer was described as a *quiet,* [and] *efficient worker.* ("and" can be inserted)

The ship was a *large grey* shape moving through the fog. ("and" cannot be inserted)

adjective plus noun

DO NOT use a comma when the last adjective in a series is closely connected in thought with the noun so that the first adjective modifies the combined idea of the last adjective plus the noun (adjectives and nouns in italics).

Example:

The lawyer was described as a *quiet, efficient worker.*
They re-adjusted the *old three-dimensional network.*

TEST: Reverse the order of the adjectives. If they CAN be reversed, use a comma between the adjectives. If they CANNOT be reversed, do not use a comma.
an efficient, quiet worker (OK, use a comma)
a three-dimensional old network (NOT OK, do not use a comma)

Comma with expressions that identify or explain

Words, phrases, or clauses that identify or explain other terms should be set off by commas.

Example:

Dr. Smith, the dean, is retiring in May.
He enjoys team sports, such as football and baseball.
The grade point average is based on two factors, grade points and credit hours.

or

When *or* introduces a word or a phrase that identifies or explains the preceding word, set off the explanatory expression with commas.

Example:

They decided to investigate how useful NAVSTAR, or GPS, would be for the offshore fishing fleet.
GPS is merely another name that identifies NAVSTAR.

They decided to investigate how useful NAVSTAR or Transit would be for the fishing fleet.
Transit is a completely different system, thus it is an alternative thought and no commas are used.

introductory expressions

A phrase introduced by *as well as*, *in addition to*, *besides*, *accompanied by*, *together with*, and similar expressions should be set off by two commas when it falls between the subject and the verb. Elsewhere in the sentence, the commas are not required.

Example:

The professors, as well as the students, attended the guest lecture.
The guest lecture was enjoyed by the students as well as the professors.

interruptions

Use commas to set off words, phrases, or clauses that interrupt the flow of a sentence or that are added as an afterthought. Be careful where you place the commas. The sentence minus the set-off phrase must make sense. The test is to eliminate the set-off phrase. If the sentence still makes sense, then you have the commas in the right place.

Example:

	He was to receive, as we thought, a medal for bravery.
	The book has many useful references, if I remember correctly.
(wrong)	That is the fastest, though not the best method, of processing data.
(right)	That is the fastest, though not the best, method of processing data.

contrasts

Set off contrasting expressions by commas. Such expressions often begin with *but* or *not*.

Example:

The more efficient the program, the better the results.
John was willing to buy the car, but only on his terms.

names, dates, etc.

Use two commas to set off the name of a province, a country, a branch from a department, a year from a month, and so forth.

Example:

You can drive from Fredericton, New Brunswick, to Halifax, Nova Scotia, in under five hours.
The research for the Geodetic Survey of Canada, of Energy, Mines and Resources Canada, was completed on time.
It was in March, 1984, that the data were collected.
Dr. Egg, of The University of Calgary, gave the guest lecture.

SEMICOLON

Although a comma is usually used to separate two independent clauses joined by a coordinating conjunction (*and*, *but*, *or*, *nor*), under certain circumstances a semicolon is used:

stronger break

(a) To achieve a stronger break between independent clauses separated by a conjunctive adverb (*moreover*, *however*, *therefore*). This eliminates a comma splice.

Example:

Power tends to corrupt; moreover, absolute power corrupts absolutely.

misreading

(b) When one or both clauses contain internal commas and a misreading might occur.

Example:

From these data, we should be able to compile the tables, graphs, and figures; write the report in May; and submit it in July.

(wrong) He ordered one disc, two tapes, and three boxes of computer paper and three discs, one tape, and two boxes of computer paper were delivered instead.

(right) He ordered one disc, two tapes, and three boxes of computer paper; and three discs, one tape, and two boxes of computer paper were delivered instead.

coordinating conjunction

When a coordinating conjunction (*and*, *but*, *or*, *nor*) is omitted between two independent clauses, use a semicolon — not a comma — to separate the clauses.

Example:

The day was hot; the night was cold.

transitional expression

When independent clauses are linked by transitional expressions (e.g., *accordingly*, *for example*, *furthermore*, *hence*, *however*, *that is*, *therefore,* etc.), use a semicolon between the clauses.

Example:

The verdict of the jury was based on biased testimony; therefore the lawyer decided to initiate an appeal.

Our cost of employing researchers has increased; our productivity, however, has not.

transitional expressions

In general, when two independent clauses are linked by a transitional expression (*for example, namely, that is*) use a semicolon before the expression and a comma after.

Example:

He is highly qualified for the job; *for example*, he has had over 15 years' experience.

COLON

Use a colon between two independent clauses when the second clause explains or illustrates the first clause and there is no coordinating conjunction or transitional expression linking the two clauses.

Example:

The job you have applied for sounds good: the salary is high and the location is ideal.

If the second clause does not explain the first, use a semicolon.

Example:

> The job you have applied for sounds ideal; it is the kind of job I have been looking for.

transitional expression

Use a colon before a transitional expression (*for example, namely, that is)* if the first independent clause suggests that an explanation or an illustration will follow.

Example:

> A professor has three important duties: namely, research, teaching, and publishing.

anticipatory word

When a clause contains an anticipatory word (such as *the following, as follows, thus,* and *these*) and leads to a series of explanatory words, phrases, or clauses, use a colon between the clause and the series.

Example:

> These are the job requirements: a university degree, four years' experience, and a car.
> The three main grammatical rules are as follows:
> 1. Be as concise as possible.
> 2. Check the spelling.
> 3. Ensure that the punctuation is correct.

explanatory series

DO NOT use a colon if an explanatory series follows a preposition or a verb, and the sentence is written on one (or two) lines.

Example:

> The panel consists of five students, four professors, and three members of the senate.

lists

Keep the colon if the items are listed on separate lines. Capitalize the first word after a colon when the material starts on a new line. Use a period to end each point when the point makes a complete sentence.

Example:

> The panel consists of:
> Five students,
> Four professors, and
> Three member of the senate.
> 3. Use the check list to:
> a. Turn on the computer.
> b, Mount the tapes.
> c. Operate the printer.

emphasis

Capitalize the first word of an independent clause after the colon if it requires special emphasis or is presented as a formal rule.

Example:

> Let me say this: If the contract is to be fulfilled, we will have to work 12-hour days.
> Here is Murphy's law: If there is a possibility of something going wrong, it will.

3.1.2 Minor marks

These minor marks are the dash (—), parentheses ( ), brackets [ ], quotation marks (" "), underscore (__), apostrophe ('), ellipsis marks(...), asterisk (*), and slash (/).

DASH —

When used as an alternative to the comma, the semicolon, the colon, or parentheses, the dash creates a much more emphatic separation of words within a sentence. The indiscriminate use of dashes, however, is inappropriate. Use the dash sparingly!

When typing a dash on a typewriter, use two hyphens with no space between them, but a space before and after the hyphens. This avoids confusing a dash with a hyphen. Some word processing packages have the ***em dash*** — a line the size of a capital 'm' (—). Use this with a space before and after if you have it; the double hyphen (--) if you do not.

Example:

> He does the work — I get the credit!
> Call Mr. Jones — he is the job counsellor — and get his opinion.
> Success — that's all he cares about!

PARENTHESES ( )

Parentheses can set off only **non-essential** elements. The sentence must make sense when the material in parentheses is omitted. While dashes tend to emphasize the material they embrace, parentheses **de-emphasize** the material. An exception is in the list of references at the end of the document. There parentheses are used to make the year easily found.

independent material

Use parentheses to enclose explanatory material that is independent of the main thought of the sentence. Be careful that only what is truly parenthetical is enclosed in parentheses.

Example:

A very small number of bids (five) were received for repairing Smith Street (formerly Jones Street).
(wrong) I said I was averse (not opposed to) your idea.
(right) I said I was averse (not opposed) to your idea.

explanatory material

Use parentheses to set off independent items that will further explain your comments. References to tables, figures, illustrations, and graphs that do not form an essential part of your sentence should appear in parentheses, before the final punctuation.

Example:

We think the plan is expensive (see the expense report attached) but worth the cost.
A computer printout of the program is provided (see Appendix I).
All of these items can be listed in a table (see Table 3).

punctuation placement

Be sure any sentence punctuation occurs outside the parentheses and usually after the closing parenthesis. Punctuate inside the parentheses as you would ordinarily.

Example:

I will write the report as soon as possible (as I said I would), and give you three copies.
I will write the report tomorrow (Thursday, 17 May), and give you three copies.

sentence

If the item in parentheses is to be treated as a separate sentence, make sure all punctuation is completed before the closing parentheses.

Example:

(wrong) He said he would arrive at three o'clock. (I expect he will be late). We will start as soon as he arrives.
(right) He said he would arrive at three o'clock. (I expect he will be late.) We will start as soon as he arrives.

equation

Use parentheses to enclose equation numbers both at the right-hand margin opposite the equation and in the text.

Example:

$a + b = c.$ (1)
From eqn. (1) we can write a second equation.
Equation (1) should be re-written.

BRACKETS [ ]

Brackets are used (a) to enclose references in the text, and (b) to insert explanatory material in a direct quotation. Parentheses, however, are used around the date in the list of references.

reference

The Department has chosen to follow the mathematics / physics system of referencing. This means that brackets should be used when you provide a reference in the text. Notice where the final punctuation is!

Example:

The Dene nation has had its land claims mapped [Asch, 1984].
Asch [1984] proved that the Dene nation land claims could be mapped.
Asch et al. [1984] used the verbal recollections of about 600 trappers.
The maps cover more than 180 000 km^2 of the three western provinces and the two territories [Asch and Williams, 1984].
Many researchers are using Asch's technique to map other native land claims (e.g., Smith [1984]; Jones [1984]).

interpolation

Brackets used in a direct quotation indicate that you have added the interpolation; it was not in the original.

Example:

Wells [1983] has stated that, "The most accurate navigation system will be the GPS [Global Positioning System], scheduled to be operational by 1989."

The interpolation *[Global Positioning System]* was not in the original document you are quoting from. The brackets in a quotation indicate to the reader that this is your own insertion.

errors [*sic*]

Sometimes you encounter spelling errors, errors in typesetting, or translation mistakes in quoted or referenced material. If you are aware of the error, use the italicized (or underlined) word "[*sic*]" (which means ***so*** or ***thus***) to indicate to the reader that the original was wrong. Otherwise the reader might wonder about your level of competence!

Example:

Adam [1960] states that, "The biggest meteor crater, located in the province of Québec, is 20 [*sic*] miles wide."
The crater is only 2 miles wide!

Reinhart, E. (1983). "Global Positioning Systems [*sic*] present status of technologie [*sic*] and future trends." Seminar on Topographic and Hydrographic Surveying, UN, Dubai, United Arab Emirates, April.
This example from a list of references has two errors. In the first instance of [*sic*], "Systems" should be possessive not plural (i.e., System's), and in the second instance, "technologie" should be "technology."

NOTE that **brackets** are used around the year for the in-text citation, but **parentheses** are used around the year in the list of references at the end of your document.

sic overuse

Do not overuse *sic*, however, since calling attention to the mistakes of other people can appear snobbish. If you are using a source that has quite a few errors, avoid the frequent use of *sic* by paraphrasing the material rather than using direct quotations.

QUOTATION MARKS " "

These serve three functions:

- to indicate the use of someone else's exact words,
- to set off words and phrases for special emphasis, and
- to display the titles of literary works.

reproduce exactly

When using a quotation, reproduce the exact wording, punctuation, and spelling of the original, including errors. To cope with any errors, see the use of [*sic*] in the section on brackets.

curly quotes

Some word processors can produce "curly" (" , ") quotation marks. If so, use them. This will reserve the "straight" (") quotation marks to be used for seconds and inches.

direct quote

Quotation marks are used to enclose direct quotations. If the quoted material is fewer than three lines long, insert it in the text between double quotation marks. If the quotation contains a quotation (or other phrase or word that requires quotations marks), then use the single marks around this material.

Example:

> Baker [1974, p.113] has stated that, "All nationwide networks are subject to galloping obsolescence."
>
> McLellan [1974, p.2] states that part of the problem is due to "...the large land area of 10 000 000 square kilometres... ."
>
> Whenever Martin [1995, p. 23] wants to sound grand, he states that "...kings are born not 'manufactured' out of woolly brains."

page number

As both of these are referenced direct quotations, the reference, as required, contains the page number (see Chapter 6 on referencing). This permits readers to easily and quickly find your edited quotation if they are interested in reading the complete text.

words, phrases

Quotation marks are used to set off words or phrases that are either direct quotations, unusual words used in unusual situations, or words that require emphasis.

Example:

> It has been generally accepted that geodetic networks are subject to "galloping obsolescence" and should be re-adjusted every five years [Baker, 1974].

pleasing phrase

Here a particularly pleasing phrase used by Baker has been taken as a direct quotation and included in a paraphrasing of Baker's idea. Thus the complete sentence is attributed to Baker, not just the direct quotation. If the sentence had been my own summary, and I merely included Baker's phrase to lend emphasis, the reference would have followed the direct quotation.

Example:

> It has been generally accepted that geodetic networks are subject to "galloping obsolescence" [Baker, 1974] and should be re-adjusted every five years.

emphasis

Quotation marks are used to set off words or phrases for special emphasis.

Example:

> They served "fresh" vegetables — fresh out of the can!
> The equipment can be termed "portable" as long as you use a truck to move it.

slang

Use quotation marks around "slang" expressions.

Example:

> He "stomped" all over the equipment.

Use quotation marks around parts of a complete published work. In the text, references to a chapter in a book; a title of an article, table, or figure in a journal; or the title of a newspaper article, an essay, a TV program, or a lecture are put between quotation marks. If you mention the title of a complete book, that title is underlined (or italicized).

Example:

> When you read Chapter 4, "Land Claims in the Maritime Provinces," give particular attention to the section on New Brunswick.
> Figure 3.5, "Census Figures for 1990-1992," in your paper looks interesting.
> I understand that "Anne of Green Gables" is the most popular Canadian TV show ever produced.

Use quotation marks to enclose titles in your list of references, except in the following cases which are italicized (underlined):

- the title of a book
- the title of a legal case
- the title of a complete set of proceedings.

See Chapter 6, "References and Footnotes," for examples. How to handle quotations shall be explained in section 3.2.

Punctuation with quotation marks

Periods and **commas** always go **inside** the closing quotation mark.

Example:

> The package was clearly labelled "Fragile."
> The package was labelled "Fragile," but this did not deter the postal employees from "stomping" all over it.

semicolons, colons

Semicolons and **colons** always go **outside** the closing quotation mark.

Example:

> The latest census report states, "1 360 800 Canadians lived in accommodation without indoor plumbing"; however, this figure has probably increased since 1992.

question, exclamation

A **question mark** or an **exclamation point** goes **inside** the closing quotation mark when it applies only to the quoted material.

Example:

> Smith [1984] asked, "When are the laws going to catch up with the new technology?"
>
> Do not put a period after the closing quotation mark: one piece of punctuation is enough!

question, exclamation

A **question mark** or an **exclamation point** goes **outside** the closing quotation mark when it applies to the entire sentence.

Example:

> Shut down the system when the CRT displays the command, "Abort the program"!
>
> NOTE: There is no period after the word "program" in this example.

UNDER-SCORE (underline)

The underscore is used to indicate italics. If your work were to be printed by a publisher, the underscored items would be printed in italics.

old fashion machines

Most word processing software is capable of using italics, boldface type, and underscoring. With such programs, use the italics capability for whatever should appear in italics, the boldface type for emphasis, and the underscoring for certain types of headings. With software incapable of these font styles users should follow these rules.

emphasis

Use the underscore for emphasis with words, phrases, sentences, or titles of section headings when boldface is not available to you.

Example:

The parcel of china is not to be used as a football.
2.3 In the Beginning

definition

Use the underscore with formal definitions when italics are not available to you.

Example:

The word muskeg was originally the Cree word muskak, meaning a swamp, which became the Algonquian word muskeg.

books, proceedings, journals, etc.

Underscore titles of complete works that are published as separate items, e.g., books, proceedings, journals, and copyrighted theses and reports, when italics are not available to you.

Example:

(in a list of references)
Vaníč ek, P. and E.J. Krakiwsky (1982). Geodesy: The Concepts. North-Holland, Amsterdam.
(in the text)
The textbook for the course was Geodesy: The Concepts.

APOSTROPHE (')

Most word processing software has the ability to produce "curly" apostrophes. If you have this capability (‘ , ’), use it. This will reserve the "straight" punctuation mark (') for all other uses (prime, seconds, and feet). If you do not have this capability, you are stuck with the "straight" version.

single quote

An apostrophe is used as a single quotation mark within quoted material. This reduces confusion.

Example:

He said, "Use the 'Fragile' label."

omissions

An apostrophe is used to indicate the omission of figures in dates.

Example:

The graduating class of '89 was the largest on record.

contractions

In **informal** writing, an apostrophe is used to form contractions. In **formal** writing, contractions are **NOT** used, except for o'clock or in a direct quotation.

Example:

(informal)	can't, won't, we'll
(formal)	cannot; will not; we will

prime
minutes

A "straight" apostrophe is used as a prime in equations. It is used to signify minutes in degrees/minutes/seconds. The seconds are a "straight" quotation mark.

Example:

a = bc'
26°50'30"

plurals

An apostrophe is used to form some plurals when confusion would result from its omission. It is no longer necessary to use an apostrophe with numbers or capital letters.

Example:

Seven Ph.D.s graduated this spring.
That report was written in the 1970s.
Give me no ands, ifs, or buts.

EXCEPT: dot the i's
The teacher put three 1's on the board.

Use the apostrophe here to avoid confusion with "is" or "Is".

Apostrophe and possessives

An apostrophe is used to form possessives.

Example:

TEST: To be sure the possessive form should be used, try substituting an **of** phrase or a **by** phrase in the sentence. If the substitution works, the possessive form is correct.
the student's marks (the marks of the student)
the university's finances (the finances of the university)
Smith's book (the book written by Smith)

noun no s

To form the possessive of a singular noun **NOT** ending is **s** or in an **s** sound, add an apostrophe plus **s** to the noun.

Example:

the computer's memory
the team's equipment

noun with s

To form the possessive of a singular noun that ends in **s** or an **s** (**x** or **z**) sound, listen to the way the word is pronounced. If a new syllable is formed in the pronunciation of the possessive, add an apostrophe plus **s**.

Example:

Gauss's formula
Marx's theories
the boss's desk

If the addition of an extra syllable would make an s-ending word hard to pronounce, add the apostrophe only.

Example:

That is John Hawkins' car. (His last name is Hawkins.)
for goodness' sake

plural noun

To form the possessive of a regular plural noun, add only an apostrophe.

Example:

Students' marks must be in by Friday.
The professors' union organized a strike.
the developing countries' needs

adjective

The apostrophe can be deleted in phrases where the possessive noun becomes an adjective. You can also recast the phrase to eliminate the possessive.

Example:

two weeks holiday (rather than two weeks' holiday) or two weeks of holiday
thirty days sentence (rather than thirty days' sentence) or a sentence of thirty days

EXCEPT: use the apostrophe for the singular
a day's work

too many possessives

Avoid attaching a possessive form to another possessive form. Reword the sentence.

Example:

(wrong) I have not yet seen the department's students' petition.
(right) I have not yet seen the petition of the department's students.

second possessive only

If possession is shared by two or more subjects, add the possessive **'s** to the last word only.

Example:

Adam and Eve's children
Tom, Dick, and Harry's antics

EXCEPT: to indicate individual possession, add **'s** to each element:
John's and Jim's children
Tom's and Dick's marriages

inanimates

DO NOT use possessives with nouns referring to inanimate things. Use an **of** phrase instead.

Example:

the leg of the tripod (**not** the tripod's leg)
the terms of the contract (**not** the contract's terms)

ELLIPSIS MARKS (...)

These marks are used to indicate that a word, a phrase, or a sentence has been omitted from a direct quotation. They are formed with one word space before and after the three dots. See section 3.2 for examples.

ASTERISK (*)

If you use only one or two footnotes in your report, an asterisk can be used to refer the reader to a footnote at the bottom of the page. Only one asterisk per page is allowed. If you have two footnotes on the same page, the second indicator should be a dagger (†).

SLASH (/)

The slash has entered our language on the wave of Internet usage. It is used, however, in other than URLs.

Example:

c/o (care of)

division

The slash can be used to indicate a fraction or division.

Example:

2/3 (two thirds)
c/2 (c divided by 2)

3.2 Quotations

reproduce exactly

A quotation may consist of a word, a group of words, a sentence, a group of sentences, a paragraph, or a group of paragraphs. Every word must be reproduced exactly, including spelling errors, grammatical mistakes, and punctuation.

use sparingly

Direct quotations should be used sparingly. Only when an example or proof is required, or if the term is particularly appropriate, should a quotation be inserted to back up your argument. A report or thesis built around quotations, as may happen in the Arts, is inappropriate in Engineering. It is better to paraphrase or give a summary of the ideas you wish to convey in your own words, making sure that you provide a reference for this information.

signal phrases

If a quotation is to be used, signal the reader as a courtesy that one is to appear shortly. Make sure that the signal phrase is appropriate to the context. If you are arguing a point, stating a fact, mentioning a belief, or drawing a conclusion, choose the correct verb.

Example:

As Smith [1989, p. 25] asserts, "The GPS constellation will be completed in 1994."

Other signal phrases are:

acknowledges	comments	implies	reports
agrees	compares	insists	suggests
believes	emphasizes	observes	writes

formats

There are two formats for quotations:

- the **run-in** format, and
- the **set-off**, or **block**, format.

The run-in format is used for quotations occupying fewer than three lines of text. The set-off, or block, format is used for quotations of more than three lines of text.

3.2.1 Run-in format

The run-in format is used when the material you are quoting occupies **fewer than three lines** of typewriting. Usually, the run-in quotation consists of a word, a clause or phrase, a sentence, or portions of a number of sentences.

< 3 lines

Quotation marks enclose direct quotations of fewer than three lines.

Example:

Baker [1974, p.113] has stated that, "All nationwide networks... [are subject to] galloping obsolescence."

McLellan [1974, p.2] states that part of the problem is due to "...the large land area of 10 000 000 square kilometres... ."

page number

As both of these are referenced direct quotations, the reference, as required, contains the page number (see Chapter 6 on referencing). This permits readers to easily and quickly find your edited quotation if they are interested in reading the complete text.

ellipsis marks

In the first example, a few words have been taken from one sentence and a few words from another sentence. Ellipsis marks (...) have been used to indicate that a word, a phrase, or a sentence has been left out. The personal interpolation [are subject to] was added to make the quotation comprehensible. (See the section on brackets.)

period with ellipsis marks

In the second example, the beginning and the end of the quoted sentence have been omitted. The first and last series of ellipsis marks represent the omitted words; the fourth period at the end of the quotation signals the end of the sentence.

set off

Quotation marks are used to set off words or phrases that are either direct quotations, unusual words used in unusual situations, or words that require emphasis.

Example:

> It has been generally accepted that geodetic networks are subject to "galloping obsolescence" and should be re-adjusted every five years [Baker, 1974].

phrase

Here a particularly pleasing phrase used by Baker has been taken as a direct quotation and included in a paraphrasing of Baker's idea. Thus the complete sentence is attributed to Baker, not just the direct quotation. If the sentence had been my own summary, and I merely included Baker's phrase to lend emphasis, the reference would have followed the direct quotation.

Example:

> It has been generally accepted that geodetic networks are subject to "galloping obsolescence" [Baker, 1974] and should be re-adjusted every five years.

3.2.2 Set-off, or block, format

no quotation marks

When a quotation takes more than three lines of text, use the block format. This sets the quoted material off from the text. DO NOT USE QUOTATION MARKS. Indent the text from both left and right margins by about an inch, and single space the block.

> 3 lines

If the quotation is takes **more than three lines**, separate it from the text, indent it, and use single spacing with either reduced font size or italics in standard font size.

Example:

> Do not put quotation marks around a quotation that has been set up in this fashion. Put your source at the end of the quotation unless you have used the author's name, and date in brackets, in an introductory phrase, clause, or sentence. In the latter case, put a colon at the end of the introductory phrase or clause, and capitalize the first word of the quotation as done here. [Wells, 1984].

paragraphs omitted

If one or more paragraphs are omitted from a lengthy quotation, insert a separate line of ellipsis marks. This line should match the borders of the quoted material.

Example:

> Indent the first line of a lengthy quotation if it is the start of a paragraph in the original text, otherwise left justify the block. When you have completed the partial quotation and are ready to begin the excerpt from another paragraph, then insert a line of ellipsis marks.
> .....
> These ellipsis marks run from border to border of the indented block.

new paragraph

If your quoted material starts with a new paragraph, or if it includes a new paragraph, indent the quoted paragraph two spaces from the left-hand quotation margin.

add emphasis

If you want to add emphasis to something with a quotation (that is not already emphasized), you can underline (italicize) the words and add "[my emphasis]" in square brackets immediately after the italicized elements. If you add italics to a complete sentence, or if you emphasize a number of words or phrases throughout a lengthy quotation, add "[my emphasis]" at the end of the quotation. This warns the reader that the italics did not appear in the original material.

Remember that if italics already appear in a quotation, you must show those italics.

4. CAPITALIZATION AND ABBREVIATIONS

There are three basic uses of capitalization. Capital letters are used to give emphasis, as in official titles; to distinguish proper nouns and adjectives; and to highlight words in headings and captions.

The earth sciences seem to require extensive use of abbreviations to shorten recurrent terms and thus provide a more concise style. Abbreviations fall into three categories: the short forms of common nouns, Latin expressions, names, months, and days; acronyms and initialisms; and symbols used with mathematical expressions and metric units.

4.1 Capitalization

minimize

Along with spelling, capitalization can cause grief and frustration to the technical writer. As a general rule, capitalization is to be minimized, not maximized. Unfortunately, status frequently dictates the size of the letters. Very rough rules for status are as follows:

status

- Federal, national, and international organizations in capital letters (Government of Canada, Supreme Court of Canada); provincial, municipal, and local organizations in lower case letters (government of New Brunswick, supreme court of Alberta).
- Current title holders in capital letters (Prime Minister Smith); titles modified by *former*, the *late*, *ex-*, *acting*, or *retired* to be in lower case letters (former prime minister Turner).
- Titles of high rank to be capitalized (King, Queen, Prince, Princess, Governor General, President, Pope, General, Chief Justice); those of lower rank to be in lower case letters (duke, duchess, vice-president, bishop, lieutenant, member of the legislature).

uses

There are three uses for capital letters:

- to give emphasis (e.g., to an official title or first words);
- to set off proper nouns and adjectives from common ones (e.g., Henry; Canadian maple syrup);
- to highlight words in headings and words in figure or table captions.

This last item is not as important as it used to be because of the ability of many word processors to use boldface type.

4.1.1 Capitalizing for emphasis

Capitalize the first word of a sentence.

Example:

> The first word in a sentence should be capitalized.

direct quote

Capitalize the first word of a direct quotation as long as it is a complete sentence. Do not use a capital if only part of a sentence is used.

Example:

> He said, "You are being very difficult."
> The author said that he was "pleasingly surprised" at the turnout.

See subsection 3.1.2 and section 3.2 for more information on quotations.

colon

Capitalize the first word after a colon if it begins a direct question, a formal statement, or a formal rule.

Example:

> The question is: Will the country survive free trade?
> Let me say this: If the contract is to be fulfilled, we will have to work 12-hour days.
> Here is Murphy's law: If there is a possibility of something going wrong, you can bet your life it will!

4.1.2 Capitalizing proper nouns and adjectives

Capitalize personal names.

Example:

> John Brown
> Peter the Great
>
> Special cases: McDonald vs. Macdonald
> Robert de Cotret
> Cornelius Van Horne vs. Ludwig van Beethoven
>
> These special cases must be checked to ensure proper spelling and capitalization.

report parts

Capitalize certain parts of an undergraduate report or graduate report, thesis, or dissertation. When followed by a numeral (i.e., when the item is "named"), then the words "figure," "table," and "chapter" are capitalized. When there is no numeral, these words are NOT capitalized. The word "section" is NEVER capitalized. See section 4.2 for more examples.

Example:

	This will be shown in Figure 2.3.
BUT	In this figure, the shaded area provides emphasis.
	See Table 2.2 for a list of the existing programs.
BUT	This table cannot be copied.
BUT	When the user has a problem, see section 3.2.2 for a solution.

adjective

As a general rule, capitalize an adjective derived from a proper noun or part of a name.

Example:

Franciscan friar	Roman history
Newtonian physics	Doppler (as in Doppler's principle)

common adjective

BUT, once an adjective derived from a person or place has become common, the capital is dropped.

Example:

manila envelope	venetian blind
roman numeral	doppler (as in doppler radar)

Usage in this particular area is not standard, thus the proper noun derivatives should be checked in a dictionary.

Government titles

Capitalize the titles of national and international governments, and government departments and agencies, only when you are using the full, proper, and legal title and the short form of the title as shown in the example. THE FULL OFFICIAL FORM MUST BE GIVEN THE FIRST TIME IT IS USED. The short form is capitalized in the **specific** sense only.

Example:

the Government of Canada	(the Government)
the Parliament of Canada	(Parliament)
the House of Commons	(the House; the Commons)
the Supreme Court of Canada	(the Court)
The Department of Energy, Mines and Resources	(the Department)
the Earth Physics Branch	(the Branch)

short form

DO NOT capitalize the short form of the above examples if they are used in a **non-specific** sense. When these forms are preceded by an adjective and when they are used in an adjectival form, use lower case letters.

Example:

The branch held its monthly meeting today.
The Canadian government has issued a policy statement.

federal

The word **federal** is capitalized ONLY when it is part of the official name of a federal agency, act, or some other proper noun.

Example:

Federal Reserve Board
BUT the federal government
The provincial and federal departments of Agriculture met on Friday.

plurals

DO NOT capitalize the words *government, department, division*, etc., when used in the plural form.

Example:

Ministers from the departments of Fisheries and Oceans, External Affairs, and Energy, Mines and Resources met yesterday.
The governments of Canada, France, and the United States were in conflict over the fisheries in the Atlantic Ocean.
The Ontario and Manitoba legislatures are in recess.
When will she swim lakes Superior and Ontario?

short forms

DO NOT capitalize short forms of provincial or local government groups.

Example:

The mayor's advisory group met yesterday.
The city's electrical department was called upon for advice.

Institutions

Most official names of institutions are capitalized. Partial forms retaining the essential specifying element are capitalized, but use lower case letters when the specifying element is eliminated. This reduces the form to a general term of classification.

Example:

the National Film Board	the Film Board	the board
the Fredericton School Board	the School Board	the board
the Fredericton Police Department	the Police Department	the police

Official documents

The full official names of treaties, agreements, acts, and other official documents are capitalized; the short forms are not. The words *Addendum*, *Comment*, *Communication*, *Letter*, *Note*, and *Circular* should be capitalized in the FIRST reference when they refer to the official title; otherwise they are lower case letters.

Example:

the Treaty of Versailles	the treaty
the Law of the Sea	the law
the Land Titles Act	the act

Titles of office

Official (civil, military, religious, professional) titles and titles of nobility are capitalized when they **precede** personal names. They are also capitalized when they follow or are used in place of a personal name for those of high rank. Do not capitalize lower ranks.

Example:

National	Prime Minister	Governor General	Secretary (of State)
	Minister (of Justice)	Director (of an agency)	Chief Justice
	Ambassador	Senator	Member of Parliament
Prime Minister Smith		Smith, the Prime Minister	
Provincial	Premier	Lieutenant-Governor	
BUT	attorney general	member of the legislature	
Premier Frank Brown		Brown, Premier of New Brunswick	
International	Queen	King	Prince
	Princess	President	Premier
	Pope	Secretary General of the UN	
	Queen Elizabeth II	Charles, Prince of Wales	
BUT	duke	duchess	
The duke of Norfolk won the race.			

Except for the President of the United States, none of these is capitalized when used as a general term of classification.

	every queen	a provincial premier	all prime ministers
BUT	every American President		

plural titles

DO NOT capitalize titles when they are in the plural form or when they are preceded by an indefinite article.

Example:

the lieutenant-governors of New Brunswick and Nova Scotia
the premiers of all the provinces
a member of Parliament

modified title

DO NOT capitalize titles when they are modified by a possessive or other type of adjective.

Example:

They discussed it with their member of Parliament.
They sent it to the Canadian prime minister.

job descriptions

DO NOT capitalize job descriptions, only titles.

Example:

Professor John Smith,
BUT John Smith, professor of law

the

Use of **THE**. Careful research must be done to ensure whether **the** is capitalized.

Example:

the University of New Brunswick
the Koran
the Bible
BUT The University of Calgary
The Associated Press
The Pas, Manitoba

Geographical terms

There is a problem in Canada with geographical names. We cannot decide whether our regions have official names, thus this category of capitalization is fraught with exceptions.

Points of the compass

† Use lower case words when a **simple direction** is intended;.
† Use capitalized words when the direction is **part of the street name**.
† Use capitals with periods when the compass points **follow an address**.
† Use capitals without periods when compass points are used in **technical** work.

Example:

The east side of town is the shopping district.
He lived at 1099 North 36th Street.
He lived at 332 14th Street N.W.
The position was 23°36'N, 42°27'E.

East and West

† from the point of view of both the *East* and the *West*, the **West** means British Columbia, Alberta, Saskatchewan, and Manitoba;
† from the *East*, the **East** means Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland;
† from the *West*, the **East** means Nova Scotia, New Brunswick, Prince Edward Island, Newfoundland, Quebec, and Ontario.

Example:

(all from the eastern point of view):
There were forest fires raging all over the West.
The West was a hotbed of political unrest.
The most famous politicians all came from the East.
The East provides some of the most scenic areas of Canada.

North and South

† The North may mean only the Yukon and the Northwest Territories, or it may mean the territories plus the northern parts of all the provinces except Atlantic Canada.
† The Far North is used to designate the area beyond the Arctic Circle, when the North is also being used.
† The South is used only by Northerners to designate that part of Canada to the south of them. From the southern Canadian point of view, there really is no south; the South means the lower portion of the United States.

Example:

The Prince and Princess of Gibbins made a tour of the North.
The search for oil has moved from the North to the Far North.
From the point of view of the Inuit, the South is to be avoided.

When Canada or Canadian is part of the phrase, then the North, the South, the East, and the West, all become lower case.

Example:

A sense of mystery surrounds the great Canadian north.
The east of Canada tends to have more rainfall than the West.

DO NOT capitalize regional directions unless they have a political or other connotation, or are the titles of administrative regions.

Example:

The building is in the southern part of town.
The northern part of the country has a very scattered population.
These are hard times for the western farmer.
The rest of the country views central Canada with suspicion.
The Easterners felt out of place in the big city.
Much of Northern Ontario had been mined of its gold.

Capitalize the names of countries, regions, counties, cities, other political, administrative, and geographic divisions, and topographical features.

Example:

the Northern Hemisphere	the Pacific
the International Boundary	the Okanagan Valley
the Canadian Shield	the Maritimes
the Atlantic provinces	the Crow's Nest Pass
the East Coast (all Atlantic provinces)	the West Coast (just B.C.)

The minister is touring the East Coast.
A tanker spilled oil off the west coast of North America.

There are four regions in Canada where the designation is capitalized: Prairie, Maritime, Atlantic, and Arctic. The word *province* is not capitalized when used with these.

Example:

The Prairie provinces, or the Prairies, are Alberta, Saskatchewan, and Manitoba.
BUT do not capitalize prairie when it is a noun or adjective describing the landscape.
The wind roared across the prairie.

The Maritime provinces, or the Maritimes, are Nova Scotia, New Brunswick, and Prince Edward Island.
The Atlantic provinces are the Maritime provinces plus Newfoundland.

The Arctic is the region north of the Arctic Circle.
BUT arctic is not capitalized when referring to temperature or flora and fauna.
The arctic winds swept across Canada and into the United States.
The arctic flowers bloom for only three weeks.
Oil exploration is difficult in arctic conditions.

4.1.3 Capitalizing headings or captions

The general rule for headings that combine upper and lower case letters is to capitalize all words with **four or more** letters. It is also usual to capitalize words with **fewer** than four letters **except**:

- articles: the, a, an
- short conjunctions: and, as, but, if, or, nor
- short prepositions: at, by, for, in, of, off, on, out, to, up

the

BUT remember to capitalize ***the*** at the beginning of a title if it is actually part of that title (see section 4.1.2 "the").

Example:

The letter was sent to The University of Calgary.
The letter was returned to the University of New Brunswick.

dash, colon

Capitalize the first word following a dash or a colon in a title. (See Chapter 6 on referencing for further examples.)

Example:

Least-squares adjustment—A new attempt.
The Global Positioning System: An update.

hyphenated words

Capitalize **hyphenated words** within a sentence only if they are proper nouns or proper adjectives. At the beginning of a sentence, capitalize the first word but not the subsequent word(s) unless they are proper nouns or adjectives. In a heading or title, capitalize all the words except the articles, short prepositions, and short conjunctions mentioned at the start of section 4.1.3.

Example:

Within Sentences	Beginning Sentences	In Headings
up-to-date	Up-to-date	Up-to-Date
French-Canadian	French-Canadian	French-Canadian
mid-September	Mid-September	Mid-September
one-sixth	One-sixth	One-Sixth
post-World War II	Post-World War II	Post-World War II

captions

Just remember that captions of figures and tables are treated as complete sentences and only the first word and proper nouns or adjectives are capitalized.

See section 1.4 for more information about the format and style of headings.

4.2 Abbreviations

There are three types of abbreviation:

- **short forms** (e.g., Figure vs. Fig.);
- **acronyms** [a pronounceable word formed from the first letters of other words] (e.g., radar which comes from **RA**dar **D**etecting **A**nd **R**anging); and
  initialisms [abbreviations consisting of all-capital initials that do not make a pronounceable word] (e.g., UNB which comes from University of New Brunswick);
- **symbols** (e.g., metre vs. m).

Use of plurals

Plurals of abbreviations are usually formed simply by adding an **s** with no apostrophe.

apostrophe

Example:

YMCAs	ICBMs
GISs	DBMSs

In some cases, adding the apostrophe is necessary to avoid ambiguity.

Example:

c.o.d.'s	[dotting the] i's
Fig.'s Ch.'s	

Some plurals are special formations.

Example:

page	p.	pages	pp.
manuscript	MS	manuscripts	MSS

4.2.1 Short forms

Some short forms of words are now in such common use (e.g., ad, fridge, phone, exam) that it is sometimes difficult to remember the full word. In formal writing, however, the full form (e.g, advertisement, refrigerator, telephone, examination) should be used.

Use of periods

The short forms of words frequently take a period at the end (e.g., Sun., Dr., ft.). In formal writing, however, where short forms are taboo, this may not cause many problems. Acronyms, chemical symbols, mathematical abbreviations, and metric units and International System of Units (SI) symbols inevitably DO NOT take periods (e.g., H_2O, cos, tan, cm^2, kg).

unacceptable short forms

In formal writing, the following short forms are not commonly accepted: personal names (Charles, not Chas.), days of the week (Sunday, not Sun.), holidays (Christmas, not Xmas), months (February, not Feb.), courses of study (Engineering, not Eng.), and Canada Post provincial abbreviations (Alberta or Alta., not AL).

Parts of a report

When referring to parts of the report, use the following words CONSISTENTLY throughout. This means they must appear the same on all figures, tables, graphs, and appendices). Use either Figure or Fig.; Chapter or Ch.; equation or eq. or eqn. The words *table, graph, section* do not have abbreviations. They must be written out in full at all times. Remember, it is only when an items is being "named" (e.g., Figure 3.2) that a capital is used.

Example:

	Appendix	See **Appendix** II for a printout of the program.
BUT		Material that interferes with the flow of the report should be put in an **appendix**.
	Chapter	These data are explained in **Chapter** 7.
BUT		This **chapter** is much too long, thus further information can be found in Chapter 7.
	section	The figure can be found in **section** 7.1.
	Figure	A detailed sketch of the wharf can be seen in **Figure** 2.1.
OR		A detailed sketch of the wharf can be seen in **Fig.** 2.1.
BUT		This **figure** was completed in seven days.
	Table	These data are explained in **Table** 7.6.
BUT		These data should have been put into a **table**.

First word in sentence

You cannot start a sentence with an abbreviation; therefore, use the full word at the start of any sentence. This means that if you have opted to use Fig. throughout your report, you will still have to use the full form, Figure, as the first word in a sentence. This applies to numbers as well. The first word of a sentence cannot be a numeral; it must be a word.

Example:

Figure 3.2 is an alternative to the information already displayed in Fig. 3.1.
Chapter 2 will provide background information, while Ch. 3 will provide details.
One hundred and fifty out of 160 graduated with honours.

Latin terms

Some Latin terms are abbreviations with periods; others are complete words and do not require periods, as shown in the example.

Example:

	for example (*exempli gratia*)	e.g.
	that is, specifically, namely (*id est*)	i.e.
	and so on (*et cetera*)	etc.
	and others (*et alii*)	et al. [period after al., not et)
BUT		per
		sic
		via

4.2.2 Acronyms and initialisms

An acronym is a pronounceable word formed from the first letter or letters of a number of words (e.g., NATO, radar, NORAD). An initialism is formed from the initial letters only of a number of words and is usually not pronounceable (e.g., YMCA, GIS, EEC).

Acronyms

In general, acronyms are not preceded by a definite article.

Example:

> The members of CUSO had a party on Friday.
> The University and CIDA have a development agreement.

Initialism

There are initialisms that are so common that they do not need an explanation (e.g., CBC, IBM, YMCA, Ph.D.). In all other cases, follow the rule.

Rule for initialisms

> **The first time you use an initialism it must be defined.**
>
> That is, you must write out in full the name you are going to initialize. For instance, if you plan to use New Brunswick Geographic Information Corporation frequently, write it out in full the first time you use it and add the initialism in parentheses. Then you can use the initialism for all other occurrences (e.g., New Brunswick Geographic Information Corporation (NBGIC); Geodetic Survey of Canada (GSC); University of New Brunswick (UNB)).

Initialisms representing the names of organizations usually take the article, whereas those representing a substance, method, or condition do not.

Example:

> The Government of Canada is out to destroy the CBC.
> Canada switched to SI in 1985.

Use of period

Some initialisms have periods and some do not. It all depends on how the initiator of that initialism originally formed it. Geographical initialisms DO require periods (e.g., U.S.A., P.E.I., etc.). In general though, the trend seems to be to remove the periods for initialisms.

4.2.3 Symbols

abbreviations

In general, unless an actual Arabic numeral (e.g., 1, 50) is used, symbols are written out in full. Only when figures are to be used are the abbreviations added. Figures cannot be used to start a sentence, thus symbols cannot follow these numbers. Symbols cannot be used to start a sentence either.

Example:

They finished counting twenty-five percent of the votes.
They finished counting 25% of the votes.
Twenty-five percent of the votes were counted.
They travelled 50 km in one day.
They travelled only a few kilometres in one day.

&

The ampersand (&) symbol is ONLY used in the legal title of a company or organization. It is NEVER substituted for "and."

money

When distinguishing different currencies, use the following symbols with the figure.

Example:

C$20	for Canadian dollars
US$20	for American dollars
A$20	for Australian dollars

capitals

An SI symbol uses a capital when it is derived from a proper name, but the name of the unit is spelled out in lower case.

Example:

	newton	N	
	joule	J	
	hertz	Hz	
	gal	Gal	
EXCEPT	Celsius	C	both of which are always capitalized.

no periods

An SI symbol is NEVER followed by a period unless it is the end of a sentence.

Example:

The car was 3.6 m long.
The length of the car was 3.6 m.

spacing

There is ALWAYS a SPACE between the numeral and the unit symbol except for temperature. A space is used instead of a comma between sets of three digits in large numbers. Be sure that the whole number is on the same line and that part of it does not slop over onto the next line. If necessary, move the whole set of digits to the next line.

Example:

	3 kg	NOT	3kg
	200 km	NOT	200km
BUT	15°C	NOT	15° C
	1000 (optional to put a space — preference is for NO space)		
	10 000		
	1 000 000.		

plurals

SI units are NEVER pluralized.

Example:

	Only 3 m of tape were left.
NEVER	Only 3 ms of tape were left.

5. WORDS AND PHRASES FREQUENTLY MISUSED

A
An

The article **A** is used before all constant sounds, including sounded **h**, long **u**, and **o** with the sound of **w** (as in "one").

Example:

a day; a week; a home; a house; a unit; a union; a uniform; a one-week seminar; a CPA; a 60-day note.

The article **AN** is used before all vowel sounds except long **u** and before words beginning with silent **h**.

Example:

an evening; an army; an outlet; an umbrella; an umpire; an heir; an hour; an honour; an R (pronounced "ar"); an f.o.b. order (pronounced "ef o b"); an 8-hour day; an h (pronounced "aitch").

A lot

A LOT is two words. Do not write *alot*.

Example:

We have had a lot of students ask the same question.

Accept
Except

ACCEPT is a verb meaning *to receive affirmatively*.

Example:

I accept your apology.

EXCEPT is a preposition meaning *excluding* or *other than* or a verb meaning *to exclude*.

Example:

Except for John, everyone passed the course. (preposition) Those who had passed the test were excepted from an assignment. (verb)

Accuracy
Precision

ACCURACY is a measure of how close a fact or value approaches the true value and the degree to which something is free of error.

PRECISION is a measure of the fineness of a value.

Example:

The number 6.0201 is more precise than 6.02, but it may not be more accurate.

Advice
Advise

ADVICE is a noun.

Example:

John ignored the professor's advice.

ADVISE is a verb.

Example:

The professor was pleased to advise John that he had passed the course.
We advise you to take the professor's advice.

Affect
Effect

AFFECT is almost always a verb. **EFFECT** is most commonly a noun. **AFFECT** means to have an ***EFFECT****on*; *act on*; *influence.*

Example:

The failure of the mining consortium affected John's temper.

EFFECT means *result*; *whatever is produced by a cause*; *something made to happen by a person or thing.*

Example:

The effect of the consortium failure was the loss of John's temper.
The effect of John's infected temper affected the consortium meeting.

All ready
Already

ALL READY means *completely prepared.* **ALREADY** means *previously.*

Example:

Jane has already submitted the lab report.
John has the lab report all ready to be submitted.

All Right

The term "alright" should never be used. It is properly written as two words.

Example:

It was all right to go to the pub as long as the assignment was finished.

All Together
Altogether

ALL TOGETHER means *in a group.*

Example:

The professor made sure the students were all together.

ALTOGETHER is an adverb meaning *entirely.*

Example:

He was altogether certain the students were all together.

Alternate Alternative

ALTERNATE has a basic meaning of *by turns*. As a verb, **ALTERNATE** means *to change back and forth*; *to occur by turns, first one and then the other*, and is usually followed by *with*.

Example:

John and Lyn will alternate with each other in their use of the equipment.

ALTERNATE as an adjective is usually not followed by *with*.

Example:

He introduced an alternate proposal.

ALTERNATIVE refers to a situation involving a choice and means *giving or requiring a choice between only two things*; *giving a choice from among more than two things*.

Example:

John was given the alternative of failing the course or rewriting the exam. Several alternatives were tabled at the meeting.

Among Between

AMONG is to be used for three or more persons or objects.

Example:

There was discontent among the team members.

BETWEEN is to be used for two persons or objects.

Example:

There was conflict between the Professor and John.

Amount Number

AMOUNT is to be used for money or non-countable quantities.

Example:

No amount of arguing would help the team.

NUMBER is to be used for countable items. The expression **the number** has a singular meaning and requires a singular verb; **a number** has a plural meaning and requires a plural verb.

Example:

The number of students taking Survey Camp is fifteen. A number of the students are going home for March break.

And Or

The use of the "and/or" device is generally frowned upon in formal writing because it is often confusing or ambiguous.

Example:

(wrong) A curfew would cut down on the amount of stealing and/or rioting. (What was cut down? The amount of stealing? the amount of rioting? the amount of stealing *and* rioting? the amount of stealing *or* rioting?) (right) A curfew would reduce the incidence of stealing and rioting.

Anyone
Any one

ANYONE is written as one word when the intent in "*anybody.*"

Example:

Anyone can go to the exhibit.

ANY ONE means *a single person or any single thing.*

Example:

Any one of us could have driven the car.

As to whether

Leave out the "as to."

As yet

The "as' can be left out in the majority of cases. When used at the beginning of a sentence, the "as" may be necessary.

Example:

(to express "despite everything") Yet he did not succeed. (to express "so far") As yet he has not succeeded.

Because of

See due to / because of / on account of.

Between

See among / between.

But also

See not only ... but also.

Can / May (Could / Might)

CAN means *to be able*; *ability or power.* (Remember, "cannot" is one word.)

Example:

He can pass the course.

MAY means *have permission* or *imply possibility.*

Example:

You may have the afternoon off. (permission) He may pass the course if he studies hard. (possibility)

COULD, the past tense of can, and **MIGHT**, the past tense of may, are now usually used to denote only a slight possibility or doubt.

Example:

Perhaps I could write a book, but I doubt it. He might give you permission, but don't bet on it.

cf.

See i.e. / e.g. / cf.

Cite
Site

CITE means *to quote as an authority or example; refer to.* **SITE**, as a verb, means *to situate, position, place, or locate.* As a noun, **SITE** means *the location or scene of something; the ground on which a structure is, was, or will be located.*

Example:

He wished to cite a well-loved politician but could not recall any. The company decided to site their new building on the hill. (verb) The site was visited three times by the survey crew. (noun)

Compare to
Compare with

COMPARE TO means to *assert a likeness; to liken to; point out or imply a resemblance between objects regarded as essentially of a different order.*

Example:

The airplane has been compared to a flying fortress. New York City has been compared to a dying whale.

COMPARE WITH is used mainly to point out differences between objects regarded as essentially of the same order.

Example:

Montreal has been compared with Paris. The Canadian dollar is frequently compared with the American dollar.

Complement
Compliment

COMPLEMENT can be either a verb or a noun. As a verb, **COMPLEMENT** means to *go with or complete; to make perfect; something necessary to make a whole.* As a noun, **COMPLEMENT** means *something that completes or makes perfect.*

Example:

Her skill at mathematics complements his skill at physics. (verb) The information from the encyclopaedia complemented what she already had. (verb) She has her full complement of brains. (noun) This jacket will be a good complement to the rest of your wardrobe. (noun)

COMPLIMENT can be either a verb or a noun. As a verb, **COMPLIMENT** means to *flatter, praise, or congratulate.* As a noun, **COMPLIMENT** means *a flattering remark or something said in praise or congratulation.*

Example:

The professor meant to compliment her on her ability to excel in science. (verb) He paid her a compliment. (noun)

COMPRISE
INCLUDE
COMPOSE
CONSTITUTE

COMPRISE means to *embrace*; *contain*; *include*; *consist of.* It is used when what is in question is the content of the whole, and all the components are understood to be in the list. Use it when all the parts are named or referred to.

Example:

A university community comprises students, faculty, and staff.
A zoo comprises mammals, reptiles, and birds.

INCLUDE is used when what is in question is the admission or presence of an item. There is no presumption that all or even most of the components are mentioned. Use when only some parts are named.

Example:

A university community includes students.

COMPOSE means *make up*; *make or form by combining things*; *to be the constituent elements of.*

Example:

Water is composed of hydrogen and oxygen.

CONSTITUTE means *to be the substance or elements of*; *make up*; *compose.*

Example:

People constitute a university community.
Fifty-two weeks constitute a year.
Animals constitute a zoo.

Continual
Continuous

CONTINUAL means *to repeat regularly over a period of time.*

Example:

The rain caused continual delays in finishing the survey.

CONTINUOUS means *constant*; *without interruption.*

Example:

The rain was continuous for five days.

Council
Counsel

COUNCIL means *advisory or deliberative assembly.*

Example:

The Council of Maritime Premiers met in Halifax.

COUNSEL means to offer *advice* or another name for *lawyer.*

Example:

The counsel for the defence felt it prudent to counsel his client to keep quiet.

Criterion Criteria

CRITERION means *a standard for judging something.*

Example:

The results had to meet a stiff criterion.

CRITERIA is the plural of criterion.

Example:

The criteria for the test were strictly adhered to.

Currently Presently

CURRENTLY means *at the present time now passing*; *at this moment*; *right now*; or *in the present period.*

Example:

The prime minister is currently touring his riding.

PRESENTLY means *before long*; *soon*; *directly*; or *in a short time.*

Example:

The prime minister will presently tour his riding. Although I am currently ill, I hope presently to feel better.

Data

Although common usage increasingly treats this as a singular noun, formal writing still requires a plural verb.

Example:

The data **were** entered into the computer.

Decrease to

See increase to / decrease to.

Defence Defense

Canadian spelling is defence.

Example:

The Department of National Defence. Memory Clue: **C**anada = defen**c**e; US**S**A = defen**s**e.

American spelling is defense.

Example:

The Defense Mapping Agency is in Washington.

Different from

One thing **differs from** (not than) another. The exception is when a cluttered construction like the following is to be avoided.

Example:

I view the matter in a different way from the way in which you do.

The easier construction would be the following.

Example:

I view the matter in a different way **than** you do.

Due to
Because of
On account of

DUE TO introduces an adjectival phrase and should modify nouns. It is normally used only after some form of the verb **to be** (is, are, was, were, etc.). This means it should not be used either to start a sentence or as a preposition meaning *because of*.

Example:

Her success is due to her education. (modifies success)

BECAUSE OF and **ON ACCOUNT OF** introduce adverbial phrases and should modify verbs.

Example:

He resigned because of (on account of) ill health. (modifies resigned)

Each/Every
Either/Neither
One/Another

These words are always singular and imply "one." When they are used as subjects or as adjectives modifying subjects, a singular verb is required.

Example:

Each student **is** taking a calculator into the exam.
Every student **studies** hard.
Neither of the computers **is** working.
One package **has** already been mailed; **another is** to leave tomorrow.

When two subjects connected by **and** are preceded by **each**, **every**, **many a**, or **many an**, a singular verb is used.

Example:

Each computer and printer **is** expected to be operational tomorrow.
Every chair, desk, and table **is** to be cleaned.
Many an undergraduate and graduate **has** become employed.

Each other
One another

Use **EACH OTHER** to refer to two persons or things.

Example:

The two contestants had great respect for each other.

Use **ONE ANOTHER** for more than two persons or things.

Example:

The five contestants congratulated one another.

Effect

See affect / effect.

e.g.

See i.e. / e.g. / cf.

Etc.

Et cetera (etc.) means *and other things*. It is equivalent to *and the rest*, or *and so forth*. DO NOT use "etc." at the end of a list introduced by the phrases **as follows**, **such as**, or **for example**. In these cases, the complete list must be given. DO NOT use "etc." when **and the like** or **and so on** will do.

Example:

She took pencils, paper, tacks, string, etc., in case they were needed.
Surveying equipment manufacturers, such as Wild, Zeiss, Marconi, and Texas Instruments, sent in bids.
I suppose she will need her birth certificate, her passport, and the like, for identification.

Everyone
Every one

EVERYONE means *everybody*. **EVERY ONE** means *each person in the group* and is always followed by **of**.

Example:

Everyone decided to go to the party.
Every one of the participants won a prize.

Except

See accept / except.

Farther
Further

FARTHER refers to a measurable distance. **FURTHER** refers to extent — greater in quantity, time, and degree.

Example:

He ran farther than the rest of the participants.
He explained the experiment in further detail.

Fewer

See less / fewer.

Firstly
Secondly

Firstly sounds pretentious and leads to the ungainly series *firstly, secondly, thirdly, fourthly, fifthly, sixthly, seventhly, eighthly, ninethly.* Instead write *first, second, third,* and so on.

Have

See of / have.

However

Use **HOWEVER** when the meaning is *nevertheless*. With this meaning, **avoid** starting a sentence with however. It serves better when not in the first position.

Example:

(wrong) He drove the car with flair. However, last week he wrapped the car around a telephone pole.
(right) He drove the car with flair. Last week, however, he wrapped the car around a telephone pole.

When used in the first position, **HOWEVER** means *in whatever way* or *to whatever extent.*

Example:

However dangerous the consequences, she never gave up.

I / Me / Myself

There is constant confusion about the use of I or ME.

Example:

TEST: It is easy to choose I or ME — simply leave out the other person and you will pick the right one.
He gave it to (John and) me.
John and I are invited. (I am invited.)
Between you and me, that exam was unfair. (To me the exam was unfair.)

MYSELF is not a substitute for **I** or **ME**; it is an intensifier of **I** or **ME**.

Example:

Myself, I would rather pass the course.

i.e. / e.g. / cf.

I.E. is *id est* and means ***that is***; **E.G.** is *exempli gratia* and means ***for example***; and **CF.** is *confer* and means ***compare*** or ***compare with***.

Example:

Use an indirect quotation, i.e., a restatement of a person's exact words. This book is incomplete, e.g., pages 30 to 35 are missing.

Simply because they are abbreviations does not mean you can ignore the punctuation that is their right. Use the periods. Also, if the structure of your sentence demands you put commas before and after **that is** or **for example** when written out in full, so you should punctuate the same for these abbreviations.

The abbreviation **cf.** appears most frequently in a comment inserted to warn the reader that what you are saying should be compared with something you have already said.

Example:

The scale of Map 2.2 is 1:10 000 (cf. Map 2.1 where the scale is 1:100 000).

If
Whether

Be careful to avoid using **IF** as a colloquialism for **WHETHER**. Use **IF** in a statement of condition and **WHETHER** to express alternatives. Use **WHETHER** particularly in such expressions as **see whether**, **learn whether**, **know whether**, and **doubt whether**.

Example:

If he comes, we will play the game. I doubt whether he will come. If you go on a trip, whether it be to Ontario or Québec, remember to bring your coat.

Imply
Infer

IMPLY refers to what a statement suggests or indicates. A person implies something by his/her own words or actions.

Example:

The professor implied that the course was easy.

INFER relates to the audience's interpretation; a deduction. A person infers something from another person's words or actions.

Example:

The student inferred from this remark that he could pass the course without studying.

In/In To/ Into

IN implies position within a location, or a state or condition.

Example:

The bread is in the cupboard. [location] They are in good spirits. [state or condition]

IN TO

Example: The final grades are to be sent in to the Registrar's office.
The student came in to see me.

INTO implies entry into something or change of form into something. This is especially used with verbs that suggest motion.

Example: He changed into his Superman costume.
She went into the house.

In regard to

It is incorrect to write "in regards to."

Include

See comprise / include / compose / constitute.

Increase to
Decrease to

When comparing two numbers using **INCREASE** or **DECREASE**, the first figure mentioned should be the new one.

Example:

The GNP showed an increase to $20.5 billion from $20.3 billion. The GNP showed a decrease to $20.3 billion from $20.5 billion.

Irregardless
Regardless

IRREGARDLESS is not logical as it means "not regardless." Thus it is considered nonstandard and should not be used. Use **REGARDLESS**, which means *with no heed, careless.*

Example:

He planned to miss the lab experiment regardless of the consequences.

Its
It's

ITS is a form of possessive noun. This means you NEVER add an apostrophe!

Example:

The team wanted its coach.

IT'S is a contraction of **it is**.

Example:

The Dean has suggested to the students that it's time to start studying.

NOTE that contractions are not used in formal writing.

Kind of

KIND has many meanings, among them class (a *kind* of preacher) and subdivision of a category (that *kind* of orange). **KIND** is singular; therefore write **this kind**; **that kind.** **KINDS** is plural and should be used only when you mean more than one kind; therefore write **these kinds**; **those kinds.**

Example:

I like this kind of bread. What should we do with that kind of error? These kinds of chairs are rare.

The same distinctions hold for **class**, **type**, and **sort**.

Less
Fewer

LESS refers to quantity, degree, or amount and is used with singular nouns. Use less for money and things that are not countable (less flour, less money).

Example:

He received less help in his campaign than last year.

FEWER refers to a number and is used with plural nouns. Use "fewer" for things that can be counted (fewer books, fewer votes).

Example:

He had fewer students than last year.

Lie
Lay

LIE means to *recline or rest on a surface*; *take up a horizontal position*; *rest*; *stay*. **LAY** means to *put down*; to *put*; to *place*.

Example:

	Present	Past	Past participle	
recline	lie	lay	(has) lain	lying
place or set down	lay	(has) laid	laid	laying
make false statements	lie	lied	(has) lied	lying

TEST: In deciding whether to use LIE or LAY, substitute the word **place** for the word in question. If it does not fit, then use some form of LIE.

May

See can / may.

Me / Myself

See I / me / myself.

Metre
Meter

METRE is the internationally (except for the United States) accepted spelling for the metric unit of measurement. It is to be used as long as you live in Canada.

Example:

The unit name is metre and the symbol is m. Millimetres, centimetres, metres, and kilometres are the most common units of measurement in surveying.

METER is used when the discussion centres around a piece of equipment.

Example:

The students were taught how to operate a gravimeter. The water meter is read once a month.

Nor
Or

Use **NOR** with **neither** and **OR** by itself or with **either**.

Example:

He passed neither the exam nor the course. Will you have either tea or coffee?

Not only ... but also

These are correlative conjunctions that connect grammatically equal elements. If the **NOT ONLY** is used, then in most cases the **BUT ALSO** must be used. The placement of this construction is critical. It depends upon parallelism, which requires that the parts of speech or grammatical construction following **NOT ONLY** and **BUT ALSO** be parallel (of the same kind).

Example:

(wrong)	They not only failed the course but also the year.
(right)	They failed not only the course but also the year.

when not to use ***but also***

(wrong)	Diane is not only a dancer, but also an excellent dancer.
(right)	Diane is not only a dancer, but an excellent dancer.

Number

See amount / number.

Of Have

Do not use **OF** instead of **HAVE** in the verb form. The correct forms are:

Example:

could have	could've	NOT could of
would have	would've	NOT would of
should have	should've	NOT should of

might have, may have, must have, ought to have, and so on.
NOTE: contractions (could've, would've) are not used in formal writing.

On account of

See due to / because of / on account of.

One another

See each other / one another.

One of ...

ONE OF or **ONE OF THE** is followed by a singular verb.

Example:

One of the books **has** been lost.
One of us **has** to complete the race.

ONE OF THOSE WHO or **ONE OF THE THINGS THAT** is followed by a plural verb.

Example:

He is one of those who **favour** a longer March break.
I ordered one of the computers that **were** advertised.

Only

The adverb **ONLY** is negative in meaning. Therefore do not use another negative with it unless you want a positive meaning. It should be placed as close to the word modified — usually before — as possible. In the wrong place, it can change the entire meaning of the sentence.

Example:

(wrong) I only use this pen for special projects.
(right) I use this pen only for special projects. (I do not use this pen for anything else.)
(wrong) I do not only use this pen for special projects.
(right) I do not use this pen only for special projects. (I use the pen for other things as well.)

Or

See nor / or.

Practice
Practise

PRACTICE is a noun meaning *an action done many times over in order to gain skill; the usual way.*

Example:

The practice session for the band lasted over an hour. Your plan is good in theory, but not in actual practice.

PRACTISE is a verb meaning *to do as a rule; make a custom of; follow; observe; work at or follow as a profession, art, or occupation; practise a profession.*

Example:

The newly graduated surveyor practises in Moose Jaw. She was pleased to be able to practise the piano. Practise what you preach!

Precision

See accuracy / precision.

Presently

See currently / presently.

Principal
Principle

PRINCIPAL means *a sum of money; main; most significant; head of a school.*

Example:

The principal reason for the principals going to Québec was to attend the conference. The principal invested in that company amounted to over $1000.

PRINCIPLE means *basic truth, law* or *controlling idea.*

Example:

The experiment was based on a very simple principle. The principle of equal justice was expounded by the principal of the school.

Rational
Rationale

RATIONAL is an adjective meaning *logical* or *able to reason.*

Example:

It was a rational decision.

RATIONALE is a noun meaning *explanation.*

Example:

The rationale for the proposal was poorly presented.

Regardless

See *irregardless/ regardless.*

Relation
Relationship

RELATION describes a connection between things

Example:

There is a relation between poverty and poor academic progress.

RELATIONSHIP describes a connection between people.

Example: Our business relationship has improved over the years.

Site *See* cite / site.

Than
Then

THAN is a conjunction used in comparisons.

Example:
I would rather go now than wait until next year.
That pizza is more than I can eat.

THEN is an adverb meaning *at that time* or *next.*

Example:
He then stated that he could do the job better than me.
Tom laughed, and then we recognized him.

That
Which
Who

WHO and **THAT** are used when referring to persons, **WHO** being used when the individual person or the individuality of a group is meant and **THAT** when a class, species, or type is meant.

Example:
He is the student who understands the method of least squares.
He is the kind of student that we want.

WHICH and **THAT** are used when referring to places, objects, and animals. **WHICH** is always used to introduce non-essential (non-restrictive) clauses (a clause that can be removed and the sentence will make sense). **THAT** is ordinarily used to introduce essential (restrictive) clauses (a clause that is essential to the meaning of the word it modifies).

Example:
Frank's paper on computers, which was published last month, should be of some help.
The paper that was published last month should be of some help.

Their
There

THEIR is the possessive form.

Example: John saw no reason to object to their proposal.

THERE is an adverb meaning *at that place* or *at that point.*

Example: There is a reason for putting the table there.

To/Too/Two

TO is mainly a preposition.

Example:

We went to the store.

TOO is an adjective showing degree (too hot) or an adverb meaning *moreover*.

Example:

Too many people showed up. I am going, too.

TWO is the word for the number 2.

Example:

Two people raced down the hill.

Toward Towards

Both forms are correct.

Example:

They raced toward(s) the finish line.

Whether

See if / whether.

Which

See that / which / who

Who

See that / which / who, or immediately below.

Who/Whom/ Whoever Whomever

These pronouns are both interrogative pronouns (used in asking questions) and relative pronouns (used to refer to a noun in the main clause of a sentence).

Example:

(interrogative)	Who is going?
	To whom shall I give the parcel?
(relative)	John is the student who is going.
	John, whom I have never met, is arriving today.

WHO (WHOEVER) is the nominative form. Use it whenever he, she, they, I, or we could be substituted in the **WHO** clause.

Example:

The matter of **who should pay** was not decided. (He should pay.) I will speak to **whoever answers the phone**. (She answers the phone.)

WHOM (WHOMEVER) is the objective form. Use it whenever him, her, them, me, or us could be substituted as the object of the verb or as the object of a preposition in the **WHOM** clause.

Example:

It depends on **whom they mean**. (They mean him.) I will hire **whomever I can find**. (I can find her.)

Your
You're

YOUR shows possession.

Example: Your hat is too tight.

YOU'RE is a contraction of *you are*.

Example: You're going to miss your plane.

NOTE: Contractions are not used in formal writing.

PREPOSITIONAL USAGE

abound in (A man abounding in natural ability.)
abound with (A faithful man shall abound with blessings.)
accord with
accord (of one's own)
account for (something or someone)
account to (someone)
acquiesce in
adhere to
adverse to
agree on terms
agree to a proposal
agree to do (NOT accept to do)
agree with a person
aim at
alien to
angry at (something)
angry with (someone)
apply for (a position)
apply to (someone or something)
argue about (something)
argue with (a person)
associated with (NOT associated to)
averse to
aware of
begin by doing something
begin from a point
begin with an act
benefits of the benefactor

benefits to the beneficiary
capable of
capacity for
centre on (NOT around)
circumstances (in the)
concur in an opinion
concur with a person
conform to
conformity with (in)
consist in (***Definition***: Memory consists in a present imagination of past incidents.)
consist of (***Material***: The meal consisted of fish. Made up of.)
consistent with
content oneself with
content others by doing
contrast (When CONTRAST is used as a verb, it is followed by **with** (to contrast with). Either **to** or **with** may be used when CONTRAST is used as a noun (in contrast to).)
convenient for (suitable)
convenient to (near at hand)
conversant with
correspond to (resemble; agree with)
correspond with (communicate; exchange letters)
culminate in (NOT with)
demand for a thing
demand a thing from or of a person
derive from
differ with a person
disagree with a person
embark money in a business
embark on a ship, on a career
endowed with
free from or of
identical with
immune from an obligation or something unpleasant
immune to a disease
independent of
indifferent to
indispensable to
infected with disease, bad qualities
infested with insects, wolves, vermin
initiative in (take the)
initiative (on one's own)
insensible to
insight into
interested in
invest in a business
invest with an office, a garment
join in a game
join with some person or thing
labour at a task
labour for a person, for an end

labour in a good cause
live by labour
live for riches
live on an income
look after a business
look at a thing
look for a missing article
look into a matter
look over an account
moment (on the spur of the)
moment's notice (at a)
oblivious of or to
parallel with or to
perpendicular to
point at a thing
point to a fact
possessed of wealth
possessed with an idea
prefer one to the other
prefer to do one thing rather than another
preference for
prevent from doing something
proceed against a person
proceed to an act not previously started
proceed with an act already started
prohibit from doing something
provide against ill luck
provide for an emergency
provide oneself with something
pursuant to (in pursuance of)
ready for a journey
ready to do something
ready with a reply
recommend that she do (NOT recommend her to do)
reference to (preceded by **with**, NOT **in**)
regard for a person (with regard to a subject)
regard for one's own interest
relief to suffering (bring)
relieve one of a duty
relieve with a tint
replace a person with another person (BUT a person is replaced by another)
responsibility (the) of deciding, of a position
responsibility for an action (assume)
responsible to a person for an action
result from an event
result in a failure
result (the) of an investigation
retroactive to
right of way, passage
right to do
satisfaction in an improvement (find)
satisfaction (the) of knowing

satisfaction to a person (give)
satisfied with a thing
secure against attack
secure from harm
secure in a position
solution of
speak to (tell something to)
speak with (discuss with)
substitute for
suggest that he do (NOT suggest him to do)
tamper with
unconscious of
variance on certain topics (at)
variance with a person (at)
versed in
view of the circumstances (in)
view to achieving a purpose (with a)
wary of a danger

6. REFERENCES AND FOOTNOTES

6.1 What is a Reference?

References are used for two reasons. The first reason is to give credit where credit is due. This safeguards the writer from a charge of plagiarism. The second reason is to provide an interested reader with the location of additional information. A list of references is provided immediately following the chapter containing your conclusions and recommendations, or summary, and before any appendices. If you have opted to use a bibliography as well as a list of references, the bibliography follows the list of references.

6.1.1 Give credit

A reference is used to acknowledge the origin, or source, of material used in an essay, report, paper, article, or thesis. A reference **MUST** be supplied in the text (e.g., [Smith, 1992]) whenever a concept, idea, opinion, proof, or quotation is utilized in your written material, **UNLESS** it originates from your own brain. Even in an oral presentation, the source of your information must be given, especially when using direct quotations. Failure to give credit can result in (i) doubt being cast over the author's credibility, and (ii) the author being accused of plagiarism.

common knowledge

The only exception concerns matters of **COMMON KNOWLEDGE,** which any reader in your field would acknowledge to be accepted fact. For example, Isaac Newton's law of universal gravitation or Einstein's theory of relativity would not have to be referenced to either Newton or Einstein as these are items of common knowledge.

6.1.2 Provide additional information

A reference can also be used to call the reader's attention to other interpretations, authorities, or treatments not explicitly handled by the author. For instance, if you as the author felt additional material on Einstein would aid in understanding your application of the theory of relatively, a reference to a source giving the background to and a good explanation of the theory might be included. If you as the author use a landmark legal decision as the basis of the

argument but other less significant cases concerning the same subject exist, a judicious selection of these cases could be referenced to enhance the argument.

6.1.3 Hints

Scrupulous documentation of sources is the best way to avoid unintentional contempt or plagiarism. A carefully keep record of every possible citation researched for the report will mean that, as you are doing the final edition of your paper in the hour before it is due, you will not be faced with the problem of finding the source of the key quotation upon which your whole argument rests. It is a good idea to write up the list of references you use at the same time you write the paper. It is a simple matter to delete a reference from the list if you change the text, but it could be a horrendous problem to find a reference again if you leave the compilation of the page of references to the last.

6.2 Plagiarism

The University of New Brunswick uses the following definition of plagiarism [University of New Brunswick, 1996, p. B.14]:

Plagiarism includes:

- quoting verbatim or almost verbatim from a source (such as copyrighted material, notes, letters, business entries, computer materials, etc.) without acknowledgment;
- adopting someone else's line of thought, argument, arrangement, or supporting evidence (such as, for example, statistics, bibliographies, etc.) without indicating such dependence;
- submitting someone else's work, in whatever form (film, workbook, artwork, computer materials, etc.) without acknowledgment;
- knowingly representing as one's own work any idea of another.

penalties

Penalties for proven cases of deliberate plagiarism include receiving an F grade for the assignment, or receiving an F grade for the course. The minimum penalty for a subsequent offence is an F grade for the course.

6.3 Copyright Act

The invention of the printing press, which could produce multiple copies of any written material, led to the evolution of legal copyrights. Canadian copyright law protects authors from theft of any work or profits that might accrue from their efforts. Making a photocopy of a chapter from a book instead of buying the book robs the author of the royalties from the purchase of that book and thus violates the Copyright Act. INFORMATION, however, is not subject to copyright, that is, as long as the words are changed, expressing the **idea** of a copyright owner does not violate the act. The rules of ethics, though, dictate that the idea be acknowledged with a reference.

information not copyrighted

The 1924 Canadian Copyright Act, currently under review by the federal government, states that quotations from or photocopies of sources is illegal UNLESS permission to quote or photocopy has been received from the copyright owner of that source. Thankfully for students, there is an exception in the law, called "***fair dealing***," which still exists for faculty and students in the cases of criticism, review, private study, research, or newspaper summary. In these cases, portions of the source may be quoted or a **single** photocopy may be made without the copyright owner's permission (again ethical considerations demand that the source be referenced). The law considers making one copy of the whole or part of the following as "fair dealing:"

educational institutions

- an article of a scientific, technical, or scholarly nature from a book or periodical issue containing other works;
- a newspaper article or entry from an encyclopedia, dictionary, annotated bibliography, or similar reference work;
- a short story, play, poem, or essay from a book or periodical containing other works;
- up to 10% of the complete work.

If more than one copy is going to be made, however, then we enter the realm of the CANCOPY agreement.

CANCOPY

The university is a signatory to an agreement with the copyright collective known as CANCOPY, which authorizes the photocopying of works for educational purposes. This agreement covers a wide range of published works,

but with a number of exceptions. Anyone wishing to obtain more information about the CANCOPY agreement should see

CANCOPY

http://degaulle.hil.unb.ca/library/cancopy/

Those wishing to copy material not covered by the CANCOPY agreement must obtain permission directly from the copyright holder.

For the right to copy material, the university pays CANCOPY a set charge per page, which is re-negotiated usually every two years. In all cases, however, anyone using these copied materials MUST reference the source. Ignorance of the CANCOPY agreement or of the law will not protect you against charges of copyright infringement.

real world

Once you have left university, you enter the world of free enterprise where copyright violation will be dealt with more harshly than while you were in an institute of higher learning. If you ever photocopy or quote a source without obtaining permission from the copyright owner, you will be liable for prosecution under the Copyright Act. In such a case, even if you have referenced your source you will still not have met the **legal** requirements.

figures

As long as your written material is a result of research or private study, you can "lift" a figure from someone else's work provided you acknowledge it properly. To avoid any possibility of prosecution, however, it is better to re-draw the figure with enough changes that it is not immediately recognizable as coming from another source. Here as well, you will still have to acknowledge the source of your IDEA for the figure.

RULES for figure reference

idea

If you use a figure in your text, the **IDEA** of which came from one of your readings, this figure must be referenced as

... (**after** Donnan [1965, p. 12]).

Example:

Figure 2.1. An approximate representation of the coast (after Donnan [1965, p. 12]).

Note that the period to end the sentence appears OUTSIDE the parentheses.

photocopy

If the figure you use in your text is a **PHOTOCOPY** of a figure found in a source, this figure must be referenced as:

... (**from** Donnan [1965, p. 12]).

Example:

Figure 2.3. The coastline of Nova Scotia (from Donnan [1965, p. 12]).

6.4 General Information About Non-Electronic Referencing

This section gives a general overview of referencing non-electronic material. See section 6.7 for information on electronic citations.

The following subsections contain information on in-text citations, italicization, capitalization, composite works, coping with errors, and list of references.

6.4.1 In-text citations

For in-text citations, brackets ([ ]) are usually used simply to distinguish a reference from a comment in parentheses. Some publications request that parentheses be used. Some prefer that instead of name and date, a sequential numbering system be used (e.g., [1], [2], [3]. etc.). The Department of Geodesy and Geomatics Engineering requires the use of name and date in square brackets.

format

The format (of **[name, date]**) for citing a reference in the text is shown by the following (note again that the period to end the sentence appears outside the parentheses):

Example:

The Dene nation has had its land claims mapped [Asch, 1984].
Asch [1984] proved that the Dene nation's land claims could be mapped.
Many authors have stated that the Dene Mapping Project is indispensable (e.g., Asch [1984]; Wonders [1985]).

2 authors

The in-text citation for two authors is:

Adam and Smith [1979]; [Adam and Smith, 1979].

> 2 authors

For more than two authors, the in-text citation is (note that the "al." in *et al.* takes a period):

Adam et al. [1988]; [Adam et al., 1988].

author string

If you gather a number of references together in a string, they should be arranged by year from the oldest to the most recent.

Example:

> [Adam, 1978a; Adam, 1979b; Adam and Smith, 1979; Adam et al., 1988].

quotation, table, figure, equation

If you are referencing a specific quotation, table, figure, or equation, it is helpful to the reader to indicate this. Rather than leaving your reader to scour a 987-page volume to find one table, provide a clue by adding the **page** number, or in the case of an equation, the **equation number**.

Example:

> This table was obtained from Adam [1983, p. 37].
> A modified version of the basic equation [Smith, 1966, eqn. (3.21)] was used to compute our results.

multiple references by the same author

Sometimes the **same** author will provide you with more than one source written in the same year and you end up with a number of Smith [1988] citations. In addition, if an individual has co-authored a number of papers in the same year, you can end up with a bunch of Adam et al. [1980] citations. You must provide further information to help the reader identify the correct reference in your list of references.

use of "a," "b," "c," etc.

In this case, you assign an "a," a "b," a "c,", and so on, to the references. Be sure you assign the "a," "b," or "c," to the correct reference in the text **AFTER** you have completed your list of references. The "a," "b," "c," is **NOT** given to the references in the order in which they appear in the text but in the (alphabetical) order in which they appear in the list of references. If possible, try to put these references in date order in your list of references.

For instance, if Smith published a paper in April 1978, proving the world was round, and then presented a paper in September 1978, proving the grass was green, your citations in the text would be as follows.

Example:

> Smith [1978a] for the roundness of the world;
> Smith [1978b] for the greenness of the grass.

multiple authors with same name

In the case of multiple authors, which give you a number of Adam et al. [1988] citations in the text, the solution is again the same. Once you have compiled your list of references, add the appropriate "a," "b," or "c," in the list, then transfer this to your in-text citation. There will be cases where Adam is the primary author but the secondary and tertiary authors change. In this case, the list of references is still put in alphabetical order first, then the "a," "b," or "c," is applied, first to the list and then to the in-text citation.

6.4.2 Italics

Certain elements of some references should appear in italics. Most word processing machines are capable of producing italics. If you cannot print italics, what should appear *italicized* must be underlined. In the world of publishing, anything underlined in a manuscript will be printed in italics by the publisher.

Example:

> Landkof, N. S. (1972). Foundations of Potential Theory. Springer, New York.
> Landkof, N. S. (1972). *Foundations of Potential Theory*. Springer, New York.

italic items

Only the following are italicized:

- titles of copyrighted books, theses, or dissertations (the copyright mark must appear on the title page);
- the source (journal name) of articles in recognized journals;
- the name of proceedings that have been edited or refereed; and
- legal decisions, statutes, and regulations.

non-copyrighted work

If the papers of a conference are simply gathered together and bound, these are not "proceedings" but are "collected papers" and the title of the conference is not italicized (underlined). Technical papers of organizations, lecture notes, technical reports, and some older theses of universities are usually not copyrighted books, so nothing in the reference is italicized. If they are copyrighted, then treat them as you would a book.

Example:

Book:	Vanícek, P., and E. J. Krakiwsky (1986). *Geodesy: The Concepts*. 2nd rev. ed., North-Holland, Amsterdam.
Thesis	Nichols, S. E. (1983). *Delimitation of Tidal Boundaries*. M.Eng. thesis, Department of Surveying Engineering, University of New Brunswick, Fredericton, N.B., Canada.
Article:	Henssen, J. L. G. (1975). "Cadastres, including some aspects of assessment of real property." *The Canadian Surveyor*, 29(1), pp. 115-120.
Proceedings:	Markowitz, W., and B. Guinot (Eds.)(1968). "Continental drift, secular motion of the pole and rotation of the earth." *Proceedings of the International Astronomical Union Symposium No. 32*, Stresa, Italy, 11-13 March, 1967. Springer/Reidel, London.
Legal:	*Saueracher et al. v. Snow et al.* (1974), 14 N.S.R. (2d) 346.
Collected papers	Langley, R. B., J. D. McLaughlin, and D. E. Wells (1982). "The potential engineering and land surveying market for GPS." Collected papers of the American Society of Civil Engineers Specialty Conference on Engineering Applications of Space Age Surveying Technology, Nashville, Tenn., 10-12 June.

presented

Nothing in a reference to a paper presented at a conference and not published in proceedings is italicized.

Example:

Gregerson, L. F. (1975). "Inertial geodesy in Canada." Paper presented at the Fall Meeting of the American Geophysical Union, San Francisco, Calif., U.S.A., 13 December.

6.4.3 Capitals in a reference

There are a variety of styles for the use of capitals in lists of references. The Department of Geodesy and Geomatics Engineering follows the style of mathematics and physics. Use the style set out here; not the style the publisher has used.

book

The first letter of all words in the title of a book, the title of a journal, the name of a conference, or the name of a proceedings are capitalized, except articles, prepositions, and conjunctions.

Example:

Vanícek, P., and E. J. Krakiwsky (1986). *Geodesy: The Concepts*. 2nd rev. ed., North-Holland, Amsterdam.

paper
article

For a paper or an article, capitals are used for the first letter of words in the title only for those words ordinarily capitalized (e.g., proper names).

Example:

> Henssen, J. L. G. (1975). "Cadastres, including some aspects of assessment of real property." *The Canadian Surveyor*, 29(1), pp. 115-120.

6.4.4 Composite works

Most encyclopedias, dictionaries, atlases, etc., are composite works made up of separate contributions from numerous different sources. In these cases, the entry should begin with the title unless there are only one or two authors or editors.

Example:

> *Columbia-Viking Desk Encyclopedia* (1968). "John Paul Jones." 3rd ed., The Viking Press, New York, p. 123.
> McWhirter, N., and R., McWhirter (Eds.)(1975). *Guinness Book of World Records*. 13th ed., Bantam Books, New York.

6.4.5 Coping with errors

Occasionally, errors creep into published material. There are methods to cope with this problem.

reproduce
exactly

The content of titles used in a reference should be reproduced exactly. For instance, if meter (distance) has been used in an American publication, do not change it to metre (distance) simply because that is the Canadian spelling. Even if the title contains a spelling error, that error must be reproduced exactly as well.

[sic]

If the spelling error causes confusion, add "[*sic*]" after the word (the "sic' is to be italicized). This alerts the reader that you are aware of the error and did not originate it. The term [*sic*] means ***so***; ***thus***, and is used to emphasize the fact that something has been copied just as it is in the original.

Example:

> Reinhart, E. (1983). "Global Positioning Systems [*sic*] present status of technologie [*sic*] and future trends." Seminar on Topographic and Hydrographic Surveying, UN, Dubai, United Arab Emirates, 23 April-5 May.

In the first case in the above example, "Systems" should be possessive not plural (i.e., System's), and in the second case, "technologie" should be technology. Brackets indicate that you have added the interpolation; it was not in the original. The word "sic" is to be italicized.

6.4.6 List of references; bibliography

The list of references contains those sources you actually cited in your report. A bibliography contains sources you may have consulted, but which you did not cite in your report. The format for listing your sources on the page of references, or your reading material in a bibliography, is **ALPHABETICAL BY AUTHOR.** Within this alphabetical arrangement, a date order is used. Contrary to the in-text citations, the list of references and bibliography use parentheses, not brackets, around the date (e.g., (1989)).

numbering

DO NOT number the references in the list unless you have used a number in the text instead of the [name, date] format. This numbering format is unacceptable to the Department of Geodesy and Geomatics Engineering, but may be required by some companies or journals. Reverse indent the references in the list as shown in all the examples in section 6.6.

indenting

initials vs. full name

Use only initials for the author's first and second names. The full name is not necessary unless confusion would result. For instance, if you are using James T. Adam (1980) and John T. Adam (1980), supply the first name in full in both cases. The only other time you use the full name of the author is in a footnote (see section 6.7).

name order

For the primary author, the surname precedes the initials. For the second, third, and so on, authors, the initials precede the surname. Put the references and bibliography in alphabetical order first, then if there are identical author(s), order them by date, with the oldest first followed by the most recent.

Example:

Same author arranged by date from oldest to the most recent:
Adam, J. (1978).
Adam, J. (1980).

Two different authors arranged alphabetically:
Adam, S. (1990).
Adam, S. T. (1990).

For more than one author, again arrange them in alphabetical order, first by the primary author, then by the second author, then by the third author, and so on.
Adam, A. (1980a).
Adam, A. (1980b).
Adam, J. (1980).
Adam, J., and B. Brown (1970).
Adam, J., and C. Cook (1965).
Adam, J., B. Brown, and S. Moon (1960).
Adam, S. T. (1900).

and others

All authors should be listed in the reference. Some journals, however, may request you list the first three authors' names only and then add "and others." This is totally unfair to the authors you leave out, and could cause problems when searching a computerized library system. If the authors are not mentioned in the reference, they cannot be found in a computerized system. **It is therefore the standard in the Department to list all authors of a publication.**

Example:

(to be used only when specifically requested)
Adam, J., B. Brown, C. Cook, and others (1983).

abbreviations

Geographical, not postal, abbreviations are to be used when referring to a province or state. The abbreviations for provinces in Canada and states in the United States use upper- and lower-case letters.

Example:

Alabama	Ala.	*NOT* AL	Alberta	Alta.	*NOT* AB
Alaska	Alaska	*NOT* AK	British Columbia	B.C.	*NOT* BC
Arizona	Ariz.	*NOT* AZ	Manitoba	Man.	*NOT* MB
Arkansas	Ark.	*NOT* AR	New Brunswick	N.B.	*NOT* NB
California	Calif.	*NOT* CA	Newfoundland	Nfld.	*NOT* NF
Colorado	Colo.	*NOT* CO	Northwest Territories	N.W.T.	*NOT* NT
Connecticut	Conn.	*NOT* CT	Nova Scotia	N.S.	*NOT* NS

6.5 General Formats for Non-Electronic Material

This section sets out the specific formats for the most common references. Section 6.6 gives examples of the types of references you will encounter.

6.5.1 Books

Format:

Author's last name, author's initials (Ed(s).)[a] (copyright date of latest edition)[b]. *Title*. Volume number or part number [c], edition if other than first edition [d], publishing house, city [e].

a. For a book that has been compiled by an editor or editors, add the (Ed.) or (Eds.) notation. editor

b. Frequently a book will be reprinted or a new edition produced. In the case of a second, third, and so on, printing, the original copyright date is maintained by the publisher. If subsequent editions are published, the copyright date of the most recent edition is used. A second or third printing means the original manuscript has been used with no changes. Another edition means the authors have made changes and a new manuscript has been produced. You usually find the printing history of a book on the verso of the title page. edition

Example:

© 1958, 1960, 1968 by Columbia University Press

This example means that there are three editions to the book. In this case, 1968 would be the date to use in the reference. Sometimes you have to really search for the date. Try the back covers, the last page of text, the author's Foreword, or the publication number of a government publication (e.g., Surveys and Mapping Branch Misc. Ser. 73/3 gives us the year of 1973).

c. If a book is brought out in more than one volume or part, specify the volume or part that you are referencing. volume, part

d. The fact that a book is a first edition is assumed. If the book is other than a first edition, this should be specified as 2nd ed., 3rd ed., and so forth. first edition

city of publication

e. Frequently, more than one city will be listed on the title page. If the verso of the title page does not contain a statement similar to "Sole distributor for the U.S.A. and Canada" followed by an address in North America, use the first North American city listed, if there is one, or the first major city listed. Providing the city simply increases the chances of a reader being able to obtain a copy of the book.

6.5.2 Conferences and symposia

Format:
Author's last name, author's initials (year conference proceedings published). "Title of paper." *Proceedings of Whatever Conference it is*, editor's name [a]. Sponsors [b], place conference held, date held [c]. Publisher, city [d], page numbers of the paper.

editor

a. If the proceedings have been edited by a specific person, his/her name should appear as, e.g., "Ed. J. Smith."

sponsors

b. The sponsors of the conference should be listed in as abbreviated a form as possible. For instance, if the University of New Brunswick sponsored a symposium, this would appear as UNB. Most government departments and agencies and professional organizations are known by their initialisms, so use them.

conference date vs. publishing date

c. Usually a conference and the published proceedings occur in the same year so the date the conference was held will be the month (e.g., 12-15 May). Sometimes a conference will be held one year and the proceedings will be published the following year. In this case, the publishing date will appear immediately after the author's initials (e.g., (1981)) and the date of the conference will include the year (e.g., 12-15 May 1980).

unfamiliar cities

d. If the city is obscure, add the abbreviation for the (U.S.A.) state, (Canadian) province, (European) country. If the city is a familiar one (New York, Toronto, London) this can be omitted.

6.5.3 Journal articles

Format:
Author's last name, author's initials (year of journal). "Title of article." *Name of Journal*, Volume, Number, pages of article [a].

a. There are a number of ways in which the volume, number, and pages of the article can be written. The numbering system used by the journal for volume and number should be reproduced exactly. If the journal uses roman numerals for its volume numbers (e.g., Vol. XIX), use roman numerals. The idea is to be consistent throughout the list of references in the form you use for volume and number. Choose one style for each piece of writing and stick to it.

volume, number, pages

Example:

Vol. XXX, No, 4, pp. 12-30
Vol. 30, No. 4, pp. 12-30.
30(4):12-30.
Volume 30, Number 4, pp. 12-30. (Used infrequently.)
v. 30, n. 4, pp. 12-30. (Used infrequently.)

6.6 Referencing Examples for Non-Electronic Material

In all cases where italics are shown, underlining can be used if italics are not available.

Frost, N. H., and J. E. Lilly (1996). "Crustal movement in the Lake St. John area, Québec." *Geomatica*, Vol. 30, No. 4, pp. 292-299.

ARTICLE

Gough, D. I., and W. I. Gough (1980). "Stress and deflection in the lithosphere near Lake Kariba." *Geophysical Journal of the Royal Astronomical Society*, Vol. 21, Part I, pp. 65-78, Part II, pp. 79-101.

ARTICLE, IN TWO PARTS

Brown, L. A. (1979). *The Story of Maps*. Bonanza Books, New York.

BOOK, ONE AUTHOR

Vanícek, P., and E. J. Krakiwsky (1982). *Geodesy: The Concepts*. North-Holland, Amsterdam.

Telford, W. M., L. P. Geldart, R. E. Sheriff, and D. A. Keys (1996). *Applied Geophysics*. Cambridge University Press, Cambridge.

BOOK, MORE THAN ONE AUTHOR

Condon, E. U., and H. Odishaw (Eds.)(1967). *Handbook of Physics*. 2nd ed., McGraw-Hill, New York.

BOOK, EDITED

Asimov, I. (1972). *Biographical Encyclopaedia of Science and Technology*. 2nd ed., Avon Books, New York.

Vanícek, P., and E. J. Krakiwsky (1986). *Geodesy: The Concepts*. 2nd rev. ed., North-Holland, Amsterdam.

BOOK, OTHER THAN FIRST EDITION

Hancock, H. (1917). *Theory of Maxima and Minima*. Dover reprint, 1960.

BOOK, REPRINT

BOOK, ONE VOLUME OF MULTI-VOLUME SERIES

Hagihara, Y. (1971). *Perturbation Theory.* Vol. II of *Celestial Mechanics*, The MIT Press, Cambridge.

BOOK, ONE PART OF MULTI PART BOOK

Routh, E. J. (1884). *Dynamics of a System of Rigid Bodies.* Part II, 4th ed., Dover reprint, 1955.

BOOK, EDITED CHAPTERS BY DIFFERENT AUTHORS

Kaula, W. (1966). "Global harmonic and statistical analysis of gravity." In *Extension of Gravity Anomalies of Unsurveyed Areas*, Ed. H. Orlin. American Geophysical Union Monograph 9, Washington, D.C., U.S.A., pp. 58-67.

BOOK, UNEDITED CHAPTERS BY DIFFERENT AUTHORS

McLaughlin, J. (1989). "The future." Chapter 12 in *Survey Law in Canada*, Canadian Institute of Surveying and Mapping, Carswell, Toronto, pp. 507-518.

BOOK, IN A SERIES

Burnside, C. D. (1971). *Electromagnetic Distance Measurement.* In series "Aspects of Modern Land Surveying," Ed. J. R. Smith, Crosby Lockwood, London.

BOOK, TRANSLATED

Hohersel, G., and A. M. Tropper (1963). *Integral Equations.* Translated from German by W. de Gruyter and Co., Berlin, 1968.

Rektorys, K. (Ed.)(1969). *Survey of Applicable Mathematics.* Translated from Czech by Dr. Rudolf Vyborny et al., 1968, The MIT Press, Cambridge, U.S.A.

NOTE: In the first case, the first date (1963) was when the book was originally copyrighted, and the second date (1968) was when the translation was printed.
In the second case, the first date (1969) was when the translation was copyrighted (as no original copyright date was available). The second date (1968) was the year in which the translation was done.

COMPUTER PROGRAM DOCUMENTATION

Beattie, D. S. (1988). "Documentation of program GANET (Geodetic Adjustment of Networks)." Publication of the Geodetic Survey of Canada, Energy, Mines and Resources Canada, Ottawa, Canada.

CONTRACT REPORT

Wells, D. E., and A. Kleusberg (1999). "Kinematic differential Global Positioning System." Final contract report prepared by the Department of Surveying Engineering, University of New Brunswick, Fredericton, N.B., Canada, for the U.S. Army Engineer Topographic Laboratories, Department of the Army, Fort Belvoir, Va., U.S.A., March, 55 pp.

DRAWINGS

See FIGURES

Encyclopedia Britannica (1928). "Radio astronomy." London, pp. 1076-1077.

ENCYCLOPEDIA, DICTIONARIES, ATLASES, etc.

Medallion War Atlas (1973). "John Paul Jones." Hammond Inc., New York, p. 1200.

McWhirter, N., and R. McWhirter (Eds.)(1975). *Guinness Book of World Records*. 13th ed., Bantam Books, New York.

Texas Instruments, Inc. (1988). *TI 4100 GPS Surveyor*. Equipment brochure, Nashville, Tenn.

EQUIPMENT BROCHURE

Magnavox (1989). "The latest in GPS receivers." Equipment brochure, Cupertina, Calif.

NOTE: In the first example, there was a copyright mark (©) beside the date, thus it is treated as a book. In the second example, there was no copyright mark and so it is formatted as an article.

At the end of the figure caption, add (after Donnan [1965, p. 12]).

FIGURE, IDEA FOR

Example:

Figure 2.1. An approximate representation of the layout of the camp (after Donnan [1965, p. 12)].

At the end of the figure caption, add (from Donnan [1965, p. 12]).

FIGURE, PHOTOCOPY

Example:

Figure 2.3. The camp (from Donnan [1965, p. 12)].

Böhm, J. (1973). *Vyšši Geodesie 1.* *ČVUT*, Prague, Czechoslovakia.

FOREIGN PUBLICATIONS

NOTE: The proper diacritical marks for any foreign word or name should be used.

Canada, Fisheries and Oceans (1983). *Canadian Tide and Current Tables*. Vols. I-VI, Tides and Water Levels Branch, Canadian Hydrographic Service, Scientific Information and Publications Branch, Ottawa.

GOVERNMENT PUBLICATIONS

Krakiwsky, E. J. (1975). "A synthesis of recent advances in the method of least squares." Department of Surveying Engineering Lecture Notes No. 42, University of New Brunswick, Fredericton, N.B., Canada.

LECTURE NOTES AND TECHNICAL REPORTS

Wells, D. E., A. Kleusberg, and P. Vanícek (1994). "A seamless vertical-reference surface for acquisition, management and ECDIS display of hydrographic data. Department of Geodesy and Geomatics Engineering Technical Report No. 179, University of New Brunswick, Fredericton, N.B., Canada.

Pope, A. J. (1996). "The statistics of residuals and the detection of outliers." NOAA Technical Report NOS 65 NGS 1, U.S. Department of Commerce, Rockville, Md., U.S.A.

See section 6.9.

LEGAL CASES

LEGAL REFERENCING

See section 6.9.

LEGISLATION

See section 6.9.

MANUALS, BY ORGANIZATIONS

Canada, Energy, Mines and Resources (1973). "Specifications and recommendations for control surveys and survey markers." Surveys and Mapping Branch Misc. Ser. 73/3, Ottawa, Ontario, Canada, 33 pp.

United States Department of Transportation/Department of Defense (1993). "1992 Federal Radionavigation Plan." Final report January 1990 to December 1992, DOD-4650.5/DOT-VNTSC-RSPA-92-2, Washington, D.C., 240 pp.

MAPS

Canada, Energy, Mines and Resources (1980). "Canada agricultural lands." The National Atlas of Canada, 5th ed., scale 1:7 500 000. Lambert conformal conic projection standard parallels 49°N and 77°N, modified polyconic north of latitude 80°, Ottawa, Canada.

Canada, Energy, Mines and Resources (1980). "Gravity map of Canada: Bouguer on land — free air offshore." Lambert conformal. Gravity Map Series No. 80-1, Ottawa, Canada.

PAPER, IN PRESS

Georgiadou, Y., and A. Kleusberg (1989). "On carrier signal multipath effects in relative GPS positioning." Accepted for publication 23 May 1989 in *Manuscripta Geodaetica.*

PAPER, PRESENTED

Burg, J. P. (1987). "Maximum entropy spectral analysis." Paper presented at the 37th Meeting of the Society of Exploration Geophysics, Oklahoma City, Okla., U.S.A., 30-31 October.

PAPER OR REPORT, UNPUBLISHED

Nichols, S. E. (1983). "International boundary dispute between the United States of America and Canada." Unpublished report of the Department of Surveying Engineering, University of New Brunswick, Fredericton, N.B., Canada.

Dean, R.F. (1983). "Future of the Department of Surveying Engineering." Unpublished internal report of the Faculty of Civil Engineering, The University of Calgary, Calgary, Alberta, Canada.

PERSONAL COMMUNICATION

Guinot, B. (1989). Personal communication. Director of Bureau International de l'Heure, Paris, France, September.

Canada, Energy, Mines and Resources (1992). Personal communication. Earth Physics Branch, Ottawa, Canada, September.

PLANS

Jones, J. E. (1987). "Plan of Parcel 'A', Skyridge Subdivision, City of Fredericton, County of York, Province of New Brunswick." York County Registry Plan No. 86.

Ninth Geodesy/Solid Earth and Ocean Physics (GEOP) Research Conference (1978). *An International Symposium on the Applications of Geodesy to Geodynamics*. IAG/IUGG and COSPAR, Columbus, U.S.A., 1-3 October. Department of Geodetic Science Report No. 280, The Ohio State University, Columbus, Oh, U.S.A.

PROCEEDINGS, COMPLETE

Hieber, S., and T. D. Guyenne (Eds.)(1978). *Proceedings of the European Workshop on Space Oceanography, Navigation and Geodynamics*. ESA, Council of Europe, EARSeL, Schloss Elmau, Germany, 13-17 January. European Space Agency Report ESA SP-137, Paris, France.

PROCEEDINGS, EDITED

IXth National Surveying Teachers' Conference (1977). *Proceedings*. UNB, Fredericton, N.B., 11-13 June. Department of Surveying Engineering, University of New Brunswick, Fredericton, N.B., Canada.

PROCEEDINGS, UNEDITED

Anderson, E. G. (1988). "Modelling of physical influences in sea level records for vertical crustal movement detection." *Proceedings of the 9th Geodesy/Solid Earth and Ocean Physics (GEOP) Research Conference, An International Symposium on the Applications of Geodesy to Geodynamics*, Ed. I. I. Mueller. IAG/IUGG and COSPAR, Columbus, U.S.A., 20-24 October. Department of Geodetic Science Report No. 280, The Ohio State University, Columbus, Ohio, U.S.A., pp. 145-152.

PROCEEDINGS, ONE PAPER

See section 6.9.

REGULATIONS

See Paper or Report, Unpublished.

REPORT, UNPUBLISHED

Quek, S. H. (1983). *Spline Smoothing of Two-Dimensional Data Series with Precision Estimation, Applied to Satellite Navigation*. M.Sc.E. thesis, Department of Surveying Engineering, University of New Brunswick, Fredericton, N.B., Canada, 84 pp.

Wells, D. E. (1974). "Doppler satellite control." Ph.D. dissertation, Department of Surveying Engineering, University of New Brunswick, Fredericton, N.B., Canada, 395 pp.

THESES AND DISSERTATIONS

NOTE: The first example is of a copyrighted theses; the second of a non-copyrighted dissertation. UNB did not have the right to use the copyright mark (©) until fairly recently, thus some of the older theses and dissertations are not copyrighted material.

anon. (1984). "New space navigation satellite planned." *Aviation Week and Space Technology*, July, pp. 69-70.

UNKNOWN AUTHOR

Smith, P.J. (n.d.). "Where in the world are we"? *Journal of Metaphysical Science*, Vol. 23, No. 5, p. 22.

UNKNOWN DATE

6.7 Electronic Citations

Although many organizations are issuing standards concerning electronic citations (Internet material), the consensus so far seems to be to use your intelligence and format an electronic reference as you would a reference that refers to printed material. There are two reasons to offer a reference: so that your reader can go to the source of your argument and check the original information; and so that credit is given to the originating individual or institution.

When attempting to access computer-based information, make sure that the graphical WWW browser you are using has the "show locations" option turned on. This ensures that you will see the Uniform Resource Locator (URL), or Internet address, of each document being accessed.

definitions

Definitions:

WWW	World Wide Web
site	A web location containing information in the form of text, images, sound, or video.
Netscape Navigator	graphical WWW browser software
html	World Wide Web's hypertext mark-up language (the most commonly used file format for online academic journals)
URL	Uniform Resource Locator (Internet address)
FTP	File Transfer Protocol, a program used to retrieve files and information from FTP sites available throughout the Internet.
.com	indicates a commercial site.

The generic format of a URL is:

file format://computer.type-of-system.country-code/file-directory/file-name

The Department of Geodesy and Geomatics Engineering's home page URL, is <http://www.unb.ca/GGE/HomePage.html> which means

http://	Hypertext transfer protocol. This tells the Web server what electronic rules and regulations a particular file uses to move between a Web server and a Web browser (like Netscape or Internet Explorer).
www.unb	The domain is based at the University of New Brunswick World Wide Web server; unb is the sub-domain.
ca	This puts the sub-domain physically in Canada.
GGE	The file is in the GGE directory.
HomePage	HomePage is the file name.
html	This indicates that the file has a hypertext document format.

Following are some guidelines for Internet referencing.

If the print form and the electronic form of the material are the same, then a reference for the print form is preferred! **#1.**

If the electronic and print versions are not identical, and you researched the electronic form, then use the on-line (electronic) reference.

Never believe everything that you read on the Internet! **#2.**

Information found at reliable sites (newspapers, journals, and periodicals) usually can be trusted. Information put on the Internet by most corporations, reputable manufacturers, and well-known societies and institutions can be believed. Beware, however, of contributions from individuals with no affiliations. These contributors may have their own agendas, and the way they present their material may be biased and even erroneous.

Do not reference material from sources that are likely to change, be updated, or disappear from the Internet. **#3.**

Frequently Asked Questions (FAQs) or Usenet news are not published sources in the usual sense; they have had no peer review and thus are open to inaccuracies; they are often updated and revised; and some have a limited life on the Internet. If the information found in a FAQ or Usenet news is something you want to reference, it would be best to contact the author by e-mail and obtain a personal communication style reference. At least then others can verify your information or gain further information from the original source. The same can be said for Internet Drafts. These are works in progress; they are valid for only six months; and they can be updated, replaced, or made obsolete at any time.

When referencing an Internet source, repeat in the reference the same path you took to reach the information (URL). **#4.**

This routing provides easy access for your readers. When you have accessed a site, note the information that appears in the title bar (the topmost bar of the document containing the close and sizing buttons) of the WWW browser's viewing window. This can be used in the title field of a reference when no other title appears. Because of the requirements of the WWW, all

documents found there will have a file format (e.g., http), a title (e.g., UNB Geodesy and Geomatics Engineering), and a URL (e.g., <http://www.unb.ca/GGE/HomePage.html>).

#5. **What if the document has no obvious author?**

You then must use your initiative. Look for the name of the author or that of an institution in the document. This could be in the actual text, in the URL, in a link to another WWW site, or in the signature at the bottom of the document. If you are fortunate enough to locate an e-mail address, use that in the author field as it is a unique identifier that others can use.

#6. **How do you identify the publisher and place of publication** (e.g., for a hardcopy book this might be McGraw Hill, New York).

Establishing just who did the publishing can sometimes be difficult. Because of the commercialization of the Internet, often the only clue to the publisher is lost with the use of the html .com (commercial) suffix. Therefore, attempt to determine what institution is most acknowledged in the document. If this is impossible, the URL can be used for both publisher and place of publication.

#7. **What about a file that has been or may be moved**?

This is why the title of the work found in the title bar as well as the URL are essential in the reference. For example, the Department's web site was moved from a server controlled by the library to one controlled by Computing Services and our URL was consequently changed to

http://www.unb.ca/GGE/HomePage.html from

http://www.lib.unb.ca/GGE/HomePage.html

Most sites will place a URL pointer to the new location, but these pointers are usually maintained only for a short time. So, when the URL no longer is current, the title of the documents can be used to do a keyword search of the network.

#8. **What about documents that are altered by the author?**

This situation should be rare for academically orientated material, but could be common for other sites. When it is likely that a site may be altered, you would

be advised to set up and maintain a personal archive of this material. Then, if you are later questioned about your sources of information, you have a copy of all your referenced material in your personal archive.

The medium containing the material to be reference should be indicated. The medium could be "on-line," "CD-ROM," or "video."

Generic formats

The generic formats for electronic references would be:

Individual works

Author last name, Author Initials (publication date). *Title of the work (page).* Publisher and place (if known). [Medium] and date accessed. Full address of protocol://site/directory/filename

Example:

Crane, G. (Ed.) (1999). *Man at the Centre of the Earth.* Perseus Project, Classics Department, University of Toronto. [On-line] 26 July 1999. http://www.perseus.toronto.edu/Hercules/

Parts of works

Author last name, Author Initials (publication date). "Title of the part." *Title of the Work (page).* Publisher and place (if known). [Medium] and date accessed. Full address of protocol://site/directory/filename

Example:

Smith, W. E. B. (1999). "On the dawn of time." In *The Souls of Forest Folk.* Project Bartleby, Columbia University. [On-line] 27 July 1999. http://www.columbia.edu/acis/bartleby/smith/2.html

Kineman, J. J., and M. A. Ohrenschall (2001). "Global Ecosystems Database, version 1.0." Documentation manual [CD-ROM], *Arctic Stratospheric Expeditions*, Vol. 33, No. 12, pp. 2122-2144.

Magazine, journal, newspaper article

Author last name, Author Initials (publication date). "Title of the article." *Source.* Volume, Number, pages. Publisher and place (if known). [Medium] and date accessed. Full address of protocol://site/directory/filename

Example:

Scott, J. (1999). "From right to left." *Humanist*, Vol. 33, No. 27, pp. 55-56. [On-line] 15 May 1999. http://researcher.sirs.com/

Mailing list or Newsgroup

Author last name, Author Initials (date of message). Subject line of message. Publication/access date from what medium, list or newsgroup address, message ID (found in headers)

Example:

Smith, B. C. (1999). Conserving water in a closed environment. Retrieved 15 June 1999 from newsgroup, sci.bio.environment, <5B2D6CC0a45Yz>

e-mail

Author last name, Author Initials (date of message). Subject of message. [Medium] to recipient <recipient's e-mail address> from <sender's e-mail address>, date mail sent.

Example:

Wells, W. (2001). Photocopier. [On-line] to K. Delorey <delorey@unb.ca> from <wwells@unb.ca>, 28 November.

Warnings

Do not split the URL except after the backslashes (//), at a natural space in the URL, or before or after the at (@) symbol. To add a space or a return after other parts of the URL could be confusing to the person attempting to retrace your steps. Do not end a path statement with a period, because stray punctuation in a path will hinder retrieval.

6.8 Footnotes

This section applies more to theses and dissertations than to essays or reports. It also applies more to **cadastral** surveying than to the other surveying disciplines. The other disciplines may use the occasional footnote to indicate the location of authors from a number of different institutions, but footnotes in any other context are generally not required. Even if footnotes are used, the [name, date] format is kept and a list of references or a bibliography must be provided.

footnote functions

A footnote functions in two ways:

- to convey to the reader information that might be distracting if incorporated in the text;
- to serve as a reference to identify the addresses of the authors of a paper, if they come from more than one organization. Rather than take up half of the first page listing authors and their addresses, use footnote superscript numbers and put the addresses in a footnote at the bottom of the page.

Example:

TITLE OF THE PAPER
John Q. Smith[1]
Elton P. John[2]
Simon W. Public[3]
Donald S. Nobody[4]

1. Independent Research Inc., 122 Little St., New York, NY 02234.
2. Whatnot Company, 775 Smith Street, Las Vegas, NV, 77345.
3. Much More Industries Inc., 165-32nd Street, Detroit, MI, 35656.
4. Didit Company, 335 Maple Avenue, Vancouver, B.C., Canada V7M 3N6

additional information or commentary

In most fields, the use of a source for an idea, quotation, or opinion is satisfied by supplying a reference. Cadastral students may have occasions when they wish to add a pertinent comment or two to the reference, and this is when a footnote comes into play. For a good example of the use of footnotes, see Canadian Institute of Surveying and Mapping [1989]. Generally speaking, footnotes should be reserved to convey information that, if left in the main body of the text, would be a distraction to the reader.

use sparingly

In any type of writing you will be doing as a student, footnotes should be used **sparingly**! They are an aggravation to the writer, the reader, and the typist. If the point is worth mentioning in a footnote, it just might be worth mentioning in the text.

location

There are three places to present your footnotes:
(a) At the bottom of the page.
(b) Gathered together at the end of a chapter.
(c) Gathered together at the end of the publication.

No matter where they appear, they are single spaced.

footnotes vs. end notes

If placed other than at the bottom of a page, we are not longer, strictly speaking, dealing with footnotes. If gathered at the end of a chapter or the complete text, label the page "NOTES," "END NOTES," or some other such explanatory word(s).

numbering

The numbering of footnotes in a short report (one not broken down into chapters) can be consecutive from start to finish. Use this system if you place them at the bottom of the page or gather them all together at the end of the publication; For a longer product divided into chapters, **re-start** your footnote

numbering at "1" again for each chapter. If this system is used, the footnotes, or end notes, should be either at the bottom of the page or at the end of the chapter.

in-text indication

You indicate a footnote in the text with a superscripted Arabic numeral which is repeated in the footnote. Please notice that in the in-text citation, you get your punctuation over with before adding your footnote number (this applies to all punctuation).

Example:

In-text:	All of this information can be found in one particular case.[1]
Footnote:	1. Attorney-General of Canada v. Higbie et al., [1944] S.C.R. 385, at p. 431. This case is considered a classic.

If you place your footnotes at the bottom of the page, all material pertaining to the footnotes on that page has to appear on that page; you cannot slop over onto the next page!

format

The format of a footnote is slightly different from the format of a reference. Give the author's name in full (if possible) with the surname LAST. Note that you refer to the specific page your argument relies on. The footnote is left-margin justified, not indented as in the case of a reference. Remember, just because you have provided footnotes or end notes does not mean that you can ignore a list of references. The references would follow the last chapter's end notes (if any). The end notes (following each chapter) must also appear in the Table of Contents.

Example:

(text)	The Earth's surface is projected on a cylinder tangent at the Equator or secant along two parallels with its axis coincident with the Earth's axis (Figure 7), then the cylinder is cut and unrolled to a flat surface. [1]
(reference)	Ellis, M.Y. (Ed.)(1978). "Coastal mapping handbook." U.S. Department of the Interior and U.S. Department of Commerce. U.S. Government Printing Office, Washington, D.C.
(footnote)	1. Melvin Y. Ellis (Ed.)(1978). "Coastal mapping handbook." U.S. Department of the Interior and U.S. Department of Commerce. U.S. Government Printing Office, Washington, D.C., p. 37. The figure presented here is a particularly valuable one.

ibid., idem

Two terms found in footnotes:

ibid. (ibidem, meaning in the same place and usually used in a footnote to refer to the book, article, etc., mentioned in the immediately preceding footnote); and

idem (meaning the same, as previously given or mentioned)

are no longer in common use. Modern usage is to give a shortened form of the already cited reference.

6.9 Legal Referencing (by S. Nichols)

in-text citation

Cadastral surveying is based more on the law and history than on mathematics and physics. For all undergraduate work, the in-text citation will be the standard [name, date] format. Please note that legal referencing prefers periods in all initialisms (see section 4.2.1).

complete citation

There are two items of importance to remember when using legal references (case law, legislation, regulations, and so forth). The first concerns the complete identification in the text of the legal material you are using. The text must contain the complete identity of the statute, regulation, or case. If it is a statute or regulation, you must also supply the appropriate section and subsection in the text. The list of references or list of legislation cited will only mention the act, the jurisdiction, and the chapter. The other important item is that legal material, because of its unusual format, should be gathered into a list of **cases cited** or a list of **legislation cited** or both, which should appear in alphabetical order at the end of the list of references.

citation list

Example:

In text:	In section 1(k) of the *Nova Scotia Water Act* [1967], the following definition of a watercourse is given: " quote the definition here ." *Shaw v. The Queen* [1980] did not address this issue directly but is of interest to surveyors because the case involved four surveys over nearly three decades.
Legislation Cited:	*Water Act*, R.S.N.S. [1967] c. 335.
Cases Cited:	*Shaw v. The Queen*, [1980] 2 F.C. 608.

A good reference for researching and citing legal material in Canada in Yogis and Christie [1974]. A good example of legal referencing is Canadian Institute of Surveying and Mapping [1989].

6.9.1 Case citation

Guidelines for citing cases are given below with examples.

italics

The name of the case should be italicized (underlined) in the text, footnotes, end notes, and list of cases. In a case, the "v." stands for ***and*** or ***against***; lawyers shun the word versus.

Example No. 1.1:

Cases Cited:	*Horsley v. McLaren*, [1972] S.C.R. 441.
In text:	[*Horsley v. McLaren*, 1972]; or ...in *Horsley v. McLaren* [1972]

brackets vs. parentheses

The year should follow the case in brackets. Round parentheses ( ) refer to the date in which the case was decided. Square brackets [ ] are used when they are a necessary part of the reference where case reports (the books in which judgements are recorded) use the date to identify the volume. Thus, in Example 1.1, the **Supreme Court Reports** (S.C.R.) are indexed by year and not volume number unless there is more than one volume for that year, i.e., the date is necessary to find the correct volume of cases in the library.

Example No. 1.2:

Cases Cited:	*Re Walker* (1919), 49 D.L.R. 415 (Ont. C.A.)
In text:	[*Re Walker*, 1919]; or ...in *Re Walker* [1919]

re:

In Example 1.2, the case was **decided** in 1919 and appeared in the 49th **volume** of the **Dominion Law Reports** (D.L.R.) beginning on **page** 415. The word "**Re**" means ***in reference to*** and is used where the court is asked to give an opinion on a matter (such as a quieting of titles action) rather than making a decision where two private parties are involved.

punctuation

If you do not have square brackets, then use round brackets, but note the difference in punctuation. In Example 1.1, the **comma** separates the case name from the reference. In Example 1.2, the **comma** separates the case name and date from the reference.

The reference should give the volume (or date, or in some cases both the volume and date are required), the abbreviated name of the case reports in which you found the case, and the page on which the case starts. A case may be reported in several reports and, since this information is helpful to the reader, it should be included, if available.

Example No. 1.3:

Cases Cited:	*Clarke v. City of Edmonton*, [1930] S.C.R. 137, [1929] 4 D.L.R. 1010; rev. [1928] 1 W.W.R. 553, [1928] 2 D.L.R. 154, 23 Alta.L.R. 233.
In text:	[*Clarke v. City of Edmonton*, 1930]; or ...in *Clarke v. City of Edmonton* [1930]

The case in Example 1.3 was first tried in Alberta and reported in the **Alberta Law Reports** (Alta.L.R.), the **Dominion Law Reports** (D.L.R.), and the **Western Weekly Reports** (W.W.R.). The decision was **reversed** (rev.) on appeal to the Supreme Court of Canada, and again was reported in two case reports. Square brackets are used in the first four references because the dates are necessary to identify the volumes (more than one volume may be published per year). In the Alberta Law Reports, the date was unnecessary and thus was excluded.

series

Many law reports are published in series. Thus, in Example 1.4 below, **(2d)** stands for the second series of the **New Brunswick Reports** (N.B.R.), and the case location is uniquely identified without the date.

Example No. 1.4:

Cases Cited:	*Re McNichol* (1976), 20 N.B.R. (2d) 240.
In text:	[*Re McNichol*, 1976]; or *Re McNichol* [1976] states that ...

The series is given only for second and subsequent series. For example, there may be a case such as Example 1.4 in the first series.

Example No. 1.5:

Cases Cited:	*Jones v. Smith* (1919), 20 N.B.R. 240.
In text:	[*Jones v. Smith*, 1919]; or *Jones v. Smith* [1919] reveals that ...

page numbers

The page number given with the reference is the first page of the reported judgement. This is the reference given in the list of cases cited at the end of the paper or report. If you use footnotes or end notes, you should also identify the page or pages on which you found the particular material you are referring to by using the phrase "**at p.**" or "**at pp.**"

Example No. 1.6:

Footnote:	1. *Irving Refining Limited, et al. v. Eastern Trust Company* (1967), 51 A.P.R. 155 (N.B.S.C., Ch. D.), at pp. 162-163.
Cases Cited:	*Irving Refining Limited, et al. v. Eastern Trust Company* (1967), 51 A.P.R. 155 (N.B.S.C., Ch. D.).
In text:	*Irving Refining Limited, et al. v. Eastern Trust Company* [1967].

In Example 1.6, **et al.** means "and others," indicating that there was more than one plaintiff.

In Example 1.6, the case was reported in the **Atlantic Provinces Reports** (A.P.R.), but since there is no way of telling which province the case took place in, the **New Brunswick** jurisdiction (N.B.) is added. It is also very helpful to add the court that heard the case because this may determine the merit of the case as a precedent. In Example 1.6, it was the **Chancery Division** (Ch.D.) of the N.B. **Supreme Court** (S.C.). Also, see Example 1.2 above in which the case was reported in the **Dominion Law Reports** (D.L.R.); (Ont. C.A.) tells us that it was an Ontario case heard in the **Court of Appeal**.

For additional information or for difficult cases, see the case citators (books listing case references) in the law library, check reference books, or see a staff member. Yogis and Christie [1974] give the correct abbreviations for Canada and some other countries.

6.9.2 Legislation and regulations

The citations for statutes are fairly standard throughout Canada, but the citations for regulations differ with each province. The main objective is to have sufficient information in the text and in your reference to enable someone to find the source of your material.

legislation

The first part of the **LEGISLATION** citation is the name of the Act. Sometimes the statute will give a "short title" and this can be used. Statutes and regulations are not underlined or in italics in the text and reference.

Example No. 2.1:

Legislation Cited:	*Water Act*, R.S.N.S. [1967] c. 335.
In text:	[*Water Act*, 1967]

statute

The second part of the citation gives information about the jurisdiction and statute series. In Example 2.1, this information is **Revised Statutes of Nova Scotia** (R.S.N.S.). When a new statute has been passed or an old statute has been amended since revised statutes were published (since 1967 for Nova Scotia), then the citation would be, for example, **Statutes of Nova Scotia** (S.N.S.).

Example No. 2.2:

Legislation Cited:	*Beaches Preservation and Protection Act*, S.N.S. [1975] c. 6.
In text:	*Beaches Preservation and Protection Act* [1975]

date

The third part of the citation is the date. To be consistent with other formats in the Department of Geodesy and Geomatics Engineering, the date should be in square brackets. In researching legal material, you should be careful to note whether the statute (or an amendment) is in force. Often statutes exist on the books but are not yet in force. Check the conditions in the statute (e.g., *to come in force on Jan. 1, 1989*); if no date is given, then you will have to check other sources.

chapter

After the date, the **chapter** (c.) of the statute is given. This completes the reference for a List of Legislation.

section

In footnotes or end notes, the particular **section** (s.) and subsection to which you are referring should be given.

Example No. 2.3:

Footnote:	1. *Water Act*, R.S.N.S. [1967] c. 335, s. 1(k); as am. by S.N.S. [1972] c. 58, s. 1(4).

in-text citation

Remember that when the scientific referencing format is used [name, date], the act, section, and subsection **should be identified in the text.** A citation, such as in Example 2.1, should be given in a list of legislation cited following the standard list of references.

In Example 2.3 above, there is an amendment (am.) to the statute affecting the particular section referenced. It is important to the validity of your

research to check whether the section you are referring to has been amended.

regulations

REGULATIONS are much harder to reference. It is important to give the statute to which the regulation refers, but the actual citations differ from province to province (see Yogis and Christie [1974]).

Example No. 2.4:

Legislation Cited:	*Surveyor General's Instruction Regulation*, B.C. Reg. 556/80, s. 57(2); made under the *Land Act*, B.C.R.S. [1979], c. 214.
In text:	This can be found in Section 57(2) of the B.C. *Surveyor General's Instruction Regulation* [1979].

The regulation may not have a name, but the jurisdiction, number, and date should be indicated. The important point is that the reader should be able to find the regulation that you have cited!

7. PROPOSALS

(by S. Nichols)

A proposal is a specialized sales document offering to solve a problem in a particular way under specified conditions for a certain amount of money. Potential clients receiving the proposal must be convinced that the described activity is worthy of support and that the proposer will do a better job and produce better results than any other proposer.

Proposals, like résumés, are the ultimate tests of effective communication. Your potential client may have to review hundreds of submissions. Your proposal, therefore, must provide the necessary information quickly, clearly, and concisely.

7.1 Types of Proposals

Proposals are prepared for many kinds of projects, from pure research to operations. There are many types of proposals, including:

- research proposal
- unsolicited proposals (UPs)
- response to a Request for Proposal (RFP)
- response to a Request for Quotation (RFQ)

Research proposals are most typically used by university researchers and research and development sections of industry. The other three types of proposals are used by the business community.

research proposal

A **RESEARCH PROPOSAL** is usually written to a funding agency (like the Natural Sciences and Engineering Research Council — NSERC) with a proposal to conduct a scientific research project. You must provide a clear understanding of the problem and outline your research strategy.

Formal research proposals also include information about the research team and its competitive advantage. This is usually in the form of résumés outlining the special qualifications, knowledge, and experience of the team members that are relevant to the proposed project.

unsolicited proposal

An **UNSOLICITED PROPOSAL** (UP) is written in response to a perceived need. It is based on background research and negotiations in which your firm has identified a problem and proposes a solution. UPs are a form of marketing of your firm's products or capabilities.

request for proposal

A solicited proposal is written in response to a **REQUEST FOR PROPOSAL** (RFP). The institution issuing the RFP states the problem and sets out all the requirements, specifications, and restrictions. It is your responsibility to adhere to the RFP precisely, to show that you understand the problem, and attempt to prove that you can perform the work better than any other person or organization.

RFPs are common in the geomatics industry. Surveying and mapping, or geomatics, organizations issue RFPs for contract work or system development. In general, cost is only one factor that will be used to judge responses to the RFP. The potential client may also be looking for specific information about, for example, personnel, innovative solutions, timing, and deliverables.

request for quotation

A response to a **REQUEST FOR QUOTATION** (RFQ) should emphasize cost over solutions or personnel. RFQs are usually issued when the potential client has an already well established methodology and technology and merely wants to find the person or company willing to do the work at the lowest cost.

7.2 Contents of a Proposal

Formal, or complicated, proposals for products or services usually consist of two parts:

- a technical portion dealing with objectives, methodologies, equipment, scheduling, and budget;
- a management portion that outlines the experience, facilities; and qualifications of the firm as well as the key people responsible for certain tasks.

Informal, or simpler, proposals can deal with the same material in less detail. It is more common, however, to eliminate some of the components found in the more formal approach.

covering letter

Proposals are accompanied by a covering letter that gives an added opportunity to highlight any important features of your proposal. Proposals more than a few pages in length should also have an executive summary and a table of contents. As with formal reports, detailed technical information relevant to the proposal but not essential to the argument should be put in appendices.

executive summary

table of contents

presentation

The client or funding agency may have to read many proposals. How you present the information to nontechnical readers will be crucial to your winning the contract to supply the product or service.

sample contents

The contents of a formal proposal could be arranged as follows.

Title page
Executive Summary
Table of Contents
List of Figures
List of Tables
Abstract
Introduction (state problem; summarize solution; outline rest of proposal)
Background (relevant background; state-of-the-art work)
Description of proposed activity (objectives; scheduling; results)
Management (institutional resources, capabilities, and commitments)
Budget (labour, materials, services)
Personnel (proposed staffing; relevant experience of major players)
Conclusions or summary
Appendices (endorsements; relevant articles, reports, documents)

The order of some of the elements could change depending on the emphasis required. Are you solving a problem, investigating a subject, or selling a service or product.

7.3 Principles of Writing Proposals

There are four principles in writing proposals that will serve as a guide to what should be included. You must clearly demonstrate that:

- you understand the problem;
- you have an appropriate solution to the problem;
- you can accomplish what you propose; and
- you can meet your client's needs better than your competitors.

Understand the problem

The introduction must show that there is a "problem," otherwise why should you invest your time or your client invest money in this project. The problem may range from a clear technical problem (e.g., we need to produce base maps more efficiently) to a broader problem (e.g., we need to develop an environmental monitoring program). If you do not understand and properly explain the problem, your proposed solution will be inappropriate.

Firms submitting proposals often spend considerable time researching the problem during the proposal preparation. Part of this research will be to identify potential impacts of the problem (e.g., costs to the client if nothing is done). This in turn will help to identify the specific benefits of the firm's proposed solution (e.g., direct and indirect benefits of solving the problem in the proposed manner).

Give appropriate solution

Giving the appropriate solution is the most important element of the proposal. It describes what you want to do and how you intend to do it. You must show that your proposed project will solve the problem you have identified.

This technical portion of the proposal should outline and, where necessary, justify:

- the objectives of the proposed project
- the scope and emphasis of the proposed project
- the methodology (procedures, technologies) to be used
- how the results are to be tested and evaluated (including criteria for evaluation)
- the schedule for completing the work
- the deliverables the client can expect.

provide alternatives

In some cases, the proposal may contain alternative methods. For example, a proposal may focus on only one aspect of the problem but an alternative general solution (which will probably cost more) is also given. Or, different technologies and procedures may be outlined if cost or time is a major factor to the client. Providing effective alternatives that meet your client's specific needs may be part of your competitive strategy.

Show proposal to be feasible

You must show that you can accomplish what you have proposed probably better than any of your competitors. To do this you must provide information on

- the human, technical, and organization resources you have
- the knowledge you have acquired through experience or research in the problem area (substantiated through a list of references)
- the project management scheme, including a schedule showing reasonable stages, phases, and deadlines
- any special requirements (e.g., support facilities, financing)
- any constraints or problems that you foresee
- any contingency plans that you may need to make.

Show you are competitive

You must prove to the potential client that you can do what needs to be done and meet the client's need better than your competitors. Part of this sales pitch includes:

- your costs and overall pricing schedule
- your completion schedule
- the benefits to be derived from your proposed project.

Also, part of the proof will include the special expertise you can bring to the project, the qualifications of your institution and its personnel, and the resources you can commit to the project.

client's special needs

The benefits to your client from the proposed project in general and, more specifically, from your proposed methodology should be highlighted in the proposal, in the executive summary, and in the covering letter. Often a successful proposal will meet special needs of the client. Identifying those needs is part of the problem identification phase.

7.4 Presentation of Proposals

Since a client (or supervisor) may have to wade through many proposals, an efficient, clear, and concise presentation is essential. As with other forms of technical writing, the use of visual aids, an efficient system of headings; and an effective organization will all have an impact on the potential client.

diagrams

To simplify complex information, a figure or a table is an extremely useful communication tool. Scheduling of the work to be done can be shown on a critical path chart; a process can be explained in a flowchart; the layout of an office can be detailed in a blueprint. Visual aids have the advantage of being easily adapted for an oral presentation.

headings

points

The efficient use of headings and a section numbering system will make the material easier to read and to find during later negotiations. Using point form for information can help the reader identify major items (e.g., objectives) or possible problems. The proposal should be structured for maximum reader impact and it should be thoroughly professional in both content and presentation.

language

Clear, concise language is important. Third person active or passive voice is best (I, you, we should be avoided because it is not always clear to whom these pronouns refer). Gender neutral language is also expected in today's business world.

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