Guidelines for Specification report: ELEC340 & ELEC440

Specification report for project '…..name of project ….'

Author: …your name… (…your student ID…)

Project Supervisor: …name of supervisor…

Project Assessor: …name of assessor…

Declaration of academic integrity

The standard University of Liverpool statement of academic integrity [6] should go here as follows:

I confirm that I have read and understood the University's Academic Integrity Policy.

I confirm that I have acted honestly, ethically and professionally in conduct leading to assessment for the programme of study.

I confirm that I have not copied material from another source nor committed plagiarism nor fabricated, falsified or embellished data when completing the attached piece of work. I confirm that I have not copied material from another source, nor colluded with any other student in the preparation and production of this work.

SIGNATURE……
DATE……

Abstract

These guidelines are a suggestion for the structure of a specification report. Your project supervisor may have different ideas so you should consult them. Note that an abstract is different from an introduction. An abstract is a quick summary or overview of the complete report. Someone should be able to read the abstract in order to know if this is the report that they should read in full.

1. Introduction

   This section should introduce the project as well as the structure of the report.

2. Project Description

   An overview of the project. What are the aims and **objectives** of the project? What exactly do you aim to develop in your project. ?

3. Project Specifications/objectives

   This is the most important chapter of this report.

   Give detailed specifications of what you want to achieve by the end of the project. These specifications will be used to judge your progress during the project.

   Please agree these aims with your supervisor!

   Specifications and requirements are an important planning tool in an engineering project. Prior to starting a project, engineers need to be clear what they want to achieve, how their work fits within a product, regulatory framework and commercial landscape. Detailed specifications at the beginning of a project are used to plan your work by breaking it down into small work packages and judge the success and timeliness of a project.
   You (as well as your supervisor and assessor) will use the specifications drawn up in this report to evaluate the progress of your project and your achievements. So please take great care with this report. If your success criteria are not clearly defined, your project is more likely to look like a failure!

   Break your project down into clear work packages. When defining your work packages be SMART.

Specific	Break your project down into small parts relating to your project. Avoid general packages such as design, built, test. Instead, break down into packages that are specific to your project. E.g., design amplifier stage, or design data auction protocol.
Measurable	How can you judge this has been successful? Be specific how you judge quantify success. Give criteria such as bandwidth, power consumption, and accuracy with specific values you want to achieve. Think what test you can do to measure that you achieved this.
Achievable	Can it be done in time with the resources you have? Be realistic, are you sure, you can do it the timeframe or is it too much.
Relevant	Does this relate to your project? Is this package critical to your project or just a 'nice to have' feature? Give priority to critical difficult work packages. If you finish early you still can add additional features
Time-bound	How long will this step take? Don't underestimate external factors such as ordering components, manufacturing PCB etc.

4. Methodology

   How are you going to complete this project? What is it that you are actually going to do? How are you planning to do it?

   In this chapter you are presting how you aim to achieve your objectives. You detail how you break your work into specific work packages, present what you think are the best parts/tools to address your objectives

5. Project Plan

This section should refer to the tasks, milestones and deliverables agreed with your supervisor (included in Appendix 2). This section must refer to a GANTT chart included in appendix 1.

6. Project Rationale and Industrial Relevance (this section must be included)

   Why are you doing this project? Is it relevant to industry? Does it have market potential? Is it related to the research interests of your project supervisor?

7. Literature Review

   A complete literature review is not expected at this stage, but you should have gained an initial overview during the summer. The reference list should be structured following the IEEE format (examples are shown below). Use the correct format for different sources such as books, periodical and academic journal articles, conference technical articles, patents, standards, theses, and unpublished work (e.g. the final year project report of a student who did a related project in a previous year) and finally online sources of information.

   The IEEE referencing style should be used and can be augmented by adding ISBN numbers for books, DOI numbers for academic journals and conference articles and date of access for online sources.

   For further detail on using the IEEE referencing style, see:

   https://ieeeauthorcenter.ieee.org/create-your-ieee-article/create-the-text-of-your-article/ieee-editorial-style-manual-2017/

   https://ieee-dataport.org/sites/default/files/analysis/27/IEEE%20Citation%20Guidelines.pdf

   https://libguides.liverpool.ac.uk/referencing/home

8. Results

   At this early stage, you might not have many results yet, but you can report on the progress you made so far. E.g. For hardware projects, this may include any circuit designs, if you have not started to build the circuit. For software projects, this may include hierarchical charts, flow charts or Nassi–Shneiderman diagrams, if you have not started writing programme code.

9. Conclusion

   Summarise the report in this section.

Appendix 1. Key Specificatiosn.

An overview of your kei specifaction/objectives incudinghow you can verify that you achived them.

Ideally this should be measurable parameters

Example bleow could be for a weather station:

Parameter	Verification

Humidity 0% to 100%, resolution 1%	Test against calibrated reference
Temperature -30°C to +90°C, resolution 0.1°C	Test against calibrated reference
Wind speed 0m/s to 40m/s, resolution 0.1m/s	Test against calibrated reference
Record data every 30s	Measure data rate using ……
Save data on removable memory for up to 30 days	review calculation
Battery powered for up to 30 days	Measure current for x seconds and extrapolate
Data displayed over inbuilt wireless network	demonstration
…	…

Appendix 2. A Gantt chart preferable produced by MS Excel or MS Project.
The Gantt chart must include detailed work packages and millstones

Appendix 3. List of work packages, milestones and deliverables.

- Work packages, in some cases, a brief description can be useful. Make sure your work packages are 'SMART'
- Project milestones - where several work packages come together
- Deliverables - What will you deliver at the end of your project? Give detailed, measurable criteria of what you want to achieve.

Appendix 4. The risk assessment form.
You will not be able to start lab work before the risk assessment form has been completed, uploaded to Canvas and approved by your supervisor. Please include the form you uploaded
If no risk assessment has been uploaded onto Canvas (and included in this report) by the report deadline, the report will be marked as failed.

Appendix 5. Ethical approval questionnaire.

Please include a screenshot of the four main questions as you answered them on Canvas.

Appendix 6. References.

Reference Examples

Books

[1] R. Tressell, "*The Ragged Trousered Philanthropists*". London, UK: Penguin Books, 2004, ISBN 9780141187693

Periodicals and academic journals articles

[2] J. S. Marsland, "On the effect of ionization dead spaces on avalanche multiplication and noise for uniform electric fields", *J. Appl. Phys.* vol. 67, no.4, pp. 1929 – 1933, Feb. 1990, DOI: 10.1063/1.345596

Conference articles (if any)

[3] J. S. Marsland, “Resonance effects on gain and noise in avalanche photodiodes”, in *2nd Int. Conf. on Optical and Optoelectronic Properties of Materials and Applications*, London, England, 2007, pp. 514 – 518, DOI: 10.1007/s10854-008-9714-1

Patents, Standards, Theses, Unpublished (if any)

[4] J. Bardeen, W. Shockley, W. Brattain, “Three-electrode circuit element useful semiconductive materials”, US Patent 2524033 A, October 3, 1950.

[5] J. S. Marsland, "Experimental and theoretical ionization coefficients in semiconductors", PhD dissertation, Dept. Electronic & Elec. Eng., Univ. of Sheffield, Sheffield, UK, 1988.

Online material

[6] The University of Liverpool. (2015/16) *CoPA appendix L: Academic Integrity Policy* [online]. Available: https://www.liv.ac.uk/media/livacuk/tqsd/code-of-practice-on-assessment/appendix_L_cop_assess.pdf (accessed 26th September 2016)

[7] D. Graffox. (2009 Sept.) *IEEE Citation Reference* [online]. Available: http://www.ieee.org/documents/ieeecitationref.pdf (accessed 26th September 2016)