Latex Style Guideline For Design For Electrical and Computer Engineers

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# Contents

# Chapter 1

# Latex Usage

*The journey of a thousand miles begins with one step.*

I can't be the only one. I say this as I struggle to convert a textbook written in Microsoft Word to Latex and post it on GitHub. There must be others like me with quality content they've created for their classes that they want to share. So this text is an Open Education Resources, free to use under the Creative Commons license. But how can we take advantage of deep reservoir of knowledge the community of senior design faculty have created over the years. In taking this particular project on, I want to move a step towards the solution.

By hosting this textbook on Github, I want to encourage others to contribute their insights and ideas into our text. For example, some of the processes in this text are outdated. If that annoys you, then go to the https://github.com/coulston/Design-For-Electrical-and-Computer-Engineering textbook repository fork, clone, make a branch, make your changes and then do a pull request to merge them into the existing text. If that sounds a bit overwhelming, don't worry, I plan on writing a chapter 2 to this how-to to walk you through it. The world is an imperfect place, I want you to be empowered to make it better.

## Learning Objectives

By the end of this chapter, the reader should:

- Understand some of my motivations in this project.

- Understand the general philosophy of writing Latex for this text.

- Know how to create common structures like table, figure, examples.

- Know how to use the Example environment.

- Know how to create references to structures.

## 1.1   Table

When deciding on a methodology to implement some text formatting question, my preference is to work with the existing LaTex packages before adding new packages because every additional package adds additional time to build the text. All things being equal, I will always prefer a Minimum Working Example (MWE) over something more complex. As a consequence of these two preferences, when you inevitably need to search for a way to complete some text formatting goal, I generally preface "MWE" in front of the thing I am trying to accomplish.

While tables are an incredibly important tool to communicate a lot of information in a structured format, they can be a challenge to tame. As a result, I'll introduce Table 1.1 as an example. The Latex code for this table is shown in

```
\begin{table}[h]
\caption{This is an important table.}
\label{table:thisIsTheFirstTable}
\begin{tabular}{|l|c|c|c|c|}
\hline
\rowcolor{Gray}
 & & \multicolumn{3} {c|} {Alternatives} \\ \hhline{|~|~|-|-|-|}
\rowcolor{Gray}
 \multirow{-2}{*}{Selection Criteria} & \multirow{-2}{*}{Weights}  & Project 1 & Proje
A (Match to skills) & 0.52 & 0.40 & 0.20 & 0.40 \\  \hline
B (Technical Complexity) & 0.12 & 0.40 & 0.30 & 0.30 \\ \hline
C (Creativity) & 0.09 & 0.45 & 0.20 & 0.35 \\ \hline
D (Market potential) & 0.18 & 0.05 & 0.35 & 0.60 \\ \hline
E (Industry sponsorship) & 0.09 & 0.00 & 1.0 & 0.00 \\ \hline
Score & & 0.31 & 0.31 & 0.38 \\ \hline
\end{tabular}
\end{table}
```

Table 1.1: This is an important table.

| Selection Criteria | Weights | Alternatives | | |
|---|---|---|---|---|
| | | Project 1 | Project 2 | Project 3 |
| A (Match to skills) | 0.52 | 0.40 | 0.20 | 0.40 |
| B (Technical Complexity) | 0.12 | 0.40 | 0.30 | 0.30 |
| C (Creativity) | 0.09 | 0.45 | 0.20 | 0.35 |
| D (Market potential) | 0.18 | 0.05 | 0.35 | 0.60 |
| E (Industry sponsorship) | 0.09 | 0.00 | 1.0 | 0.00 |
| Score | | 0.31 | 0.31 | 0.38 |

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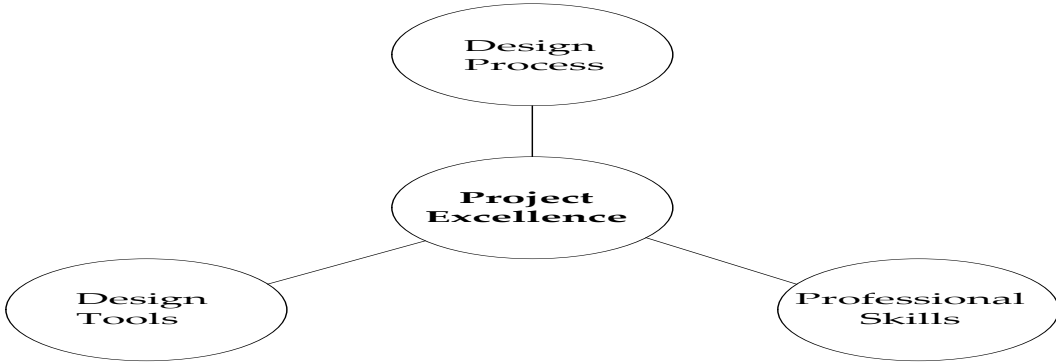


Figure 1.1: The dimensions of the engineering design process according to Ford and Coulston.)

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$$x = \int v(t)dt \qquad (1.1)$$

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**Example 1.1 A Simple Example**

***Problem:*** Consider....
***Solution:*** The parallel systems...

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- US Bureau of Labor Statistics, `http://stats.bls.gov`. different industry sectors.

- US Government Official WebPortal, www.FirstGov.gov.

- US Patent Office, www.uspto.gov. A searchable database of all patents back to 1790.

## 1.2   Summary and Further Reading

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## 1.3  Problems

1. In your own words, describe the differences between creative, variant, and routine designs.