



L^AT_EX Template for MQP Reports

A Major Qualifying Project

Submitted to the Faculty of the

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

Degree of Bachelor of Science

By

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Date: August 6, 2012

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Key Words: Lorem ipsum, dolor sit amet, consectetur, adipiscing elit

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Abstract

The abstract may only be 800 characters long. It, along with a short title, is reported on your transcript. Use the same short title in the footer. If you print your report double-sided, the abstract should be on the right-hand side of the opened report. (Insert a blank page after the title page.) The abstract starts the front matter, which is numbered with roman numerals, as seen below.

Acknowledgements

The author expresses sincere appreciation...

Dr. John Doe

Dr. Jane Doe

Joseph Smith

Kappa Zeta

Authorship

If your MQP was a team effort, you should spell out who did what on an Authorship page, placed immediately before the Table of Contents. Sole authors should delete this section.

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Executive Summary

The executive summary plays the role of a substantive abstract, since the abstract for your transcript is so restricted in length. Write the executive summary for a busy executive who does not have the time to read your report, but is interested in its contents. The summary should be at least one page long, yet should not be longer than five pages. The use of a few key figures is acceptable in a longer executive summary.

Whereas a summary at the end of a report restates the important conclusions, abstracts and executive summaries should reflect a complete picture of your work, as they are likely to be read independently of the report. They should give the reader clear statements of:

- Content
- Motivation
- Methods
- Important results
- Implications of the important results

1 Introduction

Break the chapters into logical sections as seen here. It is helpful to the reader to write a few sentences of introduction before beginning the first section.

1.1 Formatting your Text

Text immediately below a chapter or section heading should not be indented, yet subsequent paragraphs should be indented, as seen in this and the following paragraph.

Each chapter should start on a new page. If your report is printed double-sided, the chapters should start on the right-hand side of the opened document. Insert a blank page at the end of the previous chapter, if necessary.

Note that the front matter was labeled with roman numerals. Page 1 of arabic numerals starts with the first page of Chapter 1.

1.2 Purpose of the Introduction

The introduction answers the question “Why?” That is, it gives the broad problem that motivates the work. Write it for a college-educated person of any background. A typical length for an introduction is five to ten pages.

A reader will be interested in:

- What is the broad societal problem?
- How does the problem relate to this project?
- How will you address the problem?
- How is the rest of the report structured?

2 Literature Review

The literature review is written for an interested reader with a bachelor's degree in your major. In it, you *synthesize* previous work by others, both WPI students and external researchers. The word "synthesize" is purposely emphasized here – a poor approach is to robotically write one paragraph describing each of the papers that you have read. Your job is to help readers make sense of prior research, not merely to help them memorize which researchers have done what. After you discuss the previous work, conclude the chapter by identifying the gaps in the literature that you will address throughout the course of your project.

Students have the most difficulty writing this chapter. A good way to begin is with a "figure outline," in which you compile the most instructive figures from the papers that you have been reading, placing them in a logical order. Then write to explain the figures, and in doing so, the field of study.

After the first draft of your literature review, ask yourself:

- Will readers understand my work, based on the background in this chapter?
- Will the reader understand the significance of my project, based on the gaps in the literature that I have identified?

Ten to twenty pages is a typical length for a literature review. Fewer than thirty references will make your report seem weak. This is an example of how referencing is done [1, 2]. Be consistent in your referencing style within each and among all chapters.

3 Methods

Write the Methods chapter for a future student who will continue your work. Any detailed methodologies, which could be of great help to future students, should be relegated to appendices. Fewer than ten pages of methods would diminish the value of your report.

3.1 Handling Equations

Short, simple equations should be in line with the text, such as $e^{i\pi} = -1$. Longer or complicated equations should be offset from the text, for example,

$$e^{i\theta} = \cos \theta + i \sin \theta. \tag{3.1}$$

Note that the equation is punctuated in the same way as a sentence. As a continuation of the paragraph that started before Eq. 3.1, this block of text is not indented. The first digit in the equation number reflects the number of the chapter.

If you do not refer to your equations in later text, there is no need to number them.

3.2 Handling Figures

Figures are an important part of your report. Choose each one to illustrate a significant point. If readers were to merely look at the figures and read their captions, they should come to a good understanding of what you have done. Explain axes and abbreviations in the figure caption, and give the reference if you have not created the figure yourself.

A figure should appear shortly before or after you refer to it in the text, ideally on the same page, but if not, soon thereafter. If you refer to a figure within a sentence, abbreviate the word “Figure.” An example is Fig. 3.1. However, if “Figure” begins a sentence, write it out completely. Figure 3.1 is an example.

There should be enough figures to enliven your report, but they should not dominate it. Roughly one figure per five pages is enough to enliven. One figure per page or excessively



Figure 3.1: Sed pulvinar, felis id consectetur malesuada, enim nisl mattis elit, a facilisis tortor nibh quis leo [1].

large figures creates the impression that you are padding the length of your report. If a lot of figures resulted from your data acquisition, and they are similar, use one or two example figures in the main body of the report, and put the rest in an appendix.

3.3 Handling Tables

Interestingly, whereas captions for figures lie beneath the figures, captions for tables lie above the tables, as seen in Table 3.1.

Table 3.1: Lorem ipsum dolor sit amet, consectetur adipiscing elit.

	24°C	26°C	28°C	30°C
L_1 values	1280 nm	489 nm	684 nm	550 nm
L_2 values	154 nm	105 nm	108 nm	175 nm
s_1 values	2.37 nm	4.01 nm	1.42 nm	2.35 nm
s_2 values	2.22 nm	1.34 nm	6.27 nm	7.01 nm

4 Results and Discussion

Fewer than ten pages of results, discussion, and explanations of the challenges that you faced would be interpreted as if you did not put much effort into your MQP.

4.1 Results

As the name suggests, in the Results section you describe your results. Every important point should be illustrated with a figure or table. Tell your readers what they should observe.

4.2 Discussion

After you describe your results in the Results section, you discuss them here in the Discussion section. Points that readers look for in the Discussion are:

- A reminder of the purpose of the project
- Descriptions of the expected or unexpected trends in your results
- Comparison of your results with existing literature
- Limitations and challenges of your project
- A discussion of what is still not understood about the topic

Readers of your electronic document will be impressed with its sophistication if you include links to the figures, tables, and equations as you discuss them, e.g. Fig. 3.1, Table 3.1, and Eq. 3.1. One click, and they return to the right place to review the results. Yet be careful not to make the link color so garish as to distract your more traditional readers. A good choice of color is one that looks black when printed, yet is a slightly different color when viewed on the screen. This template uses dark blue.

5 Summary and Future Work

Fewer than five pages of summary and future work would be viewed as a report that has been hurriedly written. Often a busy reader will read only the abstract, executive summary, and the last chapter. In the Summary, make sure to tie your most important results back to the broader societal problem that you described in the Introduction. Discuss their implications. Similarly, the Future Work is often the most helpful part of an MQP report for the next team of students. Therefore care and thought are valued.

5.1 Summary

Cras ut diam eu velit tincidunt consequat. Ut a nisl lectus. Vestibulum hendrerit eros at libero condimentum id dapibus velit luctus. Nunc eros tellus, lobortis ut volutpat in, ullamcorper sit amet tortor. Etiam porttitor feugiat augue, vitae consequat odio mattis at. Cras diam dui, commodo quis hendrerit eu, pulvinar in augue. Ut faucibus mauris cursus elit mollis auctor sagittis dolor pretium.

Nam mattis congue magna vitae adipiscing. Morbi facilisis facilisis fermentum. Aliquam et tellus lacus, ut varius tellus. Nullam tellus arcu, bibendum ac auctor fringilla, auctor et nulla. Aenean vitae eros sit amet dolor pellentesque venenatis in vitae tortor. Donec feugiat laoreet eleifend. Nam dignissim tellus sed justo venenatis ut tincidunt erat ultrices. Curabitur elit dolor, posuere vitae aliquet ut, consequat eu erat.

5.2 Future Work

Vestibulum blandit varius pellentesque. Nullam sapien augue, consequat id ornare at, convallis quis magna. Sed hendrerit nibh non arcu ultrices commodo. Donec aliquam euismod elit vitae commodo. Duis quis arcu vel libero vulputate sollicitudin. Curabitur hendrerit mi eget magna rutrum porttitor. Nam eu massa nibh, id fermentum magna. Morbi aliquet, justo ac laoreet aliquet, turpis libero feugiat ligula, sed sodales mauris nibh et ipsum.

References

- [1] Costerton J.W., S. Lewandowski, D. Caldwell, D. Korber, and G. James. MiniReview: Biofilms, the Customized Microniche. *Journal of Bacteriology*, 176(8):2137–2142, April 1994.
- [2] Parsek Matthew R. and Clay Fugua. Meeting Review; Biofilms 2003: Emerging Themes and Challenges in Studies of Surface-Associated Microbial Life. *Journal of Bacteriology*, 186(14):4427–4440, July 2004.

Appendices

A Sample Preparation

The main body of the report contains enough detail to describe your project in depth, but not so much detail that the reader becomes bored. The appendices are where *all* of the details appear. Write them for a future student who must replicate your work. Sample preparation and experimental methods are typical appendices. There are many more possibilities; some professors will ask you to include the slides from a talk or poster that you gave, for example.

B Detailed Methodology

Generous use of lists is appropriate in appendices.

B.A Nullam laoreet lorem et velit

1. Vivamus at nisl quis sapien tincidunt volutpat a at tellus.
2. Duis a felis vitae augue eleifend bibendum.
3. Vivamus accumsan placerat nisl, ac semper augue vestibulum sed.
4. Nulla eleifend metus quis eros rutrum luctus.
5. Ut vestibulum ipsum vel purus luctus volutpat.

B.B Mauris ac ligula felis, placerat molestie libero

1. Praesent et nulla eleifend diam posuere facilisis.
2. Donec euismod justo eget lorem consequat hendrerit.
3. Vivamus lacinia mattis massa, in iaculis mauris scelerisque in.
4. Nullam non ipsum neque, vitae interdum enim.
5. Pellentesque at nulla odio, a volutpat felis.