



IOWA STATE UNIVERSITY

AERE 294X/AERE 494X

MAKE TO INNOVATE

M:2:I Milestone Example Report

Project: HABET

Team: Engineering Team

Author(s):

Matthew E. Nelson

James Benson

Christine Nelson

Role:

Team Leader

Team Member

Team Member

Faculty Adviser: Matthew E. Nelson

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1 How to use this template

This template is provided so that M:2:I teams can easily write reports that comply with the reporting standards set forth by the Make to Innovate Program Coordinator. This template uses \LaTeX to generate a PDF that can be submitted on Blackboard. Students should also upload their \LaTeX files as a zip file or should share them with the instructor. This template will be made available through Overleaf as a template.

To begin with, make sure you edit the items noted in the above code. You will want to make sure you that you set the Title, Authors (team members) and faculty adviser as it pertains to your group. The rest should be left alone. All other formatting is handled automatically by \LaTeX .

Do not forget to delete this entire section. It is only here to help you get started. When done, simply delete all the text in this section. The other sections will be required in your report.

1.1 Writing Style

For writing a report students should read and refer to the book "Writing Style and Standards in Undergraduate Reports". Specifically students should look at section 1.5 (page 32) and the example found on section 1.9 (page 55) of Donnell et al. (2016). Students should also refer to Chapter 2 which goes into more detail on writing standards. Remember that you need to convey to your reader (in this case the instructor) about what you have accomplished, why you did what you did and how you came to any conclusions. Your reports should have a good flow and it is encouraged that you use paragraphs to transition from one section to the next.

1.2 Table of Contents

The table of contents will be automatically created based on the use of `\section{...}` and `\subsection{...}` commands used. This template will provide section headers for any section that is required. You are free to add any other sections or subsections as needed.

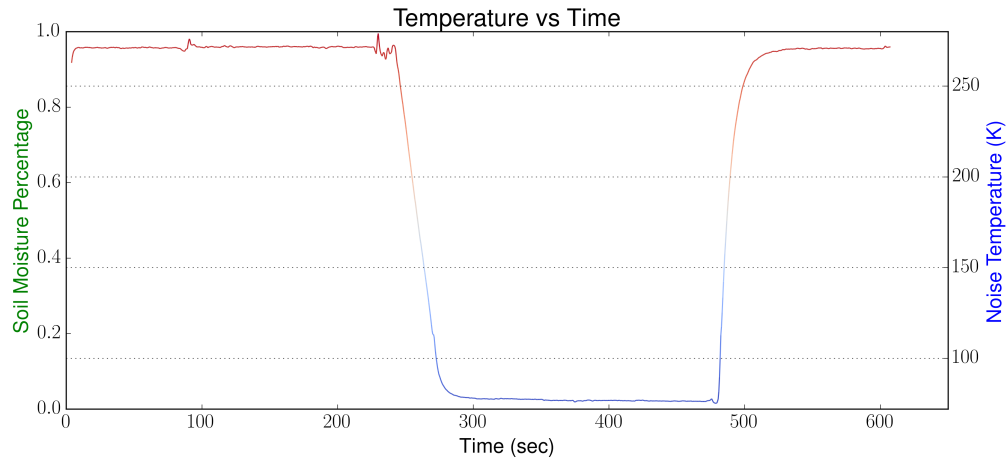


Figure 1: An example image placed in the report.

1.3 Images

Images are handled differently in \LaTeX . To begin with, you should upload all images into the "images" folder (if you are using Overleaf, otherwise place them in the images folder). This file is setup so that it will search that folder for images. To use images we first use the `\begin{figure}` to setup an area for our image. The `\includegraphics[width=\textwidth]{sdr_soilmoisture.png}` is then used to call the image. The "width" in the first part is set as the same width as your document text. The filename is then next. Finally we want to put a caption for this image. This is done using `\caption{...}`. It will automatically number the figure for you. Finally, please note that `\label{...}` command. This allows you to reference that image easily by using `\ref{...}` like this: Figure 1 shows the calibrated soil moisture readings in comparison to the noise temperature.

A final note on images. \LaTeX will automatically place the image in the best location according to the standards we have put forth. This can be confusing as it may not put it exactly where you put the code. However this is perfectly acceptable and this is the reason why you need to reference your figures in your writing. Generally \LaTeX will place images on the top of the page but it may move it to its own page if needed. In other words, do not worry about the image placement, just let \LaTeX do its job.

1.4 Bibliography

Students are expected to cite all references used. This includes any equations you used from any textbook, any journal articles (Mohan et al., 2010), conference proceedings (Nelson, 2014) websites (ABET, 2015) or other source material. Make to Innovate uses the Chicago style for references. The formatting will be handled for you automatically by L^AT_EX. However, you will need to add your references to the `biblist.bib` file. You can upload and use other sources such as a link to your Mendeley account if you are using Overleaf. Just make sure you edit the `\bibliography{...}` command that is at the bottom.

1.5 Appendices

Students are encouraged to use appendices in order to show additional information that is relative to the report. This may include source code, additional 3D drawings, specifications and requirements, datasheets, or other additional information.

1.6 Final advice

Remember that your report needs to tell a story, a story about the work that you did. Plan your report out ahead of time and it should go a lot easier than just writing things out. Also, yes, you will repeat yourself...a lot. This is normal for almost all report writing. Just make sure you are not just copying and pasting whole paragraphs, rephrase and rewrite. The sections provided should give you a good start. Make sure you do a spell check and also read it and have others read it for grammar mistakes. Overleaf does have a spell checker, but does not check for grammar. Finally if you want me (the instructor) to look over a report before submission I will be more than happy to do so. Just remember that I will probably need at least 1 or 2 days to read over it and give you feedback. Make sure you send me the source `.tex` file or share it with me on Overleaf. Good luck!

Abstract

This is your abstract. A well-structured abstract defines the need, specific goal or problem, the action you took, and the results and assessment of the results. Your abstract should include what the deliverable(s) of the milestone was, what the milestone is about and why it is important. The abstract should not be numbered and should be on its own page.

2 Introduction

This is your introduction. It should state the problem and what the need is in general terms. Introduce your problem and how this milestone will solve it.

3 Background

A background of the problem or system. Describe what lead to this issue if that applies. Your goal should also be clearly specified here.

3.1 Deliverable

Outline what exactly the deliverable(s) are for this milestone.

4 Problem Identification

Fully outline your problem statement. Include all technical details in this section that helps to define the problem that this milestone will solve.

5 Problem Solution

State your solution to the problem. Include all technical information here.

6 Experimental Validation

Your deliverable should include that you have built and/or tested something. Include those results here.

6.1 Experimental Theory

What were your expected results? State what theory backups your claim.

6.2 Experimental Procedure

This should describe what procedures you did to conduct your test or experiment.

6.3 Experimental Results

This is the results of that testing or experimentation.

7 Discussion

Here discuss how successful the milestone and deliverable are and other thoughts that you have in regards to this milestone. This is also a good place to make recommendations for future work if needed.

8 Conclusion

Summarize your report here.

9 Acknowledgments

If you wish to acknowledge any person, group or entity you should do so here.

References

- ABET (2015). Criteria for accrediting engineering programs. <http://www.abet.org/accreditation/new-to-accreditation/eligibility-requirements/>.
- Donnell, J., S. Jeter, C. MacDougall, and J. Snedeker (2016). *Writing Style and Standards in Undergraduate Reports* (3rd ed.). Glen Allen, Virginia: College Publishing.
- Mohan, A., D. Merle, C. Jackson, J. Lannin, and S. S. Nair (2010). Professional skills in the engineering curriculum. *IEEE Transactions on Education* 53(4), 562–571.
- Nelson, M. (2014). Teaching students science and engineering with high altitude balloons and ChipKits. In *2014 ASEE Annual Conference & Exposition*, Indianapolis, Indiana.

A Example Appendix

This is a very short example of doing an appendix in \LaTeX . An appendix is not required but is a good place to put code, additional drawings, tables or other information that will help the instructor in determining that you met the requirements of the milestone. I have included an example of how you can use \LaTeX to automatically import code.

```
1 clear , clc
2 % AerE 160, Fall 2015, Lab 1–Demo
3 % Matthew E. Nelson
4 % My first program in MATLAB, Hello World!
5 disp( ' Hello , World! ' );
6 %-----
7 clear , clc
8 % AerE 160, Fall 2015, Lab 1–Demo
9 % Matthew E. Nelson
10 % User Input
11 % See if the students can catch the error
12 Name = input( ' Enter your Name in single quotes: ' );
13 disp( 'Hello!' )
14 % make a mistake on purpose: use name instead of Name
15 disp(name)
16 %-----
17 clear , clc
18 % AerE 160, Fall 2015, Lab 1–Demo
19 % Matthew E. Nelson
20 % putting it all together
21 Name = input( ' Enter your Name in single quotes: ' );
22 fprintf( 'Hello , %s !' , Name)
```