Department of Computer Science
School of Mathematical and Computer Sciences
Heriot-Watt University

4th Year Dissertation

2021/2022

Guidelines, calendar, and other snippets

BSc Honours in Computer Science
BSc Honours in Computer Systems
BSc Honours in Information Systems
MEng in Software Engineering

Honours Project Coordinators

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Previous Versions
Stefano Padilla: 2019
Alasdair Gray: 2014 revised 2015, 2016, 2017
Peter King: August 2008, revised August 2009, 2010, 2011, 2012

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1 About this document

The purpose of this document is to:

- Explain how the final year dissertation works.
- Specify the complete calendar for your dissertation work.
- Provide guidelines about the main aspects of the dissertation.
- Summarise dissertation-related information in the final year.

2 Important dates at a glance

The table below summarises the milestones and the deadlines: those given as a specific week mean the end of the respective week. See *Section 8* for details on deliverables.

Deadline	*Milestone*	*Submitted via*
Semester 1 Week 2	Project allocation form completed	Project system
Semester 1 Week 7	Ethics and Health & Safety forms	Project system
22 Nov 2021 (15:30 Local Time)	Deliverable 1 submitted	CANVAS
Semester 1 Week 14	Feedback session completed	
21 Apr 2022 (15:30 Local Time) [TBC]	Dissertation submitted	CANVAS & project system
7-14 May 2022 [TBC]	Online Discussion/Presentation Session	Online (Teams/Skype)

Semester 1 Week 1 = 13th September 2021
Semester 2 Week 1 = 10th January 2022
The final presentation/dissertation submission dates are to be confirmed in Semester 2

3 Online Project System

The honours projects are managed through an online system available at

https://www.macs.hw.ac.uk/cs/project-system/index.php?group_id=ugcse

Your username is the same as for other Heriot-Watt systems, but you will have a different password which will have been sent to you at the start of the year[1].

The online project system allows you to modify the title and abstract of your project. Please ensure that these are as accurate as possible. Any changes you make to the title or abstract, or any changes to the supervisor or second reader (which would be made by the Project Coordinator) will be emailed to all parties concerned. Your application for ethical approval is also managed through the project system (see *Section 5*).

An archive of past projects is available through the project management system. These are available for you to browse by clicking on the "*Completed Projects*" link on the "*Project*" menu. Distinction level

[1] The Honours Project Coordinator can reset your password if required.

projects are marked with a red asterisk. You can filter the list of projects by year, supervisor, or degree programme. As part of the submission of your dissertation, you are required to upload a PDF of your dissertation together with the associated files to the project system.

4 How are dissertation topics allocated?

Your choice of dissertation should reflect the educational aims of your degree programme and should enable you to demonstrate the subject mastery for your programme. These can be found in your programme handbook.

To be allocated a dissertation, you need a *supervisor* and a *topic*. There are two ways to get these.

- ## Choosing a topic on offer

  A list of dissertation topics (titles and abstracts) offered by staff members is available from the honours project system by clicking on the "View Proposals" link under the "Proposals" menu. Logging into the project system will show you a list of topics suitable for your degree. It will also allow you to contact the project proposers by email.

  You should identify the projects that you find appealing and contact the staff members proposing them. The project system provides a link to allow you to email the proposer of a topic. Each staff member will discuss the project's availability with you.

  Once both you and the staff member are satisfied, the project can be allocated by the supervisor. They need to log into the project system, click on the "My Proposals" link under the "Proposals" menu and then click on the "Allocate Project" button next to the relevant project. The student to be allocated can be selected from the drop-down list.

- ## Proposing your own topic

  If you have your own idea for a dissertation, identify a member of staff who has the technical competence for supervising the project (ask your Personal Tutor, the Honours Project Coordinator, or the fourth-year supervisor to help you here if needed). Once you identify a potential supervisor, discuss your idea with them, especially:

  - Is your idea suitable for a good final year dissertation?
  - Is the necessary equipment available or can it be bought through the Student Equipment Fund[2]?
  - If any company or body outside the Department is involved, do they guarantee to commit sufficient time and resources?

  If a member of staff agrees to supervise you, and the answer to all the questions above is yes, you can go on with your own dissertation. You will need to create a new project proposal and then have the staff member allocate the project to you.

5 Ethics

Note: All **projects are required to make an ethical approval application. Projects without appropriate ethical approval will be given a mark of 0**.

Ethical approval applications are made through the project system by completing the form available through the "*Ethical Approval*" menu. This form is also used to make a health and safety risk assessment for the project. There are three levels of ethical screening, depending on the project and its use of human subjects. All students must complete the "Health and Safety Risk Assessment" section.

[2] https://www.hw.ac.uk/schools/mathematical-computer-sciences/departments/computer-science/student-equipment-fund-sef.htm (alternative URL: http://tiny.cc/hwsef)

No human subjects: For projects where there are no human subjects you need to

- State the aim of the evaluation mechanism and tick the checkbox stating that "*None of the above*" applies. Do not tick any of the other boxes.
- Complete the "*Health and Safety Risk Assessment*" section.

Interface only: For projects where the use of human subjects is to evaluate an interface, then the following sections of the form should be completed. Note that approval must be granted by your supervisor in the project system before any evaluations are conducted.

- State the aim of the evaluation mechanism and tick the checkbox stating that Human subjects are involved. Do not tick any of the other boxes.
- Complete the "*Interface Only Screening*" section declaring that you will conduct your evaluation according to the criteria outlined.
- Complete the "*Health and Safety Risk Assessment*" section.

Human subjects: For all other projects involving human subjects, then the full ethical approval form must be completed before any work with the human subjects. The School's Ethical Coordinator must grant ethical approval before any work with humans is conducted.

- State the aim of the evaluation mechanism and tick the checkbox stating that Human subjects are involved. You should also consider whether you are using personal or sensitive information (as defined by the Data Protection Act[3] and GDPR).
- Check the "*No*" option in the "*Interface Only Screening*" section.
- Complete the "*Full Ethical Screening*" section.
- Complete the "*Use of Human Subjects*" section.
- Upload the consent form to be handed out to participants; examples can be found on CANVAS.
- Complete the "*Data Protection Compliance*" statement.
- Complete the "*Health and Safety Risk Assessment*" section.

It is your responsibility to keep your ethical approval correct throughout the year. If your work changes to involve more work with human subjects, you will need to update your Ethical Approval application *and* wait until it is approved *before* any work with human subjects starts.

5.1 Consent Forms

In *all* cases involving human subjects, you *must* give each subject a statement of what they are being asked to do and why. Sample consent forms are available on the F20PA CANVAS course. (note you should take into account any physical/face-to-face interaction/limitations between yourself or human subjects – i.e., data collection/testing and how these should be conducted – given the COVID19 situation).

You should keep a copy of all completed consent forms in a safe place, and a sample form included as an appendix to your dissertation. Each participant *must* sign and date a consent form that indicates that they understand why they are participating in the experiment and that they are free to leave the experiment at any time. You should keep these consent forms safely.

Any data gathered from experiments involving human subjects should be anonymised so that individuals cannot be identified. Only the anonymised form of data should be uploaded to the project system at the end of your dissertation.

[3] https://www.jisc.ac.uk/guides/data-protection-and-research-data

5.2 Health and Safety Risk Assessment

All projects are required to complete the "Health and Safety Risk Assessment" section of the ethical approval form. For many projects, the assessment will be simple — only standard software is being used in an office environment, and no special safeguards are needed. If your project requires the use of specialist equipment, e.g. robots, eye trackers, etc., or use of devices not in a standard office environment, e.g. use of mobile devices while moving around, then the risks should be identified and appropriate measures to mitigate these risks.

6 What are the different types of project?

There are broadly speaking two styles of project. These are:

- Research-based: focus on investigating some research hypothesis generally through surveys or observing human behaviour with some existing system.
- Technical: focus on implementing some software and evaluating it or developing a formal framework and proving its correctness.

Table 1 gives a breakdown of the work to be conducted in each style of the project. Additional guidance notes for research-based projects can be found in *Appendix B*.

Semester	*Research-based*	*Technical*
1	▪ Conduct a literature review of existing related work. ▪ Decide on research questions and style of research – exploratory or confirmatory (see *Appendix B.1*). ▪ Identify appropriate research methods – qualitative or quantitative (see *Appendix B.1*). ▪ Define the scope of the project.	▪ Conduct a literature review of existing related work. ▪ Identify system requirements. ▪ Outline the initial system design and technology choices. ▪ Define the evaluation strategy.
2	▪ Design and implement research methodology. ▪ Conduct your research according to the methodology. ▪ Analyse results and discuss in relation to the research hypothesis. ▪ Write up the dissertation. ▪ Prepare for online discussion/presentation session.	▪ Iteratively develop and improve the prototype. ▪ Perform detailed evaluation. ▪ Analyse results with respect to the original aim and objectives. ▪ Write up the dissertation. ▪ Prepare for online discussion/presentation session.

Table 1: Typical programme of work for the different types of project.

7 How are projects supervised?

Supervision of projects **varies** from member of staff to member of staff. However, you should meet regularly with your project supervisor; **typically, these would be small meetings during semester time (week 1-12)**. The structure of the project meetings will be defined by the supervisor, and may vary in format and duration (e.g., **group sessions** or short one-to-one discussions). Please remember as well, the meetings will depend on **availability** (illness/holidays). These meetings should commence

as soon as your project is allocated; it is your responsibility to contact your supervisor to arrange these meetings. You may agree on a mutually convenient fixed slot which can be rearranged via email as required. If you are not going to attend a session, please inform your supervisor via email. **Depending upon the given the COVID19 situation for 2021-22, these interactions may be undertaken virtually as well (i.e., meetings and discussions with supervisors conducted online via Teams/Skype**).

Project meetings are your opportunity to update your supervisor on your progress and get guidance for the future direction of your work. You will receive verbal feedback on your progress at these meetings and may also receive feedback on drafts of deliverables; this is at the discretion of your supervisor. You can expect feedback on chapters of your dissertation providing you give sufficient time (e.g. a week or more) to your supervisor to read them and give you feedback (see *Section 2* and *Section 10.4*).

Important!

- **The structure of the project meetings will be defined by the supervisor, and may vary in format and duration (e.g., group sessions or short discussion meetings).**
- You *must agree on a project timetable* with your supervisor in time for inclusion in the first deliverable.
- You are *strongly* encouraged to ask your supervisor to identify examples of good dissertations from previous years; these are available through the "*Projects → Completed Projects*" section of the project system.
- You *must agree with the dissertation contents* with your supervisor.
- You must allow sufficient time to let your supervisor read chapters and give you feedback so you can incorporate their comments and produce a final copy on or before the hand-in day (see deadlines, *Section 2*).

8 What are the dissertation deliverables?

The *deadlines* related to all deliverables are listed in *Section 2*. This section gives essential information about each deliverable. *The supervisor and the second reader assess all deliverables*; all assessments are integrated into your final mark. The exact formula of your final assessment is given in *Section 10*. The marking rubrics for each deliverable are available through CANVAS associated with the appropriate assessment.

Note that projects without appropriate ethical approval will be awarded a mark of 0.

8.1 Deliverable 1: Research Report

What should it contain? At least the following sections:

Front Matter

- Title page: including the following details
  - Title of your project.
  - Your full name.
  - Your supervisors' names.
  - The caption "Deliverable 1: Final Year Dissertation".
  - The degree programme for which you are studying.
- Declaration: confirming that the dissertation is your own work (see *Appendix C.1*).

- Abstract: a short description of the project and the main work to be carried out – probably between one and two hundred words.
- Table of Contents: giving the main chapter and section titles and the pages on which they start.

Main Body

- Introduction: summarising the context of the dissertation project, stating the aim and objectives of the project, identifying the problems to be solved to achieve the objectives, and sketching the organisation of the dissertation.
- Background: discussing related work found in the technical literature and its relevance to your project.
- Requirements Analysis/Research Methodology: One of the following sections depending on the style of the project:
    - Requirements Analysis: This is required for technical projects and should be linked back to the project aim and objectives. It should provide a detailed use case scenario and suitable use case descriptions, user requirements, and MoSCoW analysis of the requirements.
    - Research Methodology: This is required for research projects and should be linked back to the project aim and objectives. It should describe the research methods that will be employed in the project and the research questions that will be investigated.
- *Design (optional):* an initial design of software or sketch of the research methodology.
- Evaluation Strategy: Details of the evaluation and analysis to be conducted.
- Project Management: This section should include:
    - A timetable for the whole year agreed with your supervisor and specifying activities, deliverables and deadlines.
    - An analysis of the risks for the project together with appropriate mitigation plans, i.e. not due to illness.
    - A well-researched consideration of any Professional, Legal, Ethical, and Social Issues pertinent to the project. (e.g. codes of conduct (BCS), codes of practice, standards, computer law, ethical decision making, intellectual property, social aspects, copyright, data protection, and so on).

Back Matter

- References: listing complete details of all the documents cited in the text.
- Appendices: to include additional material, consult with your supervisor.

Please notice this is a *minimum* set of requirements. If you have done more than what is suggested here, for instance, a preliminary implementation or tests of existing software tools, by all means, *report it*. Use the marking rubrics to guide you on which areas you will be assessed (*Appendix D*).

Any special format? Research reports should be succinct and stick to relevant materials, with supplementary material in appendices. It should conform to the formatting specification given in *Appendix C.2*. The *main body* in the **D1 report should not exceed 30 pages**; reports exceeding this limit will be deducted 10% of the mark awarded. Front and back matters can be of any length (e.g. table of content, references, appendices can be of any length).

Where do I hand it in? Through CANVAS (i.e. no paper reports required) – there is a Turnitin assignment page in CANVAS (F20PA) to allow this. You may submit as often as you like before the deadline. A plagiarism report will only be generated after the submission deadline.

When do I hand it in? See timetable in *Section 2*.

8.2 Dissertation

What should it contain? At least the following sections:

Front Matter

- Title page: including the following details.
  - Title of your project.
  - Your full name.
  - Your supervisors' names.
  - The caption "Final Year Dissertation".
  - The degree programme for which you are studying.
- Declaration: confirming that the dissertation is your own work (see *Appendix C.1*).
- Abstract: a short description of the project and the main conclusions – probably between two and three hundred words.
- Table of Contents: giving the main chapter and section titles and the pages on which they start.

Main Body

- Introduction: summarising objectives, problems solved to achieve the objectives, methods, results, achievements and limits, and sketching the organisation of the dissertation.
- Background: discussing related work found in the technical literature and its relevance to your project.
- A central part in several sections, describing the work carried out as part of the dissertation.
- Testing and performance assessment reporting on performance evaluation and any experimental work carried out.
- Conclusions: summarising:
  - the main achievements of your work, in relation to the initial objectives as well as similar work by others;
  - the main limitations of your work;
  - possible extensions and future work.

Back Matter

- References: listing complete details of all the documents cited in the text.
- Bibliography: listing documents related to your work but not cited in the text (if applicable).
- Appendices: consult with your supervisor on what to include in the appendices.

There is no recipe for a "perfect" dissertation; the above is a set of good practice guidelines to structure your document. You are strongly encouraged to ask your supervisor for examples of good-quality dissertations from previous years or to browse the past projects available through the project system. Use the marking rubrics to guide you on which areas you will be assessed (*Appendix E*).

Any special format? Dissertations should be succinct and stick to relevant materials, with supplementary material in appendices. It should conform to the formatting specification given in *Appendix C.2*. The *main body* in the Dissertation report should not exceed 60 pages; Dissertation reports exceeding this limit will be deducted 10% of the mark awarded. Front and back matters can be of any length (e.g. table of content, references, appendices can be of any length).

Where do I hand it in? Through *CANVAS* and the *project system*:

1. A copy of your dissertation text as a PDF through the TurnItIn assignment in the F20PA CANVAS course. A plagiarism report will only be generated after the submission deadline.

2. A copy of your dissertation text together with a zip file containing your electronic files (see *instructions below*) through the project management system.

When do I hand it in? See timetable in *Section 2.*

Electronic Copy Submission (project system)

What should it contain? Machine-readable copies of your documents, your code, your experiments, your anonymised data, and your analysis. No personal or copyright restricted data should be uploaded to the project system.

Any special format? The electronic version should be compressed with a ZIP compression format and readable on a standard departmental PC.

Where do I hand it in? Through the honours project system (https://www.macs.hw.ac.uk/cs/project-system/index.php?group_id=ugcse).

8.3 Online Discussion/Presentation Session

At the end of the exams in semester 2 a 10 minute session is held where each student will demonstrate and summarise their project, and the results obtained. The date of the session will be coordinate by the student, i.e., organise a time and date for the online meeting during the week given in the timetable in *Section 2*. The online discussion session should take place after your final dissertation has been submitted; **it is your responsibility to contact your supervisor and 2nd reader to arrange the online session**. You may agree on a mutually convenient fixed slot which can be rearranged via email as required

During the session, you will summarize, demonstrate and discuss your work including answering any questions about your project. Your discussion markers[4] will mark your presentation during this session.

What should the discussion session contain? A summary of your project highlighting the key contributions.

Any special format? Summary online session:

- 5 minute presentation (online).
- 5 minutes of discussion/answering questions

Where do I hand it in? You do not need to hand-in the presentation for the discussion session. However, you need to coordinate and arrange a date and time when both your first and second reader will be available online to attend.

When is the discussion/presentation session? See timetable in *Section 2*.

9 What are the dissertation courses?

There are three dissertation-related courses coordinated by Benjamin Kenwright (b.kenwright@hw.ac.uk) in Edinburgh and Hani Ragab Hassen (h.ragabhassen@hw.ac.uk) in Dubai.

9.1 Semester 1: F20PA

The course in Semester 1 (Research Methods and Requirements Engineering) consists of a series of talks and online resources will be available online (CANVAS), such as:

[4] Your discussion markers will be your supervisor and second reader unless they are unavailable in which case another academic will be assigned.

- Departmental lecturer notes: illustrating various aspects of the dissertation-related work (e.g. writing introductions, researching literature, presenting your work, managing your project, writing tools);
- Staff notes/slides from various services within the university covering topics such as the use of the library services for research, student welfare, and careers advice.

The online resources will be available and circulated through CANVAS.

9.2 Semester 2: F20PB and F20PC

Both courses in Semester 2 are allocated to full-time, individual work on the dissertation.

10 How is my work assessed?

10.1 Who are the assessors?

All deliverables (research report, dissertation, discussion session) are assessed by your supervisor and second reader. The dissertation, which counts more than any other deliverable, is assessed by

- Your supervisor: who is familiar with your work;
- The second reader: who knows your work through deliverable 1. They assess you mostly on the basis of the dissertation;
- An external examiner: (*for a few dissertations only*) who does not know either you or your work at all, and bases their judgement entirely on your dissertation.

Important!

Given the above, it is *vital* that your dissertation can be understood by a competent academic in the department with little or no specific knowledge of your dissertation subject. Avoid unnecessary details and excessive jargon. The more the assessors find your dissertation hard to read, the more negative their judgement.

10.2 How exactly is my final mark calculated?

Your *overall* mark for your honours project is determined as follows:

- 15% Deliverable 1
- 75% Dissertation report
- 10% Online discussion/presentation session

Your *overall* degree mark is determined as follows:

- BSc Computer Science, BSc Computer Systems, & BSc Information Systems
    - 30% dissertation project
    - 50% fourth-year taught courses
    - 20% third-year courses
- MEng Software Engineering
    - 40% fifth-year courses
    - 25% fourth-year taught courses
    - 25% dissertation project
    - 10% third-year courses

10.3 What criteria do the assessors follow when marking?

The following are the main categories on the assessment forms of each deliverable; each contributes to your mark for that deliverable. The assessment forms are available through CANVAS.

Deliverable 1

- Background literature: thoroughness of review, appropriateness of references, organisation, presentation and use of references, conclusions reached.
- Requirements section: amount of detail, organisation, thoroughness.
- Schedule of work: detail, realism.
- General presentation, organisation, length.

Dissertation

- Organisation and structure.
- Conciseness and understandability.
- Amount of work achieved.
- Quality of outcome.
- Originality and initiative.

Online Discussion Session

- Summary and details of the project focus and outcomes.
- Ability to communicate ideas, whether verbally or through the presentation.
- The aesthetic quality of the presentation.
- Quality of any software demonstration.

10.4 Do I get feedback on my deliverables?

Yes. You get a copy of the assessment forms filled in by your supervisor and second reader for the first deliverable. If you require extra information from your second reader, you can also optionally request to discuss your feedback with them. **You do not receive feedback for the dissertation**. However, you can get feedback from chapters of your dissertation in your weekly meetings with your supervisor; these should give you sufficient feedback to improve the final version of your dissertation this might also include areas in your dissertation like the overall structure, critical thinking, style, quality, conclusions – please note your supervisor will not help you with small grammatical mistakes or proof-read your dissertation chapters.

A FAQs

How long should my dissertation be? See *Section 8.1/8.2*.

Should I include my code or not? See *Section 8.3*.

Do I need a special cover or first page? See *Section 8.3*.

Can I have an extension on deadlines? You are told the exact deadlines for the whole year in week 1, semester 1; so, you have plenty of time to get organised. However, the University recognises that, on occasion, students may be unable to submit coursework and dissertations on the submission date. In these cases, the University's Submission of Coursework Policy outlines are:

- No individual extensions are permitted under any circumstances.
- Standard 30% deduction from the mark awarded (maximum of five working days).

- In the case where a student submits coursework up to five working days late, and the student has valid mitigating circumstances, the mitigating circumstances policy will apply and appropriate mitigation will be applied.
- Any coursework submitted after five calendar days of the set submission date shall be automatically awarded a no grade with no formative feedback provided.

Please contact your Personal Tutor or Supervisor if you are unable to meet the deadlines or need information for *Temporal Suspensions of Studies* or *Mitigating Circumstances*.

How much is the dissertation worth in my final evaluation? See *Section 10.2*.

My dissertation file is too big for TurnItIn. TurnItIn has a maximum file size of 40mb. You will need to ensure that your dissertation file is less than this size. High-resolution images can be included in the supplementary material submitted through the project system.

How can I avoid collusion or plagiarism? The deliverable and dissertations are your own work (see *FAQ C.)* as so here are some reminders:

- Reports must be written in your own words and any code must be your own code. If some text or code has been taken from other sources, these sources must be properly referenced.
- Failure to reference work that has been obtained from other sources or to copy the words and/or code of another student is plagiarism and if detected, this will be reported to the School's Discipline Committee. If a student is found guilty of plagiarism, the penalty could involve voiding the course.
- Students must never give hard or soft copies of their reports or code to another student. Students must always refuse any request from another student for a copy of their report and/or code.
- Sharing a report and/or code with another student is collusion, and if detected, this will be reported to the School's Discipline Committee. If found guilty of collusion, the penalty could involve voiding the course.

B Additional Guidance for Research-based Projects

The text for this appendix was put together by Judy Robertson in July 2011 with input from Greg Michaelson, Rob Pooley, and Mike Chantler. It has subsequently been refined with input from Jenny Coady and Tessa Berg.

The aim is to provide additional guidance notes for students embarking on a research-based project.

B.1 Research Method

There are a number of choices to be made in the course of your dissertation. One of the most important is deciding which research methods you will use. This depends on whether you are conducting exploratory or confirmatory research.

Exploratory research

Exploratory research is conducted on problems where there has been little previous research. In the field of technology, this often occurs because a new product has emerged which changes how people perform tasks. The aim of an exploratory study is to raise and provide initial answers to research questions, perhaps with a view to developing a new theory. For example, in 2006 when the Wii game console was introduced, a student might have conducted exploratory research to investigate the ways in which the Wii games console changed interactions between family members in the living room. There would have been no prior theory about this as that particular technology didn't exist. The student could

have formulated sensible research questions to ask based on the previous academic studies about the impact of other sorts of consoles on the family group though.

Confirmatory Research

Confirmatory research, on the other hand, starts with an existing theory and aims to test hypotheses relating to it. This is appropriate where more prior research has been conducted in the area. For example, if there was a theory which predicted that left-handed users would be disadvantaged by using the play station game controller, then a confirmatory study would ask both right and left-handed users to use the game controller for a period and evaluate whether left-handers performance did indeed suffer. Again, a thorough literature review will help you to decide what theory might be appropriate to test and what other empirical results have been found in the area recently.

Qualitative versus Quantitative methods

There is a whole toolbox of research methods which you can use to answer your research questions, whether they are exploratory or confirmatory. There are no right and wrong answers about which method you should use – one method is not "better" than another. It depends on what you are trying to find out. There may be multiple valid ways of approaching the same set of questions (see below for some methods commonly used in research projects). The point is that the methods you use should be appropriate and you should apply them rigorously and honestly. *Qualitative methods* refer to research methods which attempt to answer questions by collecting data in the form of words, pictures, video and artefacts and analysing these data sources in a systematic way based on your interpretation of their meaning. *Quantitative methods* involve the collection and rigorous statistical analysis of numerical data in an objective way. Often (but not always) qualitative methods are used in exploratory work, and quantitative methods are used for confirmatory research. It is often effective to use complementary qualitative and quantitative techniques together, such as following up trends indicated by analysis of questionnaire data with in-depth qualitative analysis on interviews.

Collecting data for qualitative analysis.

- Interviews with subject experts.
- Diaries kept by users.
- Observation of technology used in a real environment (such as an office or class).
- Interviews or focus groups with users.

Collecting data for quantitative analysis.

- Counts of user errors.
- Timing users as they attempt to complete tasks.
- User satisfaction questionnaires.
- Automatic log files recording users' interface actions.

B.2 What makes a good research-based project?

Here are some of the things markers are looking for in a good project:

- A thorough and up to date literature review consisting of respectable academic articles rather than just web pages.
- A coherent argument about why your research will contribute to what has already been discovered by previous researchers
- A discussion of why you chose your research methods, and how you developed your research instruments. Here "instruments" means the tools you use to make measurements, such as a

user satisfaction questionnaire or a set of interview questions. If you choose to create your own instrument rather than using one previously published in the literature, you should make sure you construct it correctly and pilot test it.

- If you conducted an experiment, you should explain your reasoning behind the choice of experimental design (e.g. why you chose within-subjects rather than between-subjects).
- If you are doing quantitative analysis you should report descriptive statistics at the very least. If you are hypothesis testing, you should make sure you have picked the right form of statistical test for the type of data and experimental design you have (see books listed on CANVAS for this). You should report the test results thoroughly, including effect size.
- If you are doing qualitative analysis you should describe which coding scheme you used (either from the literature or one you devised).

C Document Preparation

C.1 Declaration

The following declaration statement should be included in both the first deliverable and the final dissertation.

> DECLARATION
>
> I, *your name* confirm that this work submitted for assessment is my own and is expressed in my own words. Any uses made within it of the works of other authors in any form (e.g., ideas, equations, figures, text, tables, programs) are properly acknowledged at any point of their use. A list of the references employed is included.
>
> Signed: *your signature*
> Date: *date of submission*

C.2 Formatting

- Typed, double spaced, (font size) point size 11, 1-inch margins on A4 sheets. Excerpts of code or pseudo-code, captions and the like should be single spaced.
- Pages should be numbered, as should chapters and sections within chapters.
- Chapters should start on a new page.

D Deliverable 1 Marking (D1)

The D1 marking criteria will be broken down into a number of key areas:

- Introduction/motivation, (**10%**)
- Literature review, (**40%**)
- Requirements and/or proposed methodology (incl. evaluation) (**30%**)
- Project plan (incl. professional, legal, ethical, and social issues) (**20%**)

Then there will be three sections for feedback

- Strengths:
- Weaknesses:
- Improvements:

Final mark will be allocated out of 100 (i.e., 0-100)

General guidelines and checklist on what each area section should contain

Criteria	*General Guidelines/Checklist*
Introduction/motivation (10%)	• Abstract, Aims, Objectives, Project Description • Are these clearly expressed, testable, and achievable?
Literature review (40%)	• How relevant is the literature that is covered? • Is there missing material? • Is it well structured? • Are good quality sources used and properly cited? • How strong are the comparative and critical aspects? • Is the literature review of an appropriate length?
Requirements and/or proposed methodology (incl. evaluation) (30%)	• Are the requirements and/or hypothesis/research questions clearly expressed, testable, and achievable? • Are there details for any strategy for testing and evaluation
Project plan (incl. professional, legal, ethical, and social issues) (20%)	• Is a realistic project plan and timetable proposed? • Has a risk analysis been performed and sensible mitigation plans proposed? • Is there a safe core to the project, with scope for more challenging activities? • Does the student show a good understanding of the PLES issues relevant to the project and discussed these?

E Dissertation Marking

The final dissertation marking criteria will be broken down into a number of key areas:

- Motivation and scope (20%)
- Project Background (20%)
- Implementation/Work conducted (20%)
- Evaluation and conclusions (20%)
- Quality of the document (20%)

Then there will be two boxes for feedback
- Strengths:
- Weaknesses:

Final mark will be allocated out of 100 (i.e., 0-100)

General guidelines and checklist on what each area section should contain

Criteria	*General Guidelines/Checklist*
Motivation and scope (20%)	• Is the topic meaningful, complex and challenging? • Does the report justify any technical qualities, rationales and objectives? • Are the objectives and aims clearly stated?

	• Are the main areas of investigation for the project identified? • Has the student provided ideas and approaches of original thinking?
Project background (20%)	• Is there evidence of sufficient background reading? • Is there evidence of a clear understanding of the project area/research topic? • Is the literature study up to date and critically evaluated? • How pertinent is the background/referenced material? • Has the student used appropriate tools/software? • Have the appropriate design methodologies been employed? • Is the topic investigated to an appropriate depth?
Implementation/work conducted (20%)	• Is the implementation (and/or) work conducted appropriate and correct? • Does the student demonstrate an appropriate level of understanding of the work?
Evaluation and conclusions (20%)	• Are the results presented clearly in a logical manner? • Are problems and difficulties explained? • Does the student demonstrate an understanding and interpretation of results and their significance? • Is the application/product complex? Or is it of limited functionality? • Does the student demonstrate an appropriate level of understanding of the complexities of the project? • Is there any critical evaluation of the project? • Has the student suggested future work? • Are evaluation and recommendations coherent and logical?
Quality of the document (20%)	• Is the writing clear, concise and with good English? • Is the dissertation sensibly structured into chapters and sections? • Is the dissertation of an appropriate length? • Is the approach adopted well justified? • How well did the student discuss and explain their own work? • Is the dissertation as a document of a high standard, appropriate for an honours degree? • Are the appendices relevant? • Does the student appear to have undertaken a significant volume of work? • Was the student required to master new material to enable them to undertake the project? • Does the dissertation show a deep understanding of the topic?

F Online Discussion Session Marking Guidelines for Staff

Guidelines for Marking Online Discussion/Demonstration Session

The purpose of the mark allocated for the online discussion/presentation component of the project is to assess the student's ability to articulate and discuss the results of their research coherently and professionally. Accordingly, the marks awarded for the discussion session should focus on the quality of the online presentation and the ability of the student, through the medium of their demonstration augmented by their own explanations, to describe the work they have undertaken. Where the student has no demonstration, either because of the nature of their project or because of commercial confidentiality, the marker should concentrate more on their ability to verbally describe the outcomes of their project.

The discussion session is an opportunity for the student to discuss and demonstrate their work, while giving them a chance to present any further material or comments they may have prepared.

A suggested marking scheme is as follows, although academic staff may exercise their judgement to mark more flexibly if they feel the student discussion deserves it:	
Criteria	*Marks*
Articulate, explain and summarize concisely the project focus and outcomes.	0 to 4
Clear exposition of the project (verbally and/or through slides/demo).	0 to 4
The aesthetic quality of the presentation, and possibly of the demonstration.	0 to 2
Additional Comments	