

Software Engineering Group Project – Project Guide 2024-2025

This document describes the Software Engineering Group Project process and contains important information for completing the project. This document should be read in conjunction with the Project Specification document and the Stage 1 and Stage 2 documents. Additional information is posted on Canvas.

Rationale

Most software developers working in industry do not work alone but in groups, working on parts of some common project. Experience of group work is an extremely valuable asset. The group project is designed to give students exposure to group working on a substantial software development project. It is structured to mimic the workings of a small software company as far as is possible or practical in an academic environment. The group project also provides an opportunity for students to develop additional skills and abilities that will be useful in Honours and MEng dissertations and beyond the university environment in further employment.

Objectives

The objectives of the group project are to gain experience in:

- Managing and working within a project group
- Planning and costing a substantial development project
- Specifying, designing, implementing, and evaluating a substantial piece of software
- Considering marketing strategies and product promotion, and
- Documenting and reporting on all of the above activities.

Campus Variations

This document applies to the Edinburgh, Dubai, and Malaysia campuses. There may be some local variations, for instance, with regard to the interpretation of the project topic and the approach to supporting the project.

The People

A number of people are involved in the Group Project process, including:

- The **Group**, a team of up to eight students.
- The **Manager**, a member of staff who acts as a line manager to the group.

- The **Project Coordinator**, who organises the groups and oversees the projects. The Project Coordinator also acts as the **Proxy Customer** and **Client**

The staff involved with the group (notably the Manager and Project Coordinator) will mark the product and associated documentation.

Group Composition and Name

Groups consist of up to eight members. Each group contains a mixture of students with a spread of abilities and backgrounds. Students have no choice about the group to which they are assigned. A typical group (depending on campus) may consist of a mix of students from different programmes. Each group is initially given a group name or number but should also invent a name/brand for the imaginary small software company that they are working for.

Group work

Group members are expected to support each other throughout the project. For example, some members may not be native English speakers. All students are expected to contribute to the application development. The group should organise tasks so that this is possible, allowing for the fact that there is likely to be a spread of abilities within the group. For instance, there are a lot of tasks that can be done by students who are not strong programmers: project management, requirements engineering, costing, GUI design, usability evaluation, playing the role of customer, program testing, company website development, user guides, etc. Anyone on the team can undertake marketing/promotion aspects of the project, and the group as a whole should contribute to the overall strategy for such tasks.

Peer assessment

Each group member will be asked to assess the other group members on the quantity and quality of their work. This assessment is taken into account when calculating final individual marks. Group members should let others know in plenty of time if they are having problems with their workload. Failing to produce work at the agreed time, or producing substandard work, will affect both a person's individual mark and their relationship with other group members.

Manager

Each group will undertake a project with guidance from a member of staff. This member of staff is known as the **Manager** and represents the immediate line manager of the project group in the software company. The Manager is responsible for overseeing the **professional conduct** of the group and checking that appropriate progress is being made. The Manager can be asked to comment on draft documentation before submission. The group should meet the Manager regularly, at most 30 minutes, most meetings (no more, and with the precise meeting arrangements to be decided together with the Manager), to discuss technical progress, developments, changes, and problems. The group should normally meet the Manager together but, when everything is going well, they may sometimes select

one or more representatives to report on their progress. The Manager should also monitor group progress by receiving regular minutes or diary extracts from group meetings. The Manager could sit in on one group meeting in each semester as an observer, then provide advice. Meetings with the Manager can be virtual/online meetings.

Contact with Manager

At the end of the project, part of the mark awarded to the group is for Professional Conduct, which includes appropriate contact with the Manager. The group should therefore ensure that adequate contact is maintained throughout the year. However, the group should respect the fact that staff have busy schedules and not bombard them with frequent queries or inadequately prepared documents. Requests for meetings or feedback should be planned well in advance. Make emails recognisable by using the subject line and not sending them from strangely named email addresses. If requesting a meeting, suggest some possible times that could be chosen.

Client

The Client's role is to commission the development of a piece of software to meet a specific business need, together with a request for a marketing/promotion strategy. The Client is responsible for providing the initial project requirements. The Client may discuss these requirements and come for a question and answer (Q&A) session. The Client may be an industrial contact and will have varying levels of time to respond to clarification requests/feedback on interfaces and functionality etc. As a result, the Project Coordinator acts as a Proxy Customer. Students are NOT to email the Client directly to avoid the Client being bombarded with requests.

Project Coordinator and Proxy Customer

Academically, all projects are overseen by the Project Coordinator. The Project Coordinator forms the groups and assigns the Managers. The Project Coordinator should ONLY be consulted by groups if there is a problem that the group or their Manager cannot solve, or if they have a clarification question for the Client.

The Project

All groups will be allocated the same project topic. Topic details are given in a separate document, which sets out the basic requirements. Examples of previous projects will also be made available on Canvas.

Starting the Project

Groups should start by exchanging information about members' strengths and weaknesses, to determine what each person could and would like to contribute to the project. The group should decide

how they are going to keep in touch, and exchange contact details. Roles can change over time, but initial role assignments should be made for the following roles:

- **Reporter**, to keep minutes of meetings,
- **Liaison**, to contact members of staff and keep in touch with group members,
- **Organisational Manager**, to ensure that all planned tasks are allocated sensibly and that appropriate progress is being made, and
- **Technical Manager** for application development. It's a good idea if the Technical Manager is not also the Organisational Manager.

Groups will be given an initial project specification, and this will be followed by an opportunity for detailed questions and answers, ideally in a session with the Client present. Come prepared with specific questions. Depending on the topic, it would be a good idea to research other organisations and systems in the Client's area of work or the topic of the project to determine standard/good practices to employ in requirements capture and to assist in discussions with the Client. Groups are also responsible for arranging to initially meet their Manager, to introduce themselves, discuss the project content, and give details on how the group plans to organise themselves.

Software Development

For most of Semester 1, the group should concentrate on planning and prototype evaluation, and working on the Stage 1 documents. The requirements should be specified in as much detail as possible, so the group has a clear idea of their task. Subsequently, the group is expected to develop the software using some form of **incremental iterative development**. The use of an adapted form of Scrum development is suggested but not essential. The product functionality should be divided into increments and the group commits themselves to work on each increment in a set period of time. Typically, design, development, evaluation and documentation are limited to the items chosen for the iteration. At the end of each iteration, a working product should be available. Throughout the project, it is essential to identify tasks that could be worked on simultaneously by different subgroups.

Time Management

Since the group may contain students following different degree courses, conflicts may arise over the availability of students at different times of the academic year. These may be because of assessments or project deadlines. It is the responsibility of the students concerned to negotiate appropriate agreements. If a student feels that they will be unable to contribute as much time as they should then negotiation with other group members should allow the load to be shared. Any student who loses some load at one time within a stage should expect to take more at another time within the same stage or the following stage. It is common in industry to be working on several projects simultaneously, and time management is a highly transferable skill.

Project Diary

The group should maintain a Project Diary, which keeps track of the minutes of all meetings, including who attended them and details of all important decisions. It should contain **brief** summaries of all project meetings and of progress against the milestones laid out in the project plan. Records of meetings with the manager should be included. It should also include a description of the responsibilities of each member of the project team at each stage of the project. The diary should be summarised and submitted along with copies of all other documentation at the end of the project.

Stages

The Group Project is divided into three separate stages. An overview of each stage is given here, but **full details of each stage are given in separate documents. Links to these documents are available on Canvas.**

1. Stage 1 (30%): The Bid

At the end of Stage 1, students should have:

- A. Identified and documented requirements.
- B. Decided on the software to be used, the high-level system architecture, the methodology, and risks, and produced an initial plan.
- C. Produced a project costing.
- D. Drawn up mock-ups and performed a short usability study with documented findings and recommendations.

2. Stage 2 (36%): Final product

At the end of Stage 3, students should have:

- A. Produced a Marketing Analysis and Strategy for the product. Promotional materials should be produced.
- B. Produced a small website to promote the group's company.
- C. Finished the implementation and evaluation of the application(s).
- D. Demonstrated the final application(s) to the Manager, Project Coordinator, and others at the Expo.
- E. Submitted full documentation for the project, including project diary summary, the final design and implementation report, several evaluation reports, user guides, maintenance guides, and operational guides.

Submission at the end of each Stage

See the individual Stage documents and the Group Project information on Canvas for details on what and how to submit during each stage.

Peer Assessment

At the end of Stage 1 and 2, students must submit an individual peer assessment consisting of:

1. The peer point allocation sheet is available on Canvas. Fill it in to show your rating of how much each person in the group contributed to the project.
2. Personal statement: about one page of A4 paper, giving more details of your own contribution to the project, and an explanation for the scores that you entered in the peer point allocation.

The peer assessment process is used to assign individual marks to students in each group, moderated as necessary by the Project Coordinator. If any issues arise within the group, contact your Manager as soon as possible. Don't leave it until it's too late!

Assessment

The Project Coordinator and the Manager will each mark parts of the project, with the Project Coordinator moderating the process. Marks will be based on the criteria specified for each project stage (see individual Stage documents). These include quality and content of the documents and the system, strategies adopted, planning, execution, demonstration of product, and group organisation and management. The group's final mark is obtained from the Stage 1 mark (weighted 30%), and Stage 2 mark (weighted 36%).

A student's individual Group Project mark will consist of the group's final mark adjusted by the values in the peer assessment. Any anomalies (e.g., obvious injustices) are dealt with at the discretion of the Project Coordinator, whose decision is final. An example of how the peer point allocation process affects individual marks will be made available on Canvas before the end of the project process.

Synoptic Courses Software Engineering (F29SO) and Professional Development (F29PD)

Software Engineering (F29SO) and Professional Development (F29PD) are both evaluated by coursework only (i.e., no final exam). The F29SO and F29PD marks will each be calculated as a weighted combination of coursework from the particular course (34%) and the individual Group Project mark (66%). The individual Group Project mark contributes to both the F29SO and F29PD final marks.

For instance, imagine that the student gets the following marks:

- Software Engineering (F29SO) coursework: 60/100
- Professional Development (F29PD) coursework: 50/100
- Individual mark for the Group Project: 60/66
- Final mark for F29SO = $60 * 0.34 + 60 = 80.4\%$
- Final mark for F29PD = $50 * 0.34 + 60 = 77.0\%$

Mark for F29SO = 80% Mark for F29PD = 77%

Deadlines

The (tentative) deadlines for the 2024-2025 Group Project are as follows:

- Stage 1 submission due: **22/11/2024**
- Group Project Expo: **21/03/2025**
- Stage 2 submission due: **26/03/2025**

These deadlines are subject to change. Please refer to Canvas for the most up to date deadlines.

Feedback

Feedback will be provided to groups after each Stage of the project is marked, approximately three working weeks after the submission/completion of each Stage. Feedback may be written and/or verbal.

Learning Objectives

The Group Project has the following high-level aims:

- To equip students with knowledge and skills for the effective management of a group project which encompasses the software development lifecycle.
- To enable students to reinforce their knowledge and skills gained in software processes, internet technology, database management, and interaction design.
- To build students understanding, knowledge and skills in teamwork, software development in groups, and project planning.
- To enable students to develop a broader understanding of the interrelationship of development life cycles and a critical capability in the selection of tools and methods to support project planning, systems analysis, requirements capture, and system specification.

It also contributes to the following learning objectives:

Subject Mastery

Understanding, Knowledge and Cognitive Skills Scholarship, Enquiry and Research (Research-Informed Learning):

- A broad and integrated understanding and knowledge of the various development and programming
- paradigms, software development life cycles, teamwork, and project planning.
- Detailed theoretical and practical knowledge of the use of methodologies for requirements capture, iterative design, resource capture and management, deployment, and evaluation of systems.
- Practice in the use of object-oriented programming, databases, scripting, and/or markup languages applied to a substantial project.

Personal Abilities

Industrial, Commercial & Professional Practice Autonomy, Accountability & Working with Others
Communication, Numeracy & ICT

- Identification, critical analysis, and evaluation of the development of a software system.
- Practice in working in a group, negotiating requirements, reaching a consensus, taking responsibility for own work, taking part in a presentation, and working with others to a deadline.
- Appreciation of the interrelationship of knowledge domains.

Late submission of coursework

Coursework deadlines are fixed and individual coursework extensions will not be granted. Penalties for the late submission of coursework follow the university's policy on late submissions:

- The mark for coursework submitted late, but within 5 working days of the coursework deadline will be reduced by 30%.
- Coursework submitted more than 5 working days after the deadline will not be marked.
- In a case where a student submits coursework up to 5 working days late, and the student has valid mitigating circumstances, the Mitigating Circumstances policy will apply. Students should submit a Mitigating Circumstances application for consideration by the Mitigating Circumstances Committee.

The MACS policy on coursework submission is that the **deadline for coursework submissions**, whether hard-copy or online, is **15:30 (Edinburgh time)** for the Edinburgh Campus, **17:00 (Dubai time)** for the Dubai Campus, and **23:59 (Malaysia time)** for the Malaysia Campus. The University Policy on the Submission of Coursework can be found here:

<https://www.hw.ac.uk/services/docs/learning-teaching/policies/submissionofcoursework-policy.pdf>

Mitigating Circumstances (MC)

There are circumstances which, through no fault of your own, may have affected your performance in an assessment (exams or other assessment), meaning that the assessment has not accurately measured your ability. These circumstances are described as **mitigating circumstances**. You can submit an application to have mitigating circumstances taken into account. Full details on the university's policies on mitigating circumstances and how to submit an application can be found here:

<https://www.hw.ac.uk/students/studies/examinations/mitigating-circumstances.htm>

Plagiarism

"**Plagiarism** is the act of taking the ideas, writings or inventions of another person and using these as if they were your own, whether intentionally or not. Plagiarism occurs where there is no acknowledgement that the writings, or ideas, belong to or have come from another source."

(Heriot-Watt University Plagiarism Policy). Although you are working as part of a group, the coursework you submit must be completed independently by your group:

- Group reports must be written in a student's own words and any code produced by the group must be their own code. All students in a project group may contribute to the writing of the reports and the development of the code. External libraries may be used for code development, but these should be cleared by the Project Coordinator and referenced in the project reports. If small amounts of text or code have been taken from other sources, these sources must be

properly referenced If some text or code in the coursework 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 project 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 project 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.
- Plagiarism will be treated extremely seriously as an act of academic misconduct which will result in appropriate student discipline. All students should familiarise themselves with the university policies around plagiarism which can be found here:
<https://www.hw.ac.uk/students/studies/examinations/plagiarism.htm>