PRCO304: Computing Project Guidelines

2017-2018

Contents

Appendices

If you have any questions or concerns about the PRCO304 project, please discuss them with your supervisor.

1. Formalities

PRCO304 is a 40 credit final-stage spring semester module. This should normally equate to 400 hours of your time. All deadlines are noted in Section 2 below, and are also posted on the **Student Project Management System** (SPMS), details of which are available in the DLE's ProposalPID folder. The module leader is Chris Johnson: c.johnson@plymouth.ac.uk

The PRCO304 **module aims** are:

A. To enable the student to undertake an individual project on an approved topic of interest, that addresses a significant computing related problem relevant to the programme of study
B. To provide an opportunity for the student to integrate many of the threads of their programme of study

The PRCO304 **module learning outcomes** are:

1. Demonstrate an investigative component to the project showing consolidation and development of knowledge and understanding relevant to their programme of study.
2. Produce an approved deliverable appropriate to the programme of study that addresses a significant computing related problem.
3. Manage the project effectively by demonstrating the application of project management skills.
4. Identify and take due consideration of the legal, social, ethical and professional issues that are appropriate to the project.
5. Communicate effectively all aspects of the project deliverables including the theoretical and methodological framework.

So this is a substantial individual piece of work based on a problem chosen by you. In this you have two roles: Project Manager and Project Personnel. Keep these roles separate in your thinking. Project Management is about planning the project and monitoring its execution; the role of the Project Personnel is to carry out the underlying work. Your supervisor's role is more akin to that of a Project Sponsor, providing guidance and approving deliverables.

Relevance to the programme of study

This means that your project topic should (to some extent) align with your degree topic (e.g., networking, security), and that you are building upon knowledge and skills acquired during your earlier studies. That said, you may wish to use the project to explicitly develop new skills, and this is perfectly fine.

2. Supervisors, submission requirements and schedule

The module officially runs in Semester 2, starting Monday 29 January, 2018.

Project proposals are submitted in accordance with the information posted in the ProposalPID folder. Project supervisors will be allocated after 11 December and once project proposals have been submitted.

Please study these Guidelines fully and in detail before discussing your project with your supervisor.

Following the approval of your proposal you'll need to submit your PID (via the SPMS) **by 5pm, Friday 2 February.** Your supervisor will either *Approve* your PID submission or *Reject* it (in which case you need to ascertain why, and resubmit)[1].

During the project itself you will submit a Highlight Report each week between the second week of the project (5 February) and the Easter break.

The **final deliverables – to be submitted by 4pm, Thursday, 17th May 2018** – are the "Final report" and the "Code submission":

- **Final report**
  - A **pdf** copy of your final project report to be submitted via the SPMS **and** the DLE[2]**.** You should upload the exact same file to the SPMS and the DLE. Please upload a single pdf file rather than a zip of multiple files.
- **Code submission**
  - Your code files should be uploaded to a directory within your University of Plymouth OneDrive filespace[3]. The URL of this directory should appear in your final report. Please ensure that you set permissions accordingly so that your markers can access the directory contents.

Your **Demonstration** is to be conducted **between Friday 18 May and Friday 1 June**[4].

Further details regarding the above are to be found below, and will also be posted in the FinalReportDemo folder.

[1] We shall endeavour to process your submissions within 5 working days although in some cases delays may be unavoidable. If your submission is not processed in a reasonable timeframe, please contact your supervisor. If your submission is rejected we'd like to see resubmission within 10 working days.
[2] This is your formal submission … if it is late, marks capping will be applied in accordance with the University regulations
[3] For CGD projects, an alternative online filespace may be provided by Dan Livingstone (due to large file size)
[4] It is your responsibility to organise the demonstration: we expect this to be done by 27 April.

We recommend also that you submit (via the SPMS) a draft copy of your final report for perusal and feedback by your supervisor – **by 4 May.** Staff will not read draft reports in details, but nevertheless past experience has shown this to be a worthwhile exercise. **Staff will not read multiple drafts.**

In addition to the formal submissions detailed above, you should provide other deliverables (e.g., requirements document, design document, test plan, …) for scrutiny by your supervisor as they are produced: *You should upload such documents to the SPMS via the "Miscellaneous deliverables" option on the SPMS.*

3. Getting started: The Proposal and the PID

3.1 Project Proposal

The first thing to do is to identify an idea for your project, and to write this down in the form of a proposal. Guidance on developing your idea and writing your proposal are to be found in the DLE's ProposalPID folder. Your proposal will be used to allocate a project supervisor, from whom you should promptly seek feedback on your proposal: you should then start to work on your Project Initiation Document (PID).

3.2 Project Initiation Document (PID)

The PID is a standard way of defining a project[5]: in this context, it forces you to think through the details of your project more carefully, and allows us to make a clear decision as to whether we are able to approve your project[6]. Further details are to be found in the DLE's ProposalPID folder. Please discuss your draft PID with your supervisor prior to submission; once they are happy with it, please submit immediately (via the SPMS).

4. Highlight Reports and Project Supervision

We expect that:

- You will meet[7] with your supervisor weekly between the start of the project (29 January) and the Easter break; ***before the start of the semester, you should set up a regular time slot for these meetings***. We expect that these meetings[8] will take

[5] The process of project definition should be seen as an important part of a project – in real life your project won't get funded without such a definition

[6] Your supervisor's approval of your PID is our formal approval of your project idea

[7] From *March* it is acceptable for some of these meetings to be conducted over the telephone/Skype subject to the agreement of the supervisor, provided the project is up to date and provided that that week's Highlight has been submitted.

[8] These meetings will be individual meetings

around 15 minutes *on average*, although generally speaking initial meetings will be longer than those closer to Easter.

- You will submit a Highlight Report (via the SPMS) each week between the second week of the project (6 February) and the Easter break.
    - Each Highlight Report has a formal submission deadline (visible via the SPMS) which you should of course adhere to; however, please *also* ensure that you submit your Highlight Reports the day before your supervision meeting[9].

We expect that a Highlight Report will be at most one side of A4 (frequently shorter), and will take you approximately 10 minutes to write and submit. A template for Highlight Reports is available in the DLE Guidelines folder. A Highlight Report should (briefly) cover the following:

1. Review of work undertaken (and comparison with work planned) since the last Highlight[10], including identification of any products[11]. Identification of any issues/risks that have arisen since the last Highlight, and any previous issues/risks that are still a concern.
2. Brief notes from supervisory meeting(s) held since the last Highlight (*including meeting date(s)*).
3. Brief plan of work for the next week (derived from the current stage plan).

As noted above, you should submit your weekly Highlight the day before your supervisory meeting – the meeting can then be used to review the contents of the Highlight – which your supervisor will either *Approve*[12] (usually) or *Reject* via the SPMS. You should also discuss/review any recent products delivered (which should have been submitted via the Misc. Deliverables option on the SPMS).

We leave it to your discretion how you manage the project after the Easter break; however we suggest that you arrange at least two supervisory meetings in order to review the final product and report.

Further information on roles & responsibilities is to be found in Sections 9.2 and 9.3 below.

4.1 Missing a Highlight

[9] This may require you to submit your Highlights several days before the formal submission deadline depending upon the timing of your supervisory meeting

[10] Or in the case of the 1st Highlight – work undertaken to-date

[11] E.g., requirements document, designs, …, software components. Documents can be uploaded to the SPMS via the "Miscellaneous deliverables" option

[12] Please note that approval of a Highlight Report is approval of the report – not the work documented in the report. For example if you are ill all week and accomplish nothing, then provided you say so honestly in your report, it should be approved (and your supervisor will no doubt wish to make comments that you need to catch up).

If you are unable (for whatever reason) to submit *one* of your Highlights, then please don't worry about it[13]: inform your supervisor and when you are able, either upload the Highlight or upload a brief document (instead of the Highlight) noting the reasons for your inability (and then put the outstanding details into the next Highlight). Use your common sense.

If circumstances prevent you from submitting multiple Highlights, then an EC claim may be appropriate. Discuss with your supervisor.

4.2 Missing a supervisor meeting

If you are unable (for whatever reason) to attend *one* of your supervisor meetings, then please don't worry about it[14]: inform your supervisor and carry on as appropriate.

If circumstances prevent you from attending multiple meetings, then an EC claim may be appropriate. Discuss with your supervisor.

4.3 If your supervisor becomes unavailable

In the case of a short absence, continue as best you can. In the case of a longer unplanned[15] absence, then you can consult with your second marker for supervisory assistance. (Second markers will be posted on the SPMS).

In all cases above, please consult Chris Johnson if there are unresolved problems.

5. Final Deliverables

5.1 Final report

Further information and guidance on the final report – including information about the word limit - will be posted in the FinalReport file in the DLE's FinalReportDemo folder.

It is important that you "write up as you go along" by keeping detailed notes of what you did and why you did it. The products that you produce will be visible at the end of your project, but the process (which is also something you can gain credit for) won't be unless it is described in your report, and over a 3-month period it is easy (for you) to forget the specifics of what you did and why.

[13] We would not normally demand that you submit an EC claim in the event of missing ***one*** Highlight
[14] We would not normally demand that you submit an EC claim in the event of missing ***one*** meeting
[15] In the case of *planned* absence, your supervisor will inform you of alternative supervisory arrangements

We strongly recommend that you submit (via the SPMS) a draft copy of your final report for perusal and feedback by your supervisor. Supervisors will not read your draft in detail – but experience has shown that it is still a very useful exercise. Do this in good time so that your supervisor has time to look at your report: by the deadline given in Section 2 please.
Please note that supervisors will look at only one draft copy: ***they will not comment on multiple drafts.***

5.2 The demonstration

- **It is your responsibility to arrange the demonstration; we expect this to be done by 27th April.**
- **In the absence of a demonstration you'll receive a mark of ZERO for your project.**
- **The demonstration should take place in the timeframe specified in Section 2 above.**

Full details of the demonstration will be posted in the DLE's FinalReportDemo folder.

5.3 Final products

The deliverables from your project will be described in your final report, presented at the demonstration, and uploaded within your "Code submission" (see Section 2 above).

6. Project Assessment

6.1 Non-submission and late submission

In the absence of validated extenuating circumstances:

- Non-submission of the final report or failure to provide a demonstration will result in a mark of ZERO for the whole project. Late submission/provision will be dealt with in line with the University regulations.
- Non-submission or late submission of interim deliverables will be taken into account by your markers when they award marks.

6.2 Assessment criteria and the marking process

Project Assessment Criteria are available in the appendices below. Given that all projects are unique, markers are at liberty to interpret these criteria as appropriate (although they are required to justify their marks). You are welcome to discuss with your supervisor how the Assessment Criteria could apply to your project.

Each marker will produce an independent set of marks (see Grading Criteria (a) in the Assessment Criteria). If the two final marks differ significantly (i.e., by a degree classification or by > 10 marks) then the markers are asked to try to find a resolution; if such

is not possible, a 3rd marker is appointed[16]. If the two final marks do not differ significantly, then the average of the two marks is taken. All project marking information and final reports are made available to the External Examiner.

6.3 In the event of failure

If you don't pass first time, you *may* be referred during the summer or invited to repeat the project in the following academic year. Students who repeat the project will normally find that a further fee is payable.

If you are referred, you may choose to repeat the module. (You will receive a letter from the Faculty Office stating the options.) Please contact your supervisor as a matter of urgency to elicit from them guidance on what you would need to do to improve your project to a passing level; you should also use this information to decide whether it is feasible to achieve this in time for a refer submission. If in doubt, our guidance is to choose to repeat.

Unless you are informed to the contrary, you should assume that a refer attempt will have the same supervisor and second marker. You should assume that a further demonstration is required unless you are explicitly informed that it is not. If a further demonstration is required, it is your responsibility to organise this.

Refer and repeat attempts will be treated in accordance with the University regulations. Informally, a refer/repeat attempt, without validated extenuating circumstances, will have the mark capped at 40%.

6.4 Feedback

You will receive brief verbal feedback immediately after the demonstration. If you wish to gain further feedback, please contact your supervisor after June 15 (by which time the marking process should be over).

6.5 Plagiarism

The project is to be an individual piece of work and the University regulations on academic dishonesty apply. You are expected to be aware of (and adhere to) University guidelines on referencing and plagiarism: this applies to all products (e.g., code, report[17]). *Students are warned that we will subject student products to plagiarism detection devices.*

7. Withdrawing from the project

[16] Marks differences in excess of 10 marks are extremely rare, as is the necessity of a 3rd marker.

[17] Referencing and plagiarism in written reports is detailed in the Essay Writing guidelines in the FinalReportDemo folder

If you are considering withdrawing from (or deferring) the project for any reason, discuss this *straight away* with your supervisor and/or the module leader.

If you decide to go ahead with the withdrawal/deferral, you need to contact the Faculty Office. You need to do this promptly: If your withdrawal/deferral takes place after the University's "final date for withdrawal[18]", then you will be considered to have attempted the module (which may impact your eligibility for deferral and the mark that can be obtained within any possible repeat attempt).

If you defer the project, then the intention is to complete the project the following year as a part-time student (subject to passing your other modules in the current year). A further fee may apply; please check with the Faculty Office.

Students who do not complete the project may be eligible for an Ordinary (i.e., non-honours) degree – consult with your programme manager for further clarification.

Overseas Students on TIER 4 visas
Students on TIER 4 visas who *choose* to defer their project should note that the University will not sponsor an application for a visa extension under TIER 4. Such students would therefore need to either conduct their project whilst in their home country with remote supervisory support, or seek advice on other student visa routes that may be suitable to cover this period.

The situation differs for students who are *forced* to defer their projects (e.g., as a consequence of extenuating circumstances).

In all cases, please contact the International Student Advisory Service (ground floor Roland Levinsky Building) for further clarification.

[18] In the past this has been at the end of the first week of teaching (in the Spring semester), but do please check with the Faculty Office

8. Accessibility and disability

Every effort is made to ensure accessibility for students with disabilities. If you have any accessibility requirements (including provision of materials in alternative formats), please discuss these with your supervisor and/or the module leader.

If you have a disability you should already be registered with the University's Disability Service, in which case the module leader will receive a notification. Subject to authorisation, this information can be shared with the supervisor, although it would be better for you to raise the issues directly with the supervisor if you think they have a bearing on your project.

If appropriate, disability issues can be included as part of the project risk assessment.

If you are concerned that you may have a disability, please do seek assessment from DAS directly. DAS is available to decide upon support issues and can allocate resources where appropriate.

9. Miscellaneous

9.1 How much time should I spend on the project?

The norm is 10 hours effort per credit … which equates to 400 hours. This amounts to 30 hours per week (during Semester 2) … *on average*. With this in mind it really is important that you stay on track. You'll help yourself tremendously by getting your PID approved before the start of the spring semester so that you can make a prompt start to your project.

9.2 Your supervisor's responsibilities

Your supervisor will:

- Approve (or reject) your PID and Highlights
- Monitor your progress and provide guidance & suggestions
- Respond to your queries
- Provide feedback in response to your formal submissions and other products that you produce/provide to your supervisor. Please note that written feedback to Highlight Reports may be just an Approval of the Report (particularly if all is well, or if feedback is provided in the supervisory meeting).
- Assess your project (together with the second marker)

It is not the responsibility of the supervisor to provide technical assistance.

9.3 The student's responsibilities

- The project! Putting in the necessary (suggested) hours.
- Defining the project
- Solving practical problems
- Producing submissions & deliverables (on time)
- Arranging the demonstration
- Keeping a log of activities, decisions, etc. (Your final report needs to document the *process* as well as the products. *Write up as you go along, else you'll have forgotten it all by the end.*)
- **Arranging supervisory meetings: We expect you to meet with your supervisor weekly between the start of the Spring semester and the Easter break.**
    - After Easter is at your discretion
    - The importance of maintaining proper contact with your supervisor during the project cannot be over-emphasised
- Contacting your supervisor (and/or module leader) promptly in the case of problems
- You have the responsibility to be **proactive** in the management of your project – don't expect to be prompted.

9.4 In the event of problems …

In the event of any problems which are outside your control and which may cause significant disruption to your project, you are advised to promptly submit an *Extenuating Circumstances* form to the Faculty Office in line with University regulations. (In particular you should note that time limits for the submission of such apply.) Make sure you also maintain appropriate contact with your supervisor and/or module leader who will advise as appropriate.

If you have a disability, then you should only need to submit an Extenuating Circumstances form if this causes disruption to your project; if in doubt discuss with your supervisor.

10. Further information

Further information may be found in:

- The University of Plymouth Student Handbook
- The University of Plymouth Regulations

APPENDICES

Appendix A: Database development

Many student software development projects include the development of a relational database; here's a reminder of what we usually expect you to provide:

- An ERD … in the main body of your report
- A description of the database tables (most probably in an appendix), including table names, attributes (and data types), specification of primary and foreign keys, and details of any constraints that have been applied to the database tables
    - Students sometimes use diagrams that are output from their DMBS, although this is often not the clearest or most readable way of presenting this information
- Details of the explicit use of normalisation[19] (to 3NF or BCNF).

If you are developing a non-relational database, then please adapt the above as appropriate.

Appendix B: Project management

We advise you to use a subset of PRINCE2, specifically:

- The proposal (which in PRINCE2 might be referred to as the Project Brief)
- The PID and project plan
- Stages: stage objectives, plans and reviews
- Exception reports & plans (if required)
- Highlight reports (and review meetings)
- Risk management
- Quality management
- Communication plan

In the context of the PRCO304 documentation, *stages* are intended as project management constructs (rather than being part of the software development process).

Although this list looks extensive, it is important that the volume of project management effort is commensurate with the scale of your project. So in particular keep the project management deliverables relatively brief.

[19] In very exceptional circumstances (e.g., perhaps in a Business Intelligence project) you might decide to de-normalise the database, in which case you'd provide the details of (and rationale for) the de-normalisation.

Software development processes
It is important to understand that this use of PRINCE2 (and in particular stages) is not intended to constrain your software development process: you are welcome to use evolutionary prototyping, incremental development, agile, etc., etc., as is appropriate.

Students using agile development have found it useful to employ weekly sprints/week-by-week planning (as suggested in the PID guidance) that coincides with the pattern of Highlight submissions.

The PID guidance advised against using a true waterfall development. Students often fall in the trap of spending far too much time trying to perfect their analysis and design.

Support lectures
The final stage module on project management is ISAD362. Feel free to look at the lecture content if it helps: https://dle.plymouth.ac.uk/course/view.php?id=31220

Of obvious relevance are the lectures on: Risk management; Planning and scheduling; PRINCE2; Software processes; Quality management (including V&V).

Appendix C: Diary
We recommend that you keep a diary of your day-to-day activities, including information about how many hours you have worked (on the project) each day. This should contain notes of what you did *and why you did it*. The products that you produce will be visible at the end of your project, but the process (which is also something you can gain credit for) won't be unless it is described in your report, and over a 3-month period it is easy (for you) to forget the specifics of what you did and why. Remember also that you need to be working 30 hours per week on your project. It is all too easy to convince yourself that you've "done some work on the project this week", when in fact the number of hours is significantly short. If this persists over the course of the semester, then obviously the quality of your project will suffer significantly.

Appendix D: Intellectual property
If you have any general concerns about intellectual property issues, please discuss with your supervisor in the first instance. For more detailed queries, the University's IP Department can be contacted at ipmatters@plymouth.ac.uk

Needless to say, we expect that you respect the intellectual property rights of others whilst conducting your project.

Appendix E: University ethics policy

Research (e.g., system evaluations) involving human participants must comply with the University's Ethics policy (and you should note that such compliance is part of the PRCO304 assessment criteria).

Ethics approval applications

A generic ethics application (see ApprovedEthicsApplication.pdf in the DLE Guidelines folder) has been approved for PRCO304, subject to students/investigators noting that

- Participants must be made fully aware that video/audio recording is optional (not compulsory) and will not be carried out without the permission of participants.

If your project *is* covered by this ethics application, then you will not need to make a separate ethics application.

If your project is *not* covered by this ethics application, then you *will* need to make a separate ethics application (via your Project Supervisor) using the application form provided. Further guidance on ethics applications can be obtained from Dr. Mark Dixon who represents our school on the Faculty Ethics committee.

The University Ethics policy and ethical approval application forms are available from https://staff.plymouth.ac.uk//scienv/humanethics/intranet.htm

A good paper on the issue of ethics in software engineering is to be found at http://cogprints.org/6740/1/vinson_2008.pdf

Appendix F: Concerns

- If you have any questions or concerns about the PRCO304 module, please read the documentation; if this fails, discuss with your supervisor.
- For concerns about supervision, please discuss these with your supervisor in the first instance. If your concerns about supervision are unresolved, any complaints can in the first instance be directed informally to Torbjorn Dahl.
- Wider concerns and/or feedback about the module can be raised with your student rep. I am happy for student reps to forward such concerns to myself as a batch.

Appendix G: Use of email

Please do not send *unnecessary* emails to the module leader: with over 200 students on the module, this is untenable. Instead, consult with the documentation and then your supervisor. Because of these considerations, emails to the module leader may result in brief answers – ***please do not take offence***.

Appendix H: Overseas Students on TIER 4 visas

The University is under an obligation to monitor the attendance of students on TIER 4 visas. Because project work is not based upon attendance in the same way as other modules, could students on TIER 4 visas please:

- Ensure that you submit all required deliverables
- Ensure that all deliverables are provided to your supervisor via the SPMS
- Ensure that you attend all required meetings with your supervisor
- Ensure that all communication from you to your supervisor is via the "SPMS Comments" rather than via email (so that there is a persistent record of such)
- Ensure that you log all meetings or other interactions (e.g., phone calls, skype meetings) with your supervisor on the SPMS (either by recording them in a Highlight Report – or by including a brief note in an SPMS Comment).

Appendix I: Assessment criteria

Students who fail to provide a demonstration of their project will be awarded a module mark of zero.

Students who fail to produce a Final Report whose main body exceeds 5000 words and which satisfies minimal quality criteria[20] will receive a module mark of at most 38%.

Beyond this, PRCO304 projects are assessed according to 8 categories:

1. Background and objectives
2. Approach
3. Outcome
4. Verification and validation
5. Legal, social, ethical and professional issues
6. Project management
7. Reflection
8. Communication

Grading criteria

a) For each category, a mark classification (40-49, 50-59,…, etc.) will be assigned and an overall final module mark produced.

In generating the final module mark, it is assumed that the "Outcome" category will be roughly weighted 70%

b) Mark classifications for individual categories are based upon the pass-fail criteria (required to gain a mark ≥ 40) and assessment criteria given below.

c) A mark ≥ 60 is awarded for a category only if its assessment criteria were met and the quality of work undertaken would have been regarded as satisfactory had it been undertaken in a professional environment. Of course "satisfactory" does not mean perfect.

d) A mark ≥ 80 is awarded for a category only if the work undertaken within that category is outstanding; it should significantly exceed the criteria given in (c) above with respect to one or more clearly identifiable characteristics[21] (e.g., product features, product quality, process quality).

Given that all projects are unique, markers are at liberty to interpret these assessment criteria as appropriate. Students are welcome to discuss with their supervisor how these criteria might apply to their project.

[20] Obviously this implies the need to get feedback from your supervisor on a draft report

[21] There is no set list – discuss with your supervisor

1. Background[22] and objectives

Inputs to be considered

i. Final Report; PID
ii. Any additional information available about the background

Assessment criteria

1. *At the start of the project*, were the associated elements of the PID (specifically Introduction; Business case; Project objectives; Initial scope; Quality expectations) considered by the supervisor to be reasonable[23]?
2. Were the project objectives complete and SMART[24]? In particular, were the objectives reasonable given the project background?
3. Does the Final Report contain an appropriate introduction and account of the background of the project?

Pass-fail criteria

- Assessment criteria 1 and 3 above

2. Approach

Inputs to be considered

i. PID; plans
ii. Final Report
iii. Any additional information available relating to the student's approach

Assessment criteria

1. *At the start of the project*, was the PID considered by the supervisor to be reasonable?
2. Does the Final Report contain an appropriate evaluation of possible approaches (e.g., methodologies, processes, technologies, tools) and other background materials; is this evaluation of appropriate depth and breadth; does it display appropriate knowledge and/or research?
3. Does the Final Report describe the intended approach at an appropriate level of detail?
4. Was the scope[25] clearly documented (either in the PID or subsequently)?
5. Does the Final Report robustly justify the intended approach?

[22] In the current context we take "background" to be mean the client/business background as expressed in the business need and business objectives. In the case when a real client does not exist, the alternative information identified in (at the end of) the PID guidance can be used instead

[23] Needless to say if (at the start of the project) the PID was not seen as being reasonable, then the PID should have been rejected until the matter was rectified.

[24] Meaning: Specific; Measurable; Achievable; Relevant (to the Business; traceable to the business need/ objectives); Time-bound

[25] Scope should cover both what the student will (and possibly won't) do and what the student will (and possibly won't) produce

6. Does the Final Report provide a description of the execution of the approach at an appropriate level of detail? Was execution of the approach carried out to a high standard?
7. Was the student proactive in their handling of the project?

Pass-fail criteria

- Assessment criteria 1 and 3 above

3. Outcome

Inputs to be considered

i. Project objectives; Project plan; Quality plan; Scope definition; Requirements document[26]
ii. Final Report; end-Project report; User Guide
iii. Demonstration
iv. Code submission[27]
v. Any additional information available about the outcome

Assessment criteria

1. Were the project objectives met? Were they demonstrated to have been met?
2. Were the products identified in the project objectives/plan/scope delivered and did they have the required core[28] characteristics and quality features?
3. Did the code submission contain the required data, and was it submitted on time?

Pass-fail criteria

- A minimal final deliverable was produced which satisfies some of its core requirements[29]

4. Verification and validation (V&V)

Inputs to be considered

i. Final Report
ii. Review meetings (with Supervisor)
iii. Any additional information available about V&V on the project

Assessment criteria

1. Was appropriate validation of interim products carried out during the project (e.g., of project objectives, requirements, designs) to ensure that quality expectations and user needs were being addressed?

[26] The form of the definition of the intended outcome may vary from project to project
[27] See Section 2 above
[28] Students have been advised to divide scope into a core – which they are confident of delivering, together with optional additional features. The priority should be to deliver the core features with high quality.
[29] Students are strongly encouraged to gain feedback on this issue from their supervisor via product review meetings.

2. Was appropriate validation of the final product carried out to ensure that quality expectations and user needs were met?
3. Was appropriate verification/quality control carried out to ensure compliance with the requirements and quality plan?
4. Were methods chosen for V&V appropriate, and was their usage (and results) documented in the Final report?

Pass-fail criteria

- Some verification and/or validation of the final product/outcome was carried out and documented in the Final Report

5. Legal, social, ethical and professional (LSEP)

Inputs to be considered

i. Final Report
ii. Any additional information available on LSEP issues

Assessment criteria

1. Does the Final Report provide an appropriate (retrospective) evaluation/discussion of LSEP issues that were encountered/relevant to the project?
2. Were LSEP issues identified during the project and factored appropriately into the execution of the project?
3. Does the evaluation of LSEP issues have appropriate breadth and depth, and does it demonstrate appropriate knowledge and/or research?
4. Did the project adhere to the University's Ethics policy and requirements for ethical approval?

Pass-fail criteria

- Assessment criteria 1 and 4 above

6. Project management

Inputs to be considered

i. PID; Highlight reports;
ii. Stage objectives, plans and reviews;
iii. end-Project report; project post-mortem;
iv. Any other project management artefacts (e.g., exception reports & plans)
v. Final Report
vi. Review meetings (with supervisor)
vii. Any additional information available about the management of the project

Assessment criteria

1. Were the project management artefacts (i above) produced in a timely fashion and did they adhere to the quality criteria set out on the PRCO304 documentation?
2. *At the start of the project*, was the PID seen as reasonable by the supervisor?

3. Were review meetings held as planned/required and were they effective?
4. Were deviations from the plan a result of mis-management[30]?
5. Was project control exercised properly (and in line with the control plan identified in the PID) with respect to:
    a. Schedule control
    b. Risk management
    c. Communication
    d. Stage management
    e. The use of exception reports and (supervisor-agreed) exception plans
6. Does the Final Report provide a reasonable overview of the project management of the project, and do the appendices contain copies of the project management artefacts?
7. Was the student proactive and "on-top of" their management and handling of the project?
8. Does any additional information that is available suggest that the project has been well-handled?

Pass-fail criteria

- Assessment criteria 2; was a PID submitted on time?
- Were the majority of Highlight reports produced on time and did they adhere to the quality criteria set out on the PRCO304 documentation?
- Were the majority of review meetings held as planned/required?

7. Reflection

Inputs to be considered

i. Final Report, particularly: end-Project report; project post-mortem
ii. Any additional information available about the student's reflection on the project

Assessment criteria

1. Does the end-Project report provide a robust, objective and detailed evaluation of the achievement of the project objectives?
2. Does the post-mortem provide a reflective evaluation (e.g., of methods, approaches, technologies, etc.), and suggest/justify lessons learnt and/or alternatives that (with the benefit of hindsight) might have been preferable?
3. Do the project conclusions provide a reasonable summary?
4. Do the student's evaluations/reflections have depth?

Pass-fail criteria

- Does the end-Project report provide an evaluation of the achievement of the project objectives?
- Does the post-mortem provide some reflection on methods/approaches/technologies?

[30] Deviations from the plan are acceptable provided they are not the result of mis-management, and provided they are well managed.

8. Communication

Inputs to be considered

i. Final Report
ii. Demonstration
iii. Review meetings (with Supervisor)
iv. Any further communications

Assessment criteria

1. Is the Final Report written and presented to a quality (e.g., structure, clarity, conciseness, grammar, typos) that would be acceptable in a professional environment?
2. Does the Final Report include a statement of the word count, and is this within the stated limit?
3. Were the demonstration and supervisory meetings conducted effectively (and with appropriate planning), and was student communication there-in clear & authoritative?

Pass-fail criteria

- Does the main body of the Final Report exceed 5000 words?
- Does the Final Report have an appropriate structure[31] and provide at least a basic overview of the project?
- Did the demonstration provide a basic understanding of the project and its products/outcomes?

[31] E.g., As given in the FinalReport guidance