THE UNIVERSITY OF
AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

ENGINEERING

Part 4 Projects Handbook

[Image Source]

Last Revision: December 2019

Contents

1 Introduction

The Part 4 (Final Year) research projects provide an opportunity for students to work largely on their own initiative but under supervision, on a topic approved by their Department. Work takes place over a complete academic year, requiring students to enrol in both 700A and 700B versions of the paper. Students will work in pairs under the direction and continuing guidance of a supervisory team.

The research project requires independent thought and action. The project can also be seen within a professional context where our students, as engineers, investigate a specific and open problem in some depth, to produce both a solution informed by sound analysis and practise. It is expected that students will need to draw upon a good level of theoretical knowledge and the skills they have acquired so far in the degree. In some areas they will need to extend their knowledge and expertise. Some projects focus primarily on laboratory work and can involve substantial liaison with local industry, while others may be more analytical or computational in nature.

Work on the project commences at the start of Semester 1 and continues until the end of Semester 2, with the expectation that students will spend on average about 8 hours per week on their project throughout this period. It is important that all projects start at the same time so that no student group gains an advantage. For the same reasons, projects that develop from work experience, or that have a lead-in requirement, are to be avoided.

The research will start with the preparation of the research objectives and scope of the project and a literature review to identify what has been done previously and look at alternative approaches to the problem. This will lead into the detailed work on a solution, which may require some or all of:

i) the design of equipment to carry out specific tasks,

ii) to investigate phenomena or the behaviour of complex systems

iii) computer analysis, modelling, and/or simulation of the engineering systems,

It is important that there is a research component to the project so that the students can develop their research skills.

The outcome of the project is an independent written project report that includes a literature review, a description of the research and its findings, and a statement of research contribution. Further supporting technical material is provided as a compendium.

The final year research projects meets all the requirements of an NQF Level 9 course, and is a required course for the BE(Hons) programme.

1.1 Learning Outcomes

At the end of this course, students should be able to:

i.   Retrieve, assess, and evaluate existing research outcomes and technologies relevant to the field of research. Demonstrate an in-depth understanding of the related work, including an in-depth knowledge of the literature, the important authors, the related terminology, and the research findings (theories, models, structures, designs, principles etc.).

ii.   Classify, summarise, explain, and critique the basic findings of the literature review and identify gaps in the current knowledge. Demonstrate an ability to extract and list the key issues from the literature review in order to conclude to the required problem statements and research questions. Demonstrate the ability to synthesise an exemplary problem statement, propose research questions, and formulate research hypotheses.

iii.   Demonstrate clearly their knowledge of the underlying theory, methods, and procedures. Demonstrate an in-depth understanding of the required experiments and/or simulations and how they actually relate to the research questions or hypotheses. Demonstrate an understanding of the experimental design or numerical study, giving consideration to statistical significance and quality of collected data.

iv.   Correctly use the theory and research methods and efficiently conduct the required experiments and/or simulations. Demonstrate the ability to use data to extract appropriate models, cluster data into relevant groups, extract major and minor components, perform statistical analysis, organise data into appropriate tables, graphs, and diagrams, interpret data and compare them with previously published data, address the validity or inappropriateness of the data (discussing possible limitations), critique and recommend future improvements for the experimental design and the research direction.

v.   Design, develop, evaluate, and experimentally validate appropriate solutions for the selected research questions. Demonstrate proficiency related to hardware and software co-design (where applicable).

vi.   Demonstrate their proficiency in engineering / technical writing by being able to generate a technical research report summarising the research findings and to create a research compendium containing all the required supplementary information.

vii.   Deliver a public presentation and an exhibit to industry members of the research project findings.

viii.   Provide knowledgeable and logical explanations and expert opinion in relation to the research findings. Demonstrate the ability to add, at a satisfactory level, to the existing knowledge, articulating the importance of the work, in relation to solving a larger, 'real-world' problem.

The deliverable of the research project is a Project Portfolio that consists of a number of components, with assessment being based on this portfolio as a whole. The components include a 25 page Final Research Report that adequately covers all aspects of the investigation, and a Research Project Compendium that contains all the required supplementary information that allow the reproducibility of the research (e.g., data,

specification sheets, 3D models, etc). In addition, students will be required to give presentations (the exact nature of which will vary from department-to-department).

2 Project Proposals

Projects are typically designed by the academic staff within a Department but projects can also be student-initiated, industry-oriented, and Cross-Departmental.

2.1 Staff-Initiated Projects

All full-time academic staff are expected to prepare **at least 4 research project proposals [Including preallocated?]**

2.2 Student-Initiated Projects

Students have the opportunity to propose student-initiated projects that are of interest to academic staff members of our department. Students need to prepare a project proposal that will include a project description and the project outcomes and contact potential supervisors in order to discuss if the project would be of interest to them. If the academics agree to supervise the project then the students should submit the project proposal to their Departmental project coordinator, and staff member who agreed to act as main supervisor. The project proposal should also include all the details that are required for the regular proposals.

2.3 Industry-Oriented Projects

Supervisors or students who have strong ties with industry or government partners, are allowed to submit industry-oriented projects that are of interest not only to the academic that will be involved but also to an industry partner / company / defence force.

These projects could be sponsored by the industry partner or not. In case that the industry-partner is also the sponsor of the project, a special agreement should be signed for the Intellectual Property (IP) that will be created during the project. If the industry partner is not a sponsor then all IP created remains with the University (students and staff), the industry partner has no claims over this IP, and standard licensing agreements should be negotiated if the industry partner decides to use the outcomes or parts of the IP of the project. Some industry initiated projects may require the involvement of an industry person or possibly a PhD student. It is most important that the supervisor makes sure that these people are aware of the student workload and do not make any extra demands on the students. If a report is required for the industry partner, the students should be made aware of this at the onset of the project. The reports should not have an impact on their other studies.

2.3.1 Cross-Departmental Projects

For a project to be considered as Cross-Departmental it should involve students from two different departments (e.g., a MECH student and an ECSE student), and two supervisors from the two participating departments. The supervisor and Department submitting the project is referred to as the Host Department, with the other Department being the Partner Department.

The two supervisors from the two different departments are allowed to also nominate a co-supervisor from their department (it is not compulsory).

Each Department is responsible for assessing and marking only the Project Portfolio that has been submitted by the student from their Department.

It must also be noted that although all Departments are now largely aligned in their policies and regulations, in cases where there are differences in processes between Host and Partner Departments, the student should follow the policies and regulations of their home Department.

If students are interested in proposing a cross-departmental, student-initiated project they should follow all the directions and steps that are required for the student-initiated projects, they should find a project partner from another department and they should identify two project supervisors from the two participating departments (one from each department) that would be interested in supervising the project. Both potential supervisors should be copied in the email that the students should send to the P4P coordinator to register their interest.

2.4 Submission of Project Proposals

Each Department has its own policy on the number of permissible pre-allocated projects, which should be followed (including student-initiated and industry-sponsored projects and excluding cross-departmental projects) before the start of the semester. The deadline for the submission of all pre-allocated projects (standard, industry-oriented, and student oriented) is given in Table 2. How do staff submit pre-allocated?

All non-pre-allocated projects should be submit to the P4P project portal at the following URL:

https://part4project.foe.auckland.ac.nz

For the submission of the project proposals, the following details are needed:

- Project description (typically 1-2 paragraphs)
- Project outcomes

- Compatible specialization of students
- Research categories (to select among the available categories)
- Confidentiality (if the project is confidential or not)
- Sponsorship (if the project is sponsored or not)
- Name of co-supervisor
- Name of assessor

During the project submission, each main supervisor should nominate at least one assessor for the project who should be knowledgeable in the field of research. More names can be provided in the project description field. The P4P coordinator will be going through and adjusting the examiners and assessors so we have a balanced workload for all staff.

Supervisors will be given the opportunity to re-offer any unallocated Cross-Departmental projects as Departmental projects (note that this re-designation will not occur automatically, and a new project submission will be required).

3   Project Allocations

3.1   Cross-Departmental Projects

The Cross-Departmental projects are allocated first. Students that are interested in a Cross-Departmental project should submit their preferences (**up to 2 projects**) by the date given in Table 2. Please note that students that are allocated to a Cross-Departmental project will not have the opportunity to submit their preferences for Departmental projects or to change project, thus students are advised to select carefully the projects before they submit their preferences. Students that have not been successful at getting a Cross-Departmental project will have the opportunity to submit their preferences for a Departmental project.

3.2   Departmental Projects

Students should submit their preferences of Departmental projects (**up to 7 projects**) by the date given in Table 2. Please note that students that will be allocated to a specific Departmental project will not have the opportunity to change project.

Students that have not been successful at getting a Departmental project during the allocation process will be contacted by their P4P coordinator in order to discuss what are their preferences among the remaining unallocated departmental projects.

4　Project Management

The following information is intended to provide essential information and guidance on how projects should run over the course of the academic year.

4.1　Research under supervision

Meetings between staff and student pairs are considered an essential part of the learning and research training process. The expectation is that all academic staff will have **at least one weekly meeting** with each group of students. It is expected that the students should drive the meeting, keep notes of the issues discussed and actions decided, propose targets and report on their progress.

Record keeping (in a journal book or electronically) is an important part of any research or engineering project. Whatever the nature of a project work is, students should keep comprehensive notes and log data ideally in a hardcover journal book (alternatively in an electronic format). If record keeping is done properly, the records contain a detailed and permanent account of every step of the project, from the initial brainstorming to the final data analysis. Many science and engineering projects require a complicated number of steps and multiple trials. By recording the steps of the procedure, observations, and any questions that arise along the way, the project is properly documented, recording exactly what was done and when. With a complete record of the project, one can look back at the notes later if a question arises or if it is decided to pursue an alternative project idea based on something that was observed. Similarly, writing down the product design ideas, engineering challenges, and testing data will help students keep track of all of the ideas, what was already tried, and how well a particular idea or design performed. Well documented records can result in good quality reports at the end of the project, especially when the project spans over several months, as in a final year undergraduate project. The outcomes of meetings with supervisor(s) and others (your partner and/or any adviser) that concern the project should be recorded in the logbook for later use. Loose sheets of paper are easily lost and are to be avoided. Tidied up minutes of meeting (in electronic form) should be sent to the meeting attendees for their comments.

Supervisors should ensure that projects will not start early, as an early start of one project is not equitable for other students. They should also monitor the progress of their students, if they are falling behind, missing meetings or not contacting them, they should notify them by email and inform the project coordinator. Supervisors should also keep in mind that project ownership belongs to the students.

Supervisors should set professional standards for the students to follow. All emails about the project progress should include the project partner. Failure to attend the meetings should be recorded, and if it occurs more than once without an excuse then the supervisor should

inform the student by email (copying the project coordinator) that this is unacceptable behaviour.

Although students **should consult** their supervisors regarding the organisation and content of all their reports and submissions, supervisors are **not permitted** to make substantial editorial changes and are expected to provide only high-level feedback. It is permissible for the supervisors to comment on a small section (e.g. a single page or the abstract) so as to provide an example of how the writing style of the students can be improved.

4.2   Workload

Prior to the commencement of the research work students should complete a checklist that has a number of tasks, such as research lab induction and ethics approval (if needed). Students are expected to spend **at least 8 hours a week** on their project throughout the academic year and they are expected to keep a log-book. The academics should ensure that the workload for the project fits within this time frame. The first project component will focus on the objectives, project scope, and literature review and it should give an idea as to whether the project goals are achievable in the available time.

The mid-year technical report will also give the opportunity to the supervisors to provide meaningful and constructive feedback on the preliminary results and the technical work prior to the submission of the final report. The work within the project scope should be appropriately divided. In cases where it is not possible to assign separate roles, students will do the work jointly but must prepare individual reports in the form of a research paper.

4.3   Laboratory Work

To obtain the maximum benefit from a series of experiments, they must be properly designed. How can the experimental program be designed to achieve the experimental objectives in the simplest manner with the minimum number of measurements and the least expense.

Please refer to your Department's policy for any expenditure allowance. Students need to coordinate with the laboratory technician for purchasing the required consumables or desired equipment. Purchasing should be approved (via email) by the supervisor. It should be noted that students are strongly discouraged from purchasing with their own funds. It is not only against procurement procedures, but furthermore, reimbursement is extremely difficult and very time consuming for a number of people involved.

A successfully designed experimentation is a series of organized trials which enables one to obtain the most crucial information experimentally with the least amount of effort. Once a hypothesis, context, and any theoretical models have been considered and the aims and objectives have been clearly identified, the experiments are designed so that it becomes clear:

i) what variables are to be measured, ii) how are these to be measured – what tools and instruments will be required, and iii) what methods of data analysis will be employed. It is useful to produce a schematic diagram of the experimental setup. From this exercise, it will also be determined whether an existing test rig can be utilised or a new one will need to be designed and built. Prior to performing the experiments, some important steps include setting up, testing of the rig and apparatus, calibration of instruments, and the conduct of preliminary experiments need to be carried out.

There are no "correct" answers in laboratory work. It is inevitable that repeating an experiment under exactly the same conditions will almost certainly not lead to exactly the same result. Therefore, sensible conclusions can be drawn only if the accuracy of the results is known or tested. This may be determined from an error analysis based on repeat experiments (at least five repeats are recommended) and considering the stated or predetermined accuracies of instruments used. A lecture that will focus on the design of experiments will be given during Semester 1.

The technicians of each lab will assist students to achieve their research goals by offering expert opinion on the design of prototypes, the preparation of experimental setups, the execution of the experiments, the use of equipment etc. The technicians are also able to assist students with the ordering of the materials required for the successful completion of the project. Students are responsible for preparing the required Bill of Materials (BoM) and make sure that the materials are sourced from appropriate university approved vendors.

For the manufacturing of test rigs and designs, each group is required to finalise their design in discussion with their supervisor to address academic requirements, and with the technician to address practicalities that pertain to the capabilities of the laboratory and workshop, and constraints of cost. It can be helpful to visit the manager of the Faculty Technical Services Workshop, now located at Newmarket Campus, with a technician (if possible), to obtain feedback before finalising a design. It should be noted that jobs can only be logged with the workshop by a technician or supervisor (and not directly by the students).

Booking of workshop jobs

4.3.1   Laboratory Access and Safety

Experimental and design / build / test-based projects inevitably require the use of laboratories and physical workspaces with tools, instruments, and rigs. Depending on the academic area of the project, each student group will be assigned to a laboratory. The student group will work with the lead technician or the assigned technician for all their project work requirements from the laboratory or the workshops. In these areas, safety is of paramount importance and the students are responsible for their own safety as well as the safety of others through the safe use of the space, tools, and equipment that the students have been authorised to use.

Students are not permitted to enter the laboratories unless they:

- Have attended the safety lecture (Week #1)
- Are aware of all the safety requirements of the faculty, as discussed in the lecture, and outlined in the faculty Health and Safety Manual (a copy is available on Canvas)
- Are aware of all the safety requirements of the laboratory through a safety induction in the laboratory (Week #2), reading the safety brief for students (if any), and/or discussions with the technical staff.
- Have signed a Mechanical Engineering Laboratory Safety Induction Form provided in the course and forwarded it to the lead technician in their assigned laboratory.
- Have completed a Risk Assessment Form and reviewed it with the project supervisor.

Students are not permitted to work in the laboratories:
- Without signing the appropriate declarations and forms
- When they are just by themselves (i.e. alone) (must work at least in pairs or have others around in the lab)

When in doubt, the student should seek advice from the lead technician in the laboratory. It should be noted that the project will not progress far without help from technical staff. Students will find the technicians much more willing to help if they are polite, if they know exactly what they want, if they do not pester them continually about minor things, and if they remember to keep the lab and workspaces tidy.

Each student must complete a Mechanical Engineering Laboratory Safety Induction Form for each lab space that they intend to use during the course of the project. This is to ensure that each student is made aware of lab-specific safety precautions and emergency procedures. Each group must complete a Project Information Sheet as well. Access to lab spaces is restricted until the forms are completed and logged with the technician-in-charge of the lab. Additionally, a Risk Assessment Form will need to be completed by each student to the satisfaction of the supervisor (and lead technician) before any project work can commence. Copies of these sheets will be made available via weekly lectures, Canvas, or the laboratories. A student will not be permitted to start lab work until these are done.

Forms to Be Submitted:
- Safety Induction Form (1 per student per lab space) and a Project Information Sheet (1 per group), logged with the technician-in-charge of the lab
- Risk Assessment Form (1 per student) should be submitted to the project supervisor.

To ensure all students become familiar with the process of conducting risk assessments, on projects that do not require an assigned lab space (for example ones that are purely

computational), the students will be required to complete a Risk Assessment Form on a sample project specified by the Supervisor.

Your P4P coordinator will provide you with a list of the key Technical Services personnel for your particular specialisation.

More details and contacts can be found at the following URL:
http://www.engineering.auckland.ac.nz/safety

4.4   Ethics Approval

Students conducting research involving human participants (such as interviews or surveys) are required to consult and follow the processes and policies conducting research with human participants at the University of Auckland. The Guidelines allow The University of Auckland to meet its obligation to ensure that all research by staff or students conforms to the highest appropriate ethical standards. In this way, research participants are treated with respect and dignity. Their privacy, safety, health, personal, social and cultural sensitivities are protected. Those requiring University Ethics Approval should follow the guidelines and complete the research project application form that can be found at the following URL:

http://www.auckland.ac.nz/uoa/re-uahpec

4.5   Intellectual Property

By default the University Policy on Intellectual Property applies. Any foreseen IP issues should be addressed by all parties, ideally before the commencement of the project.

5   Project Deliverables

The various components of the Project Portfolio are shown below, together with submission deadlines.

5.1   Project Scope, Objectives, and Literature Review Report

The first submission (report) should focus on the project scope, objectives, and the literature review. **The project scope and objectives part should be 1-2 pages long**, while the **literature review should be 8-10 pages long**.

The goal of this report is to describe the research that the students will be doing for their project. The students should present the problem that they are trying to solve, the important research questions, the objectives, and explain why this research is important. The purpose of the literature review is twofold:

- to demonstrate an awareness of the research relevant to your project, and
- to summarise the important information or findings that will form the foundations of the work to be undertaken

The literature review will also reveal if the research to be carried out in the project is something that has not been done before and is worth pursuing in order to advance the knowledge in the particular area. The review should show the breadth of the research area and some depth in particular areas.

5.2   Mid-Year Report

The **mid-year technical report should be 4-6 pages long** and should contain only technical content (e.g., mathematical formulations, algorithms, designs, analyses, experimental results etc.). The content of the mid-year report depends on the project nature and scope and students are expected to consult their supervisors in order to guarantee that they will submit an appropriate report with appropriate content. The project scope, objectives, and literature review should not be included in the mid-year report.

5.3   Final Research Report

The **final research report should have a length of maximum of 25 pages** (excluding title page, table of contents / figures / tables, abstract, references, and appendices).

The number of pages should be counted from the Introduction to the Conclusions section. The font should be Times New Roman and the font-size 11 pt. Detailed instructions on the report formatting and a final research report template will be provided. The report must be made up of the following sections: Title Page, Abstract, Table of Contents, Glossary of Terms,

Introduction, Literature Review, Middle sections appropriate to your project work, Discussion, Conclusions, Suggestions for Future Work, Acknowledgements, and List of References.

Expectations: Clarity, professional structure, technical descriptions that convey understanding of the field, analysis of results, excellent English expression, technical accuracy, sufficient technical depth, conciseness and completeness, use of sufficient and relevant references.

Each Department will offer guidance and support with regards good report writing.

5.4   Conference Presentations

Students need to jointly prepare a single conference presentation. Conference Presentations will be used by Examiners and Assessors to inform their grade for your Project Portfolio. It is expected that each student in the project pair will present and answer questions from the audience as equally as possible.

Students involed in Cross-Departmental Projects should present in the Conference of their Host Department. The partner (from the other Department) may also choose to participate but it is not compulsory. Students should summarize the overall work done (by both students) for the project and then they should focus on their individual contributions. Even for Cross-Departmental projects that have a single student presenting (if the partner is not participating) the allocated time will still be 20 minutes.

Clarity of presentation, appropriate structure, accurate technical content, sufficient technical depth, appropriate question handling, professional presentation style and skill, descriptions that convey understanding of the field of research, focus on concepts over unnecessary details.

5.5   Display Day Posters and Presentations

The display day poster should be prepared in landscape orientation and will be printed in A1 size paper. The display day presentation will take place in buildings 401, 402, and 405. A detailed programme and an annotated floor map that will contain the exact location of each project will be announced later during the year. Each group of students will have a table available that can be used for showcasing outcomes of the research (all prototypes should be small enough to fit on the table surface). A panel over the table will be used for attaching the display day poster.

Cross-departmental students should prepare the required posters and present in their home departments. During the poster presentation students should summarize the overall project

work (done by both partners) and then they must focus on their individual contributions. The partner (from the other department) may choose to participate but it is not compulsory.

Clarity of presentation, good flow and good visual linking, good readability of poster content, use of appropriate diagrams, graphs, and/or pictures, use of appropriate technical content that conveys essential components and outcomes of the research, sufficient technical depth, visual appeal: use of aesthetically pleasing colours, pictures, background etc.

5.6 Research Compendium

The research compendium should provide supporting material to the project report and project portfolio as a whole. It should provide information about all undertaken research (e.g., for aspects of research that are not included in the report), details on the experiments, tests, and procedures (including experiment setups, equipment used, serial numbers, calibration, test conditions, special components, etc.), data that was used for analysis or to generate plots for the report, cad files, images, video and audio files, as well as specification sheets of all major components used.

A well-presented compendium should contain sound information and materials that will allow replication of the research project work and outcomes by future students and/or researchers. A good research compendium can be easily read, followed, understood, and further developed. The compendium content should allow for an assessment of the initiative, competence, diligence, planning, execution, teamwork, and professionalism that the students have put into their projects.

6 Assessment

6.1 Assessment Penalties

Students are expected to follow professional standards and to submit all the project components on time and according with the instructions provided.

All project components will be submitted through Canvas. Canvas automatically flags late submissions even if the submission was uploaded a few seconds after the due date.

Please therefore be advised to submit at least 5 minutes before the deadline to avoid any late submission penalties. Updated files can be submitted, with the most recent submission being taken as the final submission. When resubmitting, you need to upload all the necessary files for that submission again. Resubmitting after the deadline will incur late submission penalties.

The following penalty will be applied for a late submission:

Deliverable	Penalty
Late Submission	2% penalty per hour late.
Report page limit	2% per page

This penalty applies to all project components. This penalty means that if a student submits a component 2 hours late, the penalty will be 4 marks out of the total of 100 marks for the whole research portfolio.

6.1.1 P4P Conference "No-Show" Penalties

Students are expected to participate in the P4P conference and give a seminar talk on their research. Failure to participate and present the work will incur:

- **10% penalty** (of the whole portfolio of research marks)

Participation in the P4P conference is **compulsory**. Students are expected to attend **all sessions** and attendance will be recorded at the beginning and end of each session. If students fail to attend 1 or more sessions, the penalty will be:

- **2% penalty** (of the whole portfolio of research marks) **per session**

6.1.2   P4P Display Day "No-Show" Penalties

Students are expected to participate in the P4P display day and give a poster presentation of their research. Failure to participate and present the work will incur:

- **10% penalty** (of the whole portfolio of research marks)

Participation in the P4P display day is **compulsory**. Students are expected to attend **the entire event** and attendance will be recorded at the beginning, before lunch, and at the end of the event. If students are "no-show" in one or more attendance lists this will incur:

- **2% penalty** (of the whole portfolio of research marks) **per attendance list**

6.2   Plagiarism

Even though project work is conducted in pairs, Project Portfolios must be prepared individually, and are assessed accordingly. It is therefore important that each individual student's report must show that it has been written independently of their partners. Each report will be submitted to TurnItIn.

A declaration has to be completed by all students, signed off by the student and the supervisor as well, and to appear in the report stating clearly what has been developed during the project and what was available from previous years (e.g., previous Part IV projects).

It is permissible that the two reports of a project have the same overall structure as dictated by the project itself. Beyond this, the reports must show no evidence of collusion. It may be inevitable that the illustrations in reports of project partners are very similar and this is allowable. If a figure that is used has been solely produced by one of the partners, it should be referenced in the figure's caption. It is strongly advised that students do not to share digital files or hard copies of written text.

If the examiner and assessor judge that the text and/or structure of project reports show collaboration in terms of a lack of independent writing, analysis, or significant overlap in written material, then the University's processes for investigating plagiarism will be followed.

6.3   Examination Process

Assessments follow the processes and procedures for 30 point research projects, as laid out in the University's *Instructions to Examiners and Assessors*.

The Examiner will provide a recommended grade for the Project Portfolio as a whole, taking into account the marking rubric. The grade must be accompanied by an Examiner's report that sufficiently discusses the reasons for that recommendation. Reports are typically 1-2

pages in length and discuss all aspects of the research portfolio. In most cases the Examiner will be the main project supervisor.

The Assessor must be independent of the project (i.e. not associated with any aspect of the project supervision). Once the examiner has completed the report, the Assessor will assess the whole research portfolio in light of the examiner's report.

If the assessor's grade is significantly different from the examiner's grade, the Disputes Process outlined in the "Instructions to Examiners and Assessors" will be followed.

Each group of students has a supervisor that serves also as the examiner of the project and an assessor. The assessor is typically an academic staff member who is sufficiently knowledgeable in the field of research of the project. Assessment of the research project will be based on the different project components and the project portfolio (combination of these components) as a whole (assessed holistically). The following are key assessment elements that clarify what are the expectations of each component.

6.4   Assessment Rubric

The student is expected to:

i)   show evidence of advanced knowledge about a specialist field of enquiry,

ii)   demonstrate mastery of sophisticated theoretical subject matter,

iii)   evaluate critically the findings and discussion in the literature,

iv)   research, analyse, and argue from evidence,

v)   engage in rigorous intellectual analysis, criticism, and problem-solving,

vi)   demonstrate a high order of skill in the planning, execution, and completion of an original, independent research project

vii)   apply research skills appropriately.

The portfolio should be assessed in accordance with the following rubric.

P4P Marking Rubric

Grade		Description
A+	Exceptionally high level of performance	A thesis/portfolio in the A range is a sustained, coherent contribution that:
A	Clear high level of performance	- demonstrates broad understanding of the subject, including current debates - demonstrates clear evidence of a scholarly stance, including a high level of independent and critical thinking - demonstrates evidence of effective synthesis of ideas
A-	First Class	- demonstrates coherence between theoretical position, methodology and questions - demonstrates thorough investigative research, high level problem solving and/or high level creative performance - demonstrates the student's ability to critically evaluate their own research in the context of the existing body of literature - may demonstrate originality in topic, method, theoretical development, creative practice or findings and conclusions (this would be expected at A+ level) - may include material of publishable quality (this criterion differs by discipline) - may include work that is exceptional or highly original in one area, but not fully realised or consistent in other sections/elements. Such work may reach A- standard - is presented to a consistently high standard - demonstrates that the student has the capacity for doctoral research and would be a viable scholarship candidate.
B+	Very Good	B grade theses/portfolios are sound and compelling, and demonstrate evidence of critical thinking and an understanding of a significant body of knowledge. Work at this level also:
B	Good	- provides a logical overall argument - selects and applies suitable methods - gathers original data (where applicable) and analyses it in a careful and coherent manner
B-	Competent	- provides evidence which clearly supports its findings and arguments - may in parts be more descriptive than evaluative or synthesised - may not fully realise the possibilities of the research data/findings - includes discussions and/or conclusions which show some

		appreciation of the significance of the findings ● may make fewer or weaker links to existing research, theoretical concepts or creative practice than would be expected in A level work ● is presented to a generally high standard but may contain noticeable errors in referencing, punctuation, grammar and/or spelling ● at the B+ level, demonstrates that the student could be expected to be successful in doctoral research with strong supervisor support and further skill development in some areas. ● at the B or B- level, does not demonstrate that the student has capacity for doctoral level research.
C+ C C-	Clear Pass Pass Marginal Pass	A thesis/portfolio in the C range: ● demonstrates understanding and analytical ability at a level that is clearly beyond undergraduate level ● presents an overall argument, but may not be fully developed or consistent in its application ● outlines a research plan and applies appropriate methods ● demonstrates competence in the formulation, conduct and analysis of an independent piece of research ● is generally sound but may be uneven or limited in some respect ● may demonstrate limited evidence of synthesis and critical engagement with literature ● is likely to focus more on description than analysis of findings ● has appropriate, but limited, evidence in support of its findings and arguments ● does not demonstrate that the student has capacity for doctoral level research ● is competent in its presentation, but may have numerous, obvious errors of referencing, punctuation, spelling and/or grammar.
D+	Fail	A thesis/portfolio in the D range demonstrates serious deficiencies in one or more expected elements: ● may present research literature, theory or methods ineffectively, inaccurately or in an unreflective way ● may lack an overall argument ● lacks breadth and depth ● lacks cohesion across the thesis/portfolio ● contains limited or inappropriate evidence ● interpretation may be minimal or flawed ● presentation is poor with numerous errors of referencing, punctuation, spelling and/or grammar

7 Key Dates

Table 1. Project due dates

P4P Component	Date
Project Scope, Research Objectives, and Literature Review	Tuesday, 28 Apr 2020 (submission)
P4P Seminar on Research Objectives and Literature Review	Saturday, 16 May 2020 (event)
Mid-Year Technical Report	Wednesday, 29 Jul 2020 (submission)
Final Research Report	Friday, 25 Sept 2020 (submission)
P4P Display Day Poster	Friday, 16 Oct 2020 (submission)
Display Date	Thursday, 22 Oct 2020 (event)
Research Compendium	Tuesday, 27 Oct 2020 (final submission)

Table 2. Project Submission and Allocation Process

Action	Deadline
Submission of All Preallocated Projects	17 January 2020
Project Submission Closed for Staff and Students	24 January 2020
Projects Released to Students	27 January 2020
Submission of Project Preferences for Cross-Departmental Projects	7 February 2020
Cross-Department Projects Allocation Announcement	10 February 2020
Submission of Academic Staff	

Updates for Departmental Projects	14 February 2020
Submission of Project Preferences for Cross-Departmental Projects	21 February 2020
Departmental Projects Allocation Announcement	24-28 February 2020
Projects Start	2 March 2020 (1st day of Semester 1 2020)