

SCHOOL OF ELECTRONIC ENGINEERING AND COMPUTER SCIENCE

UNDERGRADUATE FINAL YEAR PROJECT STUDENT HANDBOOK

2022/23

SUPPORTED BY THE

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1. INTRODUCTION

This handbook provides an overview of the final year undergraduate projects within the School of Electronic Engineering and Computer Science. You are strongly recommended to read and follow the guidelines within this handbook.

The final year project allows you to demonstrate the knowledge, skills and experience that you have gained during your degree programme and to extend these by working individually on a research or development problem. Electronic Engineering (EE) and Computer Science (CS) are both practical subjects, and potential employers are typically very interested in the project, as it is the key means by which you can demonstrate your ability to “do” EE or CS.

In addition to technical skills, the project will also involve communication skills, organisational and time management skills.

The work will be guided by a supervisor and will be expected to occupy a quarter of your effort in the final year of the programme.

1.1 AIMS

The final year project is the most crucial element of a degree programme, as it gives you an opportunity to work on an extensive piece of work within the areas of EE and CS. The project also allows you to demonstrate your problem-solving abilities by being able to apply a range of skills that you have acquired throughout your degree programme.

The final year project aims:

- To draw on knowledge, skills and experience gained from the taught modules taken during the degree programme.
- To undertake a piece of work of appropriate scope and complexity independently, under the guidance of a project supervisor.
- To communicate the achievements of the project effectively in a written report and a viva.
- To demonstrate the outcomes of the project, where applicable.

2. PROJECT SUPPORT

There will be a series of lectures given by the project coordinator to support you in your project. Attendance to these sessions will be monitored*. There is also an area on QMPlus where the lecture slides can be found, along with other supporting material. You will also be expected to watch the interactive videos and read relevant articles before the live webinar session.

There is a forum on QMPlus for the projects where discussions can take place. This will be monitored by the project coordinator, who will answer questions if this seems useful.

***Unsatisfactory attendance will be reported to your Programme Director.**

3. TYPES OF PROJECTS

Most students will work on an implementation project, but there are other possibilities. In addition to projects suggested by a supervisor, you can suggest your own project, but in this case you need to find a supervisor who is willing to supervise the project and who considers that the level of difficulty of the project you have suggested is appropriate.

3.1 IMPLEMENTATION

Implementation projects solve a practical problem. They may be hardware based, software based or a combination of hardware and software. An implementation project will involve all the normal stages of design and development of a system (the proposed solution to the problem): specification, design, implementation and testing.

3.2 RESEARCH

A research project explores a hypothesis through the scientific method. In EECS, it must be based on technology and must be a genuine research task. It must be original work, for example a review of work in an area or a simple business analysis would not be an acceptable research project.

3.3 INDUSTRIAL

An industrial project would be one that is carried out in cooperation with an external industrial partner i.e. business. It can be either a research or an implementation project. There needs to be a named supervisor from industry as well as an academic supervisor from the School.

Industrial projects may originate from contacts that academic staff have with industry or from contacts that the student has developed. It is the responsibility of the academic supervisor to ensure that the level of difficulty of the project is appropriate.

3.4 USER STUDY

A user study is a research project that is focused on studying user behaviour in a specific context. It would normally include some implementation, e.g. building a prototype or an application as part of experiment design and setup, and an experimental evaluation of user behaviour in the emulated context of interest.

4. PROJECT SUPERVISION

4.1 SELECTING A PROJECT AND SUPERVISOR

Towards the end of your penultimate year, a list of project supervisors with their project ideas and areas of interest will be published on QMPlus. Use this information to decide which member of staff you would like to contact in order to discuss your project.

Procedure for supervisor selection and allocation

1. Read the 'Supervisor Project Ideas and Expertise' document on QMPlus. Make sure you carefully consider all the information in this document before emailing a potential supervisor.
2. Before contacting a potential supervisor, download and complete the '*Initial Proposal Form*' that is available on QMPlus.
3. Complete 'Supervisor Shortlist Form'.
4. Contact the potential supervisor, by sending them an email with your completed initial proposal form. It is important that when you contact the academic member of staff that you demonstrate a keen interest and be well-informed about the potential project idea or the supervisor's areas of interest.
5. As soon as you have an agreement with a supervisor, you must a) make all other potential supervisors you were communicating with aware that you will be supervised by another academic and b) stop contacting any further supervisors.
6. The deadline for supervision selection is **5th August 2022**. After this date, you will be allocated a supervisor by the Coordinator. These allocations cannot be guaranteed to perfectly match your interests, therefore it is vital that you be proactive in finding a supervisor who best matches your interests.

Supervisors have a quota of project students and the number of vacancies for taking on students will be updated online as students are claimed. Changing supervisors, once you have one, needs the agreement of your old and new supervisors.

4.2 KEEPING IN CONTACT WITH YOUR SUPERVISOR

It is important to meet with your supervisor regularly. Different supervisors have different ways of organising meetings – either individually or as group. If your project is not going well, tell your supervisor about it and definitely do not stop going to meetings.

If you have a particular issue that you cannot deal with in a regular meeting, email your supervisor for an appointment. It is likely that your supervisor will sometimes be away at research meetings or other events, so keep a note of these.

Keep a logbook for your project and record your progress, meetings with your supervisor, difficulties etc in this book. It will help you to record issues you want to discuss with your supervisor when you meet and the logbook will be very useful when you are writing reports.

Your time with your supervisor is limited. Hence it is essential that you make the most of this time. To do so, you need to have a good idea of what you wish to achieve during your supervision meetings. You should also agree with your supervisor, as to how you could best benefit from his/her academic advice and mutually decide the time and date of meetings in advance.

4.3 STUDENT RESPONSIBILITIES

- You need to monitor the project progress. Your role is something like a project leader whereas the supervisor's role is more like a consultant and manager.
- You need to maintain regular contact and arrange appointments with your supervisor.
- It is your responsibility to gain the knowledge required and deal with implementation details. It is not the responsibility of the supervisor to provide ready-made solutions. You need to formulate the problems before asking your supervisor.
- It is important that you are self-motivated. You should not expect that you will be spoon-fed by your supervisor.
- You need to tell your supervisor about any equipment failure, technical or other difficulties, e.g. extenuating circumstances, that will interrupt your work.
- You can expect to receive a response from your supervisor and the project co-ordinator to e-mails and telephone messages within five working days. If there is no response then please notify the project co-ordinator.

5.4 SUPERVISOR RESPONSIBILITIES

- It is the supervisor's responsibility to define the project objectives and the possible outcomes, or to refine these and check whether they are adequate if you have suggested your own project.
- The supervisor will provide advice and guidance but leave solutions and implementation details to the student.
- The supervisor will explain the project assessment method to the student and be responsible for evaluating the student's project in terms of quality and quantity of the effort expended.
- The project title and specification are a joint responsibility of the supervisor and student. The supervisor is responsible for assessing the interim report, progress presentation and will be one of the assessors for the final outcome of the project, which includes a demonstration and viva.

- Your supervisor is not obliged to chase you if you fail to keep appointments with him/her.

5. PROJECT OUTPUTS AND WEIGHTING

5.1 PROJECT WEIGHTING

The overall weighting of your project in the calculation for your final degree is different for students on different programmes of study. **The project is core module, which you must take and pass to obtain your degree.**

5.1.1 COMPUTER SCIENCE PROGRAMME STUDENTS

For Computer Science programme students, the project counts as two modules in the final year and is therefore **25%** of the final year mark or **15%** of the overall degree classification. You must pass a “problem-solving project” at the first attempt to qualify for partial exemption from the BCS membership examinations.

5.1.2 ELECTRONIC ENGINEERING PROGRAMME STUDENTS

For Electronic Engineering programme students, the project counts as two modules in the final year and is therefore **25%** of the final year mark or **15%** of the overall degree classification.

For students prior to 2018/19 enrolment, the project is **20%** of the overall degree classification. This was a requirement of the IET accreditation of EE programmes and makes the project **33.3%** of the final year mark for the three-year degree and for the MEng programme **53.3%** of the final year mark. BEng and MEng degrees require a pass in the project, and project failure would either require a resit of the project or the award of a BSc(Eng) degree for BEng students.

5.2 PROJECT DOCUMENTATION

There are a series of documents that you need to produce during your project and at the end you will need to submit the final project report, any supporting documentation and your slides for your presentation.

All documents are to be submitted via QMPlus.

The documents required are:

- Project definition including a project plan
- Interim report including a revised project plan and a risk assessment
- Project progress presentation
- Final report
- Any supporting documentation

- Presentation slides

5.3 WEIGHTING OF PROJECT ELEMENTS AND DEADLINES

The weightings are as follows:

Project Element	Assessed by	Weighting	Deadline		Submission Location
Project definition and plan	Not assessed but approved by supervisor	0%	Document Submission	17th Oct 2022	QMPlus
Interim report (includes risk assessment) and Project progress presentation	Supervisor	10%	Interim Report Submission	28th Nov 2022	QMPlus
			Slides Submission	5th Dec 2022	QMPlus
			Presentation	12th - 16th Dec 2022	Location: TBC
Draft Report	Not assessed, however supervisor will provide feedback	0%	Draft Report Submission	20th Mar 2023	QMPlus
Project Video	Supervisor and second examiner	5%	Video Submission	4th May 2023	QMPlus
Final report, supporting documentation, implementation and presentation at Viva*	Supervisor and second examiner	85%	Final Report Submission	2nd May 2023	QMPlus
Presentation at Viva*	Supervisor and second examiner		Viva Presentation	8th to 19th May 2023	Location: TBC

Key

Formative Assessment	Summative Assessment
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***Failure to attend and participate at the viva will lead to mark of zero for the project.**

6. PROJECT ASSESSMENT

6.1 PROJECT DEFINITION AND PLAN

You will be expected to submit a project definition document on **17th October 2022**, which should be a 3-4 page description about your project. This document will also need to include a project plan.

6.1.1 PROJECT DEFINITION

Your final achievements in your project will be judged against your project definition. It is possible to amend the definition during your project, but you will need to keep a record of any changes and the reasons for the changes. Any changes must be agreed with your supervisor.

Exactly what will appear in your project definition will vary with the nature of your project, but typical items will be:

- The project title;
- Project aims;
- Objectives - state how you intend to achieve your aims (i.e. the deliverables required to reach your aims). The number of objectives that your proposal should contain is not fixed and will be dependent on what you consider to be appropriate, but will include objectives to report on the literature, objectives dealing with the analysis/design/implementation of your system and objectives to evaluate your project and reach some conclusions.
- Details of the specific problem being addressed;
- An initial analysis of user requirements and data collection methods;
- The algorithms, methodologies and techniques to be employed;
- An initial specification of how users will interact with the system;
- Programming languages, software, hardware, databases;
- A list of background materials consulted so far, including Internet resources.

Your project definition must be agreed with your supervisor. A pro forma is provided for you to use when writing your project definition.

6.1.2 PROJECT PLAN

Your project plan should break down the work you expect to carry out for your project into activities (tasks and sub-tasks) and estimate how long each will take, whether one relies on the completion of another or can be carried out in parallel, etc.

The deadlines that you have for producing documents and the final demonstration should also appear on the plan. The format can be a Gantt chart or a list of activities and their start

and end dates. You will be asked to revise the time plan when you submit your interim report so the first semester plan could have much more detail than the second semester plan. The plan should also be agreed with your supervisor.

6.2 INTERIM REPORT & PROJECT PROGRESS PRESENTATION

You will be expected to submit an interim report on **28th November 2022**, which is an opportunity for you and your supervisor to review the progress that you have made. Submission is electronic via QMPlus and Turnitin will be used on submissions. You will then have an opportunity to present your interim report findings to your supervisor during the week commencing **12th December 2022**.

6.2.1 INTERIM REPORT

The interim report is a subset of your final report, hence it should consist of

- A literature review of previous work and the background to your project;
- An account of your achievements to date;
- An amended plan for the work you will carry out in the second semester;
- Risk assessment.

The risk assessment should consist of a list of the risks to the successful completion of your project, the impact of the risk, the likelihood of the risk occurring, the severity of the effect of the risk on your project and how you intend to manage the risk. This should be presented in the form of a five-column table. The ratings will be low/medium/high.

Description of risk	Impact of risk	Likelihood rating	Impact rating	Preventative actions

Some of the risks in hardware construction will be physical risks associated with construction activities.

6.2.2 PROJECT PROGRESS PRESENTATION

During the last week of semester 1, you will be expected to prepare a 10-minute presentation, which will give you the opportunity to:

- Provide and update about your project and your progress to date;
- Summarise literature review findings;
- Design of proposed implementation;
- Present your project plan with achieved and future milestones.

The interim report and project progress presentation will be marked by your supervisor and counts **10%** towards your final project mark.

6.3 FINAL REPORT

The purpose of your report is:

- to describe the project to the examiners
- to “sell yourself” by bringing out the best of what you have achieved
- to show that you have evaluated your work and know the successes and limitations
- to demonstrate that you are capable of a sustained piece of writing.

You are required to submit a draft version of your final report to your supervisor (see deadlines) so that you can get feedback to improve the final submission.

The structure will vary depending on the nature of the project, but for an implementation project, there should be an introduction justifying the usefulness of the project, a review of previous work on the topic, a requirements section, a design section, an implementation section, a testing section, conclusions, suggestions for further work and references. In more detail the structure should be:

- **Title page** – template will be provided
- **Acknowledgements**
- **Abstract / summary**
 - One page maximum, a complete summary of your work, which makes sense without reading the rest of the report.
- **Table of contents**
- **Introduction**
 - Context for report and the motivation for your work.
- **What others have done chapters**
 - e.g. Background research and a literature review.
- **What you have done chapters**
 - e.g. Requirements capture / analysis – what your system should do
 - Design – how you went about your work
 - Implementation – practical techniques, problems, solutions
 - Testing and/or evaluation – how well your solution worked
- **Discussion / conclusions**
 - This should be a critical analysis of your work and an honest appraisal of the achievements of your project.
- **Further work**
 - What more you would do if you had time.
- **References / bibliography**
- **Appendices**
 - More detailed material that is not crucial to understanding of main message(s), e.g. Detailed experimental results, data sheets, copy of questionnaire / interview scripts.

The report length should be **10,000 words ($\pm 10\%$)**. This excludes references and appendices. Use 12- point type and make sure that figures and tables have captions. Word or LaTeX can be used for the document.

The submission deadline for your dissertation is **2nd May 2023**. This will be assessed by your supervisor and second examiner. Submission is electronic via QMPlus and Turnitin will be used on submissions. Any computer code in text format should be submitted as a separate file under supporting documentation.

Disclaimer

Please note: The project report you submit could be used in the future as an exemplar for future cohorts. These exemplars will be anonymous (i.e we will remove any information from these submissions that could make it possible to identify you).

If you would like to opt out of this can you please email the project co-ordinator Dr Usman Naeem (u.naeem@qmul.ac.uk) Also if you would like to make your work non-anonymised for citation purposes then also let the project co-ordinator know.

6.4 PROJECT VIVA

The viva assessment will be split into two subcomponents:

- Project Showcase Video
- Viva Q&A Session

The viva assessment will be assessed by your supervisor and second examiner. Please note that the viva itself informs the project mark. The viva should **not** be treated as a separate component from the project itself. Hence a viva can both increase and decrease the mark gauged from the project report.

6.4.1 PROJECT SHOWCASE VIDEO

Video is a powerful medium to disseminate your project, as it gives you an opportunity to showcase your project to a wider audience and provide further insights. In relation to this, you will need to create a 10-minute video ($\pm 10\%$ duration), where you will be expected to provide an overview of your project and contributions. This is a unique opportunity for you to convince your examiners that your project is of high quality and interesting. The purpose of this video will be to provide an overview of the:

- area you worked in,
- problem you focused on,
- solution you designed and implemented.

The video is an opportunity for creativity. However, it is important that you cover the following aspects of your work:

- the statement of the problem you investigated,
- the description of the methods used to solve the problem,
- a demonstration of your practical/implementation work,
- a summary of your work,
- a presentation of your results (both positive and negative).

The submission deadline for your video is **4th May 2023**, where submission will be done via QMPlus.

6.4.2 VIVA Q&A SESSION

During the week commencing **8th May 2023**, you will be allocated a time-slot where you will be assessed on your ability to answer questions about your project to your examiners. This session will be 20 minutes, where you will be expected to answer questions about your project contributions (i.e., methodology and demo), which will also include questions about the implementation/practical (i.e., coding or experiments) aspect of your project.

The objectives of the viva session are for you:

- To explain and justify your work
- To show your ability to respond to questions about your project

Do not assume that the second examiner will be an expert in the area of your project, hence you will need to ensure that you articulate your project findings in a clear and concise manner.

If you fail to attend the viva, then you will receive a mark of zero for the project.

You will also fail your project if you fail to submit the final report, supporting documentation and project video.



7. PROBLEM DEFINITION

An excellent project is dependent on the construction of a clear problem definition. Stating the problem to be solved is more than just writing a series of anecdotal notes for the reasons that have motivated you to develop some hardware or write a particular piece of software. For example, it is not sufficient enough to write that you have an interest in healthy living and you wish to develop an application that supports users within the elderly community by providing them with intelligent recommendations to lead an independent and healthy lifestyle. This motivation may be a good starting point for a project of your choice. However, you need to do some reading to establish the nature of Electronic Engineering or Computer Science that would be required to solve this particular problem.

The method to investigate the underlying problem will require reading books, and research articles (e.g. conference and journal papers).

In relation to the project example above, you would do the following:

- Read research articles on current software systems developed to encourage health and wellbeing within elderly communities.
- Investigate and review the range of functionalities they support.
- Identify issues and shortcomings.
- Investigate current software frameworks adopted to solve this problem.

It is essential that you have a clear idea of the underlying problem you are trying to solve; therefore it is strongly recommended that a suitable starting point for research will be to use the following resources:

- ACM Digital Library - <https://dl.acm.org>
- IEEE Xplore Digital Library - <http://ieeexplore.ieee.org/Xplore/home.jsp>
- Google Scholar - <https://scholar.google.co.uk>

It is essential that you create notes and summaries of the references that you find useful, as these will be useful when writing your literature review, which is a significant component of your interim and final report.

8. ETHICS AND PROJECTS THAT INVOLVE HUMAN PARTICIPANTS

The obvious ethical issues are fraud (e.g. passing off work that was done by someone else as your own) and plagiarism (which will be discussed further in Section 10.4). However, projects that involve human participants, e.g. user studies or experimental evaluations, also involve ethical issues. The principal issues are ensuring that participants have given informed consent and ensuring that personal details are protected in accordance with the Data Protection Act. You will find a checklist for ethical issues concerning projects that include human participants on the project QMPlus pages. If your project involves human participants, please discuss these issues with your supervisor.

9. RESOURCES

9.1 HARDWARE

There is an area of the electronics laboratory for project hardware development and you can request to be allocated a cupboard space in the lab to keep your hardware and work on your project.

The electronics lab provides a supply of basic electronic parts and you can take parts from the carousel in the 3rd floor electronics lab. For other specific parts you must request that an order form is created. The Lab Manager can authorise purchases up to £15, your supervisor up to £50 and above £50 the Project Coordinator must authorise. The total maximum budget per project is £100. Check whether we have parts already before you order anything, and we prefer that parts can be re-used. Any items purchased yourself cannot be reimbursed. The project remains property of QMUL and should be returned to the Lab upon completion of project.

Be careful about the package that integrated circuits use. Standard DIL packages are good for development on breadboard and strip board, but surface mount parts must have adequate adapters or fabrication of a suitable PCB must be considered before purchasing. If you need to have a PCB manufactured, also see the PCB technician to discuss complexity and lead times for manufacture. All purchasing and fabrications need to have been authorised appropriately before purchase or works are commenced.

You can check a general guide to the items stocked in the lab at: <http://services.eecs.qmul.ac.uk/eecs-laboratories/electronics-labs/components/>.

All components not available in the carousel still need to be ordered, even if stocked.

To request a cupboard/order form email electronicslab@lists.eecs.qmul.ac.uk and copy your supervisor.

If you are using microcontrollers, check that we have access to a software development environment and programming capability for your chosen part.

Note: The project budget is only hardware-based projects, where you require electronic components to build a system, as opposed to purchasing off the shelves products to be an add-on to your system.

9.2 SOFTWARE

Final year students have access to all ITL floors when there are no scheduled labs (check lab timetables via your landing page). This is booked space, hence you will need to book a space before going to work in the ITL. Even when there are labs, you may be able to access the unused machines. However, you must always be considerate of labs that are running in the ITL.

All the software you need should be available, but if you think you need something else please consult the EECS services support staff and your supervisor.

10. REFERENCING AND PLAGIARISM

10.1 REFERENCING

There are standard ways of referring to documents that you have accessed when you want to show the source of the information in your reports. The two main systems are the Harvard and Vancouver styles. The Harvard system has the author's name and year appearing in the text, which links to a list at the end of the document. The Vancouver system has a number appearing in the text as a superscript or in brackets, which links to a list at the end of the document. Our Faculty requires students to use the Harvard system.

10.2 THE HARVARD SYSTEM (REQUIRED)

In the text

In his recent article, Leyden (2005) claimed that...

Google's new IM service has had a less-than-enthusiastic reception (Leyden 2005) "Early reaction to the service has been lukewarm." (Leyden 2005)

Reid and Dunlop (2003) stated that...

Beymer et al (2005) stated that... (3 or more authors)

Fig. 1. Audio classification framework (Divakaran 2004, p.29)

Web references

Leyden, J. (2005) Google Talks Up IM Service. The Register [on-line].

Available from http://theregister.co.uk/2005/08/24/google_talk/ [Accessed 7 November 2014]

Department of Health (2006). Fluoridation of drinking water [online].

Available at: <http://www.dh.gov.uk/assetRoot/04/13/60/15/04136015.pdf> [accessed 13/9/2006].

Book reference

Naisbitt, J. (1984). Megatrends. New York: Warner Books.

Periodical (journal) reference

Raikkonen, K., Pesonen, A.K., Jarvenpaa, A.L. & Strandberg, T. E. (2004).

Sweet babies: chocolate consumption during pregnancy and infant temperament at six months. Early Human Development, 76 (2), 139-145.

Conference proceedings reference

Beymer, D., Russell, D. and Orton, P. (2005) Wide vs. Narrow Paragraphs: An Eye Tracking Analysis. In: Costabile, M.F. and Paternò, F. eds. Human- Computer Interaction – INTERACT

2005. Proceedings of the Tenth IFIP TC13 International Conference, LNCS. Vol. 3585. pp. 758 - 792. Heidelberg: Springer-Verlag.

10.3 THE VANCOUVER SYSTEM (FOR INFORMATION)

In the text

Mean opinion scores do not correlate well with PSNR values for video [43]. Or Mean opinion scores do not correlate well with PSNR values for video ⁴³.

The reference

43. Sotelo R, Joskowicz J, Anedda M, Murroni M, Giusto DD. Subjective video quality assessments for 4K UHD TV. 2017 IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB): 1-6.

Full details on referencing can be found in the Reference It! Section of the **Find It! Use It! Reference It! QMUL Information Literacy Skills 2017/18** on QMPlus. There are various guides available to the Harvard and Vancouver styles on the Internet.

10.4 PLAGIARISM

Plagiarism effectively means presenting the work of others without stating where it has come from (sourcing), or to put it simply, trying to pass off someone else's work as your own. The formal definition from the College is:

“ QMUL defines plagiarism as presenting someone else's work as one's own irrespective of intention. Close paraphrasing; copying from the work of another person, including another student; using the ideas of another person without proper acknowledgement; and repeating work that you have previously submitted – at QMUL or at another institution - without properly referencing yourself (known as 'self plagiarism') shall also constitute plagiarism.” (Academic Regulations 2.103, page 36, available at <http://www.arcs.qmul.ac.uk/media/arcs/policyzone/academic/Academic-Regulations-2018-19-FINAL.pdf>)

Unfortunately, including material without proper acknowledgement has become far too common and QMUL takes a **very firm line** on any such offences.

If you are suspected of plagiarism, you will be reported to the Academic Registrar for an examination offence under the QMUL *Regulations for Assessment Offences*. Under these Regulations, students found to have committed an offence may have their whole diet of assessments invalidated or be expelled from the College.

A range of methods, including special software tools such as TurnItIn, is used to detect plagiarism, and project reports are routinely put through an electronic plagiarism detection system.

11. TIME MANAGEMENT

Managing your time over the two semesters is an important part of your project. You have a time plan, but this has to be vague as you have little experience of how long things will take. Take time to research, read, think and discuss with others before diving in.

Plan for slippage and have a contingency plan. Revisit and review your plans and progress regularly. Do not lie to yourself - or anyone else - about your progress! It does not help you. Make sure you are aware of the many deadlines and demands you will have during the course of this year and allow for these issues in your time plans.

An important issue is the balance between the project and other modules. You want to do well in all your final year modules.

Steady work throughout the period is important for success in your project. You cannot leave most of the work until the last month. Remember to leave enough time to write your final report, as this will be very important in how your success is judged.

12. PROJECT MARKING POLICY

Project marking policy for undergraduate projects:

- The pass mark for the project is 40%.
- The final report and viva are worth 85% of the final project mark, which is assessed by two examiners (supervisor and second examiner).
- When there is a discrepancy of 10% or less between the marks of both examiners then the average is taken as the final mark; unless marks span pass/fail.
- When there is a discrepancy of 10% or less between the marks of both examiners and the marks span the pass/fail borderline, then both examiners will discuss for agreement, if no agreement then the project will be assessed by a third examiner.
- When there is a discrepancy of greater than 10% between the marks of both examiners but is within the same grade i.e. A or F, then the average is taken as the final mark.
- When there is a discrepancy of greater than 10% between the marks of both examiners, across different grades then both examiners discuss for agreement. However, if no agreement is reached then the project will be assessed by a third examiner.
- Third examiner marks will account for 85% of the final project mark, as the 10% of the interim report/ progress presentation mark and 5% of the project video mark would have already been assessed during the academic year, hence the marks from these components will remain the same.
- Normally the third examiner mark remains within the original two examiner marks.

13. RESITTING A PROJECT

If you do not pass your project in the May exam period, a late summer resit is possible. A late summer resit consists of submitting a revised report and supporting material at the beginning of the late summer resit exam period and attending a presentation/viva session during the late summer resit exam period. If the project is passed on resit the mark will be capped at 40%, as with any other resit.

14. CALENDAR - IMPORTANT DATES

Semester	Week Comm.	Week	Weekly Content	Project Deliverables	
1	26th Sept 2022	1	Introduction & Project Definition		
	3rd Oct 2022	2	Introduction to Research Methods*		
	10th Oct 2022	3	Literature Review*		
	17th Oct 2022	4	Referencing, Plagiarism & Information Literacy*	Project Definition Submission 17th October 2022	0%
	24th Oct 2022	5	Interim Report, Risk Assessment and Employability Workshop*		
	31st Oct 2022	6	Ethics*		
	7th Nov 2022	7			
	14th Nov 2022	8			
	21st Nov 2022	9			
	28th Nov 2022	10		Interim Report Submission 28th November 2022	10%
	5th Dec 2022	11		Progress Slides Submission 5th December 2022	
	12th Dec 2022	12		Progress Presentation 12th - 16th December 2022	
2	23rd Jan 2023	1	Project Showcase Videos*		
	30th Jan 2023	2	An Examiner's View and Marking Scheme*		
	6th Feb 2023	3	Employability Workshop*		
	13th Feb 2023	4	Lessons from Previous Reports*		
	20th Feb 2023	5	Viva Assessment*		
	27th Feb 2023	6			
	6th Mar 2023	7			
	13th Mar 2023	8			
	20th Mar 2023	9		Draft Report 20th March 2023	0%
	27th Mar 2023	10			
	3rd Apr 2023	11			
	10th Apr 2023	12			
3	1st May 2023	Exam Period		Project Video Submission 4th May 2023	5%
				Final Report Submission 2nd May 2023	85%
	8th May 2023			Viva 8th to 19th May 2023	
	15th May 2023				

*Employer Takeover

Key

Formative Assessment	Summative Assessment
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APPENDICES

APPENDIX A - MARKING SCHEMES

MARKING SCHEME – FINAL PROJECT REPORT AND VIVA 85%

	%	0 – 39% Poor	40-49% Satisfactory	50-59% Good	60-69% Very Good	70-79% Excellent	80-100% Outstanding
PROBLEM DEFINITION, BACKGROUND (LITERATURE REVIEW), AIM AND OBJECTIVES <ul style="list-style-type: none"> Clarity of problem definition Critical analysis of the literature Clarity of the project aims Clarity and relevance of project objectives <i>Determined by viva and report</i>	15	<p>The problem is not substantial for a final year project.</p> <p>There is no evidence of the student providing an overview of relevant literature.</p> <p>The student has not defined the aims and objectives of the project.</p>	<p>The problem definition has very little substance, as it is informed by anecdotal experiences, as opposed to research.</p> <p>The report has an adequate overview of a few relevant papers with no critical analysis.</p> <p>The student has defined the aims of the project, however the objectives are vague.</p>	<p>The problem definition is informed by research. The student has also defined a series of research questions.</p> <p>The report has a satisfactory review of relevant papers with a limited critical analysis.</p> <p>The student has clearly articulated the aims of the project, with a number of relevant objectives.</p>	<p>Meets the 'Good' criteria and the following:</p> <p>Very good, concise review of relevant papers with some critical analysis, relevant to the context of the project.</p> <p>Objectives clearly support the project aims.</p>	<p>Meets the 'Very Good' criteria and the following:</p> <p>Excellent literature review with a concise critical review relevant to the context of the project, which also identifies gaps in knowledge.</p>	<p>Meets the 'Excellent' criteria and the following:</p> <p>Evidence of extra-curricular academic reading, critical thinking and original interpretation.</p>
ACHIEVEMENT <ul style="list-style-type: none"> Achievement of aims and objectives Use of appropriate methodologies, tools and techniques Evidence of advanced problem-solving skills Quality of output/solution (including creativity and innovation) e.g., computer code <i>Determined by viva and report</i>	30	<p>The student failed to achieve the aims and objectives of the project.</p> <p>The student did not use the appropriate methodologies, tools and techniques.</p> <p>There is no evidence of use of advanced problem skills.</p> <p>The student has not produced sufficient deliverables.</p> <p>Quality and completeness of work is poor.</p>	<p>The student has partially achieved the aims and objectives of the project.</p> <p>The student has provided evidence of very basic methodologies and tools for the practical element for the project.</p> <p>Some evidence of problem-solving skills, but they are not advanced for the level of study or founded on solid and sound discipline knowledge.</p> <p>Evidence of effort, but implementation may be only partially functional.</p>	<p>The student has provided clear evidence of achieving the aims and objectives of the project.</p> <p>The practical element is good; however, it lacks rigour or has not been implemented correctly.</p> <p>Evidence of advanced problem-solving skills.</p> <p>Quality: the code or hardware are functional but not neat or tidy.</p>	<p>Meets the 'Good' criteria and the following:</p> <p>The student has adopted a sound methodology to solve the project problem.</p> <p>Advanced problem-solving skills steeped in discipline knowledge are demonstrated throughout the project.</p> <p>Achievement not substantial enough to warrant top mark, e.g. it may contain some ambiguities or faults.</p>	<p>The student has adopted a rigorous methodology to solve the project problem.</p> <p>Advanced problem-solving skills used both within and outside student's core discipline or skill-set (developed by the degree program).</p> <p>The student has produced a considerable output in terms of creativity and innovation. There may be some minor faults in execution or understanding.</p>	<p>Meets the 'Excellent' criteria and the following:</p> <p>Project objectives may have been exceeded.</p> <p>The project demonstrates depth of conceptual thinking and methodological rigour.</p> <p>Workmanship is elegant.</p> <p>The project has made a contribution to the field.</p>

	%	0 – 39% Poor	40-49% Satisfactory	50-59% Good	60-69% Very Good	70-79% Excellent	80-100% Outstanding
QUALITY OF WRITING/REPORT <ul style="list-style-type: none"> Clarity of ideas <ul style="list-style-type: none"> Style – technical, precise, concise and formal wording Logic – reasoning Flow – the purpose of each section is clear. The links between and within sections are established Quality of figures and legends Correct referencing <p><i>Determined by report</i></p>	12	<p>The report is unclear or written badly.</p> <p>It is very difficult to understand core ideas.</p> <p>The write-up is disorganised.</p> <p>Figures and figure legends are of insufficient quality.</p> <p>There is no referencing/ done incorrectly.</p>	<p>The write-up is somewhat incoherent, rushed, or verbose, contains important omissions, or irrelevant material.</p> <p>Figures and figure legends are of satisfactory quality.</p> <p>Referencing is satisfactory, but incomplete for some claims or sections.</p>	<p>Adequate project write-up, lacking clarity or detail in places, or containing irrelevant material. Good use of technical language.</p> <p>Figures and figure legends are of good quality, and they are helpful for understanding the project.</p> <p>It is easy to understand the core ideas.</p> <p>Referencing supports claims well, is used well, and uses consistent format throughout.</p>	<p>Clear write-up with logical structure and good flow. Precise, technical, formal style.</p> <p>Figures and figure legends are of very good quality. Graphs are clear, fully annotated, easy to read and used appropriately to support claims.</p> <p>Referencing is good and follows a standard consistently.</p>	<p>Very good write-up with a logical structure, good flow, technically precise and concise style.</p> <p>Figures demonstrate conceptual thinking; graphs are fully annotated, are easy to read and interpret, provide insight, and fully support claims and conclusions; figure legends are concise and informative.</p> <p>Referencing is employed throughout and follows the prevailing or recommended discipline standard.</p>	<p>All criteria for “excellent” met. Only very minor faults in execution, depth of understanding or write-up.</p> <p>Close to faultless in execution and write-up.</p>
EVALUATION, TESTING AND ANALYSIS <ul style="list-style-type: none"> Adequacy and rigour of testing Quality of the documentation of testing Critical analysis of results Analysis of strengths/weaknesses Presentation of possibilities for further work Critical analysis of the relationship between theory and practical work produced Awareness of Legal, Social Ethical Issues and Sustainability <p><i>Determined by viva and report</i></p>	13	<p>For <i>design & build, integration, or software-based</i> projects, testing is insufficient or poorly designed, so that it does not support the claims.</p> <p>For a <i>research-based</i> project, there is no critical analysis of the results. Weaknesses and improvements are not considered.</p> <p>For both types of projects, critical</p>	<p>For <i>design & build, integration, or software-based</i> projects, testing is attempted but is not complete or has design flaws.</p> <p>Testing documentation lacks detail or is incomplete.</p> <p>For a <i>research-based</i> project, the critical analysis of the results is trivial. Weaknesses are only partially identified.</p>	<p>For <i>design & build, integration, or software-based</i> projects, testing may be designed and planned well, but it is not comprehensive, or it may lack rigour. Not all requirements are fully verified by testing.</p> <p>For a <i>research-based</i> project, critical analysis of results is presented but may lack rigour or may present some reasoning flaws. Weaknesses and improvements have partially been considered, but some gaps remain.</p>	<p>For <i>design & build, integration, or software-based</i> projects, testing verifies majority of requirements using rigorous and well-documented procedures with only minor flaws.</p> <p>For a <i>research-based</i> project, there is evidence of critical analysis of results. Weaknesses and improvements have been considered to some depth.</p> <p>For both types of projects, documentation</p>	<p>For <i>design & build, integration, or software-based</i> projects, there is evidence of thorough and flawless testing.</p> <p>For a <i>research-based</i> project, there is critical analysis of the results. Weaknesses and improvements have been fully thought out with well-supported arguments.</p> <p>For both types of projects, the evaluation provides an evidence-based critical analysis of the project,</p>	<p>For <i>design & build, integration, or software-based</i> projects there is comprehensive testing. Analysis of strengths & weaknesses are present.</p> <p>Documentation is outstanding (includes details to allow replication).</p> <p>For a <i>research-based</i> project, there is critical analysis of methods and results. Weaknesses and possible extensions are argued well and offer further interest in the topic.</p>

		<p>analysis is not attempted.</p> <p>Documentation is poor.</p> <p>There is no reference to the legal, social and ethical issues and sustainability.</p>	<p>For both types of projects, the the evaluation is limited, e.g. it is primarily based on informal observations or the results do not fully bear out the conclusions.</p> <p>Documentation is patchy; it provides information but not insight. Description of procedures lack detail. Result tables do not support drawing of conclusions.</p> <p>There is a very brief reference to the legal, social and ethical issues and sustainability.</p>	<p>For both types of projects, the evaluation lacks rigour in execution and reasoning.</p> <p>Documentation enables replication of tests. Tables are used appropriately to document test conditions and results and support drawing of conclusions.</p> <p>There is awareness of the legal, social and ethical issues and sustainability, but complex issues are not explored.</p>	<p>provides the detail that enables scrutiny and replication of tests.</p> <p>For both type of projects, the student adopted rigorous evaluation process and the results fully support conclusions.</p> <p>There is awareness of the legal, social and ethical issues and sustainability that goes beyond the obvious or the trivial.</p>	<p>drawing strongly on deep discipline knowledge.</p> <p>Documentation is detailed, methodical, rigorous, and clear, enabling replication of tests and proper scrutiny of results.</p> <p>There is a clear awareness of the legal, social and ethical issues and sustainability, with some complex issues teased out.</p>	<p>Documentation is outstanding (includes details to allow replication).</p> <p>There is a very clear awareness of the legal, social and ethical issues and sustainability.</p>
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	%	0 – 39% Poor	40-49% Satisfactory	50-59% Good	60-69% Very Good	70-79% Excellent	80-100% Outstanding
DIFFICULTY LEVEL AND AMBITION (In light of the student's prior knowledge) <ul style="list-style-type: none"> Level of difficulty of the project in terms of understanding and implementation <i>Determined by viva and report</i>	10	<p>Level of difficulty is insufficient. E.g. the project may have replicated existing work without adding contribution, or execution is trivial for the level of study within the student's core discipline.</p> <p>The student has produced very limited or incomplete deliverables (code, hardware, report).</p> <p>No evidence of troubleshooting or seeking work-arounds when problems were encountered.</p>	<p>The level of difficulty is basic and satisfactory. The project produced a working solution with only basic functionality. Novelty and contribution are minor or trivial.</p> <p>Some evidence of troubleshooting or seeking work-arounds when problems were encountered.</p>	<p>Project not particularly ambitious, however the student has implemented a good project or a working solution to the problem.</p> <p>Evidence of resourcefulness: student proactively sought alternative routes to solving issues in the project.</p> <p>Evidence of good troubleshooting skills.</p>	<p>The challenge that was set was met with correct and confident application of the scientific or engineering methods.</p> <p>Evidence of resourcefulness: Student proactively sought alternative routes to solving issues in the project.</p> <p>Evidence of good troubleshooting skills.</p> <p>Evidence of critical thinking in all stages of the project, including when tackling unforeseen difficulties.</p>	<p>Meets the 'Very Good' criteria and the following:</p> <p>The student has produced a considerable body of deliverables in terms of both software/hardware and write up.</p> <p>Excellent troubleshooting skills.</p> <p>Evidence of lateral thinking and proactive engagement with challenges.</p>	<p>Meets the 'Excellent' criteria and the following:</p> <p>Challenging goals, and substantial deliverables, which have the potential to inform further development or study (e.g. publication).</p> <p>The student has produced work that should be put forward for a prize nomination.</p>

	%	
VIVA Q&A SESSION	5	<ul style="list-style-type: none"> Ability to answer questions - synthesis and ability to defend Confidence in answering questions related to the practical/implementation (i.e., code) aspect of the project Demonstration of knowledge and understanding

MARKING SCHEME – PROJECT SHOWCASE VIDEO 5%

	%	
PROJECT SHOWCASE VIDEO	5	<ul style="list-style-type: none"> Problem Statement - A clear statement of the problem being investigated. Method - The video clearly outlines the methods (i.e., implementation/practical) that been used to the solve the problem. Contribution - The video highlights the contribution that this project makes. Demonstration – The video provides a clear demonstration of the implementation/practical aspect of the project. Quality of Video – organisation, presentation and does not exceed the maximum time of 10 minutes (+/- 10%).

MARKING SCHEME – INTERIM REPORT AND PROGRESS PRESENTATION 10%

	%	
INTERIM REPORT AND PROGRESS PRESENTATION	10	1. Project aims and objectives
		2. Clear problem definition, which is informed by research
		3. Standard of literature review (Understanding of the topic area)
		4. Identification of potential risks to the project
		5. Realistic project milestones and objectives
		6. Proposed solution - correctness of solution proposed
		7. Quality of report – format, structure, figures, tables & references
		8. Q&A - ability to answer questions
		9. Quality of slides – format, presentation and structure
		10. Project engagement – regular meetings with supervisor