CS408 INDIVIDUAL PROJECT

Information and Guidance 2025-26

SEPTEMBER 12, 2025

DEPARTMENT OF COMPUTER & INFORMATION SCIENCES

Contents

Note - the information in this guide is believed to be accurate at the time of publication, but if you notice any typos or issues, please contact the project co-ordinator.

1. Introduction

The information in this document is for the module CS408 Individual Project – the official syllabus is available via the CS408 Syllabus page. Each student taking CS408 Individual Project is expected to complete a departmentally approved project under the supervision of a member of staff. The sections below are organised in chronological order. The next section describes each of the deliverables and their due dates, and subsequent sections provide details regarding what you will need to do for each deliverable.

Important! You must obtain a mark of 40% or more for your project to qualify for consideration for an Honours or MEng degree in Computer Science or a Computer Science-related subject. This fourth-year class is worth 40 credits which means that you are expected to spend a nominal **400 hours** on your project.

The British Computer Society (BCS) sets certain accreditation requirements for Individual Projects for both BSc (Hons) and MEng degrees which can be found in section 12. British Computer Society Individual Project Accreditation Requirements.

1.1 Project Skills Support and Myplace

In addition to supervision from your project supervisor, there are a series of short articles covering the skills required for your 4th year project on the CS408 Myplace page. These include aspects such as project management, ethical approval, user evaluations, and scientific writing. The Myplace page also provides links to other resources which are designed to help you with your project, so it is important to engage with them to ensure you perform to the best of your ability.

2. Project Timetable

Project suggestions released	15/09/2025
Project choices due	29/09/2025, 23:59:59
Project allocation available	06/10/2025 *if possible
Project progress report due	01/12/2025
Project progress presentation	15/01/2026
Project submission deadline	31/03/2026
Project Demo Day	02/04/2026

3. Choosing Your Project

Each year, members of staff within the Department propose a number of different project suggestions which are listed on the project suggestions page https://local.cis.strath.ac.uk/wp/extras/projects/showCS408.php

The project suggestions tend to involve themes and can be taken by more than one student but as separate, individual projects. It will be your responsibility to decide how to work out your own interpretation of the theme.

The process for choosing your project from staff suggestions is as follows.

1. You will be expected to choose six project themes from those listed on the CS408 Project Suggestions page.
2. You must choose project themes that are clearly specified as appropriate for your degree.

3. You must choose no more than two projects suggested by the **same** member of staff AND you must choose projects from a minimum of four different members of staff. This means one of the following:

    - you may choose two different projects suggested by two different supervisors W and X, plus two more from supervisors Y and Z.
    - you may choose two different projects suggested by one supervisor V, plus four more from supervisors W, X, Y and Z.
    - you may choose six projects suggested by six different supervisors.

4. For each project theme you choose, you are strongly advised to discuss it with the member of staff that suggested it. The reason for this is that your understanding of a project theme may not be what the supervisor has in mind.
5. Your project theme choices should be submitted in order of preference with 1 being your top choice and 6 your sixth best choice. However, it is possible that you may not be allocated any of your choices.
6. If you do not comply with the above, you may be allocated a project theme at random.

*There is **no guarantee** that the member of staff that suggested a project theme will end up supervising that project and although reasonable effort will be made to ensure that you are allocated one of your chosen projects, this cannot be guaranteed.*

You are responsible for thinking very carefully about the projects that you select (this means being happy with all 6 of your choices) as it is *not* possible to change project once the allocation has been completed.

4. Student and Supervisor Expectations

4.1 Student Expectations

As a student completing your 4th year project you are expected to take responsibility for the following:

1. Consider your choice of project themes very carefully to make sure that you are happy with all of your choices.
2. Obtain regular guidance on what is appropriate for your project.
3. Prepare for meetings and direct them.
4. Meet with your supervisor in person once every two weeks to inform them of progress.
5. E-mail updates on your progress to your supervisor in the weeks where you are not meeting.
6. Inform your supervisor as soon as possible if you run into difficulties, and, if appropriate, the project co-ordinator.
7. Inform the project co-ordinator if you have concerns which cannot be addressed by your supervisor.
8. Maintain appropriate backups of your work, preferably using the department GitLab server.
9. Agree with your supervisor appropriate deadlines to obtain feedback on your work.

10. Take initiative and responsibility for project progress, including technical problems such as debugging code.
11. Read the guidance in this document and on Myplace in depth.
12. Reflect and respond to supervisor feedback.
13. Take steps to understand required deadlines, marking criteria, and develop the necessary skills for your project.

4.2 Supervisor Expectations

Supervisors are expected to:

1. Agree with the student the best way to communicate and set regular meetings.
2. Meet with students in person once every two weeks for 30 minutes throughout Semesters 1 and 2.
3. Provide guidance on the process and requirements of a 4th year project. Note this can be verbal or written.
4. Inform the project co-ordinator if the student is struggling or not in regular contact.
5. Provide in-depth feedback on one chapter of the report in a timely fashion, as agreed in advance with the student.
6. Provide high level feedback on a complete draft of the report in a timely fashion, as agreed in advance with the student.
7. Provide feedback on interim work as appropriate and agreed with the student.
8. Seek clarification from the project co-ordinator where needed.
9. Point students towards university services where appropriate, e.g. library skills, study skills, student wellbeing.

5. Project Progress Report

Around week 10/11 of semester 1, a project progress report is required. This report provides an opportunity for structured feedback on your project progress and plans. See 2. Project Timetable for dates.

5.1 Project Name and Marking Scheme

Before submitting your progress report, you should decide on a project title and marking scheme. You should discuss the most appropriate marking scheme with your supervisor – further detail on marking schemes can be found in 11.2 Marking Schemes.

5.2 Progress Report

The purpose of this report is to present the background and scope of your project. It is an opportunity for feedback, including feedback on your writing. It also means you can make adjustments on the basis of this feedback to refine your work and achieve the best mark you can for your final report. It is not formally assessed but can contribute to the Student Performance mark in your final submission.

Submission of this is completed through the appropriate assessment activity on Myplace. The

submission should contain the following:

A report (the main body of which is a maximum of 12 pages) covering:

- Project Aims and Objectives (approximately 1 page)
- Related Work Chapter (approximately 5 pages)
- Project Specification (approximately 2 pages)
- Project Plan including summary of progress – ideally includes some prototype development (approximately 2 pages)
- Brief summary of proposals for Development Methodology, Design, Implementation, Testing and Evaluation including proposed technologies to be used (approximately 2 pages).

The page count of 12 is exclusive of bibliography and appendices.

The text should be the default font for Latex (i.e. Computer Modern) or Word (Aptos) and should be size 11. An equivalent sans serif font in size 11 from alternative word processing software is also acceptable.

6. Project Progress Presentation

The next submission is in January, when you will give a progress presentation to your second marker (your project will be marked by two people which is explained in section 11. How Your Project is Assessed).

6.1 Guidelines for Preparing Your Progress Presentation

The purpose of this submission is to demonstrate that progress has been made with your project, your plans, and to highlight any changes that may have been made as a result of feedback on the interim report submitted in Semester 1. It also explores your ability to present your project and demonstrate depth of understanding.

The presentation will be given to your second marker who will provide you with feedback. The date of the presentation can be found in 2. Project Timetable.

This deliverable takes the form of a presentation, potentially including a demo of a prototype, with a maximum of 10 slides. The presentations will normally be presented on the computers in the 11th or 12th floor lab.

You should briefly summarise the following information:

- Aims and Objectives
- Summary of Related Work
- Project Specification
- Progress to date, e.g. demonstration of prototype, presenting UI design. You should speak with your supervisor to determine what this might be for your project.
- Approach to Development – Methodology, Design, Implementation and Technology ideas
- Testing and Evaluation plans

In addition, the slides must contain your name, the title of the project, the proposed marking scheme, the name of your project supervisor, and the name of your second marker.

Your Project Progress Presentation slides should be submitted through Myplace as a single PDF file, using the appropriate assessment activity by 9am on the day of the presentation.

When thinking about how you will evaluate your project, you should also consider whether or not you will require ethical approval for your evaluation (see the section 7. Evaluation and Ethics Approval) and ensure you take this into account within your project plan.

6.2 The Project Progress Presentation Day

Each student will be required to be present either during the morning or afternoon (although you may wish also to be present for the other half of the day to see what your classmates have done for their projects).

- The morning presentations typically take place between ***11am*** and ***1pm***.
- The afternoon presentations typically take place between ***2pm*** and ***4pm***.

You will be allocated a 20-minute slot during which the presentation will be attended by your second marker. You are advised to aim for 10 minutes presenting, and 10 minutes for discussion.

The purpose of the progress presentation day is for you and your second marker to review your progress, understanding and plans for the project. The slides are just used as a visual aid to facilitate discussion. The review aims to discuss:

- The appropriateness of the proposed design for your project with respect to your project aims and objectives.
- Your technical understanding of the project, including the main challenges involved and the risks associated with it.
- Your progress and plans for the execution of the project.

Other staff and students may also wish to view your presentation and investigate the projects currently being undertaken in the department. For this reason, you should be prepared to talk about your project with a variety of visitors.

It is important to remember that your progress presentation day performance will be considered by your second marker as part of the final project assessment (see the section 11. How Your Project is Assessed) of the project.

During the project progress presentation day, verbal comments and feedback will be provided by your second marker, giving their overall impression of the approach taken, your understanding, the progression to date, and work plan, and including advice on the maintenance or revision of existing patterns of work or on possible alternative lines of development.

Further typed feedback for your project progress presentation will be provided within 3 working weeks. All feedback will be released at the same time through Myplace.

Some Presentation Tips, adapted from Dr David Harle, EEE:

- Discuss your project with your supervisor. They are there to help.
- Use a mix of diagrams and text in your presentation.
- Do not be afraid to use colour, but use it sparingly.
- Choose presentation font sizes and styles so that your presentation is readable at arm's length.
- Review the overall effect of your presentation with your supervisor, and perhaps friends and family members.
- Take time to become very familiar and comfortable with your presentation before the presentation day. Prepare a brief description of your project that answers the question "What is your project about?"
- You may also find it beneficial to prepare notes that you can use to elaborate on your presentation. Past students have reported that this has been very helpful to them.

7. Evaluation and Ethics Approval

As part of the evaluation of a project, you may wish to involve a community of users or pseudo-users. Before any testing or evaluation involving human subjects can be undertaken, you must obtain clearance from the Departmental Ethics Committee.

In order to obtain ethics approval, you should use the Ethics Approval system to provide the following information:

- Title of research
- Summary of research
- How will participants be recruited?
- What will the participants be told about the conduct of the research?
- How will consent be demonstrated?
- What will participants be expected to do?
- What data will be collected and how will it be captured and stored?
- How will the data be processed?
- How and when will data be disposed of?

The form should be submitted well in advance of any planned study. Requests are normally processed within one working week but may take longer than this for more complex studies or at certain times of the year.

The following list gives additional guidance for answering (some of) the above questions. Further guidance can be found via the Ethics in CIS web page.

1. You should say who will be asked to participate and how subjects will be selected.
2. You should say what will be asked. The only effective way to convey this information is to submit the information, release forms, and/or questionnaires that the subjects will get when they agree to participate in your evaluation.
3. You should say whether the subjects will be filling in questionnaires or giving verbal responses during the evaluation, and whether or not there are any pressures or obligations for the participants to complete the evaluation study (there should be none).
4. You should say how the results will be published. No personal data should be published, and results should only be used anonymously and in the project report.

8. Project Report Writing Guidelines

8.1 Introduction

The report of the work which you have done in your final year project is the principal means by which that project is assessed. Whilst your supervisor will have fairly detailed knowledge of your work, this is not true of other examiners. They have only your description of the work to go on. It is therefore essential that you spend time on producing a good report which presents your work in the best light possible.

It is most important that your report documents an engineering or scientific approach. The reader must be convinced that you have solved a practical problem in a professional and methodical manner, making appropriate and justified use of computer science techniques and technologies throughout.

A good final year project report should be detailed enough to allow the examiner to assess your work, and yet should not be so detailed that it is excessively tedious to read. You should make a point of outlining your general approach to the problem you are solving, as well as describing your solution in enough detail that the reader can verify that your solution *is* a solution and understand

why it is a *good* solution. You should also highlight key or innovative work in the body of the report. Details not needed to understand your overall solution or its significance (e.g. detailed design documentation and test cases) should be relegated to your report's appendices.

8.2 General Advice

Obviously, the report which you produce is highly dependent on the work which you have done. No two reports will be the same or have exactly the same structure. However, the general guidelines set out below will tell you what should normally be included.

For your particular project, it may be appropriate to include chapters or appendices other than those indicated below. The general structure described should not be taken as the only possible one. If you have any questions about the structure of your report you should discuss them with your project supervisor. You are strongly advised to let your supervisor read and comment on your report before you submit it.

Whilst writing style – even scientific writing style – is a very personal attribute, remember that your style should be such that the reader will find your work reasonably interesting and understandable. It is important that you avoid overly florid or turgid prose and convoluted constructs. When you have written something, read it back to yourself and, if it sounds confusing, pompous, or otherwise suboptimal, change it! It is almost impossible to write a perfect report the first time around, so make sure you leave yourself plenty of time to revise it. To write a good report, you will almost certainly have to re-draft it several times.

You should make appropriate use of a spell-checker (and, probably, of a grammar checker) – but do remember that such tools are no more than imperfect aids. You should therefore read over your report carefully before handing it in for assessment.

8.3 Specific Rules

There are specific requirements you *must* meet for the report on your final honours project.

1. *Title Page* You must prepare a title page. The title page must include the following, in the order shown:
    - The project title
    - Chosen marking scheme
    - Your registration number
    - Your name
    - "Submitted for the Degree of B.Sc. in Computer Science" and the academic year. If you are a Software Engineering, Mathematics & Computer Science or Data Analytics student, or on the MEng Computer Science degree, you should adjust the title of the degree accordingly.
    - "Except where explicitly stated all the work in this report, including appendices, is my own and was carried out during my final/fourth year. It has not been submitted for assessment in any other context."

2. *Imported Material* You *must* highlight in the body of the report any work, particularly code that is not your own (see the disclaimer associated with the title page). It is essential that no suspicion of plagiarism attaches to your report. It is extremely unlikely that the examiners will award a passing mark to any project where plagiarism (as opposed to referenced reporting) is suspected. If you have questions about the difference between referenced reporting and plagiarism in any particular situation, check carefully with your supervisor. See also the University's Guidance on Maintaining Academic Integrity (see Appendix 1 and 2) and Student Discipline Procedure: Academic Misconduct (Annex 3 provides examples of academic misconduct).

3. *Style, layout and Length* Submissions should use an 11-point sans-serif font, e.g. Arial, Calibri or Aptos, 1.5 spacing and default margins (A4 size with a 2.5cm margin on every side). The project report should not exceed 30 pages of main text (plus or minus 10%). This page limit relates to the **main** body of the report and excludes the title page, abstract, table of contents, lists of illustrations or tables, references and appendices. There is no restriction on the total length as the limit only applies to the main body of the report.

4. *Final Submission* Your final submission should be electronic and submitted to Myplace by the appropriate deadline as detailed in 2. Project Timetable.

8.4 Typical Report Format

The following presents a typical report format. Note that while you should cover these aspects, it is not necessary to name the chapters precisely as follows, they can be adapted to reflect your project.

1. *Introductory Pages* Before the chapters of your report, there should be a number of introductory pages. These should include:
    - the title page (see the format described above) with marking scheme identified,
    - a page giving an abstract of your work,
    - an acknowledgements page, and
    - a table of contents.

2. *Introduction* This should briefly describe the problem which you set out to solve and should essentially summarise the rest of your report. The aim of an introduction is to convince the reader that they should read on, so it is very important that excessive detail is avoided at this stage.

   The introduction should include the list of objectives that you identified for the project, as well as a brief overview of the outcome. In its final part, the introduction will usually outline the structure of the rest of the report.

3. *Background and Related Research* This chapter should present any related background or literature appropriate for your project. Describe in detail, with examples if appropriate, the problem which you are trying to solve.

4. *Software Specification* You should clearly and concisely specify the problem and should say how the specification was arrived at. You should also provide a general discussion of your approach to solving the project problem. If appropriate, this could include user stories, user acceptance criteria, or use cases and descriptions.

5. *System Design* In this chapter, you should describe how the project was designed. You should include discussions of the design method, design process, and final design outcome. This is where you include the high-level description of the architecture of your project's product and, if appropriate, the design of the user interface and data management.

6. *Detailed Design and Implementation* In this chapter you should describe your design in more detail, taking the most interesting aspects right down to the implementation details. You should include detailed design decisions and trade-offs considered and made, such as the selection of algorithms, data structures, implementation languages, and appropriate tools to support the development process. It should also include your justifications for these choices. Note that it is **not** normally very helpful to provide details on the IDE used, or what common languages like HTML are. *It is best to focus on aspects which are unique and particularly important to your project.* In addition, you should describe how you have tried to address relevant qualities of the product produced, such as maintainability, reliability, and user-friendliness. It is not necessary to describe every aspect of your system in excruciating detail, but you should describe each in enough detail that the reader of your report can understand

the overall project, and you should thoroughly discuss the most demanding and interesting aspects of your design and implementation.

7. *Verification and Validation* (Testing) In this section you should outline the verification and validation procedures that you've adopted throughout the project to ensure that the final product satisfies its specification. In particular, you should outline the test procedures that you adopted during and after implementation. Your aim here is to convince the reader that the product has been thoroughly and appropriately verified. Detailed test results should, however, form a separate appendix at the end of the report.
8. *Results and Evaluation* The aim of this chapter is twofold. On one hand, it aims to present the final outcome of the project – i.e. the system developed – in an appropriate way so that readers of your report can form a clear picture of the system operation and provided functionality without the need for a live demo. This would normally require the inclusion of screenshots and/or images of the system in operation, and indicative results generated by the system. On the other hand, this chapter also aims to present an appropriate evaluation of the project as whole, both in terms of the outcome and in terms of the process followed.

   The evaluation of the outcome is expected to be primarily evidence-based, i.e. the result of either an experimental process, such as usability tests and evaluations, performance-related measurements, etc., or a formal analysis, such as algorithmic and mathematical analysis of system properties. The precise nature of the evaluation will depend on the project requirements. Please note that if you intend to carry out usability tests, you will need to first obtain approval from the Department's Ethics Committee - section 7. Evaluation and Ethics Approval provides further detail.

   The evaluation of the process is expected to be primarily a reflective examination of the planning, organisation, implementation and evaluation of the project. This will normally include the lessons learnt and explanations of any significant deviations from the original project plan.
9. *Summary and Conclusions* In the final chapter of your report, you should summarise how successful you were in achieving the original project objectives, what problems arose during the course of the project which could not be readily solved in the time available, and how your work could be developed in future to enhance its utility. It is OK to be upbeat, especially if you are pleased with what you have achieved!
10. *References/Bibliography* The references should consist of a list of papers and books referred to in the body of your report. These should be formatted as for scholarly computer science publications. Most text- and word-processors provide useful assistance with referencing - for example latex uses bibtex. As you know, there are two principal reference schemes.
    - In one, the list is ordered alphabetically on author's surname and within the text references take the form (Surname, Date). For example, a reference to a 2014 work by Zobel would be written (Zobel, 2014).
    - In the other, the list is ordered in the sequence in which a reference first appears in the report.

    For both schemes, each reference in the reference list should contain the following information: author, title, journal or publisher (if book), volume and part, and date. Depending of the style of references you use, Zobel's 2014 book might be listed in the references of your report as follows: Justin Zobel. Writing for Computer Science. Springer-Verlag, 2014.

    For more examples of the first style, see the way in which references are laid out in "Software Engineering: A Practitioner's Approach" by Roger Pressman. Note carefully that your references should not just be a list of URLs! Web pages are not scholarly publications. In particular, they are not peer-reviewed, and so could contain erroneous or inaccurate

information.

11. *Appendix A - Detailed Specification and Design* This appendix should contain the details of your project specification that were not included in the main body of your report.
12. *Appendix B - Detailed Test Strategy and Test Cases* This appendix should contain the details of the strategy you used to test your software, together with your tabulated and commented test results.
13. *Appendix C - User Guide* This appendix should provide a detailed description of how to use your system. In some cases, it may also be appropriate to include a second guide dealing with maintenance and updating issues.

Acknowledgement: These notes have mostly been developed by Mr P. Goldfinch and are based on earlier versions by Dr M. I. Wood and Dr S. Terzis.

9. Project Submission Guidelines

Project Submission Deadline

The deadline for the electronic submission of your project report and code is provided in section 2. Project Timetable.

You should submit **two** files using the submission link on Myplace.

1. Your **complete project report**, including appendices. This should be in **pdf format**.
2. A **single .zip file**. Please create a directory/folder called fourth_year_project. In this directory/folder you should place the items below. You should then create a single .zip file of this directory/folder.
    - The **entire source code** of the project **exclusive of external libraries**.
    - Suitable makefiles (or similar) to enable the complete program to be reconstructed whenever required.
    - **Any special data files needed** by the project.
    - **A 'readme' file** which tells the markers **how to run your code** to allow them to better assess it.

9.1 Late Projects

Any final project report and code which is submitted after the final Project Report Submission deadline is subject to the University policy on **late submissions.** The mark for late projects is calculated in accordance with University policy.

Submission up to 1 working day late – reduction of 10% off the mark for the project.

Submission greater than 1 working day late, but not later than 7 calendar days after the original submission (see project timetable for precise dates) – a reduction of 5% off the mark for the project per day or part thereof.

Any project later than 7 calendar days after the original deadline for submission (without prior extension or personal circumstances) will receive a mark of 0. **Note that this is according to University Policy** see https://www.strath.ac.uk/media/ps/cs/gmap/academicaffairs/policies/Policy_and_Procedure_for_late_submission_of_coursework_-_published.pdf for details.

The final mark is the result of this calculation, rounded to the nearest integer.

Note that if you submit your project late and pass the project, you will be awarded your degree

(assuming a pass the 4th year superclass) but the mark with the penalty applied will contribute to your final classification.

Projects submitted after the late project report submission deadline (7 calendar days after the deadline) without sufficient submitted personal circumstances will not be considered by the Honours Exam Board. There is no opportunity to resubmit.

9.2 Illness and Personal Circumstances

Medical evidence for illness or other personal circumstances can only be accepted if it explicitly states that the illness or personal circumstances has significantly affected your ability to complete the project. Such circumstances must be beyond what a typical student will experience, as issues such as technical challenges and stress of 4th year are not normally acceptable circumstances.

All medical evidence and personal circumstances should be brought to the attention of the project co-ordinator as promptly as possible. Request for extensions must be received with accompanying evidence prior to the final project submission deadline. Extensions can be requested through Myplace, for details on how to do so see this guide.

Please see the University's Personal Circumstances guidance on what you should do if you are absent, and/or if personal circumstances have affected your ability to study. You can also see the Policy and Procedure on Extensions to Submissions of Coursework. It is worth noting the list of indicative circumstances that are grounds for granting an extension as well as indicative circumstances which are **not** normally accepted. In particular, aspects such as mismanagement of time, general pressure of 4th year studies, and technical challenges in completing a 4th year project are not normally suitable grounds for extension.

9.2.1 Extensions and Late Submissions

It is important to note that due to the time sensitive nature of marking and quality assurance with 4th year individual projects, if a student has an approved extension of 1 calendar week or more they cannot submit a late project with penalties. If a student has circumstances which warrant further extension, they should discuss this directly with the project co-ordinator in advance of the original project deadline.

10. Project Demonstration and Demo Day

Each student is required to demonstrate their project to the second assessor, normally in the presence of their supervisor. The demonstration is expected to last *approximately 30 minutes*. Project demonstrations normally take place on **Demo Day** (see 2. Project Timetable for the date) – a day during which almost all students are scheduled to demonstrate their projects in one of the labs (normally in the 11th floor lab) within the Department. Representatives from industry may be invited to attend Demo Day so the Department can showcase students' projects and to give students the opportunity to talk to different companies about employment opportunities.

It is essential that you are present for the duration of your allocated slot for your project presentation on Demo day.

It is important to remember that the project demonstration is taken into consideration as part of the overall project assessment (see 11. How Your Project is Assessed).

As part of the demonstration, you will be required to give a brief (approximately 5 minutes) informal introductory presentation of your project. This presentation should identify what the project set out to achieve; what its outcome was; what the main challenges faced were; what its main achievements are; and what the areas for future improvement and development are.

The following guidelines apply to project demonstrations:

1. You will demonstrate your project to your supervisor and to your second marker. Normally this will be a single demonstration.
2. Your supervisor may moderate the questions asked by your second marker. Your answers should not be influenced by your supervisor, nor may your supervisor answer questions on your behalf.
3. The demonstration will usually last for thirty minutes.
4. The demonstration will be in two parts:
    - Initially, you will provide a *brief* (about 5 minutes) introductory presentation of your project.
    - Subsequently, you will demonstrate the functionality of the system created, while the examiners may ask questions (and request further demonstrations as required) about the work and its context.
5. The demonstration is to be of the project *as submitted*. Program code, report, etc., *must not* be altered in any way after submission. However, for the purposes of or during the demonstration, you may produce a page or so of new output results to support the presentation.

You should be aware that different markers approach demonstrations in different ways. Some prefer not to have looked at the report at all; some like to have skimmed quickly through some or all of it; some prefer to have studied it in depth. Regardless of the type of markers assigned to a project, you should remember that it is your demonstration, and that you set out to show off the best points of your work.

11. How Your Project is Assessed

Projects are assessed on the basis of the product, process, results and evaluation, presentations, and student performance. Note that the project progress presentation in January is taken into account by your second marker when marking the 'Student Performance' criterion (see below).

The assessment of the final submission is normally carried out by the project supervisor and a second marker from the Department in two stages. In the first stage, the two assessors independently assess the project. In the second, the two assessors follow a prescribed process for reaching agreement on the overall project mark to be returned (see 11.3 The Final Project Assessment Process).

The assessment is based on a marking scheme (see 11.2 Marking Schemes) that the student and the project supervisor agree on at the start of the project. You will be asked to submit your title and marking scheme (via Myplace) prior to submitting the project. There are three alternative marking schemes to choose from, each aimed at a different type of project. Each of these marking schemes is described in 11.2 Marking Schemes. Both the project supervisor and the second marker use the *same* marking scheme.

The three marking schemes include *all* of the components detailed in 11.1 Assessment Criteria. Each of the components is assessed according to the *same* criteria and on the basis of the kind of evidence specified.

Each individual marking criterion is weighted by an associated percentage. The weights of some of the criteria differ between the three marking schemes.

11.1 Assessment Criteria

Student Performance

Student performance is evaluated on the basis of a student's thoroughness and devotion to work, initiative, organisation, planning and progress, appreciation of project achievement (strengths,

weaknesses, and limitations), and potential for further development and extension.

Assessment can be based on aspects such as supervision meetings, the project progress report, and the project demonstration. The second marker will also take into account the project progress presentation given in January.

Project Product

The project product is evaluated on the basis of its functionality and overall quality, as well as on the basis of the supporting documentation produced. More specifically:

1. Software Implementation: The implementation is evaluated on aspects such as how well the software meets the project requirements, the extent to which it incorporates the required functionality, its look and feel, and the organisation and quality of the code produced. This also incorporates project documentation. Documentation can include aspects such as code comments e.g. using Javadoc, a user manual, and a maintenance guide. The documentation should be comprehensive, of sufficient quality and provide a useful user guide and maintenance documentation.

2. Verification and validation (testing) is evaluated based on aspects such as the quality and appropriateness of the adopted testing strategy, the extent of testing carried out, and the extent to which product reliability and robustness are verified.

Project Process

The project process is evaluated on the extent to which a well-planned and well-organised approach has been followed throughout, on the extent to which alternatives have been considered, appropriately justified and built on throughout the project. It also covers the extent to which a process informed by best practices has been followed throughout.

1. Background study, methodology, analysis and documentation: This aspect of the project is evaluated on aspects such as the depth of background study and related work, quality of the analysis of the problem, the clarity and the quality of the specification, as well as the extent to which the background study informs the rest of the project development.

2. Design: The design is evaluated on aspects such as the appropriateness of design choices (e.g. the use of design patterns), how extensible the design is and how easily it is understood, as well as how well it follows best practice design principles such as maintainability. It should also demonstrate consideration of alternative designs and justify any choices made. Note this is at the architectural and detailed design level.

Project Results and Evaluation

The project process is evaluated on the extent to which the project product and process are appropriately and critically evaluated, and the appropriateness and quality of the experimental evaluation methodology identified, implemented, and presented.

Report Presentation

The report presentation is evaluated based on how well it presents and communicates the achievements and challenges of the project, as well as on its structure, readability, and language.

The section CS408 Project Feedback and Mark Descriptors gives a further breakdown of the criteria, and the typical aspects of a performance in each of the classification brackets.

It should be noted that a performance of different classification can be achieved in each of the criteria. The final mark considers the weighting of the criteria for the specific marking scheme selected. This document is provided for guidance only.

11.2 Marking Schemes

There are three marking schemes which weight the assessment criteria as follows.

	Software Development Based	**Experimentation-based with Significant Software Development**	**Experiment-based**
Product			
Software Implementation (including documentation as this indicates maintainability)	25	20	10
Verification and Validation	10	5	5
Product Total:	35%	25%	15%
Process			
Background study, Methodology, Analysis and Process documentation	20	25	25
Design	10	5	5
Process Total:	30%	30%	30%
Results and Evaluation	15%	25%	35%
Report Presentation	10%	10%	10%
Student Performance	10%	10%	10%

11.3 The Final Project Assessment Process

The final project submission is marked by both the supervisor and second marker according to the following procedures.

1. Each assessor assesses the project independently using the agreed marking scheme.
2. The two assessors meet to try to agree an overall mark to be returned for the project. This meeting is moderated by a member of the departmental Teaching Committee in the following cases:
    - The overall marks given by the two assessors differ by 10% or more.
    - The overall marks given by the two assessors cross the 2.1/1st or fail/3rd classification boundaries.
    - If either of the two assessors requests it.
3. If after the meeting the two assessors fail to agree an overall mark to be returned for the project, the project is marked by a third assessor from the department. This assessor marks the project independently of the original two assessors.
4. A meeting is held between the three assessors, moderated by a member of the departmental Teaching Committee to try to agree an overall mark to be returned for the project.
5. If after the meeting the three assessors fail to agree an overall mark to be returned for the project, the overall mark returned is at the discretion of the Head of the Department.
6. Marks are reviewed for quality assurance internally, and subsequently reviewed by the External Examiners prior to the Honours and Integrated Masters Examination Board to ensure that the marking process has been fair and marking is appropriate.

7. At the external exam board marks are formally approved by the board and sent to student business for release shortly after. The exam board normally takes place late May/early June.
8. Final marks are released via Pegasus, normally within one week of the final exam board. Agreed feedback will be released to students through the following page https://local.cis.strath.ac.uk/wp/extras/projectfeedback/CS408.php Students will normally be notified once this has been released. Note that marks are final and have been approved by external examiners. If feedback is unclear, you can request further clarification from your supervisor directly, however they are not required to provide further feedback.

11.4 CS408 Project Feedback and Mark Descriptors

11.4.1 Project Progress Report and Presentation Feedback

Your supervisor will normally provide written feedback for the progress report up to 15 working days after the submission deadline.

Your second marker will provide verbal feedback during the progress presentation in January as well as written feedback via Myplace. The written feedback will normally be provided up to 15 working days after the presentation.

This feedback is formative although it is important to note that the supervisor and second marker will take the progress report and presentation into account as part of the mark for Student Performance.

11.4.2 Project Final Submission Mark Descriptors

Project mark descriptors are presented in the following matrix. Each project aspect has a description which is likely to reflect the sort of performance we would expect at each percentage range in marking.

%	**< 40**	**40-49**	**50-59**	**60-69**	**70-100**
Classification	**Fail**	**3rd**	**2:2**	**2:1**	**1st**
Student Performance	Student did not engage with the supervisor.	Student's engagement with the supervisor is likely to have been limited.	Student has engaged with the supervisor in a satisfactory manner. There is significant room for improvement. For example, they could seek the supervisor's advice more, arrive on time to meetings, initiate more discussion and take more responsibility for their performance.	Student engaged with the project and supervisor in a mostly professional manner. They were generally dedicated to their work and approached many aspects in a methodical and thorough manner. The student demonstrated that they were self-motivated and could critically evaluate their own work.	Student engaged with the project and supervisor in a highly professional manner. They were dedicated to their work and approached all aspects in a methodical and thorough manner. The student demonstrated that they were self-motivated and could critically evaluate their own work.

%	< 40	40-49	50-59	60-69	70-100
Project Product	The quality of the final product and supporting documentation produced is inadequate to demonstrate sufficient depth of understanding. The functionality is inadequate, and documentation is likely to be minimal. The testing strategy is extremely weak or non-existent. The software is unlikely to be verified or validated.	The quality of the final product and supporting documentation produced is limited. There is likely a limited implementation which may not adequately match the requirements. The functionality demonstrates limited understanding, only sufficient to warrant a pass mark. It is unlikely to follow best practice. The testing strategy is limited, with a restricted range of coverage. The software has been insufficiently verified and is likely to be insufficiently robust and/or correct.	The functionality of the product matches the requirements in places and the functionality demonstrates some understanding and capability. All software produced is of satisfactory quality. Whilst it is likely to be mostly functional, its quality could be substantially improved. It may be substantially improved in areas such as its robustness, design, reusability, security, extensibility, correctness and use of best practice. It is accompanied by some documentation such as a user guide and maintenance documentation. The testing strategy is mostly appropriate and has satisfactory coverage, but this could have been substantially more extensive. The software has been verified to a satisfactory level.	The functionality of the product mostly matches the requirements and the functionality demonstrates some depth of understanding and capability. Any software produced is of very good quality – it is mostly robust, reusable, secure, easily extendable, correct, well designed and mostly follows best practice. However, there is room for improvement in these areas. It is accompanied by mostly thorough and useful documentation such as a user guide and maintenance documentation. The testing strategy is appropriate and has very good coverage, but this could have been more extensive. The software has been verified to a comprehensive level.	The functionality of the product matches the requirements and the functionality demonstrates a high depth of understanding and capability as well as clear original thought. All software produced is of excellent quality – it is highly robust, reusable, secure, easily extendable, correct, well designed and follows best practice. It is accompanied by thorough and useful documentation such as a clear user guide and maintenance documentation. The testing strategy is appropriate, extensive and has resulted in reliability and robustness being well verified.

Project Process	The depth of background study, related work, methodology and analysis of the problem is very weak. There is no evidence of independent critique and ideas, and many main aspects of the background have been missed out or not covered to sufficient depth. The project specification is not appropriate or clear and the background study is unlikely to inform the project. The architectural high-level design and detailed design are of weak quality and choices made are not considered or justified.	The depth of background study, related work, methodology and analysis of the problem is limited. There is likely to be no evidence of independent critique and ideas, and some main aspects of the background have been missed out. The project specification is not entirely appropriate or clear and the background study only marginally informs the project. The architectural high-level design and detailed design are of limited quality and choices made are not often considered or justified.	The depth of background study, related work, methodology and analysis of the problem is satisfactory. There is likely limited evidence of independent critique and ideas, but the main aspects have been covered. There is satisfactory evidence of independent critique and ideas. The project specification is appropriate, mostly clear and the background study informs the project in most areas. The architectural high-level design and detailed design are of satisfactory quality and choices made are sometimes considered and justified. There is definite room for improvement in some areas.	The depth of background study, related work, methodology and analysis of the problem is comprehensive – demonstrating some evidence of independent critique and ideas. The project specification is appropriate, mostly clear and the background study informs the project in most areas. The architectural high-level design and detailed design are of comprehensive quality and choices made are considered and justified. However, there was definite room for improvement in some areas.	The depth of background study, related work, methodology and analysis of the problem is outstanding – demonstrating high levels of independent critique and ideas. The project specification is appropriate, clear and the background study clearly informs the rest of the project. The architectural high-level design and detailed design are of very high quality and choices made are well considered and justified.

%	< 40	40-49	50-59	60-69	70-100
Project Results and Evaluation	The project results and evaluation are weak. A minimal attempt is likely. The evaluation and analysis are inadequate in scope and may not be appropriate for the project.	The project results and evaluation are of limited depth, with many substantial clear aspects for improvement. The evaluation methodology identified is likely to be unsatisfactory or insufficient. The evaluation and analysis is very limited in scope.	The project results and evaluation are of satisfactory depth, with one or two substantial clear aspects for improvement. The evaluation methodology identified is a satisfactory approach for the project and it has been implemented and presented to an acceptable standard. The evaluation is limited in its scope, and analysis leaves room for improvement.	The project results and evaluation have some depth to them, but it is unlikely to be consistent. Some critical thought has been displayed, but this is likely to be limited. There are likely to be a few areas for improvement. The evaluation methodology identified is an appropriate approach for the project and it has been implemented and presented to a comprehensive standard. However, there are likely to be clear aspects for improvement. The evaluation is thorough in places and the quality of the analysis is very good. There are likely to be clear areas for improvement.	The project results and evaluation are in-depth, appropriate and demonstrate critical and independent thought. The evaluation methodology identified is the best approach for the project and it has been implemented and presented to an outstanding standard. The evaluation is extremely thorough and the quality of the analysis is very high.

%	< 40	40-49	50-59	60-69	70-100
Report Presentation	The report is likely to have missed many appropriate aspects of the project and is likely to be very disorganised and unclear. It demonstrates no critical and reflective thought processes. It is often illiterate. There are many areas for substantial improvement.	The report is likely to have missed appropriate aspects of the project and is likely to be somewhat disorganised and often unclear. It is unlikely to demonstrate a critical and reflective thought process. It is illiterate in places. There are clear areas for substantial improvement.	The report communicates most appropriate aspects of the project in a somewhat clear and organised manner. It demonstrates satisfactory critical and reflective thought processes. It is also mostly literate. There are clear areas for improvement.	The report communicates most appropriate aspects of the project in a mostly clear and organised manner. It demonstrates a critical and reflective thought process. It is also literate and relatively easy to read. There are likely to be one or two larger aspects which could have been improved.	The report communicates all appropriate aspects of the project in a clear and organised manner. It demonstrates a clear, critical and reflective thought process. It is also highly literate and very easy to read.

11.5 Appeals

Students have the right to appeal a decision made by a board of examiners. Appeals are initially processed by the Faculty and can be made on the basis of procedural irregularities (such as miscalculation), personal circumstances which were not presented to the examiners at the time of assessment, or inadequate assessment, prejudice or bias on the part of the examiners (adapted from university appeals webpage). Information on the appeals process can be found on the university appeals webpage.

It is important to note that appeals based on how academic judgement has been applied (such as a student believing their work is worthy of a different mark) will not be accepted. An appeal board will not make changes to an awarded mark or pass comments on marks awarded, but can however consider if the appropriate procedures have been followed, or whether there was any bias or unfair actions taken, or if there were personal circumstances which should be taken into account where there is a strong reason for not presenting these at the time of assessment. It is also worth noting that if an appeal is made on the basis of the award decided by the exam board, you will not be eligible to graduate while the appeals process is taking place. As a result, graduation is likely to be delayed until the next graduation period (normally November for 4th year students). Full details of the policy can be found in the personal circumstances and academic appeals document.

12. British Computer Society Individual Project Accreditation Requirements

Note that the following is a direct excerpt from the BCS Guidelines on course accreditation (April 2022).

12.1 Major projects

Projects must include the students undertaking practical work of some sort using computing/IT technology. This is most frequently achieved by the creation of an artefact as the focus for covering all or part of an implementation lifecycle. Dissertations based solely on literature review activity and/or user/market surveys are not acceptable.

Students must be provided with written guidance on all aspects of the project, including selection, conduct, supervision, milestones, format of the report and the criteria for assessment

Projects must involve the production of a report which should include:

- elucidation of the problem and the objectives of the project
- an in-depth investigation of the context and literature, and where appropriate, other similar products (this section is likely to be emphasised less for an IEng project)
- where appropriate, a clear description of the stages of the life cycle undertaken
- where appropriate, a description of how verification and validation were applied at these stages
- where appropriate, a description of the use of tools to support the development process
- a critical appraisal of the project, indicating the rationale for any design/implementation decisions, lessons learnt during the course of the project, and evaluation (with hindsight) of the project outcome and the process of its production (including a review of the plan and any deviations from it)
- a description of any research hypothesis
- in the event that the individual work is part of a group enterprise, a clear indication of the part played by the author in achieving the goals of the project and its effectiveness
- references

Projects must be passed without compensation.

12.2 Undergraduate projects

It is expected that within an undergraduate programme, students will undertake a major computing project, normally in their final year and normally as an individual activity, giving them the opportunity to demonstrate:

- their ability to apply practical and analytical skills present in the programme as a whole
- innovation and/or creativity
- synthesis of information, ideas and practices to provide a quality solution together with an evaluation of that solution
- that their project meets a real need in a wider context
- the ability to self-manage a significant piece of work
- critical self-evaluation of the process

In the event of this major activity being undertaken as part of a group enterprise, there is a requirement that the assessment is such that the individual contribution of each student is measured against all the above learning outcomes.

For accreditation for CITP or CEng, the individual project should be worth at least 30 credit points at level 6 or above. The project must be passed without compensation.