

ASSIGNMENT INTERNAL VERIFICATION FORM (2017-2018)

ASSIGNMENT TITLE:	Final Report & Viva Voce	LEVEL:	6
MODULE :	PSDE6019 Major Project	ASSIGNMENT NO (x of y):	2 of 2
PROGRAMME:	BSc (Hons) Electrical and Electronic Engineering	ASSIGNMENT AUTHOR :	W. McIntyre

VERSION:	DATE SUBMITTED FOR VERIFICATION :	INTERNAL VERIFIER COMMENTS (Approval or detail of amendments required):	DATE
1.	13/03/18	Conforms to the assessment pattern described in the module syllabus, tests the module learning outcomes appropriately	14-03-18
2.			

INTERNAL VERIFIER PLEASE TICK TO INDICATE THAT THE COURSEWORK:	
Yes	Conforms to the assessment pattern described in the module syllabus
Yes	Tests the module learning outcome(s) appropriately

SIGNATURES OF FINAL APPROVAL:	SIGNATURE	DATE
INTERNAL VERIFIER: I confirm that this version of the assignment specification is ready to be sent to the external examiner	<i>R. Davies</i>	14-03-18
ASSIGNMENT AUTHOR: I confirm that internal verifier and external examiner approval have been received and that this version of the assignment specification will be distributed to students		

LEVEL/ LEFEL 6
SEMESTER 2

MODULE CODE/ COD Y MODIWL:
PSDE6019
Major Project

ASSESSMENT TYPE/ MATH O ASESU: ASSIGNMENT

ASSESSMENT/COMPONENT/ ASESAD/CYDRAN: 2 OF 2

COMPONENT WEIGHTING/ PWYSAU'R CYDRAN: 70%

WORD COUNT (or WORD COUNT EQUIVALENT)/ NIFER Y GEIRIAU:
Up to 10000 WORDS/O EIRIAU

MODULE TUTOR / TIWTOR Y MODIWL: W. McIntyre

SUBMISSION DETAILS/ MANYLION CYFLWYNO:

- Make sure that Your Name, Your Student P Number, Your Module Title, Assignment Title and Your Module Lecturer's Name are clearly shown on the front page of your assignment
- All assignments must be submitted electronically to Turnitin unless indicated by the module lecturer here:
- If lecturer additionally requires you to upload coding separately to Moodle it will be indicated here:...**NO**
- If a paper submission is required, then it will be indicated here:...**YES**
You will then be required to submit the assignment parts in a suitable report folder–not in poly-pockets - to the module tutor.
For paper submissions only this form (ALL PAGES) MUST be printed out, signed, attached to the front of your assignment and submitted to the module tutor separately from your electronic assignment submission. Paper submission assignments will not be accepted without this form as it is a requirement that you sign the disclosure regarding the referencing convention.
- DO NOT put this form into Turnitin or it will match many similarities with other students' submissions

ASSIGNMENT SPECIFICATION

Student name:		Student P number:	
Programme:	BSc Hons Electrical and Electronic Engineering		
Lecturer:	W McIntyre	Internal Verifier:	Robert Davies
Assignment Title:	Major Project Final Report, Log Book and Viva Voce		
Hand Out Date:		Submission deadline:	

Referencing:	In the main body of your submission, you must give credit to authors on whose research your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have read or quoted in order to complete this assignment (e.g. for books: surname of author and initials, year of publication, <u>title of book</u> , edition, publisher: place of publication).		
Disclosure:	I declare that this assignment is all my own work and that I have acknowledged all materials used from the published or unpublished works of other people. All references have been duly cited.		
Student's Signature:	<i>Hardcopy assignments will not be accepted without a signature here</i>	Date:	
<u>Late submission will result in a late penalty mark, as follows:</u> Up to one week late, maximum mark of 40% for first attempts. No late submission for resit work. (Academic Quality Handbook 2016/17 7.5 (5)) Only the Extenuating Circumstances Committee may grant an extension.			

Learning Outcomes tested (from module syllabus)
1. Have a detailed understanding of project management and be able to produce formal project plans for a complex project, defining progress-monitoring mechanisms with identified milestone activities and quality issues and their application to continuous improvement.
2. Research, plan, organise and execute a substantial investigation within time and budgetary constraints and be able to work independently, with limited supervision, working within health and safety guidelines, assessment of risk, developing and implementing a solution to a complex technical problem to meet customer or user needs ensuring fitness for purpose including operation, maintenance and reliability and with consideration of environmental protection and sustainability showing high levels of professional conduct.
3. Write and defend a comprehensive technical report on the outcomes.

TASK DESCRIPTION

On completion of your project you must submit a final report of up to 10000 words. The following information is a guide as to how the report should be structured.

Format

The report should be typed on white A4 paper at 1.5 line spacing leaving a 25 mm left hand margin and a 25 mm right hand margin. The top and bottom margins should also be 25 mm. Text pages should be numbered at the bottom. Diagrams and tables should normally be presented adjacent or close to the relevant text. The font used should be Times New Roman and the main body of the report should be 12 pt.

All Final Year Project reports will have a report format that complies with that stated below:

- The first page of your report should be a title page and should indicate the project title, author, award scheme, date of submission and word count.
- This should be followed by an abstract, or summary, of about 150 - 250 words. The purpose of the abstract is to define the area covered by the project. It should contain sufficient information to enable any electrical engineer to determine whether the content will be of interest to him/her. It must not be written as a table of contents in paragraph form, it should be a complete summary of everything that was done and written in the past tense.
- Any acknowledgements should come next, followed by the 'contents' page, listing the chapter headings and relevant page numbers, and a list of figures / tables.
- All reports should contain an introduction and conclusion. The introduction sets out the background to the project (aims and objectives should be clearly stated) and the overall intention while the conclusions give the achievements of the project (related again to success in terms of achievement of the aims and objectives). It should be possible by reading them to determine exactly what was done without having to read any of the other sections of the report.
- All text pages except the title page, abstract, acknowledgements and contents, should be numbered.
- All diagrams, tables and figures must be labelled and referenced (e.g. figure 1, <title> or Table 4, <title>).
- All reports should contain a literature review of existing technologies and solutions that may already exist or alternative solutions that you may consider before the final design method has been selected. This information together with the research you have carried out related to the final solution is expected to have influenced your decision making process. This must be clearly traceable in the report using the Harvard method of citing.
- The report should address issues related to safety, sustainability, environment, professionalism, maintenance and reliability.
- The remainder of the report sets out the theoretical, design and implementation details of the project. The choice of final solution is also expected to be justified which should include cost and technical reasons. Normally, the rest of the report is not defined in terms of structure, but you should use the optimal chapter structure to reflect the project. If in doubt, the background theory, literature review, design, implementation, and test /evaluation chapter approach is acceptable. (Discuss with project supervisor on or before project review. (Week 24))
- A final conclusion section is required: This should critically review the results obtained in the context of the original project aims and objectives.
- A citation list is required using the Harvard method. This should define all the sources used to form the basis for the project. This includes all text books (specify chapter / pages), papers and journals, application notes and Internet references. A complete citation list should normally exceed 20 references and indicates the quality and depth of the research conducted. A bibliography can be added if needed but should not contain any of the sources already listed in the citation list. Remember, a bibliography is simply a list of additional

sources used but not referenced directly or indirectly in the report but could provide additional information for your reader.

▪ APPENDICES:

Appendix 1	Project Planning. (Containing original action plan, updated actual plan followed by reasons for any discrepancies)
Other Appendices	Could include examples of code etc. but optional and should be discussed with the project supervisor.

The work reported must be your own work.

Where previous work, work of colleagues or lecturers, or open source materials are used this must be acknowledged.

Students are reminded of the rules on plagiarism.

Plagiarism means taking words or ideas from another person or source and using these words or ideas as though they are your own. An academic report is expected to be the student's own work (reference. Project handbook)

You must list all sources referred to in the report in a citation list section at the end of the report using the Harvard method, and you must document your source:

- When you quote directly from another writer.
- When you are paraphrasing or summarising material you found in another writer's work.
- Even if you rephrase this material in your own words it is still plagiarism if you do not cite your source in a note.
- When you state a fact that is not common knowledge

The report should not include the following:

- Complete data sheets (critical datasheets can be included in the Appendices if required). If the information on a datasheet is relevant to the discussion, extract the appropriate section for insertion as a figure or table in the text at the point of use.
- For those doing project for an industrial sponsor or in industry as part of their employment the report should not include complete company specific forms (e.g. Health & Safety forms, design change request forms, user guides etc.). These should be included in the appendices. If the use of extracts from such material is required in the main body of the report, then such extracts can be inserted as Figures or Tables.

The guide given in the module handbook is of up to 10000 words. Avoid padding out your work with generally known theory and masses of bookwork; state only enough theory to put the work you have done into context.

Style

The Headings system in Microsoft Office (Word) should be used throughout the project report which will produce the contents page when the report has been completed.

The Harvard referencing system available in Microsoft Office (Word) should be used throughout the project report which will automatically produce a Citation List when the project has been completed.

Appendices should be used for large volumes of tabulated data, program listings etc. which would otherwise disturb the flow of the main text. Data sheets (except where critical pages and information is referenced) should not be included as a rule.

Submission of Report

Two bound copies of the report are required by the Faculty (these are not returned) and all of the costs of typing and copying must be met by the student. The copies should be submitted to the first supervisor on or before Week 26 as stated in the Schedule of Events. You are also required to upload your report to Turnit-in. Please ensure that any loose material such as CDs, DVDs are secured.

The Viva Voce

The *viva voce* or oral examination provides the opportunity for you to meet the examiners, to explain and defend your approach to and the conclusions of, your final project report.

This oral examination is normally carried out by your supervisory team. The Viva Voce will consist of a 10 minute presentation followed by a 10 minute Q&A examination.

The examiners are likely to ask you questions such as the following:

- What are your main conclusions?
- What is innovative about your work?
- How did you plan and monitor the progress of the project? Did you have to change the plan?
- How do your results relate to the literature? What were your guiding sources?

The examiners are also likely to focus in detail on your work and may point you to sections/pages of your report asking you to explain methods, or approach, sampling, analysis, or asking you to justify a statement or claim, or to relate your work to other studies in the area. They may argue with you, and they will expect you to defend your work and your conclusions and to state and justify the contribution and originality of your work.

How to Prepare

There are many ways to prepare and there will be different views expressed on how you should do so. Here are some suggestions:

- If possible, practise presenting and discussing your work, and dealing with questions;
- Find colleagues/staff who are willing to read parts of the report and then ask you questions;
- Make a systematic summary of your report so that you know the contents of every page.
- Talk to others who have gone through a viva successfully and ask for their advice.
- Make sure that you have read through your report and are thoroughly familiar with it, particularly the whole argument, the main findings and the major contribution of your work.
- You might benefit from a practice viva, though this may not be that useful since different examiners will ask different kinds of questions.

GUIDANCE FOR STUDENTS IN THE COMPLETION OF TASKS

Requirements

The Final Report should contain up to 10000 words and *should* be structured using the following sections:

- Title Page
- Abstract
- Acknowledgments
- Table of Contents
- List of Figures / Tables
- 1. Introduction and Background Research
- 2. Literature Review
- 3. Specification and Test Planning
- 4. Safety, sustainability, environment, professionalism, maintenance and reliability
- 5. Project Design
- 6. Project Implementation
- 7. Project Testing and Evaluation
- 8. Conclusions and Recommendations
- 9. Citation List
- 10. Appendix including Project Planning

You will be assessed against the five common assessment criteria as follows:

1 Research Informed Literature (20%)

This will be assessed by your abstract, acknowledgements, introduction and setting out of aims and objectives, background research, setting the context of the project, statement of user or customer needs, literature review, solutions considered and choice made, and your use of Harvard Referencing for citing and listing sources.

2 Knowledge and Understanding of subject (20%)

This will be assessed by your specification, design requirements and project outcomes, time and financial constraints, test planning and procedures, formal project planning and identification of milestones, and your consideration of maintenance and reliability.

3 Analysis (20%)

This will be assessed by your evaluation of the implementation stage, monitoring of progress and milestone activities, testing and results, comparison of project outcomes to specification, and by your conclusions, recommendations and reflections.

4 Practical Application and Deployment (20%)

This will be assessed by the quality, innovation and creativity of design solution, implementation stage, working independently with limited supervision, meeting customer or user needs, fitness of solution to purpose, working within time and financial constraints, and by the quality of your log book (which must also be available to the examiners).

5 Skills for Professional Practice (20%)

This will be assessed by your professionalism and ethical conduct, awareness of health and safety issues, assessment of risk, consideration of sustainability and environmental protection and the presentation and organisational quality of report.

MARKING CRITERIA AND STUDENT FEEDBACK

This section details the assessment criteria. The *extent* to which you demonstrate these determines your mark. The marks available for each criterion are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement. **There are 5 criteria headings related to the module outcomes, each criterion is worth 20% but is marked out of 100.**

Final Report: - Common Assessment Criteria Applied 60% of Total Module Content		%age Marks available	WM	RD	Actual
1. Research-informed Literature (20%) Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions.					
Abstract, acknowledgements, introduction and setting out of aims and objectives		20			
Background Research, setting the context of the project, statement of user or customer needs.		30			
Literature Review, solutions considered and choice made		40			
Use of Harvard Referencing for citing and listing sources.		10			
Total for this criterion		100			
2. Knowledge and Understanding of Subject (20%) Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.					
Specification, design requirements and project outcomes, time and financial constraints		30			
Test planning and procedures		20			
Formal project planning and identification of milestones		25			
Consideration of maintenance and reliability		25			
Total for this criterion		100			
3. Analysis (20%) Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence					
Evaluation of Implementation stage, monitoring of progress and milestone activities		20			

Testing & Test Results		30			
Comparison of project outcomes to specification.		20			
Conclusions, recommendations and reflections		30			
Total for this criterion		100			
4. Practical Application and Deployment (20%)					
Deployment of methods, materials, tools and techniques; application of concepts; formulation of innovative and creative solutions to solve problems.					
Quality, innovation and creativity of design solution.		20			
Implementation stage, working independently with limited supervision		30			
Meeting customer or user needs, fitness of solution to purpose, working within time and financial constraints.		20			
Log Book		30			
Total for this criterion		100			
5. Skills for Professional Practice (20%)					
Attributes in professional practice: individual and collaborative working; deployment of appropriate media; presentation and organisation.					
Professionalism and ethical conduct		25			
Health and Safety, assessment of risk.		25			
Sustainability and environmental protection.		25			
Presentation and Organisational Quality of Report		25			
Total for this criterion		100			
Weighted Total		500			
Actual Total		100			

Viva Voce: - Common Assessment Criteria Applied 10% of Total Module Content		Marks available	WM	RD	ACT
1. Research-informed Literature Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions.		20			
Literature Review (level of progress, suitable synthesis of background material completed)		20			
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.		20			
Project Design		10			
Response to Questioning		10			
3. Analysis Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence		20			
Discussion of findings		10			
Proof of functionality		10			
4. Practical Application and Deployment Deployment of methods, materials, tools and techniques; application of concepts; formulation of innovative and creative solutions to solve problems.		20			
Prototyping / programming & testing to specification		20			
5. Skills for Professional Practice Attributes in professional practice: individual and collaborative working; deployment of appropriate media; presentation and organisation.		20			
Project action plan & contingencies.		10			
Quality of Presentation		10			
Total		100			

BACHELORS COMMON ASSESSMENT AND MARKING CRITERIA

	OUTRIGHT FAIL	UNSATISFACTORY	SATISFACTORY	GOOD	VERY GOOD	EXCELLENT	EXCEPTIONAL
Assessment Criteria	0-29%	30-39%*	40-49%	50-59%	60-69%	70-79%	80-100%
1. Research-informed Literature Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions	Little or no evidence of reading. Views and findings unsupported and non-authoritative. Referencing conventions largely ignored.	Poor evidence of reading and/or of reliance on inappropriate sources, and/or indiscriminate use of sources. Referencing conventions used inconsistently.	References to a limited range of mostly relevant sources. Some omissions and minor errors. Referencing conventions evident though not always applied consistently.	Inclusion of a range of research-informed literature, including sources retrieved independently. Referencing conventions mostly consistently applied.	Inclusion of a wide range of research-informed literature, including sources retrieved independently. Selection of relevant and credible sources. Very good use of referencing conventions, consistently applied.	A comprehensive range of research informed literature embedded in the work. Excellent selection of relevant and credible sources. High-level referencing skills, consistently applied.	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.
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.	Major gaps in knowledge and understanding of material at this level. Substantial inaccuracies.	Gaps in knowledge, with only superficial understanding. Some significant inaccuracies.	Evidence of basic knowledge and understanding of the relevant concepts and underlying principles.	Knowledge is accurate with a good understanding of the field of study.	Knowledge is extensive. Exhibits understanding of the breadth and depth of established views.	Excellent knowledge and understanding of the main concepts and key theories. Clear awareness of challenges to established views and the limitations of the knowledge base.	Highly detailed knowledge and understanding of the main theories/concepts, and a critical awareness of the ambiguities and limitations of knowledge.
3. Analysis Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence	Unsubstantiated generalisations, made without use of any credible evidence. Lack of logic, leading to unsupportable/missing conclusions. Lack of any attempt to analyse, synthesise or evaluate.	Some evidence of analytical intellectual skills, but for the most part descriptive. Ideas/findings sometimes illogical and contradictory. Generalised statements made with scant evidence. Conclusions lack relevance.	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	Evidence of some logical, analytical thinking and synthesis. Can analyse new and/or abstract data and situations without guidance. An emerging awareness of different stances and ability to use evidence to support the argument. Valid conclusions and recommendations, where relevant	Sound, logical, analytical thinking; synthesis and evaluation. Ability to devise and sustain persuasive arguments, and to review the reliability, validity & significance of evidence. Ability to communicate ideas and evidence accurately and convincingly. Sound, convincing conclusions / recommendations.	Thoroughly logical work, supported by evaluated evidence. High quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Strong, persuasive, conclusions, justifiable recommendations.	Exceptional work; judiciously selected and evaluated evidence. Very high quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Highly persuasive conclusions
4. Practical Application and Deployment Effective deployment of appropriate methods, materials, tools and techniques; extent of skill demonstrated in the application of concepts to a variety of processes and/or contexts; formulation of innovative and creative solutions to solve problems.	Limited or no use of methods, materials, tools and/or techniques. Little or no appreciation of the context of the application.	Rudimentary application of methods, materials, tools and/or techniques but without consideration and competence. Flawed appreciation of the context of the application.	An adequate awareness and mostly appropriate application of well-established methods, materials, tools and/or techniques. Basic appreciation of the context of the application.	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 very good application of a range of methods, materials, tools and/or techniques. Very good consideration of the context of the application, with perceptive use of examples, where relevant. Evidence of some innovation and creativity.	An advanced application of a range of methods, materials, tools and/or techniques. The context of the application is well considered, with extensive use of relevant examples. Application and deployment extend beyond established conventions. Innovation and creativity evident throughout.	Outstanding levels of application and deployment skills. Assimilation and development of cutting edge processes and techniques.
5. Skills for Professional Practice Demonstrates attributes expected in professional practice including: individual initiative and collaborative working; deployment of appropriate media to communicate (including written and oral); clarity and effectiveness in presentation and organisation.	Communication media is inappropriate or misapplied. Little or no evidence of autonomy in the completion of tasks. Work is poorly structured and/or largely incoherent.	Media is poorly designed and/or not suitable for the audience. Poor independent or collaborative initiative. Work lacks structure, organisation, and/or coherence	Can communicate in a suitable format but with some room for improvement. Can work as part of a team, but with limited involvement in group activities. Work lacks coherence in places and could be better structured.	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.	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.	Can communicate professionally and, confidently in a suitable format. Can work professionally within a team, showing leadership skills as appropriate, managing conflict and meeting obligations. Work is coherent, very fluent and is presented professionally.	Can communicate with an exceptionally high level of professionalism. Can work exceptionally well and professionally within a team, showing advanced leadership skills. Work is exceptionally coherent, very fluent and is presented professionally.

IET Grading Scheme

PSDE6019

Final Report: - Engineering Design

Code	Learning Outcomes	Grading Criteria			Grade Awarded			IET Grade
					WM	RD	ACT	
D1i	Be aware of business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics.	Unsatisfactory	Poor evidence shown of awareness of business, customer and user needs.	F				
		Satisfactory	Limited evidence shown and not covering all aspects such as the wider engineering context, public perception and aesthetics.	P				
		Good	Inclusion of a wide range of evidence of awareness of business, customer and user needs but needed to be more detailed.	M				
		Very Good / Excellent	Comprehensive evidence shown covering all aspects of the learning outcome to a high degree.	D				
D2i	Define the problem, identify any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards.	Unsatisfactory	Problem definition and specification not clearly stated and very little constraints discussed.	F				
		Satisfactory	Problem definition and specification are satisfactory and identifies a limited range of constraints.	P				
		Good	A good range of constraints shown and the problem identified clearly with a good specification given. More detail required in some aspects.	M				
		Very Good / Excellent	Very Good / Excellent definition of the problem / specification and identity of any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards	D				
D3i	Work with information that may be incomplete or uncertain and be aware that this may affect the design.	Unsatisfactory	Poor standard of research undertaken and not referenced well. Very little use of research made in the design process.	F				
		Satisfactory	Limited research undertaken and used in the design process to a satisfactory level.	P				
		Good	Good research work undertaken and used well in the design process. Some aspects of adaptation of the research to the specific design problem noted and used.	M				
		Very good / Excellent	A wide range of research undertaken and adapted to suit the design for the project. Good awareness shown that incomplete or uncertain information may affect the design.	D				
D4i	Apply problem solving skills, technical knowledge and understanding to create or adapt design solutions that are fit for purpose including operation, maintenance, reliability etc.	Unsatisfactory	Problem solving skills not demonstrated in the project to any acceptable level. Very little evidence of differing solutions noted.	F				
		Satisfactory	Design solution shown is satisfactory and fit for purpose but technical knowledge could have been much more detailed. Limited evidence of differing solutions noted.	P				
		Good	Good design solution shown that fits the project problem / specification well. More detail required in adapting the design solutions that are fit for purpose including operation, maintenance, reliability etc. Good range of differing solutions noted.	M				
		Very Good / Excellent	Very Good / Excellent technical knowledge shown in applying problem solving skills to create the project design solutions that are fit for purpose including operation, maintenance, reliability etc. Wide range of solutions examined with the best solution taken forward to implementation.	D				
D5i	Manage the design process, including cost drivers, and evaluate outcomes.	Unsatisfactory	Design process not shown to be managed well. Log book and / or project planning poor.	F				
		Satisfactory	The design process from start to finish shown satisfactorily in both the log book, report and project plan. More detail in all aspects would have greatly improved mark obtained.	P				
		Good	Good detail given in log book, plan and report of the management of the design process, including cost drivers. The evaluation of the design outcomes are clear and concise.	M				
		Very Good / Excellent	The management of the design process carried out to an excellent standard covering all aspects of the design. The evaluation of the design is shown in great detail.	D				
		Total						

Final Report: - Engineering Analysis								
Code	Learning Outcomes	Grading Criteria			Grade Awarded			IET Grade
					WM	RD	ACT	
EA2i	Ability to apply quantitative methods in order to understand the performance of systems and components.	Unsatisfactory	Project implementation not broken down and performance of individual systems and components not understood to any great degree.		F			
		Satisfactory	Limited / satisfactory application of quantitative methods in order to understand the performance of systems and components within the overall project.		P			
		Good	Components and sub-systems within the project broken down well and analysed to a good degree in order to complete the project to specification.		M			
		Very Good / Excellent	Proof of extensive quantitative methods being applied on components and sub-systems within the project to test implementation and ensure specification is reached.		D			
EA3i	Ability to use the results of engineering analysis to solve engineering problems and to recommend appropriate action.	Unsatisfactory	The main project problem not analysed and solved to any great degree. Appropriate action not made clear, through analysis, to solve the problem.		F			
		Satisfactory	Satisfactory analysis of test results obtained through specified test procedures which solved the engineering problems encountered during the implementation stage.		P			
		Good	Detailed analysis of test results obtained through specified test procedures which solved the engineering problems encountered during the implementation stage.		M			
		Very Good / Excellent	Extensive test procedures undertaken at relevant stages throughout the project design / implementation stage. The results obtained were analysed well with appropriate actions recommended.		D			
		Total						

Final Report: - Economic, Legal, Social, Ethical and Environmental context

Code	Learning Outcomes	Grading Criteria			Grade Awarded			IET Grade
					WM	RD	ACT	
ET1i	Understanding of the need for a high level of professional and ethical conduct in engineering and a knowledge of professional codes of conduct.	Unsatisfactory	Very little evidence shown of the understanding of the needs of professional and ethical conduct in engineering and a knowledge of professional codes of conduct.	F				
		Satisfactory	Satisfactory evidence given of the Understanding of the need for a high level of professional and ethical conduct in engineering and a knowledge of professional codes of conduct.	P				
		Good	A range of evidence given relating to the understanding of the need for a high level of professional and ethical conduct in engineering and a knowledge of professional codes of conduct.	M				
		Very Good / Excellent	Excellent range of good evidence given showing a good understanding of the need for a high level of professional and ethical conduct in engineering and a knowledge of professional codes of conduct.	D				
ET2i	Knowledge and understanding of the commercial, economic and social context of engineering processes.	Unsatisfactory	Little to no evidence given relating to the Knowledge and understanding of the commercial, economic and social context of engineering processes.	F				
		Satisfactory	Shows a reasonable knowledge and understanding of the commercial, economic and social context of engineering processes.	P				
		Good	Good evidence shown of knowledge and understanding of the commercial, economic and social context of engineering processes.	M				
		Very Good / Excellent	Very good/excellent evidence given of knowledge and understanding of the commercial, economic and social context of engineering processes.	D				
ET3i	Knowledge of management techniques that may be used to achieve engineering objectives.	Unsatisfactory	Little or no evidence shown of any management techniques that may be used to achieve engineering objectives.	F				
		Satisfactory	Satisfactory knowledge shown of management techniques that may be used to achieve engineering objectives.	P				
		Good	Good, ranging evidence shown of management techniques that may be used to achieve engineering objectives.	M				
		Very Good / Excellent	Excellent range of management techniques shown that may be used to achieve engineering objectives.	D				
ET4i	Understanding of the requirement for engineering activities to promote sustainable development.	Unsatisfactory	Very little evidence shown in the understanding of the requirement for engineering activities to promote sustainable development.	F				
		Satisfactory	Reasonable evidence given in the report of the requirement for engineering activities to promote sustainable development.	P				
		Good	A range of evidence given which shows a good understanding of the requirement for engineering activities to promote sustainable development.	M				
		Very Good / Excellent	Wide range of evidence given in the report which shows, clearly, the understanding of the requirement for engineering activities to promote sustainable development.	D				
ET5i	Awareness of relevant legal requirement governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and reliability issues.	Unsatisfactory	No or very little awareness shown of relevant legal requirement governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and reliability issues.	F				
		Satisfactory	Satisfactory awareness shown of relevant legal requirement governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and reliability issues.	P				
		Good	Good awareness shown of relevant legal requirement governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and reliability issues.	M				
		Very Good / Excellent	Good range of evidence given which clearly shows awareness of relevant legal requirement governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and reliability issues.	D				
ET6i	Awareness of risk issues, including health and safety, environmental and commercial risk.	Unsatisfactory	No/ little evidence shown of risk issues, including health and safety, environmental and commercial risk.	F				
		Satisfactory	Limited evidence shown of risk issues, including health and safety, environmental and commercial risk.	P				
		Good	Good awareness shown in the report of risk issues, including health and safety, environmental and commercial risk.	M				
		Very Good / Excellent	Very good range of evidence shown related to risk issues, including health and safety, environmental and commercial risk.	D				
		Total						

Final Report: - Engineering Practice								
Code	Learning Outcomes	Grading Criteria			Grade Awarded			IET Grade
					WM	RD	ACT	
EP1i	Knowledge of contexts in which engineering knowledge can be applied. (E.g. operations and management, application and development of technology, etc.)	Unsatisfactory	Very little to no knowledge shown of contexts in which engineering knowledge can be applied.	F				
		Satisfactory	Some knowledge shown of operational management and application development of relevant technologies.	P				
		Good	Detailed knowledge shown of contexts in which engineering knowledge can be applied.	M				
		Very Good / Excellent	Extensive knowledge shown of operational management and application development of relevant technologies.	D				
EP2i	Understanding of and ability to use relevant materials, equipment, tools, processes or products.	Unsatisfactory	Very little detail given of the ability to use relevant materials, equipment, tools, processes or products.	F				
		Satisfactory	Satisfactory understanding of and ability to use relevant materials, equipment, tools, processes or products shown in the report and / or logbook.	P				
		Good	Good detail shown of understanding of, and ability to use relevant materials, equipment, tools, processes or products.	M				
		Very Good / Excellent	Very good detail shown in the report of understanding of, and ability to use relevant materials, equipment, tools, processes or products.	D				
EP3i	Knowledge and understanding of workshop and laboratory practice.	Unsatisfactory	Little to no knowledge and understanding of workshop and laboratory practice given.	F				
		Satisfactory	Some knowledge and understanding of workshop and laboratory practice shown in report and/or logbook.	P				
		Good	Detailed evidence show of knowledge and understanding of workshop and laboratory practice.	M				
		Very Good / Excellent	Extensive detail shown in report of knowledge and understanding of workshop and laboratory practice.	D				
EP4i	Ability to use and apply information from technical literature.	Unsatisfactory	Very little research carried out related to technical literature.	F				
		Satisfactory	Satisfactory range of research showing the ability to use and apply information from technical literature.	P				
		Good	Very good range of research showing the ability to use and apply information from technical literature.	M				
		Very Good / Excellent	Extensive research carried out which clearly shows the ability to use and apply information from technical literature.	D				
EP5i	Ability to use appropriate codes of practice and industry standards.	Unsatisfactory	Little or no ability shown in how to use appropriate codes of practice and industry standards.	F				
		Satisfactory	Some detail given in report related to the ability to use appropriate codes of practice and industry standards.	P				
		Good	Good range of evidence in the report shows an ability to use appropriate codes of practice and industry standards.	M				
		Very Good / Excellent	Extensive evidence shown of the ability to use appropriate codes of practice and industry standards.	D				
		Total						

Final Report: - Viva Voce								
Code	Learning Outcomes	Grading Criteria			Grade Awarded			IET Grade
					WM	RD	ACT	
D6i	Communicate their work to technical and non-technical audiences.	Response to Questioning						
		Unsatisfactory	Very little positive response to questioning, showing little understanding on how the project was designed with limited knowledge on design procedure, planning and research. No / little specification noted.	F				
		Satisfactory	Showing limited / satisfactory response to questioning in relation to the project design, planning and research. The specification could have been more detailed.	P				
		Good	Detailed response to questioning, showing a good understanding of how the project was designed and planned with very good research undertaken. The project specification was detailed with a full test procedure noted.	M				
		Very Good / Excellent	Excellent design undertaken with extensive research shown. Project specification and planning very detailed and allowed the final testing to be carried out to specification. Very good, enthusiastic response to questioning.	D				
		Discussion of findings						
		Unsatisfactory	Very little or no analysis carried out and compared to specification.	F				
		Satisfactory	Good set of results obtained. Limited / satisfactory analysis of these results and limited testing back to the specification given.	P				
		Good	Detailed set of results obtained which have been thoroughly tested to ensure specification has been reached.	M				
		Very Good / Excellent	A comprehensive set of results obtained which were compared to specification at every stage. Very good, enthusiastic and knowledgeable discussion on project findings.	D				
		Demonstration of final project or proof of functional project if work based						
		Unsatisfactory	Very little to no evidence of project functionality shown. Project not finished or uncomplete results shown.	F				
		Satisfactory	Limited / satisfactory evidence shown of project functionality. Testing methods not detailed enough with results not fully analysed.	P				
		Good	Good detail shown on how the project worked and good comparison back to the design. Testing procedure showed very good understanding on how the project was designed.	M				
		Very Good / Excellent	Very good / excellent detail on project functionality showed excellent understanding on what the project design was meant to be.	D				
		Presentation Style						
		Unsatisfactory	Limited and stilted presentation style which did not show understanding of the project work undertaken	F				
		Satisfactory	Presentation was satisfactory but not confident. Showed limited understanding of the project work undertaken.	P				
		Good	Good, confident presentation style which demonstrated a clear understanding of the subject matter.	M				
		Very Good / Excellent	Presentation was punchy and confident and clearly showed understanding of the subject matter.	D				
		Quality of Presentation						
		Unsatisfactory	The project presentation was confusing and did not cover all aspects of the project design, planning, specification, building and testing. No or little reflection or conclusion given.	F				
		Satisfactory	The project presentation was satisfactory and covered most aspects of the work undertaken. Presentation slides could have been clearer and more relevant. Limited / satisfactory reflection or conclusion given.	P				
		Good	Good use made of media in producing slides which were used effectively in the project presentation. Very good review of project results which were used effectively in the presentation.	M				
		Very Good / Excellent	Very good use made of presentation media used effectively in producing a presentation which clearly showed understanding of the project design through to implementation. Excellent review / conclusion given.	D				
				Total				