Suggested Style Guide

North Dakota State University

Agricultural and Biosystems Engineering

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EXECUTIVE SUMMARY

The Executive Summary is a concise stand-alone summary of the full document and is printed on a separate page directly after the title page. Please refer to Section 2.1.2 for more information.

This document serves as a suggested style guide for students in the Agricultural and Biosystems Engineering (ABEN) Department at NDSU. It provides an outline of what to include in reports for the engineering capstone course, as well as recommendations for how to format a document so that it has a professional appearance. It may be used as guide for engineering reports in other ABEN courses.

ACKNOWLEDGEMENTS

This document was altered from a similar style guideline used in the Agricultural Engineering program at the University of KwaZulu-Natal in Pietermaritzburg, South Africa. The NDSU Department of Agricultural and Biosystems Engineering is grateful for the example of setting high standards in engineering communication.

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# introduction

This is the suggested style guide for NDSU Agricultural and Biosystems Engineering capstone design reports. Other courses may also use this style or a modified version of it. All students submitting work for ABEN 486-7 are encouraged to follow the style conventions laid out in this document.

There are several reasons for adhering to a style convention. First, by standardizing the format of presentation, evaluators have a consistent standard to use for the evaluation of documents. Second, it gives the student practice at following conventions for professional work. Finally, poor presentation can mask good technical engineering work while clear presentation can facilitate formative review.

This document will present the conventions to be used for structure, layout, format, figures and tables, equations, and referencing in reports submitted for NDSU ABEN 486-7.

# Document structure

The structure to follow for reports will be presented in this chapter. The structure of the document is often dependent on the nature of the investigation undertaken. Therefore, the structure of the final document may be altered after consultation with the instructor.

## Lead Pages of the Document

The lead pages of the document include a title page, executive summary, acknowledgements, a table of contents and lists of (i) tables, (ii) figures and, if necessary, (iii) abbreviations, symbols and a glossary of terms. With the exception of the title page, all leading pages (those occurring before the main text) are numbered in roman numerals. This section provides more details concerning these pages.

### Title page

The title should be concise and complete, clearly outlining the project scope in as few words as possible. It is advisable to avoid repetition of any term within the title itself.

### Executive Summary

The executive summary should provide a brief overview of what is presented in each section of your document. Standards on the length of executive summaries vary but 300-500 words is a reasonable goal for a capstone design report. The summary should be written in such a way that the reader understands the key points of the project enough to be encouraged to read the rest of the document. Generally, references are not used in an executive summary. Typically the summary includes:

1. short statement of context or explanation of why the project exists and is important (problem definition),
2. summary of design objectives and design constraints,
3. summary of design process,
4. summary of design alternatives considered,
5. brief rationale for selecting which alternative was best,
6. summary of key aspects of the final design, and
7. summary of any aspects requiring further evaluation.

### Acknowledgements

An acknowledgements page may be included in design reports for ABEN 486-7. In this section all people or organizations that gave significant assistance during the duration of the project period can be thanked. Typically, this is limited to supervisors, funders, technicians, peers, and others that assisted in any way.

### Table of Contents

The Table of Contents should exactly match the headings in the text. This means that the wording, capitalization and punctuation that appears in the text, should appear in the same way in the Table of Contents. The formatting of the headings in the Table of Contents does not need to exactly match the formatting of the headings in the text, e.g. bold printing. Preferably, 12-pt font size should be used in the Table of Contents. Leader lines to the page numbers should be used. The sub-headings at the different levels should be indented and aligned as shown in the Table of Contents in this document. It is in the student's best interest to become familiar with using the automatic Table of Contents generator in Word, as this will ensure accurate page numbering and replication of headings. Each level of organization (e.g. 1, 1.1, or 1.1.1) should be associated with a specific heading style in Word (Heading 1, Heading 2, Heading 3, respectively), and those heading styles can be manipulated to have the same formatting (e.g. font and font size). Refer to the Table of Contents in this document for an example of the formatting for the Table of Contents. The heading below and in the table of contents for this document illustrates how text should be wrapped when a heading does not fit into one line.

### Long headings need to wrap over to the next line with parallel indentation as demonstrated in this example

### List of Tables

It is common practice to present a List of Tables after the Table of Contents. This list should contain the table number, the caption of the table, and the page on which the table occurs. Again it is beneficial to use the Word’s embedded options to automatically generate the List of Tables. In the REFERENCES tab, you will find a function for “Insert Table of Figures” which can be used for lists of both tables and figures. The list will self-populate if the table or figure captions are added using the “Insert Caption” function, also in the REFERENCES tab of Word. The List of Tables should appear in order of table number. The caption of the table should be listed using a hanging indent and the page number should be right aligned (leaders should be used). Refer to the example on page vi of this document.

### List of Figures

Similar to a List of Tables, a List of Figures should be included in the document. This appears after the Table of Contents and the List of Tables. Refer to the example in this document.

### Abbreviations, acronyms, or symbols

Each acronym should be written out in full and defined the first time it is used in the document and, once defined, the acronym should be used consistently in the remainder of the document. If there are many jargon terms or a long list of uncommon abbreviations or symbols which are used frequently in the body of the report, it is sometimes useful to include a Glossary of Terms or a List of Abbreviations and Symbols. This will assist readers who are not familiar with the topic to understand some of the more specific technical terms of the subject material. It is also an easier place to refer back to if an acronym is used, but the reader cannot recall where it was first used. Lists of abbreviations, however, are optional and are often unnecessary.

## The Main Body of the Document

Pages belonging to the main body of the document are numbered numerically. The document should present the material pertinent to the title in a logical sequence. Each subsequent chapter should build on the material presented in the previous chapter. The reader should be led through the thought process in a logical manner. The document should flow in a smooth manner from one chapter to the next. This can be achieved by linking the subsections and chapters, helping the reader to understand how each section fits into the document. An example of a linking sentence is given below:

"Having discussed the importance of the factors that affect x, it is apparent that y is of significant importance and it will be addressed in the following chapter/section."

The final document structure should be established in consultation with the instructor or co-operator, but will typically have the following sections:

1. Introduction and Problem Definition,
2. Design Objectives and Constraints,
3. Background information: Standards, patents, market review, and journal papers,
4. Design Alternatives,
5. Prototyping, Modelling, Testing, and/or Redesign,
6. Final Design,
7. Discussion and Conclusions,
8. Recommendations,
9. References, and
10. Appendices

Each chapter or section in the document should start on a new page.

### Introduction

The introduction to the document should include a problem description which gives a short background to the design project. It should give a clear description of the context of the project for a reader unfamiliar to the work that has been done. The problem definition may discuss an opportunity for development or improvement of a product or system.

The introduction often includes background on relevant patents or the existing product market. Some projects benefit from a short review of relevant technical research literature. All of this information gives the reader a comprehensive understanding of the situation that led to the project being initiated. The problem description in the introduction should logically flow into the Project Objective and Constraints which are presented in the subsequent section.

### Project Objectives and Constraints

After the background material to the topic has been presented, the next section should contain a clear statement of the project goal or objective(s) to enable the reader to understand specific, measurable outcomes. Depending on the scale of the project, it may have one overall goal and a number of objectives that are needed in order to achieve that goal. For example: The goal of this document is to provide a guideline towards scientific writing according to a specified style and structure. Specific objectives include:

1. to familiarize students to a suitable document structure,
2. to provide examples of the different styles that need to be adhered to, and
3. to provide students with general writing tips and recommendations.

Constraints are often related to the objectives but should be considered and written separately. While objectives identify what the final design must accomplish, constraints are boundaries on that project design based on factors including safety, economic, or practical considerations. Constraints will vary widely based on the type of project, but common examples of constraint categories include the following:

1. budget,
2. material options,
3. compatibility with other equipment,
4. physical size or weight,
5. energy efficiency, and
6. production rate.

### Other chapters

All the chapters between the Introduction and the Discussion and Conclusions should follow a logical order. The reader should at all times know the context of what is being presented and thus be able to relate the current content to the larger overall purpose of the project report. The organization should be apparent from reading the Table of Contents. Using a chapter and section numbering scheme similar to what is shown here can help the reader to follow the document structure and organization.

### Discussion and Conclusions

The Discussion and Conclusions chapter is where the team summarizes how it has met the project goals, objectives, and constraints. It is important that conclusions are made on whether the objectives defined earlier in the document have been achieved. It may be useful to have a short section discussing each of the project objectives, and another section or sections discussing constraints.

Redesign is an integral part of the engineering design process and therefore recommendations for further improvement may be incorporated in this section or as a stand-alone section.

### References

This section is where comprehensive references for all standards, websites, personal communication, and research literature are should be presented. Refer to Chapter 4 for more information on use of references and other formatting notes. The references should be presented in alphabetical order and should be left justified. A hanging indent should be used to separate the references. No blank line should be left between references. No references should be placed in the list if they are not used in the document and all references used in the document should appear in the list of references.

### Appendices

Appendices are used to include more detailed supporting information that are not appropriate for inclusion in the main body of the report. The report should be clear enough to be understood on its own, but other aspects of the design or the design process that a reader would need to verify the design details should be available and referred to in the main text. In many cases the appendices may be significantly longer than the rest of the report. Examples of items that may be placed in appendices rather than in the main report include:

1. detailed background and design calculations,
2. assembly drawings,
3. parts drawings,
4. bills of materials,
5. budgets, and
6. floor plans.

Having discussed the structure of the document, the formatting of the document will be discussed in the following section.

# Document formatting

This section will deal with all the formatting conventions when writing a report.

## Fonts and Line Spacing

The preferred typeface is 12-pt Times New Roman, with line spacing of 1.5 and “align left” justification. Conventional wisdom states that “Serif” fonts like Times New Roman are easier to read on paper, while “San Serif” fonts like Arial or Calibri are easier to read on screens.

## Title Page, Numbering, and Headings

The following sections present the format that should be followed for the various components of the document.

### Title page

The title of the document should be placed at the top of the title page and should be centered, all in uppercase and in bold 16-pt font. The names of the authors should be centered in Title Case using bold 14-point font. The names should consist of both first and last names for each author, listed in alphabetical order by last name. The rest of the title page should be typed using regular 12-pt font.

An example title page is shown in Appendix A.

### Numbering

Headings should be numbered in the following manner:

Main heading: 1. INTRODUCTION

Sub-heading: 2.1 Factors Affecting Evapotranspiration

Second level sub-heading: 2.1.1 Rainfall

Note:

* A tab stop of 0.5 in can consistently be used after the numbers.
* Typically one would not go beyond the third level of numbering (e.g. 2.1.1) as this becomes too cumbersome. Rather, group such information using bullets instead of a fourth level of numbering. An absolute maximum of 4 levels is recommended. However, going beyond the third level of headings can make the document too disaggregated and affect the flow.
* There are no periods after the last number used, except in main headings as indicated.
* Headings such as ABSTRACT, PREFACE, or TABLE OF CONTENTS are not numbered.
* In the Appendix, you may specify an Appendix letter (e.g. Appendix A) and refer to subsections of it using numbering. For example Appendix A may be used for design calculations, Appendix A.1 would refer to the first sub-heading and may be used specifically for calculating the expected runoff from an area of land.
* Single sub-heading section should be avoided. For example, there should be no section 2.2.1 if there is not also a section 2.2.2 following it.

### Main headings

Main headings are the first heading of a chapter. These should be center-aligned with 14-pt bold, uppercase lettering. A blank line should be placed between the main heading and the paragraph under it, although this convention is not used for other heading levels. As demonstrated throughout this document, main and other heading titles are not terminated with a period.

### Second level headings

These headings should be justified with “left-align” and be typed in 12-pt bold. The first letter of each word is capitalized, with the exception of common words such as for, and, on, with, etc., which are used within the heading. If the sub-section title exceeds one line, then a hanging indent should be used. A tab stop of 0.5 in may be placed between the last number and the start of the title. Again there is no period at the end of the title. These headings are preceded by, but not succeeded, by a blank line, as shown in this document.

### Third level, and greater, headings

These headings have “left-align” justification and are to be in 12-pt bold. Only the first letter of the title is capitalized, unless the title includes proper nouns. A hanging indent should be used if the title exceeds one line in length. A 0.5-in tab stop may be used between the last number and the first letter. Again, there is no period at the end of the title and a blank line comes before, but not after, the new heading as is shown in this document.

**Note:** In this document, some third level headings have more than just the first word capitalized since they refer to specific elements such as Table of Contents, and List of Figures.

### Tables and figures

The font to be used for the table and figure captions is 12 pt regular. If the table or figure is center-aligned, then the caption should also be center-aligned with the Table or Figure. Otherwise, the caption should have left justification. Table or figure numbering should contain the number of the chapter and the number of the table or figure in that chapter. For example, Table 3.1 refers to the first table in Chapter 3 and Figure 5.4 refers to the fourth figure in Chapter 5.

### Equations

Equations should be created using a suitable equation editor that is supplied with most word processing software packages. The font size used in the equations should also be 12-pt and be in the same text as the rest of the document. Some equation editors use either plain text or mathematical text for variables (v versus v). The same convention should be used for all equations, i.e. be consistent. Equations included in the text should be numbered using right alignment with the chapter number and the number of the equation in parentheses, e.g.:

(3.1)

where

E = energy [J],

m = mass [kg], and

c = speed of light in a vacuum [m.s-1].

Equations can also be labeled using the Insert Caption function in Word so that numbering will be automatically updated if an equation is added to or removed from the text.

### Lists

Lists of up to three points can be included in the text as illustrated here: (a) this is point number one, (b) this is point number two, and (c) this is point number three. Lists of more than three items should rather be placed in a table or as an alphabetically numbered list with one item per line, as demonstrated below. Alphabetical identifiers should be indented 0.25 in from the left margin, with the text indented an additional 0.25 in. Although the list is printed in multiple lines, it still remains a single sentence. As an example,

1. this is item one,
2. this is item two,
3. this is item three, and
4. this is item four.

Use the following format if each numbered item contains a complete sentence:

1. Bullets should not be used.
2. Numerical numbers are not used to avoid confusion with headings.
3. Lists containing fewer than three points are usually not printed in separate lines, although exceptions can be made when there are longer items to include.

## Page Margins and Page Numbering

The following page margins should be used consistently throughout the document:

Right hand margin: 1 in

Left hand margin: 1 in

Top margin: 1 in

Bottom margin: 1 in

Page numbers should be placed at the bottom of the page and right-justified. Roman numerals are used for the front pages and integers are used in the body of the document. Page 1 starts at the Introduction. There is no page number on the title page. Therefore the Executive Summary will usually be shown on page (ii). Follow the example used in this document.

The next section will deal with referencing in the text and preparation of a reference list.

# Referencing

This section will detail the correct manner in which referencing is to be done. This style convention should be followed in both seminars and dissertations or theses.

## Ethics

Where any statement of fact is not common knowledge (e.g. water is wet), or is not of the author's own creation, the information should be credited to the source. If a statement is copied verbatim from another source, those words should be enclosed in double quotation marks (" ") and referenced. Direct quotations, however, are rarely necessary and should be avoided whenever possible. All paraphrased material (i.e. quotes that are altered to better suit the document) should also be clearly referenced to the original source. In addition, any figures, tables, or data that are taken from another source should also be referenced at the point where the information is given. Students are encouraged to discuss this matter with a reference library staff member if they are at all unclear as to appropriate referencing and use of other material.

## Source Material

The most reliable sources of background information will be industry standards and patents. Peer-reviewed journals, conference proceedings, and government reports are also excellent sources when appropriate for the project. There is a vast amount of information available on the internet. Company websites may have product specifications that could be valuable for a market review. A large number of government agencies and other organizations make their peer-reviewed documents available online. Examples of these are the Food and Agriculture Organization (FAO), or the research departments of the United States Department of Agriculture (USDA). However, there is also a plethora of non-peer reviewed, popular press type articles that may not be acceptable as a reliable source of information. Discretion should be used when using information that has been obtained online. The NDSU library maintains a list of web pages that may help in evaluating source material found online.

<https://www.ndsu.edu/cfwriters/finding_sources/>

## Citing References

The convention for citing literature in the text and in tables and figures is based on the ASABE Guide for authors (ASABE, 2016). Specific examples are given below.

### Referencing in the text

The convention to be used for citing literature will be as follows. The name of the author(s) or company name will appear in the text followed by the date of the publication. This information will usually be placed in parentheses. For example, this is a statement of fact (Soap, 2003). The names and the year of publication are to be separated by a comma. Where there are two authors, both names are listed separated by 'and', e.g. (Soap and Bloggs, 2003). Where there are more than two authors only the first author will be listed followed by 'et al.', e.g. (Soap et al., 2003). The correct format is as shown.

Where a number of consecutive facts are to be credited to the same author(s), the following convention can be used. This is illustrated in the following example:

"Soap et al. (2002) gave the following discussion of tractive performance in …"

This is more desirable than simply putting the reference in parentheses at the end of the paragraph. It is also desirable to vary the placement of references in sentences, i.e. place some at the beginning and some at the end.

Where the original reference cannot be obtained, the reference is referred to in the following manner: (Smith, 1983; cited by Jones, 2003). Both references should appear in the reference list. However, it is desirable to obtain the original reference and to make minimal use of the “cited by” approach.

Where more than one reference is used to cite information, the references should appear in chronological order and then in alphabetical order if the years are the same. For example: (Smith, 1983; Jones, 1999; Thomas, 1999).

### Referencing tables and figures

Tables and figures should be referenced using the same convention as referencing in the text. Tables and figures should be referred to in the text before they appear in the document and should be referred to as “…shown in Figure 1.2” or “the values are contained in Table 2.1”. It is preferable to reproduce any tables of information rather than copying them directly from the source. This maintains format consistency within the document and allows the author to only include the information relevant to the project. When the source has been modified, the word 'after' is placed before the author's name in the citation. This is to account for any changes that may be made when reproducing the table from the original. See the example Table 4.1 below:

Table 4.1 Site details of the watershed catchment (after Smith et al., 2002)

|  |  |  |
| --- | --- | --- |
| **Sub-catchment** | **Area**  **[mi2]** | **Land use** |
| A1 | 2.63 | Corn |
| A2 | 4.25 | Grazing |

## Reference List

The purpose of producing a reference list is to enable the reader to obtain a copy of the material cited. For this reason, sufficient details should be supplied so that the reader can easily find the reference. In order to ensure that enough information is provided in the reference list, the style conventions detailed in the following sections should be followed exactly. It is important that the convention be used consistently throughout the reference list. The reference list should be in alphabetical order. Where the same author(s) has more than one publication, these should be listed chronologically. Where the same author(s) has more than one publication in the same year, these are differentiated by adding a lowercase letter to the year. For example: Smith, J. S. 1999a and Smith, J. S. 1999b. The letter should also be included when citing the reference in the text. The author’s name is presented first and then followed by the initials. The formats for the different types of references are described below.

References should be formatted according the ASABE Guide for Authors (ASABE, 2016). The following list gives examples of correct formatting for each source type

### Books

Allen, J. S. (1988). The Complete Dictionary of Abbreviations, New York, USA: MacMillan & Sons, Inc.

Cool, J. C., Schiff, F. J., & Viersma, T. J. (1991). Regeltechniek (Control Engineering). Overburg, Germany: Delta Press.

### Part of a book

Overstreet, H. A. (1925). The psychology of effective writing. In: Pierre, W.H, (Ed.), Effective Report Writing: Principles and Practices (pp. 87-109). Chicago, USA: Graphic Publishing Co.

### Standards

Agricultural Engineers Yearbook of Standards. (1983). S358.1. Moisture measurement -- Grain and seeds. St. Joseph, MI: ASAE.

ASTM (2016) D6751: Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels. West Conshohocken, PA: ASTM Int.

### Dissertation or thesis

Herder, A. B. (2001). Procedures for estimating irrigation water requirements from crop water requirements. MS thesis, Fargo, ND: North Dakota State University, Department of Agricultural and Biosystems Engineering.

### Personal communication

Note: In the text, cite the reference in the usual manner and include the complete reference in the reference list.

Soap, J. S. (2015). Personal communication. American Crystal Sugar, Inc., Moorhead, MN, 14 October 2015.

### Websites

Deere & Company. (2016) 650K Crawler Dozer. Moline, IL. Retrieved from https://www.deere.com/en\_US/products/equipment/crawler\_dozers/650k\_ft4/650k\_ft4.page [Accessed 18 Oct 2016].

USDA-NASS. (2015) 2015 State agriculture overview. Washington, DC: USDA-NASS retrieved from www.nass.usda.gov/Quick\_Stats [Accessed 1 Sept 2016].

Rogers, D. H., Lamm, F. R., Alam, M., Trooien, T. P., Clark, G. A., Barnes, P. L. & Mankin, K. (1997). Efficiencies and Water Losses of Irrigation Systems. [Internet]. Kansas State University, Research and Extension Engineers, Manhattan, KS. retrieved from www.oznet.ksu.edu/library/ageng2/mf2243.pdf. [Accessed 17 March 2000].

### Journals

Slaughter, D. C. & Harrell, R. C. (1989). Discriminating fruit for robotic harvest using color in natural outdoor scenes. Trans. ASAE, 32(2):757-763.

Burner, A. D. (1989). Driveline design considerations. Agric. Eng. 70(July/August):16-19.

### Conference proceedings

Miller, F. R. & Creelman, R. A. 1980. Sorghum -- A new fuel. In: Londen, H. D. and Wilkinson, W. (Eds.), Proceedings of the 35th Annual Corn and Sorghum Industry Research Conference. Washington, USA: American Seed Trade Association.

### Online images and tables

All images and tables that are taken off the internet should be referenced. If the name of the author/owner is available, then reference it to them. Otherwise, use the name of the website to reference the image/figure/table as shown below.

Arkal Filtration Systems. (2003). Spin Klin ® disk filter spine. Kibbutz Bet Zera, Israel: Arkal Filtration Systems. retrieved from: http://www.arkal-filters.com/agriculture/tm\_spin.gif. [Accessed: 14 October 2003]

An example of how this figure would be referenced in the text is shown in the caption for Figure 4.1 below.

http://www.arkal-filters.com/agriculture/tm_spin.gif

Figure 4.1 Spin Klin ® disk filters (Arkal Filtration Systems, 2003)

Bibliographic software tools (e.g. EndNote Web, RefWorks) are available for managing references and for automatically generating a list of references in a specified format. If many references are being used, such tools are valuable their use is encouraged. For further information on how to use Endnote Web, refer to the following web site:

https://library.ndsu.edu/tutorials/endnote-online-tutorial

This section has covered most typical examples for having to cite work done by others. One should strive to find a reference type that best suits the document that needs to be referenced. The next step is to acquire all the relevant information needed to adequately list the reference.

The following chapter deals with formatting details for figures, tables, equations and other style conventions.

# Additional Style conventions

This chapter will address specific style and formatting conventions for figures, tables, equations, and general conventions.

## Style Conventions for Figures

A figure is any drawing, photograph, flow chart, or graph. Figures can be used to great effect in documents to visualize products or data. They can be used to present information in an easy and understandable manner. They also allow for breaks in large sections of text. However, figures that are used should add value to the document and not just be present to occupy space. They are most effective when used to complement an explanation in the text. For this reason, figures should be placed in the document as soon as possible after they have been referred to in the text. No figure should be placed in the document if it is not referred to and discussed in the text. Each figure should be placed shortly after the first point at which it is mentioned.

The caption of a figure appears below the figure and should be numbered using the chapter number and the number in the sequence of figures in that chapter. The caption should not be terminated with a period unless it is written as a complete sentence. When figures are referred to in the text, the “f” is capitalized (e.g. … “as can be seen in Figure 4.1”). Figures should be center-aligned without any border around the figure. The caption therefore, should also be center-aligned. The figure should be able to be understood from its description in the caption. A hanging indent should be used for captions that are longer than one line.

In general figures should be included in black and white or grayscale to enable the document to be photocopied. Exceptions to this guideline include detailed GIS maps, FEA simulations, or color photos that do not lend themselves to being produced in black and white. Be aware that graphs and charts with colored bars or lines may be printed in grayscale and thus be difficult to distinguish. It is preferable to use very distinct grayscale shades or various line or fill patterns to distinguish parts of graphs showing data.

## Style Conventions for Tables

Information that is presented in a figure should not also be presented in a table. The caption for a table appears above the table. The same numbering convention as for figures should be used (e.g. Table 4.2). Table captions also do not end with a period unless they are written as complete sentences. The table should be able to be understood from its description in the caption. As with figures, a hanging indent should be used for captions that exceed one line. An example of table layout is shown in Table 5.1. Note that the number of decimal places used in a column should be consistent and be aligned. This alignment can be difficult if using center justification in each column.

Table 5.1 Example table of results

|  |  |  |
| --- | --- | --- |
| **Run Number** | **Volume**  **[m3]** | **Peak Discharge**  **[m3 s-1]** |
| 1 | 1,160 | 1.2 |
| 2 | 3,220 | 3.3 |
| 3 | 5,410 | 5.4 |

The top row and/or the first column of a table are often distinguished as headings by using a bold font. Horizontal borders should be used for the top and bottom of the table, and below the headings, but between rows of data. Similarly, vertical lines are generally not used unless there is need to distinguish between the first column and the remainder of the table contents. Care should be taken to use a reasonable number of significant figures in each column.

## Style Conventions for Equations

The formatting conventions as mentioned in Section 3.2.7 should be followed when inserting equations. All equations that were obtained from other sources should be referenced. All variables listed in the equations should be explained in the text preceding the equation or in a list directly below the equation. The following is an example of the two approaches:

 (5.1)

where

F = force [N],

m = mass [kg], and

a = acceleration [m s-2].

Another approach is shown as follows: the force, F [N], acting on a body is determined from the mass of the body, m [kg], and the acceleration of the body, a [m s-2], according to the following equation (Jones, 2000):

 (5.1)

In the first example it is preferable to have all the variables and descriptions line up vertically. This can be achieved by using tab stops. Units should be specified for all variables, unless they are dimensionless. In some case, dimensions (e.g. [T] for time, of [L] for length) may be used instead of actual units (e.g. min or cm)

## Proper Use of Tense

Tense is expected to be used properly throughout the document. Scientists and engineers often have difficulty deciding between past and present tense. Consistency is the most important rule to abide by, but a proper usage of tense in scientific writing is as follows:

Past tense – Use past tense to refer to things that have already happened. For example: “The testing was conducted in February of 2015” or “The sensors were installed at a depth of 1.4 meters.”

Present tense – Use present tense to refer to experimental or test results, because they are completed and (hopefully) valid for all time. For example: “The results indicate that rainfall intensity varies with the inverse cube of soil depth.” Also, use present tense to refer to published work of others (for the same reason).

## Active vs. Passive Voice

The use of active and passive voice is somewhat controversial in scientific writing, and a consensus has not been reached on this issue. Passive voice is more “impartial” and “scientific” because the focus of the writing is the action, rather than the person performing the action. However, passive tense can be very boring to read, and active voice is sometimes necessary to indicate human involvement. In general, use passive voice for the following three situations[[1]](#footnote-1):

1. Descriptions of processes that do not involve direct human control: “The streambed is eroded most intensely during periods of spring runoff.”
2. Descriptions of procedures: “The sample was placed in the beaker and mixed for 3 minutes.”
3. Explanations of existing knowledge: “The mechanisms of thermal exchange are not well understood.”

## General Conventions

This section lists some common errors that regularly appear in reports. These style discrepancies often detract from the quality of the document.

1. **Inadequate Proofreading** – Each team member should read through the entire document to find errors that may be overlooked by the original author. Sometimes spellchecker does not pick up words that are used incorrectly, because they are correctly spelled, e.g. fro instead of for.
2. **Sentence length** - A common stylistic trend when writing is to use long sentences. These sentences often exceed 5 lines. They become cumbersome and the meaning of what is being presented is often difficult to fathom. It is more desirable to break these long winded sentences up into shorter ones.
3. **Having a sub-heading directly follow another heading** - This can be avoided by providing a sentence or two that describes the sub-sections that follow.
4. **Inconsistent use of bullets** - The same bullet style should be used throughout the document. If the sentences in one list are separated with commas or periods, the same should be done in other lists.
5. **Not linking sections in a document** - The document should flow from start to finish. This can be achieved by presenting the information in a logical sequence that shows how the topic is being developed. Linking sentences between sections can be used to demonstrate how each section fits into the overall document plan.
6. **Inconsistencies in the document** – While it is expected that the entire document should consistently follow the required style, inconsistency in style within the document detracts from the quality of the document. It is preferable to be consistent, even if you have deviated from the required style, than for the document to be inconsistent in style!
7. **Use of italics** – Italics is generally reserved for printing variables, such as *ET*, *α* and *n*. Italics are also commonly used for words and acronyms from other languages.

# references

ASABE. 2016. ASABE Guide for Authors. American Society of Agricultural Engineers, St. Joseph, MI. Available from: https://www.asabe.org/media/59251/asabe\_guide\_for\_authors.pdf. [Accessed 18 October 2016].

# appendix A: An Example of a report title page

The example is illustrated on the next page.

TITLE OF REPORT

**First Author Name**

**Second Author Name**

Course Number and Name

Department of Agricultural and Biosystems Engineering

North Dakota State University

Fargo, ND

Month Year

1. Note that this list only has three points (whereas the style guide suggests a minimum of 4). If your list is somewhat verbose, lists of three items may be placed in bulleted form. [↑](#footnote-ref-1)