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**Major Qualifying Project Guide
for Writing Report**

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Contents of This Guide

This packet contains all the information necessary to complete your MQP report successfully. It is a good idea to look through this material before you start work on your project and to refer to it as you progress through your work so that you have a coherent and logical approach and that you follow the correct format. Enclosed you will find:

1. Report Sections.
A document outlining the general format of the MQP report
2. A part of your report will provide background information needed to comprehend your project and perceive details of your proposed solution.

Chapter 1. Introduction

Chapter 2. Literature review

Chapter 3. Project Strategy

Initial Client Statement

Objectives & Constraints

Revised Client Statement

Project Approach

Chapter 4. Alternative Designs

Needs Analysis

Functions (Specifications)

Conceptual Designs

Feasibility Study/Experiments

Modeling

Preliminary Data

3. The next four chapters will reveal how your project was conducted, how you interpreted your data and what you recommend including alternative solutions and deeper research analysis. Note that the results and discussion chapters are separate. This separation allows you to draw on all of your results in your discussion and allows easier discussion of the big picture.

Chapter 5. Design Verification

Chapter 6. Discussion

Chapter 7. Final Design and Validation

Chapter 8. Conclusions and Recommendations

4. A sample of MQP title page and Table of Contents
5. A sample evaluation form used by the MQP report reviewer

The general report format document briefly explains the purpose of each part of your report and what material should be included in that section or chapter. Each MQP report should include most--if not all--of this material (although the exact format of each section and chapter can vary and will depend upon the nature of the project). Before you begin to write your report, consult with your advisor(s) for more information specific to your MQP.

The sample table of contents, covers all of the sections and chapters outlined in this document and where they should appear in your report. All of the sections and chapters in the sample are applicable to all projects.

Preface

This guide will help you to write your Major Qualifying Project (MQP). It explains how to tailor your biomedical engineering MQP and how to format your report. Using this guide will help you to approach your MQP problem while providing you with the means of documenting the entire process.

The MQP report

The purpose of the MQP report is to document your MQP from problem conception to final result. In addition, the MQP report must communicate that you have mastered the material needed to complete the project and the project meets capstone design requirements.

For example, if your project deals with designing a device to measure the severity of peripheral edema, can you explain how such edema is measured? Can you explain the physics behind edema measurement, i.e., what happens to the edematous tissue when depressed for several seconds? Can you explain the phenomenon known as “pitting”? You need to convince the reader that you understand where the problem fits into your field and what all the relevant issues are.

What is the format of an MQP report?

Your report will typically have eight chapters. The first three chapters will identify the problem and, using background material, put into the proper context. The next five chapters will describe what you did, what the results were, and how you interpreted them.

- Chapter 1. Introduction
- Chapter 2. Literature Review
- Chapter 3. Project Strategy
- Chapter 4. Alternative Designs
- Chapter 5. Design Verification
- Chapter 6. Discussion
- Chapter 7. Final Design and Validation
- Chapter 8. Conclusions and Recommendations

References

Chapters 1-3, introduce the reader to the problem that your project is trying to address. Therefore, these chapters should present background material that helps the reader to understand the context of your project aim. Routinely, providing a context entails summarizing previous published research. This context may also be supplemented by summarizing preliminary work performed by previous MQP groups or their recommendations. The purpose of background material is to convince the reader that your ideas are sound and that the work you are proposing has a good chance of succeeding.

Chapters 4-8, gives the reader the details about what you did and what the results were. In addition, this part includes chapters that discuss and interpret the results (Chapter 6. Discussion) and a big-picture summary of their significance (Chapter 8. Conclusions and Recommendations).

Although Chapters 4-8 may resemble the material of a journal article, it contains more information than is usually presented in such an article. This additional information shows the reader in more details the steps you took along the way to your final result. For example, in Chapter 4 you will need to describe your initial-through-final designs and what criteria you used to decide on design alternatives specifications or changes.

Audience

Before you begin your report you should have a clear idea of your intended audience, which should determine the level of detail present in the report and the amount of background material that is required. In the case of the MQP report, you are writing for other students who may be continuing the project or for people outside of the field who may know something of what you are doing but who are not experts.

This information should be clearly stated in Chapter 3 (Project Strategy).

You must convince the reader that you understand the history and relevance of the design you are working on and why you chose to design in the manner that you did. The evolution of your design should be documented in a way such that the reader can follow your reasoning. The experimental methods that you used (whether for an experiment or for testing a device) should also be documented completely so that the reader can interpret the applicability and viability of your results. You should then state your final results and your interpretations. Finally, you should be able to make some recommendations for future work.

Engineering Projects

Engineering projects involve the design and construction of a device (usually a prototype) for a specific purpose. The initial step is to identify a problem to be solved. In an engineering study, the “problem” is a need to be filled. For example, there may be a need

for a noninvasive tissue pH-measuring device, because an early symptom of a particular disease results in a change in tissue pH.

In engineering projects we have to state the Project Objectives. An Objective might be to design and build a device that measures the change in pH over the disease progression.

You then need to state exactly what you intend to achieve during your MQP project. If your Objective is to measure the small pH change that occurs over the course of the disease progression, then a Project Objective might be to construct a device with the required accuracy to measure that small change.

In general, your steps can be summarized as follows:

Step	Engineering Project
1	Make Observations
2	Identify a Problem/Need
3	Define Project Objectives
4	Define Project Functions
5	Define Project Specifications
6	Develop Conceptual Designs
7	Evaluate Conceptual Design
8	Develop Preliminary Designs
	Evaluate Preliminary Designs (which may include testing and experiments)
9	Design Device(s)
10	Build the Device(s)
11	Test Performance of the Device(s)
12	Decide on a Final Design
13	Document Final Design
14	Identify Areas Needing Improvement
15	Suggest Future Optional Design Solutions

Each section heading shown below should appear in your MQP report however, the contents of the sections will vary from project to project. This document is designed to give as much guidance as possible, but a single document cannot cover all eventualities. You should, therefore, consult your advisor when questions arise.

TITLE PAGE

The Title Page should include the title of the project, the name(s) of the author(s), the date of final approval (month and year), and the name(s) of the project advisor(s). The Project Office requires that you list three keywords pertaining to the project on the left side of the

page, opposite the advisors' signatures. Careful thought should be given to the selection of a project title which should be confirmed with your MQP advisor(s). A sample Title Page is included at the end of this tutorial. Text that appears in < > is specific to your project.

TABLE OF CONTENTS

A Table of Contents directs readers to the location of specific information and gives them a quick overview of the entire project. Use the decimal numbering system for both sections and subsections. Note that page numbers for material which is not the actual text of your document should be numbered using Roman numerals especially for example, the Table of Figures. Number each page using Arabic numerals.

AUTHORSHIP PAGE

The Authorship Page should identify the work for which each group member was responsible. Information should be provided not only for the actual project work, but also for the writing of the report. This section should **not** exceed one page.

ACKNOWLEDGMENTS

In this section, it is customary to list each person and organization that has contributed to your work. The nature of the contribution (e.g., permission for the use of equipment, access to facilities, etc.) should be described and included.

ABSTRACT

The Abstract should present a concise overview of the project. The Abstract should clearly state the project's objectives, rationale, a brief summary of the procedure employed and the final results produced from the project. The Abstract should be written as a completely self-contained section, that is, it should provide sufficient information for a general understanding of the project's goals and results.

Because the Abstract is necessarily brief, it can be difficult to write. Effective abstracts will:

- 1) Contain enough specific information to satisfy both the needs of a researcher looking for information, and of an administrator looking for a progress or status definition;
- 2) Be a complete, self-sufficient description of the work and the results;
- 3) Contain numerical results and their associated errors, if appropriate (e.g. 10.1 ± 0.3 sec);

- 4) Be brief and contain only the results themselves and the conclusions, but no discussion of the results;
- 5) Be written for the general reader in easily understood language, but may contain standard, generally recognized abbreviations, and
- 6) Be consistent in tone and emphasis within the MQP report.

Using the list above, you can see that an abstract should be written after the project work is complete, the data analyzed, and the first draft of the report written. However, because the abstract is written last, it often suffers from being done too quickly. This is unfortunate since the abstract is usually read first, and a reader will often form a general impression of the work from the abstract. Thus, careful thought and planning is required to insure that this section reflects the quality of the entire report. The typical length of an abstract is approximately one double-spaced page; however, WPI limits abstracts to 170 words.

TABLE OF FIGURES

Figures should be numbered using the “chapter#.figure #” format, for example, the third figure in Chapter 5 is Fig. 5.3. Note that in referring to a particular figure in the text or caption, the word “figure” is always capitalized and abbreviated (i.e. “Fig.”), except at the beginning of a sentence, where it is capitalized and spelled out. This table should be placed on a separate page.

TABLE OF TABLES

Tables should be numbered using the same format as that used for figures. However, the table number and table description should be placed at the top of the table. The word “table” is always written out, not abbreviated. In references to a specific table in the text, the word “table” is always capitalized. This table should be placed on a separate page.

REFERENCES

This section lists any sources you have consulted, whether they are print, electronic, or personal communications. Reference any facts in your report that you have not directly verified and that are not immediately obvious to the layman. For example, if you state that heart disease is the number one cause of death for adult males over the age of 65, you should provide a reference for this fact.

The References section should be written according to common practices, i.e., there are many permissible styles of writing reference entries, do not invent your own. Ask your advisor(s) about common styles in their field or look at journal articles that you used to write the Literature Review chapter. One common style is shown below:

Searcy, W.A., and Nowicki, S., “Signal interpretation and the use of soft song in aggressive interactions”. *Ethology* **112**:865-872 (2006).

Include sources both for figures in your References as well as listing the source in the figure caption itself. In addition, any conversations or interviews that were conducted with professional experts during the MQP process should be referenced. In general, websites are NOT good sources of references and should not be used unless you refer to existing products on the market, etc.

GLOSSARY

The non-specialist reader will not understand the technical vocabulary necessary to describe your project and its results fully. Therefore, it is often helpful to add a Glossary section. Briefly define any technical term used in the text.

APPENDICES

Use Appendices for important material that is too voluminous and digressive for inclusion within the project text. For example, if you have written computer code that is important to the project, you should include it as an Appendix. If you have done some calculations that are somewhat peripheral to the project, or have come up with a new way of looking at a derivation, put it in an Appendix. All material placed in an Appendix must be referenced within the text of the project. Where necessary, separate Appendices should be used rather than one large Appendix to facilitate easy reference to the materials. Each Appendix should be lettered (i.e., A, B, C..), given an appropriate title, paged, and included with appropriate title and page in the Table of Contents.

WRITING HELP

If you would like to discuss a draft of your document with a writing consultant, make an appointment with WPI's *Center for Communication Across the Curriculum* (<http://www.wpi.edu/Academics/Depts/HUA/WC/>). For information about registration procedures, go to <http://www.wpi.edu/Academics/Projects/started.html>.

Chapters

The goal of the first four chapters of your report is to present background information necessary to the understanding of your project and to detail how you intend to solve the problem you have chosen. Note that by necessity, you will use past and future verb tenses in this section. The background information you present describes work that has already been done.

CHAPTER 1—INTRODUCTION

The goal of this chapter is to provide an introduction to your project written in language that a general audience can understand. The introduction should in the broadest terms, identify the problem and the project objectives. Remember that the background material has not yet been presented to the reader, so you should not assume that the reader has any special knowledge. This chapter should (briefly) address the following questions:

- What is the general problem you are addressing? For example, if your project is related to diabetes, you should give the reader a general impression of how prevalent diabetes is and some background of the disease. This is to give the reader some context with which to follow your literature review. This part should answer the question, “**why** are you doing the project?”
- What are the overall goals of your project? This should be written so that the reader has a clear grasp of the scope of your project. This part of the Introduction should answer the question, “**what** are you going to do?”
- What is the general procedure that will be employed in conducting the project? This material should answer the question, “**how** are you going to do it?”

The final paragraph(s) of the Introduction should preview briefly the contents of each of the succeeding chapters. It is important that this material present an accurate description of what appears later in your MQP report and, therefore, should be one of the last chapters that you write. The Introduction will rarely exceed four or five pages.

CHAPTER 2—LITERATURE REVIEW

This chapter provides the intelligent but non-specialist reader all the introductory information needed to understand the general problem that your project addresses as well as your project’s Specific Aims. Your literature review must give the reader a brief summary of what is currently known about your problem area. You should think of this chapter as your chance to build a logical argument that will convince the reader that your approach is reasonable and one that will produce relevant results.

The goal of this chapter is to build a logical argument that leads to your project approach and Specific Aims. This chapter should include the following:

1. Information about the importance of the field that you are working in.
2. How your specific project relates to the larger problem area.
3. A summary of what is currently known (and unknown) about the area your project addresses.
4. A summary of the current mathematical models used in this field and their assumptions (if applicable).

5. A summary of the state of art in this field.

After reading your literature review, your audience should be able to follow the technical reasoning you provide for your project design and your conclusions.

The literature review for projects in which the goal is the design and construction of a device. The reader must understand the general problem so that the device specifications that you have chosen will be meaningful. In addition, if current devices are not fully discussed, the reader has no context against which to judge the success of your device.

The literature review elaborates upon details and topics that were treated in a cursory fashion in the Introduction chapter (e.g., the importance of the project, debates concerning aspects of the project, specifics on alternatives, benefits to be derived from the results of the project, etc.). It should discuss only work performed by others, but not the work you performed as part of this project.

This chapter is usually quite lengthy and extensively documented. References are necessary for all quoted material, all specific facts that are not general knowledge, and all quantitative data. WPI has adopted Kate Turabian's *A Manual for Writers of Term Papers, Theses, and Dissertations* (based on the larger *The Chicago Manual of Style*) as the standard style guide for documentation. See the References section in this guide for more information on the format for references.

The literature review can be difficult to write if treated as a repository for all of the material that you read during the research phase of your project. If, however, you think of the literature review as a story you are telling readers to get them to your level of understanding, the literature review becomes much easier to write. Remember that when telling a story, you don't want to include everything you know about what happened. It is better to put only the relevant facts in the review, the facts that lead the reader directly to understanding your project approach. If it is approached in that manner, the background material is much easier (for you) to organize and for the reader to understand.

You should include any published evidence in the literature review for the following reasons:

1. It provides a historical development of the subject. Remember that you are trying to provide the reader with the background information that will be needed to understand the choices made in the project and the interpretation of the results.
2. It points out limitations of previous work.
3. It provides supporting evidence (either data or theories) for your point of view.
4. It raises opposing viewpoints. You will have to address any data or theories that run counter to your hypotheses. Either they must be shown not to be

applicable to your situation or countered with preliminary data that show them to be wrong.

The point is that you should cite work only when you have a reason either to support what you are arguing or to ward off criticism of your work by showing how data or arguments that disagree with you are either flawed or inapplicable to your work. All material that you read during the research phase does not need to appear in the Literature Review.

When citing a work, remember that you are trying to tell the reader a story and that the work that you want to refer to should be woven into the narrative. Imply rather than state that a work is important. Instead of, “This work is important because...” tell the reader the work’s main finding. For example, “Hackenbush, et al. (1964) found that the mean pO₂ of C3H murine tumors increased by 50% when the animals were breathing carbogen gas.”

Though you should be concise, you should include enough detail so that the reader can understand the significance of the citation. Assumptions that were made and numerical results (with errors) should be reported if they are crucial to your argument. If you are critiquing a work, enough detail needs to be included so that the reader can fairly assess your criticisms.

CHAPTER 3—PROJECT STRATEGY

This chapter outlines your ideas about the solutions to your design (Objectives and Constraints) and what you intend to do in your project (your Project Approach):

CHAPTER 3. Project Strategy
 Initial Client Statement
 Objectives and Constraints
 Revised Client Statement
 Project Approach

Objectives and Constraints is a statement of what is needed to solve the problem presented by the client.

Your project Objectives and Statements will state the client’s needs and wants, in addition to other essential aspects to your project. The Project Objectives should be discussed and formulated with your advisor(s).

This section should also consist of your functions and specifications. Each function and specification should have a short justification accompanying it so that the reader can understand its rationale. Specifications should follow from functions.

Project Objectives and Constraints

Your Project Objectives should be based on both the information you have gathered from your preliminary research (including background material you found in the literature) and by talking to your client(s) (i.e., your client statement).

CHAPTER 4—ALTERNATIVE DESIGNS

Engineering MQP's usually involve the design of a hardware/software product. The Design chapter, therefore, should list and discuss the objectives, constraints, functions and specifications. To start, you need to understand the problem from the user and client's point of view, which is done in the Revised Client Statement. Once you have completed this, you can begin to develop a design concept and describe how you tested this concept.

This chapter should include some of the following material as appropriate:

- Chapter 4. Alternative Designs
 - Needs Analysis
 - Functions (Specifications)
 - Conceptual Designs
 - Preliminary/ Alternative Designs
 - Feasibility Study/ Experiments
 - Modeling
 - Preliminary Data

You should detail the sources of the information used in your design process. By referring to reputable sources you raise the credibility of your design. Even statements such as, "We called Jeffrey T. Spaulding, chief engineer at Spaulding International, who told us that PVC tubing would be sufficient for our purposes" are important information for the reader and other researchers.

Needs Analysis : One of the most important tasks in design is to determine, as precisely as possible, what the actual requirements are. Therefore, you need to discuss with the prospective users or recipients of your results their "needs and wants". In the context of design, "needs" refers to properties that your result must have. Examples would be: 1) a voltage drift of less than 0.05 mV/hr over 12 hours or 2) the diffusion coefficient of water in the liver measured to a precision of $0.1 \times 10^{-5} \text{ cm}^2/\text{s}$. "Wants" refers to things that you would like to have, but that may not be possible given other constraints. One way to sort out the needs and wants pertaining to your design is to list them in a design matrix and assign weights to the different entries. Using weighting factors can help you prioritize the entries according to a certain scale (e.g., 0 to 10, with 10 being the most important). This method is discussed in the book *Engineering Design: A Project-Based Introduction* by Clive Dym and Patrick Little (2008). Once you have discussed the functional needs, you must also discuss physical limitations (size, weight, etc.) which, together with needs, have helped you to define the specifications of your end product or experiments.

Feasibility Study: Although this was investigated in the design process, at some point in the project an assessment has to be made about whether or not the experiments can be performed or the device manufactured given the limitations of the project budget and its duration. It is not always possible to determine from the initial design since, in almost every project, changes to the original specifications are made as the project progresses and

your understanding of the problem deepens. At some point, therefore, tests might be performed to determine the feasibility of the project or if certain aspects of the project will succeed. A feasibility study can be used to eliminate different approaches to the project that pass the needs/wants tests, but that, for example, may be too costly given the budget constraints of an MQP. If you performed tests to determine the feasibility of the final design, these tests should be documented in this chapter.

Conceptual Designs: Here you should discuss how you got to your final design. Conceptual designs should be detailed as well as include information used to decide for or against your preliminary designs. Include information acquired from patents, publications, or brainstorming with your partners. Scanned pages from your notebook are relevant and can either be included in this chapter or in an Appendix and merely referred to in this chapter. This material should be treated as a comprehensive answer to the question, “How did you come up with your final design?”

Design Calculations: Each design reaches a point at which decisions must be made about the material to use, the dimensions of parts, the components of a complex system, or the relationships among different components of a system. Here you should describe any physical models, mathematical models, or real-time computer-based simulations that you utilized to test your design. If it would be applicable and possible in your problem apply simulation software MathCad, Matlab, Matlab/Simulink, Solid Works and provide some examples of simulations.

Decisions: Design depends heavily on making decisions. Here you should describe, in a systematic way, how you made different decisions concerning your design. For example, the order in which the components were designed, the inter-relationships among components, and the selection of materials all involve decisions. One method to describe the decision process is to use a decision matrix.

Some projects evaluate alternative methods to achieve a desired end. In that case, what criteria were used to evaluate the alternatives? What specific measures were utilized to gain insight into these criteria? (A matrix, detailing the criteria and measures on one dimension and the alternatives considered on the other, may be a valuable table to include in this chapter.)

Optimization: Here you should discuss the process of selecting a set of specifications, such as dimensions and material characteristics that resulted in the best product or experiment for the particular design configuration chosen.

Preliminary Data: If, in your design process, you have either conducted preliminary experiments or built models and used the data obtained from these to decide on a design, then this data should be included in this chapter. Did the Preliminary Data make you go back and rethink your design?

For an engineering project, “data analysis” will include all of the testing that was done on the final device to ensure compliance with the Specific Aims. For example, “We measured

the voltage drift over a 12-hour period five times and computed a mean and standard error of the mean” includes information on both the experimental method and the data analysis.

CHAPTER 5—DESIGN VERIFICATION

This chapter presents the raw results of the project. A result could be data, findings, or tests of designs. For example, if your project measures the blood glucose levels from a number of subjects, this is the chapter to report what the levels were for each patient at each time point, what the average levels were over the entire group and what the associated errors were that you calculated for the study. This material should flow logically and, if possible, should report the results in the order in which you did the experiments. So, for example, the results of your experiments in which you first calibrated your instrument should be reported before the final results of the study. The structure of the chapter should be very similar to that of procedure/methodology, since these are the actual outcomes of the procedures outlined there. The key is to keep the presentation of the results separated from their discussion. The meaning and significance of your results should be discussed in the Analysis and Discussion chapter, not in the Design Verification Chapter.

If your project contains multiple parts, each with its own results, begin your Results chapter with a summary of the total set to provide your reader with an overview. The overview should be written as simply as possible - go for the big picture - this is not the place to get bogged down in the details (which should have been presented in the Project Approach in the Project Strategy Chapter). Remember that you are giving the reader only a reminder. If your project focuses on only one experiment, you do not need to provide an overview.

The actual numbers that you measured (along with their associated errors) should be presented next. Again, present your results in a logical order. When you write, imagine that you are explaining your project to someone who knows nothing about it and the logical order will be evident.

If you performed any additional statistical tests on the data after you acquired it, present these results last. Again, it is not a bad idea to present things in the order in which you did them (unless for example, you forgot to calibrate your instrument and had to go back and do it at the end).

CHAPTER 6—DISCUSSION

This is the part of the report that requires you to decide what the results of your project mean. Your goal in this chapter should be to place your results in the context of previous work and have the reader understand the unique aspects of what you have done. In this chapter you should strive to convince the reader that you fully understand the problem and that you have thought seriously about what your data means. In general, you need to discuss each of your results separately, discuss each of your assumptions and how they influence the interpretation of the results, and build a logical argument that convinces the reader of your point of view. In addition, this chapter sets the stage for the conclusions drawn in the final chapter.

In an engineering project, this chapter convinces the reader that you have met your Project Objectives and Constraints. This is also the chapter where you discuss how your results compare with those found by others (the latter should have been discussed in the Literature Review). For an engineering project, this chapter examines how the performance of your designed instrument or device compares with other existing devices. If you made measurements, you should discuss what your values mean in light of other work that has been reported previously. For example, is your value significantly less than the currently accepted value? If so, you should provide possible explanations. If your results differ from other published results, you need to explain these discrepancies. Your explanation might consider differences in materials, experimental methods, data analysis or any other factors you feel are relevant.

Additionally, this chapter discusses limitations of your data. Such a discussion usually will diffuse any criticism of these limitations, because you will have acknowledged them and discussed how they are not critical to the success of your experiment or that your data is meant to address a limited aspect of a problem.

In addition, **you are required to 1) write a paragraph on each of the following topics and 2) relate these paragraphs specifically to your MQP project:** a) economics (How would the results of your project influence the economy of everyday living); b) environmental impact (Consider the *possible–positive or negative--impacts that a proposed project may have on the natural environment*); c) societal influence (which can occur in production, sales and marketing of your product: How will your product have a social influence/impact on other “ordinary” people?); d) political ramifications (How would your product influence the global market? What effect, if any, would your product have on the culture of other countries?) e) ethical concern (How will your product address a good and satisfying life?); f) health and safety issue (How will your project influence the health and personal safety of people?); g) manufacturability (i.e., How easily could the subject matter of your MQP be reproduced); (h) sustainability (i.e., How would the production of your product affect biology/ecology in terms of renewable energy?)

CHAPTER 7—FINAL DESIGN AND VALIDATION

This chapter should convince the reader that the author clearly understands the problem and has pursued a logical task-sequence to achieve the project's objectives. By describing how the Specific Aims were met, this chapter explains how the project was conducted.

It is important to provide the reader with enough information so that he or she could reproduce your project work. In this chapter it is better to err on the side of more detail rather than less. Think of this chapter as a tutorial for new people in your group. If you wanted them to repeat your work, what information would you have to provide?

This chapter should include material on both your experimental methods your data analysis. To describe your experimental methods, use a clearly defined sequence of tasks. Divide major tasks into sub tasks, which you may tabulate, or represent graphically with GANTT or PERT charts. GANTT charts are discussed in the book *Engineering Design: A Project-Based Introduction* by Clive Dym and Patrick Little (2008).

CHAPTER 8—CONCLUSIONS AND RECOMMENDATIONS

In this chapter your goal is to draw global conclusions about your results. Therefore, you should summarize the big picture for the reader, what your results mean and what you have accomplished by your work. Numerical results are not necessary in this chapter. The conclusions and the abstract contain similar information; however, their goals are different and, as such, the presentation of the information is different. As noted above, numerical results are necessary in the Abstract, but not in the Conclusions. Another difference is that there should be no interpretation or discussion in the Abstract, just a statement of the main result, while the Conclusions should be a summary of your interpretation of your data.

Recommendations are a logical consequence of the conclusions. They suggest remedial actions to some problem or further in-depth studies in some specific areas. In this chapter, you should write about all of the things that were left undone either due to lack of time, finances, or equipment. A good project should always point the way to the next problem to be solved or measurement to be made.

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