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ENGR 489 Handbook – 2024

Final Year Engineering Project

Contents

Chapter 1

Introduction

ENGR489[1] consists of an individual project done under the supervision of one or more academic staff. Individual projects with a similar theme and same supervisor(s) may be collated together as a *group project* – this will allow students to work in concert on a complex problem while addressing clearly identifiable individual issues such that all marking is on an individual basis. Projects are also offered in partnership with industry – in which case supervision is shared with an industry supervisor.

The underlying aim of the project is to show-case the skills learnt during your degree, and to demonstrate your independent and critical thinking. The project will involve designing, implementing and evaluating a solution to a complex engineering problem. You will present a series of written reports on your project, and conclude with an oral presentation and practical demonstration.

1.1 Aims and Scope

The aim of this document is to provide a comprehensive guide to the ENGR489 course, for both students and staff. In particular, the document sets out the requirements of the course and clarifies the way in which student projects will be supervised and assessed.

1.2 Engineering Projects

An important consideration is the distinction between the project courses taken as part of the BE and those taken as part of the BSc(Hon) or postgraduate diploma. The former requires students to undertake a suitable *engineering* project, whilst the latter require a suitable *research* project. There are many similarities between these two types of project, but there are also some important differences. Research- and theory-only projects are not included in ENGR489.

ENGR489 projects are expected to solve real-world problems using technically innovative solutions. ENGR489 projects must show an emphasis on design and provide evidence of the effectiveness of the devised solutions through appropriate evaluation. Students are expected

[1]Note: COMP489, ELCO489, CGRA489 and AIML487 are separate courses, so have different regulations outlined in a separate handbook - although there are similarities please do not confuse the courses as there are crucial differences.

to demonstrate craft in the design and implementation of their solution, and to use tools, engineering processes and/or notations appropriate for their specialisation.

NOTE: Students should consult with their supervisor(s) and/or the course coordinator if they are unsure as to whether their project is an appropriate ENGR489 project.

1.3 Design, Implement and Evaluate

A typical project can be thought of as designing, implementing and evaluating an *artifact* that solves or addresses a particular problem. The term artifact refers to that which is delivered by the project, and may represent something concrete (e.g. an electromechanical device or mobile app) or something more abstract (e.g. a mathematical proof or a taxonomy).

In more detail, the three main stages are:

Design: This is the process of taking a problem and devising a suitable solution by considering the requirements, constraints and various options available. One may design a concrete artifact, such as a software or hardware system. Or, the design component of a project may be less tangible. For example, designing an experiment to gather data or obtain some crucial observations about an existing system. ENGR489projects need to investigate multiple possible solutions so that engineering trade-offs can be discussed.

Implementation: This is the process of taking a given design and fleshing out the details to the point where a working system forms. Considerable skill is often required to use appropriate tools and techniques to make this happen. For example, software development practices, such as testing, will be necessary to deliver a working software system. Likewise, constructing an electrical circuit board may be a necessary step in delivering a hardware system.

Evaluation: This is the process of reflecting on the artifact produced, primarily for the purpose of demonstrating it is "good" in some sense. For example, consider a tool for finding software bugs. Important questions to answer here include: *Does the tool find all possible errors? How long does the tool take to find errors? What are the tool's capabilities and limitations?* Such questions are typically answered through experimental observation of the artifact in operation.

Before embarking on these stages, it is crucial to establish a clear understanding of the problem being addressed, along with gathering key requirements and constraints. Problem definition is usually undertaken during the proposal writing phase, but complex problems may require further clarification even after proposal submission. Requirements gathering and analysis can be conducted post-proposal submission.

Finally, it should be noted that there is no formal requirement to undertake the three stages in any given order. For example, software development processes, such as agile or XP, dictate a more fluid approach. Nevertheless, these components should still be evident within the project.

1.4 Project Timeline

The following table provides a rough overview of the project timeline from Trimester 1 to Trimester 2, and identifies the main points of interest[2].

Trimester	Week	Milestones / Activities
Trimester 1	Week 1	Students rank projects using project allocation system.
	Week 2	Project allocation performed by course coordinators.
	⋮	Students meet with supervisor(s) and begin work.
	Week 5 (Thursday, 23:59)	**Students submit project proposal, health and safety forms, and IP forms on ECS Submission System** (email confirmation of IP plans is sufficient for internal projects).
	⋮	Work continues. Students meet regularly with supervisor(s).
	Week 12 (Friday, 23:59)	**Students submit preliminary report on ECS Submission System.**
Mid-Year Break		Work continues. Students meet with supervisor(s) where possible.
Trimester 2	Week 1	Students can arrange to give presentation on preliminary report to elicit feedback (Not Compulsory)
	⋮	Work continues. Students meet regularly with supervisor(s).
	Week 7 (Sunday, 23:59)	Students submit a draft of final report to their supervisor(s).
	⋮	Work continues. Students meet regularly with supervisor(s).
	Week 12 (Sunday, 23:59)	**Students submit final report on ECS Submission System.**
	TBD	**Students submit presentation slides on ECS Submission System.**
	TBD	**Students present their work during** ENGR489 **symposium.**
	TBD	**Students demonstrate their artifact.**

[2]In the event of discrepancies regarding due dates, the dates specified in the ECS Submission system shall prevail.

Chapter 2

Project Allocation and Proposal

The first stage of the ENGR489 course is the allocation of projects to students. This process attempts to allocate students to the projects they prefer. Indeed, it is in the interests of both students and staff that this is done as accurately, and quickly as possible. Once the allocation is complete, students need to produce a project proposal in conjunction with their supervisor(s).

2.1 Choosing a Project

The online Project Allocation System (PAS) is used by both staff and students to register and rank projects. Prior to the start of Trimester 1, staff upload descriptions of the projects they wish to supervise. The PAS system contains only a brief description of each projects. During pick week, students are encouraged to speak to potential supervisors to gain a better idea of what is involved.

The algorithm we use for matching students to staff and projects is a variation on the *Deferred Acceptance Algorithm* (DAA) – specifically we use a simplified version of the North American Medical Placement system which allocates about 20 thousand students to internships every year. The nice thing about this algorithm is that it produces stable matches and is strategy proof – that is, misleading the system about your rankings (e.g., to try and get a better allocation) will only lead to you getting a worse outcome.

Once everyone's rankings are complete, we run the algorithm and we're done. Well, almost. Unfortunately there may be remaining students and projects where the algorithm expended all the students choices without finding them a project (e.g. because the supervisors they chose were fully allocated to other students). In this case we enter what is called the *scramble* – which really means we just assign the remainders manually.

There are several important points to make about the PAS system:

- **Students cannot pick more than two projects (excluding the industry projects) from any given (primary) supervisor**. If you do this, you will get an error message and the system will not add your selection. If you wish to change your project selection, you will need to remove one of your previous choices first. This helps to ensure that student preferences are diverse, and do not single out specific supervisors. For example, without this restriction, a given student may only select projects from one supervisor, hoping to ensure they are allocated that supervisor. However, if several students

adopt this strategy for the same supervisor, then a problem arises as each supervisor may only take on a limited number of students (typically 1 or 2 students).

- **Students must rank at least seven different projects** If you wish to alter your project rankings (otherwise it is in order you added them to your list) just drag and drop the projects in your list to reflect your preference order. Once you have picked at least seven projects you will be able to use the submit button to register your choices. If you pick less than seven, the submit button will not be displayed and when we run the algorithm, you will go directly to the scramble (see above). This means that everyone else will get their choices before you.
- **Staff rank the student-project selections**. Each primary supervisor for a project you have ranked, will in turn rank your selection against all other selections by other students. This ranking will include consideration into your suitability for any specific project, along with the supervisor's own preference for that project (we limit the number of projects a supervisor can be allocated, given those limits, they may prefer to have project widget allocated over project gadget).
- **Privacy** All student rankings and staff rankings are kept private. Academic staff will **not** see student rankings, and students will **not** see staff rankings. Therefore you can feel free to rank your most preferred projects without fear of offending a staff member.
- **Some projects have co-supervisors listed**. Depending on the particular staff involved, some supervisors will share equally in supervision, whereas others may choose to have a co-supervisor who can provide additional expertise for a project - but play a lesser role in the supervision as a whole. Usually, all administrative aspects of the project are the responsibility of the primary supervisor.
- **Industry projects**. Industry projects have an academic staff listed as either primary or secondary supervisor. However, the academic staff will be the student's first point of contact in relation to all aspects of the project.
  A student can pick as many industry projects from a supervisor and are not counted as part of **"maximum of two projects"** constraint discussed above.

Unfortunately, despite all of these recommendations, we cannot guarantee that every student will be allocated to a project they prefer. In the unlikely event of a student being allocated to a project that they believe is not suitable for them, they should immediately contact the course coordinator.

2.2 Proposal

Once the allocation of students to projects is complete, students are expected to meet with their supervisors and put together a *project proposal*. **It is the student's responsibility to contact their supervisor and arrange an appropriate meeting time.** Students must maintain a log of points discussed in every meeting. This meeting log must be submitted at the end of the course.

Students are required to submit a proposal document by the end of Week 5. This is expected to be 8 pages in length inclusive (i.e. title page, contents & glossary, Gantt chart, References and Bibliography ... All count in the 8 pages). A separate appendix document, which may reference your approved University online repository, may also be submitted but will not

receive additional marks. For your convenience, LaTeXand Microsoft Word templates will be provided in the course website.

Generally, the proposal document should include the following topics (approximately five of the eight pages):

- An overview of the problem being addressed by the project.
- A statement regarding the proposed solution to the problem.
- A statement regarding the proposed evaluation method.
- A discussion of any ethical considerations around the project.
- A statement regarding any budgetary requirements, including appropriate justification.
- A statement regarding any risks or hazards that the project poses (either in the development itself, or in using the final artifact).
- A discussion of any other requirements for the project to be successfully completed. This might be access to particular equipment or rooms, special IP issues etc.
- Provide a proposed project timeline, in the form of a Gantt chart (or similar).

A small amount of funding is available for every project once the report is accepted (the exact amount depends on the specialisation, and should be clarified by the course coordinator). The funding is primarily to help purchase items necessary for the project, although it can be used for other purposes (e.g. as prizes for user-experiments or surveys). Students must justify their budgetary requirements in the proposal report.

For industry projects, it is a norm that the industry sponsor funds any related costs for the project. Any exceptions will need an approval from the Head of School.

2.3 Intellectual Property Agreement

All **industry project** students are required to submit a signed intellectual property agreement along with their proposal document. The purpose of the intellectual property agreement is simply to identify those parties who are stakeholders in the project.

All other students (internal supervisor only) need to agree copyright and IP interests with their supervisors. Students and staff will typically both have copyright and IP interests in internal projects, students have the right to named as authors when project outputs are disseminated and there is an expectation of mutual consultation prior to the use of project outputs for research or teaching. If there is no plans to commercialise the project outputs, then the agreement can be via email to the supervisor. The only signed Agreement that should be used with regard to IP is the University Student Intellectual Property Agreement, and only when there is an intention for project outputs to be commercialised.

Chapter 3

Supervision and You

As this is likely your first experience with an individual supervised project, it can be difficult to calibrate your expectations against your supervisor's. This section aims to describe what you should be getting from your supervisor, and what your supervisor should be getting from you. If your experience under supervision differs widely from the guidelines given in this chapter, you should first discuss this with your supervisor and if it cannot be resolved to your satisfaction please bring your query to the course coordinator. The earlier issues are identified and resolved, the better things will be handled. There is little we can do to resolve long standing problems a few weeks out from submission.

3.1 Supervisors Responsibilities

It is the responsibility of your supervisors to guide you through the academic requirements of your project. Supervisors will:

- meet with you regularly
- provide you with academic guidance and scholarly direction
- assess your progress and give you written feedback
- act as guides to University facilities
- make sure you comply with the University's administrative regulations.

3.1.1 Regular Meetings

It is expected that you and your supervisor will meet in person regularly and individually:

- For a project supervised by a VUW staff member we would expect the minimum to be a 30 minute individual meeting each week. You may agree with your supervisor to different arrangements that better suit the nature of the project, but the above should be considered a working minimum.
- For a project supervised by an industrial supervisor and VUW supervisor, we would expect a weekly supervision meeting with the industrial supervisor. The VUW supervisor would not be expected to attend every meeting, although may, but a combined meeting at least every fortnight should be considered a working minimum.

3.1.2 Academic Guidance

Your supervisors will provide guidance on a range of academic matters. These include:

- the standards required for an honours project
- planning your research
- skills you will need to acquire
- research resources
- methodology
- undertaking a literature review
- ethical, legal, professional and safety issues

Throughout, your supervisors will bear in mind the expectations of examiners.

3.1.3 Assessing Your Progress and Feedback

Supervisors will assess your progress and provide you with constructive feedback throughout your project. They will need to ensure that you possess the understanding and abilities to:

- carry out your project as envisioned
- complete your work on time, meeting the various deadlines for assessment.
- Provide prompt feedback on your work. The university guideline for feedback is 3 weeks, ECS aims for a 2 week turnaround.

3.1.4 Support

Your supervisor(s) is also there to support you. If you encounter problems of any kind, you should feel free to discuss them with them - especially if it could have an impact on your project work. The 489 coordinator is also available to help and offer support in such situations, especially if you are not comfortable discussing matters directly with your supervisor. If they can't help, they will be able to direct you to various student support services run by the university – a guideline to these services will be linked from the course homepage.

3.2 Your Responsibilities as a Project Student

You will need to abide by the university regulations governing your degree.

3.2.1 Planning and Actively Pursuing Your Work

You have an obligation to devote sufficient time to your work, to complete each phase on time, and to avoid activities that interfere with your satisfactory and timely completion of the project. You should expect to spend at least 10 hours per week on your project, spread over the 30 weeks that the course runs (i.e. including mid-trimester breaks, and the mid-year break). It can be quite challenging to maintain steady progress and dedicate the time as course loads increase during the trimester, however, it is important that you manage your time well so that you can devote at least the minimum hours each week to the project. You will get little benefit from your supervisor if you treat your project as a series of crunches.

Certainly they will not be able to provide timely feedback or appropriate guidance in this situation.

3.2.2 Ethics

It is expected that you conduct your research in an ethical manner. All forms of academic misconduct will be treated very seriously. You must:

- where appropriate, discuss ethics with your supervisors
- familiarise yourself with the University's ethical guidelines
- obtain approval from the relevant ethics committee for work involving human or animal subjects.

The link to Ethics application process is available on the course website.

3.2.3 Safety & Health

The university's approach to health and safety is based on risk management. There is a significant strengthening of level of responsibility for students and supervisors. Students must discuss with supervisors and show in the project proposal report (due at the end of week 4) that they have identified safety risks and developed a plan to manage them.

Students are expected to be aware of the Health and Safety at Work Act 2015. See : `http://www.business.govt.nz/worksafe/hswa`.

Students need to discuss with their supervisors and fill out the health and safety plan available on the ECS Wiki. They need to fill 'ECS Project Information Form'and 'Project Description and Safety Plan'. A sample can be found on the Wiki.

Please Note: For any work that takes place off VUW areas, the students need fill 'ECS Off Campus Activity Plan'. Please contact Roger Cliffe for the form.

ALL filled Health and Safety forms must be emailed to ecs-safety@ecs.vuw.ac.nz.

Chapter 4

Preliminary Report

At the conclusion of the first trimester, students are required to submit a Preliminary Report which documents the progress they have made, and identifies any outstanding issues where feedback is required. This report should be considered a first step towards the Final Report – including a good treatment of the introduction and background or work. However, as the primary purpose of the Preliminary Report is to provide the examination committee the opportunity to comment on the student's progress and identify any areas of concern, it will also include sections on development progress, requests for feedback, and a revised timeline.

4.1 Suggested Organisation

A sensible outline for the Preliminary Report is as follows:

- **Introduction.** This section should briefly outline the scope of the project, providing background information to show the "big picture" and relevance of the project to society. It should clearly state the problem and proposed solution, as well as the intermediate deliverables. Any significant deviation in the problem being addressed, or the solution being developed should be clearly highlighted and justified. Measurable performance requirements should be defined to demonstrate that the solution indeed solves the problem it intends to address. Finally, the section should include a discussion on the environmental and sustainability aspects of the problem and/or solution.
- **Background Research**. This should discuss any existing solutions to the given problem, and may reference academic papers, books and other sources as appropriate. Care should be taken to identify key differences between these solutions, and that being developed in the project. (For projects where the expected output is a model, the background research should also identify and justify existing work that would be used for benchmarking.) The background research should also look at development processes, and identify a suitable methodology for the project. Consideration must also be given to the tools (languages and developments kits, etc.) that are available, and how these tools would benefit the chosen methodology.
- **Development Progress.** This should discuss what progress has been made to realise the solution. This usually includes requirements gathering/analysis, design, implementation and evaluation. (For projects where the expected output is a model, this may include system modelling, design/analysis, model construction and evaluation.)

Care must be taken to ensure that any discussion of technical points are clearly explained, with diagrams being used where appropriate. In many cases, the evaluation proper will not yet have begun. However, it is important to demonstrate that sufficient thought has been given to the evaluation.

- **Future Plan.** Before presenting the future plan, an objective assessment how the project is progressing as per proposal must be presented. This should identify the status of every deliverable and concrete steps to align to project schedule if needed. As for the future plan, it should highlight the main components which remain to be done, and provide a proposed timeline in which this will happen. In putting together a time line, students must take into account upcoming examinations, coursework deadlines and other disruptions.
- **Request for Feedback.** This should highlight any difficulties currently faced, and make specific requests for guidance from the examination committee. For example, a student may be unsure how best to evaluate their artefact, and would appreciate suggestions for alternative methods.
- **Bibliography.** Referencing and citation are important to avoid plagiarism. You must follow an appropriate citation format (e.g. IEEE, Chicago, APA, etc.) For more information about referencing and citing, please consult this library page: `https://libguides.victoria.ac.nz/referencing-citing`.

The report does not have to confirm exactly to the above structure. For example, in some cases, students may wish to present preliminary experimental results, or include a more detailed literature survey.

NOTE: In the event of an *aegrotat* application, the Preliminary Report may be used (in conjunction with the snapshot submission) as a significant assessment item.

4.2 Getting Help with Writing

Students struggling with writing and presentation should seek help from the student learning support as early as possible. `http://www.victoria.ac.nz/st_services/slss/`.

4.3 Format

The following points clarify the main requirements of the preliminary report:

- The report should be written using the ECS report templates provided (available in LaTeXand MS Word).
- The report is expected to be **12 pages** in length inclusive (i.e. title page, blank pages, main text, bibliography ... All count in the 12 pages). A separate appendix document, which may reference your approved University online repository, may also be submitted as supporting document but will not receive additional marks.

  As a rough breakdown, a page of introduction, 3–4 pages on background research, 3–4 pages on development progress, and a page on future plan. Students are advised to ensure all necessary detail is provided.
- The report should be written in such a way that any 4th year student in your specialisation can understand. Since the report will be assessed by a panel of examiners (i.e.

not just the supervisor), it is critical that all examiners can properly understand what has been achieved.

- The report should include the original project proposal as a separate appendix document.

Finally, the Preliminary Report must be submitted via the *online submission system* on or before the given due date (which is usually set as the last day of Trimester 1).

4.4 Assessment Process

The Preliminary Report will be read by two examiners, one of which is the primary supervisor. The marks will count towards 20% of the Final Grade.

Chapter 5

Final Report

The Final Report is one of the most important components of the individual project. This is where you will set out what exactly it is you have done, why you have done it, and how well it solves the problem you have intended to solve in the first place.

5.1 Format

The following points clarify the main requirements of the Final Report format:

- The report should be written using the IEEE two-column conference format provided (available for LaTeXand MS Word). Do not change any of the font settings.
- The report is expected to contain no more than 14 pages inclusive (i.e. main text and references ... All count in the page limit). A separate appendix document, which may reference your approved University online repository, may also be submitted but will not receive additional marks.

  Reports which are longer than this will need to be justified to the supervisor and the course coordinator, or risk being penalised for excessive length.
- The report should be written in such a way that any 4th year student in your specialisation can understand. Since the report will be assessed by a panel of examiners (i.e. not just the supervisor), it is critical that all examiners can properly understand what has been achieved.
- Material from the preliminary report and/or project proposal may be used directly in the final report.

The Final Report must be submitted via the online submission system on or before the given due date (which is usually set as the last day of Trimester 2). Extensions will be granted only in exceptional circumstances. These *must* be arranged in advance through discussion with project supervisors **and the course coordinator**.

Take some care with the format of your Final Report. Remember that examiners may have to print the document and you can easily make that very hard for us. Here are some things to think about:

- Word files are terrible. Make a pdf and submit that instead.

- Check the size of your submitted file. Your file does *not* need need to be more than a couple of megabytes.
- Try to use vector graphics (ideally eps or pdf), rather than raster formats (jpg, png etc.). Not only will this look better it will produce a smaller file that will be easier to print.
- You do *not* need to use super high resolution graphics. Our printer can't reproduce them anyway, so anything greater than 300dpi or so is a waste.

5.2 Suggested Organisation

The structure of your report should be tailored to your project. However, a sensible outline for the Final Report is as follows:

- **Introduction.** The purpose of this section is to introduce the problem being solved, to motivate why it is a problem one should care about, to outline the solution developed during the project, and to highlight the key findings from the evaluation. *Remember*: the introduction is the first part of the report an examiner will read. If they finish reading it without a proper understanding of the problem being solved or what has been done, then they will almost certainly struggle with understanding the remainder. You should attempt to make the project goals and associated specifications as clear and as quantifiable as possible. These goals and specifications should inform everything else that follows, so it is important to establish them in the examiners mind.
- **Related Work.** This section should provide a comprehensive overview of existing research and literature relevant to the topic, demonstrating your understanding of the field. *Remember:* A good related work section does not just provide a list of previous works, accompanied with short summaries. It should critically analyse and compare existing approaches, highlighting their strengths, weaknesses, and gaps in knowledge. Additionally, it should establish the novelty and significance of your work by clearly identifying how it extends or addresses the limitations of previous studies.
- **Design.** The aim of this section is to articulate the technical solution with sufficient detail and clarity. When solving a complex problem, there are normally many different approaches one can take — each with its own advantages and disadvantages. It is expected that students will have initially considered a range of different solutions, and will then have narrowed these down. The reasons why a particular approach was discounted should be documented here. *Remember:* appropriate design notation (e.g. UML diagrams) can be very helpful in conveying different aspects of a design.

  It is vital that your design not be carried out in a vacuum. Your design should be motivated very clearly by your goals and specifications (i.e. requirements and constraints). Make sure that it is clear why you took the decisions that you did. Do not give the impression that you settled on a design because it "felt right" or that you tinkered around until you found something that worked. We also want to see evidence that you have used appropriate engineering, scientific and mathematical principles to make design decisions.

  The design (and other aspects of the report) should also include consideration of real-world issues (economic, social and/or environmental) around implementation and delivery such as sustainability, safety, ethics and so on.

- **Implementation.** The purpose of this section is for you to discuss how you transformed the technical solution (the design) to its realisation (the artifact). Similar to the Design section, you must provide clear and sufficient descriptions. *Remember:* we want to see clear evidence that your implementation follows the design.

  What is the key difference between this section and Design? Here, you should state the actual "components" you used. For example, if you stated that your solution would use a relational database, you should state here what database implementation you actually used (e.g. MySQL, PostgresSQL, or MSSQL) and why you chose that particular database. Another example: suppose you stated in the design that your solution would use a light sensor. Here, you should state what type of light sensor you actually used (e.g. photoresistor, photodiode, or phototransistor) and why.

  The section should include detailed technical drawings or diagrams showing the actual "components" you used. Additionally, it should discuss the justification and rationale behind implementation choices, such as material/part/component selection, manufacturing processes, or system configurations, while considering factors such as cost, feasibility, and sustainability.

- **Evaluation.** The purpose of the evaluation section is to demonstrate whether you did or did not satisfy the project goals or specifications. If you can tie the performance of your design to some real specification then your evaluation is much stronger. "My code runs in 29 ms" is much weaker than "my code runs within the 30 ms window allowable for real-time performance of the…".

  In many cases the evaluation of a project requires significant extra work to design and build test harnesses. These should be explained so that the validity and scope of the evaluation can be understood.

  Make liberal use of graphs and other figures. They are much more effective at communicating many results than are words.

- **Conclusions and Future Work.** Future work should *not* just be a list of things that you would have done if you had a little more time. Talk about new things that are possible now that you have finished your project. What projects could a '489 student tackle next year if they started from your end point?

- **References.** Referencing and citation are important to avoid plagiarism. You must follow an appropriate citation format (e.g. IEEE, Chicago, APA, etc.) For more information about referencing and citing, please consult this library page: `https://libguides.victoria.ac.nz/referencing-citing`.

5.3 Assessment

The primary purpose of the Final Report is to clearly and succinctly detail the design, implementation and evaluation of any artifact developed. The report should be written in a professional nature, as appropriate for the discipline and degree.

5.3.1 Process

The Final Report will be read by two examiners, one of whom is the primary supervisor. Where possible, the examining committee will remain the same as for the preliminary re-

port. **Examiners must complete their marking in a timely fashion, so that the committee can meet and determine a final grade for the student**. In determining the final grade, the examining committee may take into consideration those (indicative) grades awarded for other assessment items.

5.3.2 Criteria

The Final Report will be assessed using the criteria set out in the **Final Report Marking Guide**. The criteria are, by definition, subject to the examiner's individual interpretation. In any case where an examiner is uncertain regarding some aspect of the criteria or process, the course coordinator should be consulted.

Chapter 6

Artifact Demonstration

One of the key changes that is being implemented this year is the inclusion of artifact component in the course assessment structure. The marking of the artifact will be done during the Artifact Demonstration Day(s) which is tentatively scheduled during the Examination Period of Trimester 2.

6.1 Duration

The demonstration will each be 20 minutes long in total – subject to final scheduling. This should break down into around 12 minutes of demonstration, 6 minutes for questions and 2 minutes for change over. Strict time-keeping will be followed, and demonstrations that run over the time limit will be cut short. As such, make sure your demonstration is ready before your designated slot.

6.2 Venue

The demonstrations will be held in different rooms/labs, depending on the major of the student. Four rooms/labs will be used: 1 room for EEEN projects and 3 rooms for SWEN/CYBR projects – subject to room availability.

For projects that necessitate demonstration in special venues within Kelburn campus, students are responsible for making all necessary arrangements for the venue. They must also inform the course coordinators well in advance about their requirements for the special venue. In cases where a demonstration requires an outside venue, i.e., a location outside of Kelburn campus, students must inform the course coordinators in advance due to potential logistical considerations. In such cases, scheduling will need to be arranged separately from the regular demonstration days.

6.3 Assessment

The examiners will consider the demonstration according to the following criteria. Organize your demonstration in a manner that effectively showcases how your artifact successfully meets the criteria.:

- Functionality (i.e. does the artifact meet the requirements and satisfy the constraints? for projects where the output is a model, how well does the model capture the system

being studied?)

- Usability and Behavior (i.e. how intuitive and responsive is the user interface and what is the overall quality of user experience? for projects where the output is a model, how close is the model behavior to actual or target behavior?)
- Testing and Quality Assurance (i.e. how stable or robust is the artifact, and how does it handle errors and edge cases? for projects where the output is a model, how was the model validated or proved to behave correctly in the target operating region?)
- Performance (i.e. how does the artifact perform? how good is its accuracy, response time, resource utilization, scalability, and any specific performance requirements defined for the project? for projects where the output is a model, what metrics does it outperform existing models and how significant is the improvement?)
- Innovation and Creativity (i.e. does the artifact bring something new to the field or solve the problem in a unique way?)

The artifact will be marked by two examiners who will each assign a grade ranging from E to A+, based on the performance of your demonstration in relation to the above-mentioned criteria. Following a discussion, the examiners will collectively determine the final mark for the artifact.