

University of Wales Trinity Saint David
School of Engineering

Reflective Report
Engineering Applications & Study Skills
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1 Introduction

1.1 Aims

The aim of this report is to illustrate where my strengths and weaknesses were found during my foundation year. A selection of assignments and the corresponding feedback will be studied to evaluate my performance over the course of the year in various modules.

1.2 Objectives

Key areas for improvement will be highlighted throughout, detailing exactly what skills and tasks I have found difficult to complete to a high standard. Suggestions will be made as to how my results reflect my ability as a developing engineer as well as focusing on the areas in which I am competent. As part of the report, my progression in the first semester of the BEng programme can be used to show areas where improvement has been achieved and any potential difficulties I may encounter going forward.

2 Technical Report and Solidworks

2.1 Feedback

Assessment Criteria	Marks Available	Marks Awarded
Research-informed Literature	10	9.5
80-100%: Outstanding knowledge of research-informed literature embedded in the work. Outstanding selection of relevant and credible sources. High-level referencing skills consistently and professionally applied. A very good selection of sources, I am pleased to see so many journal articles included. You have clearly done a good level of research for this report. The reference list is very well presented and is in the correct Harvard conventions. The In-text citations are included correctly.		
Knowledge and Understanding of Subject	10	8.5
80-100%: Highly detailed knowledge and understanding of the main theories/concepts, and a critical awareness of the ambiguities and limitations of knowledge. Your background to CAD is very good but I would have expected to see mention of Hanratty or Sutherland. You have focussed on the background related to the engineering industry which is a really good angle to take. I am pleased to see that you have got a number of references embedded within this section. This is a really good section, which demonstrates your knowledge and understanding on this topic.		
Practical Application and Deployment	70	49.5
70-80%: Thoroughly logical work, supported by evaluated evidence. High quality analysis, developed independently through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Strong, persuasive, conclusions, justifiable recommendation		
Skills for Professional Practise	10	6.8
60-69%: Can communicate well, confidently and consistently in a suitable format. Can work very well as part of a team, with very good contribution to group activities. Work is coherent and fluent and is well structured and organised. Contents pages should include the page number for each section. I would suggest in the future that you try to break your writing up into paragraphs, as this will help with the way that the report flows when it is read. Generally, the report is well written.		

2.2 Assignment Brief

The first piece of coursework for the foundation year required several Lego parts to be made following various technical drawings provided. From these parts, an assembly was created in the form of a model car and a technical report was compiled to describe how individual Solidworks processes were achieved for the whole task. Background research was conducted into the use of Computer Aided Design and the history of CAD and its effects on industry. Finally, a conclusion was drawn to signify the importance of CAD software and how it may develop in the future.

2.3 Analysis

I attended many hours of Solidworks sessions before the assignment hand out to aid in familiarisation to the software and a copy of Solidworks 2016 (x64 Edition SP04) was provided by the university for use on my personal computer. During this time, I attempted many tutorials to gain experience with using the fundamental tools within the programme.

My approach to this assignment was positive and I had prepared as best I could for the task. I attended the study skills lectures to gain an insight to academic writing and became familiar with how best to implement the Harvard referencing convention.

I spent a great deal of time researching the relevant topics, using credible sources and my result reflects this well. Having only missed out on half a mark in this section, I now understand the importance of referencing correctly and the influence it can have on your overall result.

Although my background research was very good in this report, I had missed some key information from the field regarding pioneering CAD/CAM developers, of which I should have included within the "history of CAD" section. To reduce the chance of missing relevant information in the future, I should conduct my research from a broader perspective before focusing on specific areas of study.

The Solidworks processes that I used to follow the design brief were all together acceptable, but some small errors were made in numerous instances, most of these mistakes were from either using the wrong Solidworks tool to complete the process, or the lack of experience in reading technical drawings, as some parts I made were to the wrong dimensions. The finished assembly resembled the car but on close inspection the small errors were noticeable. Having studied the feedback and my CAD files carefully, I now realise I can take steps to achieve logical results from cross examining the technical drawing and my Solidworks model more carefully. I did, however, attempt the additional design pieces for extra marks.

The final section of the given feedback highlights my lack of experience in report writing. Although 6.5 out of 10 is perfectly acceptable, there is considerable scope for improvement. I constructed each section of the report from a solid block of text, without correct paragraphing or sub headings. On reflection, the report is more difficult than necessary to read and is not presented correctly with missing page numbers and no page breaks for each section.

My lack of experience in both Solidworks and report writing was exposed during this task but as this was my first attempt at both, I was extremely happy with the overall result I achieved. Going forward, the feedback I received from this assignment has helped me considerably with structuring my reports and following technical drawings on Solidworks.

3 Engineering Science – SHM Experiment & Report

3.1 Feedback

Assessment Criteria	Marks Available	Marks Awarded
Research-informed Literature	20	8
40-49%: References to a limited range of mostly relevant sources. Some omissions and minor errors. Referencing conventions evident though not always applied consistently. Inclusion of external information [3/8 marks] You have a few references cited in your report but much more needed to back up your findings Properly cited references [3/8 marks] Fairly good use of the Harvard system. Images and tables have no citations. Quality of references [2/4 marks] More needed be sure to use plenty of text books.		
Knowledge and Understanding of Subject	20	11
50-59%: Knowledge is accurate with a good understanding of the field of study. Generally, you have covered most bases of this assignment briefly. Figure 7 is not related to your type of experiment so is pointless. Analysis chapter should be a discussion of all your findings with some citations of other people's work that has similar findings. In your 'Conclusion' you say the period is related to the length of the pendulum, when it states in the worksheet and your graph show it is related to the square root of the pendulum length, which makes me question the citation you have given. Evaluation is nice and you make some good points about possible errors and the steps you could have taken to eliminate or reduce them some images or citations might have enhanced this.		
Analysis	30	13
40-49%: Evidence of some logical, analytical thinking and some attempts to synthesise, albeit with some weaknesses. Some evidence to support findings/ views, but evidence not consistently interpreted. Some relevant conclusions and recommendations, where relevant 13Quality of Excel tables [4/10 marks] Units missing from some columns in your tables. Quality of Graphical data [4/10 marks] Nice graphical data, but you needed to include units on the axis, otherwise they are meaningless. You need to investigate what others have found and use this to back up your findings. Calculation of the gradient [5/10 marks] You need to give citations when justifying why your answer for 'g' is not what you were expecting. Units missing for 'g'.		
Practical Application and Deployment	15	8.7
50-59%: A good and appropriate application of standard methods, materials, tools and/or techniques. Good appreciation of the context of the application, with some use of examples, where relevant. A step by step procedure might have been more appropriate, but you have used some nice terminology. A list of apparatus, more detail and reference to images will get more marks.		
Skills for Professional Practise	15	9
Can work very well as part of a team, with very good contribution to group activities. Work is coherent and fluent and is well structured and organised. Justify text both sides of the page. Chapters and sub-chapters need to be numbered for professional technical reports e.g.1.0 Introduction, 1.1 Simple Harmonic Motion etc. All images or graphical data needs to be labelled 'Figure 1: Title (ref, date)' underneath the object and referred to accordingly in the body of the text. Similarly, Tables of data should be labelled 'Table1: Title (ref, date)' underneath the object.		

3.2 Assignment Brief

A simple pendulum laboratory experiment was completed to gain raw data for the report. The results were categorised into tables and then graphs were used to demonstrate Simple Harmonic Motion. The results were analysed and any further improvements to the experiment were highlighted. A detailed conclusion and evaluation was also required.

3.3 Analysis

The marks I received from this assignment was the lowest result I received all year. Due to unforeseen personal circumstances, my attendance ceased for a prolonged period. During this time, the Simple Harmonic Motion assignment lectures and brief were given. For this reason, I had missed out on a substantial amount of subject matter and I struggled to complete this assignment in time, especially as I did not complete the experiment myself. I notified all lecturers of my absence.

I started the assignment approximately 5 days before the hand in date and experienced a considerable amount of discomfort when compiling the report due to my lack of understanding. I obtained the raw data from my group and researched the topic to the best of my ability, within the small amount of time I had. The quality of my research was low in comparison to my other assignments as I did not feel confident in my ability within this subject. I did not allocate enough time to find a large selection of credible sources. However, as my other reports show, this is an area where I usually gain substantial marks.

Having not conducted the experiment myself, I found it increasingly difficult to discuss the experimental procedure in detail and further improvements that could be made. My lack of underpinning knowledge was evident in the quality of my analysis, and rushed graphs and tables were missing key information, which is outlined in the feedback. I now take more care when inserting graphs and tables, as I could have improved my result with correct labels and formatting.

I have made drastic changes to the way my reports are structured, following previous feedback, implementing paragraphs, page breaks and sub headings, but the general academic writing standard was low in this assignment due to its rushed nature.

4 MATLAB SHM Report

4.1 Feedback

Assessment Criteria	Marks Available	Marks Awarded
Research-informed Literature	10	9.5
80-100%: Outstanding knowledge of research-informed literature embedded in the work. Outstanding selection of relevant and credible sources. High-level referencing skills consistently and professionally applied. Very comprehensive list of sources included within your research. The reference list and in-text citations are to the correct Harvard conventions. Your report includes a good introduction and good real life examples of SHM. Good description of resonance and how damping can help.		
Knowledge and Understanding of Subject	30	15.8
50-59%: Knowledge is accurate with a good understanding of the field of study. From the introduction and background research chapter it is obvious that you have a very good level of understanding and knowledge of SHM. Your methodology explains how MATLAB works and how it can be written to help the user. It would have been good if you could have included in more detail the equations that you have included within your script to solve the problems in the assignment.		
Practical Application and Deployment	10	4.5
40-49%: An adequate awareness and mostly appropriate application of well-established methods, materials, tools and/or techniques. Basic appreciation of the context of the application. I was pleased to see that you were able to make some comments about what they showed but you could have talked about the max/min values seen. It was also good to see that you realised for problem 3, you needed to use the Periodic Time to calculate frequency		
Analysis	30	15
50-59%: Evidence of some logical, analytical thinking and some attempts to synthesise, albeit with some weaknesses. Some evidence to support findings/ views, but evidence not consistently interpreted. Some relevant conclusions and recommendations, where relevant. Problem 1 and 3 are correct, however there appears to be an issue with your results for Problem 2. In your script for problem 2, you have set angular velocity to be 9.4 rad/s but as this value should be B.C, using your student number, that should actually be 4.9 rad/s. Your graphs are missing axis labels on them.		
Skills for Professional Practise	20	10
50-59%: Can communicate effectively in a suitable format but may have minor errors. Can work effectively as part of a team, with clear contribution to group activities. Mostly coherent work and is in a suitable structure A contents list should include page numbers as well Some of the layout could be improved but generally the report is reasonably well presented. As well as numbering your figures, they should also have titles.		

4.2 Assignment Brief

MATLAB was used to produce code to represent a Simple Harmonic Motion condition, mathematically. The script must have been created individually using the knowledge gained in the MATLAB sessions. There was an option to produce extra code for additional marks available. The report would need to contain details regarding the script and SHM. Research was conducted on the details of SHM followed by a discussion of real life scenarios and instances where it can occur.

4.3 Analysis

As described previously, this assignment, and related sessions took place at the time when I was absent. Again, my result reflects this.

I studied MATLAB on my laptop from home to gain a fundamental understanding of the program as I was unable to attend most of the lectures. My script was finished, but I had made some mistakes throughout. However, I did expect some errors in the coding due to my poor attendance. I know if I had been able to attend more of the lectures my result would have improved.

By this stage in the year I had developed my report writing technique to a satisfactory standard but some errors such as graph and figure labelling still occurred in this report. I now realise the importance of these smaller details and the effect they can have on the overall quality.

I demonstrated my ability to include extensive and relevant research of credible sources within this assignment.

5 Conclusion

The foundation year has proven to be incredibly useful in my academic development. Having no prior experience in essay writing to any recognised level, I am pleased that I managed to pass all modules first time.

Having lost out on a lot of lectures in the second semester, I can appreciate how important it is to attend every session and how it can affect my overall performance. I feel that I did put the maximum effort available into the assignment and despite some obstacles, I managed to persevere. This year, I have attended almost every lecture and my confidence in each assignment has increased as a result.

The quality of my academic writing has advanced since the foundation year and by looking at previous feedback, I have eliminated some bad habits. I now check all pages, tables, pictures and graphs for correct annotations and conventions before submission.

Another adopted procedure is to study the assignment brief carefully before compiling any work. Some details can be overlooked when writing a report and it is important to maximise the potential marks available by not deviating from the required task. I have generally complied with this but some of my reports from the foundation year could have been condensed, with proportional content for marks available.

I have advanced further this year to achieve excellent results from my assignments and I have used my previous feedback as a tool to refine my techniques.