

COURSE PROJECT

A software development project is a required component of the course. The goal is to develop a software product for a real-world client who plans to use it on regular production.

You will form project teams at the start of the course. The project team will work together throughout the semester to complete the entire software development cycle, from an initial feasibility study to delivering a working product. In a series of presentations, teams will present and report their work to the client and course lecturer.

GENERAL INSTRUCTIONS

Team Members and Composition

1. Using an [agile](#) process, teams must complete this project comprising a maximum of seven (7) students.
2. Students must choose and accept responsibility for the composition of project teams. This process is not to be influenced by the course lecturer. Students must approach this exercise with caution, deciding whom they want to collaborate with on this project. Once formed, teams cannot be changed or altered.
3. Teams are expected to find a suitable client/customer who genuinely requires software solutions to help them grow their business. Students are to engage the client/customer on a pro bono basis and academic purpose, following software engineering principles, to deliver client satisfaction. The delivery of the client/customer's solution forms the **course project** to be completed within a regulated timeframe. **NB:** *Teams may request introductory letters from the General Office of the Computer Science Department to send to prospective clients or customers.*

Choosing a Project

1. You are encouraged to choose your project, but the course team will suggest potential projects and clients.
2. Think broadly when selecting a project. Your project could be an app, system software, or even a toolkit. Everything from smartphones to supercomputers is covered by software engineering. The only requirements are that there be a genuine client and genuine users.
3. Except for yourself, a client can be any person or organisation (e.g., a Computer Science department, local company or other external organisation, a faculty or staff, etc.). The client should have a firm intention to use the software in production. Aim for a minimum of three years of production life with a large number of users.

Deliverables

1. Deliverables shall be received on the Sakai Course site. Each deliverable must be delivered on or before the deadline.
2. Teams will not be allowed to move on to the next project phase unless they provide a satisfactory deliverable for the previous stage.
3. Deliverables must have a title page that includes the following;
 - a. *project title*,
 - b. *deliverable name*,
 - c. *team name*
 - d. *membership*,
 - e. *submission date*.

Assessment

1. This is a group project, but you will be rewarded individually for notable contributions to the project or for failing to contribute your fair share of effort.
2. The three primary success criteria for a project are: satisfying the client's requirements, product usability, and product maintainability over the product's life cycle.
3. When grading your work in this course, the following factors will always be taken into account:
 - **Presentation:** The report is well-formatted, simple to read, and simple to navigate.
 - **Quality of writing:** Language, grammar, clarity, and professionalism are all important considerations.
 - **Consistency:** All necessary points are addressed in the order listed in each section below.

Project team info sheet (10 pts, due *Sat. Sept. 25, 2021, @ 11:55 pm*)

Learn about your teammates and make decisions about your own rules. Please submit a PDF document containing the following information:

- Introduce your team: give your team a distinct name and include a group photo of the entire team. Given that this is an entirely online class, the group photo should be a screenshot of a video conference session (via Zoom/WebEx/whatever) showing each team member's camera feed. What are your team's overall strengths? **(1 pt)**
- Introduce each team member by including a photo and a 100-word biography. A biography should be written in a professional manner as if you were introducing yourself to a potential employer. Choose one team member to be the instructor's primary point of contact. **(3 pts)**
- Hold your first virtual meeting by including a picture of your camera feeds in your preferred video conferencing software. **(1 pt)**
- Discuss every aspect of the team agreement in-depth, and have a detailed description of all your decisions in the write-up. **(5 pts)**

Your team agreement must include the following guidelines (but feel free to add any other items you believe are necessary):

- methods of communication (email, phone, messenger, slack, text...)
 - project management tools (Trello, Jira...)
 - response times in communication (email, phone, messenger, text...)
 - Attendance at meetings (when should we meet, whether all meetings are required, ...)
 - coordinating meetings (when, where, face-to-face vs online, who takes minutes/takes notes, ...)
 - planning a meeting (whether or no preparation is required, what should be prepared, ...)
 - version control (what to/not to commit, the content of log messages, ...)
 - work division (how to divide work, who will decide who does what, ...)
 - submitting assignments (when it is appropriate to submit, who will make a submission, who will be reviewing the submission, ...)
 - planning for the unexpected (What if a team member withdraws?, What if a team member consistently fails to attend meetings?, What if one of your team members is academically dishonest?...)
- Each team member needs to create a GitHub account. Include the names of each member's GitHub accounts in the write-up. **(0 pts)**
 - Each team must create a **Team Youtube Channel** for hosting presentation videos. Provision must be made in the project team info for teams youtube channel names and URLs

Project proposal (15 pts, due Oct. 2 2021 @ 11:55pm)

Submit an informal essay report (Project Proposal Report, *PDF format*). The format of the written report on the feasibility study is entirely up to you. It will most likely be ten pages long. It should include the following elements:

- The system's intended use: The client for whom the work will be done; who and how will use the system. **(4 pts)**
- Overall functionality: what will the system be capable of? How will it assist its users in completing their tasks? A statement of the task to be undertaken. A preliminary requirements analysis. **(3 pts)**
- Main system components: deconstruct the system into logical or architectural components and explain why you did so. **(8 pts)**
 - ✓ Suggested deliverables.
 - ✓ The process to be followed, e.g., iterative refinement, agile, modified waterfall model, phased development, etc.
 - ✓ Outline plan, showing principal activities and milestones.
 - ✓ Visibility plan. How will you keep in contact with the client and report progress? How will you communicate among your team?
 - ✓ Discussion of business considerations (see the Projects -> Business page on the Web site).
 - ✓ Risk analysis. What can go wrong? What is your fallback plan?

System requirements (10 pts, due Oct. 9, 2021 @ 11:55pm)

Submit the following system requirements document (*PDF with a UML use case diagram, no page limit*):

- Begin with a narrative that provides a high-level overview of the system's *functional requirements*. Provide a single large [use case diagram](#) illustrating the system's overall functionality. Describe each use case using simple natural language. **(2 pts)**
- Utilising the use case diagram as a starting point, convert each use case into a [user story](#). Make a numbered list of your user stories. **(2 pts)**

The following is an example of a user story format: As a *user role*, I want a *goal* so that *reason*:

- ✓ The *user role* represents an actor or developer who gains from this story.
 - ✓ The story's *goal* is to highlight a feature or function in the system, a tool, or a component of a production pipeline.
 - ✓ When this feature or function is used, the *reason* describes the benefit to the customer or user.
- Provide a set of *pre* and *post*-conditions (*refer to each corresponding user story by their numbers*) for each user role. **Note:** list *pre* and *post*-conditions under the related user story. **Note:** In your document, there should be a single list of user stories. **(2 pts)**
 - Are there any user stories too big or complex (*these are usually referred to as 'epics'*)? Can any of them be broken down into smaller user stories? Mention whether or not each user story needs to be broken down. (this will be done later) **(1 pt)**
 - Provide a separate list of any relevant *non-functional* requirements. **(1 pt)**
 - Include a glossary with definitions for all relevant terms that may have a special meaning in the system's context. **(2 pts)**

Product backlog (10 pts, due Oct. 16, 2021 @ 11:55pm)

Submit a detailed, prioritised [product backlog](#) document (*PDF, no page limit*) as described below:

- Refine your user stories in light of the instructor's feedback. Dissect previously identified large user stories (epics). Indicate which epics yielded which new user stories. *(2 pts)*
- Calculate the length of your user stories. To represent the relative size of each user story, use Fibonacci numbers ranging from 1 to 8. Each user story should be labelled as high, medium, or low priority. Take note of the total size of all user stories in your product backlog. *(2 pts)*
- Provide an up-to-date numbered list of all user stories.; indicate *pre* and *post*-conditions *(1 pt)*
- Determine which user stories will be implemented during the first sprint—taking into account the pre-and post-conditions (*there will be a total of four sprints*). Ensure that the total size of the selected user stories is roughly a quarter of the total size of the backlog. Describe the functionality of your partially implemented system at the end of this sprint. *(3 pts)*
- Create sketches of your designs and key features of the user interface. *(2 pts)*

Mid-Sem Presentation (10 pts, due Oct. 23, 2021 @ 11:55pm)

Each team will create and submit a 10-minute maximum professionally recorded video presentation (480p minimum file size), uploaded to the **Team's YouTube channel**. The team should create an **Unlisted Video link** and include it in the *PPT presentation* to be submitted through the Sakai course site. The video should include the following elements:

- The project, its objectives, its problem domain, project users, and their requirements (2 pts)
- The project's primary functional and non-functional requirements (2 pts)
- Highlights from the product backlog and sprint planning strategies (2 pts)
- Any lessons learned regarding client interaction, teamwork, and other non-technical aspects of the project – **NB: Video should feature every team member regarding this last point (2 pts)**

General Note: Clarity of *audio* and *video* is essential. Ensure a minimum overall file size to curb upload constraints as such excuses will not be countenanced.

Remember to submit the PPT used for the presentation. The presentation must be typo-free, readable and understandable, and well-formatted. (2 pts)

Recommended tools for video production:

- Inexpensive smartphone with good camera, in landscape rear camera mode highly recommended
- Software tools such as;
 - [Vmix](#) free for 60 days – Find tutorials [here](#)
 - [Loom](#) completely free - Find helpful information [here](#). (*Several other alternative videos are available on Youtube*)
 - Other professional video editing tools exist but are not free. – Adobe Premiere, Camtasia Studio, Davinci Resolve, Filmora, etc. **NB: Be mindful of your operating system in acquiring a particular tool**

Sprint retrospectives/reviews and reports (5 pts each, due 30/10/21, 06/11/21, 13/11/21, 20/11/21 @ 11:55pm across dates)

Submit a report at the end of each sprint (*PDF, no page limit*) that includes the following information.:

- Attach the most updated [sprint backlog](#). (*1 pt*)
- At the end of this sprint, what functionality does the system have? (*1 pts*)
- Did you make any changes to any of the user stories in the end? Did you deconstruct any of the user stories? Did you come across any new user stories during this sprint? If so, Did you add them to the product backlog or implement them right away? Explain (*1 pts*)
- What are the “lessons learned” from this sprint? What would you change the next time? Explain (*1 pt*)
- How fast was your team during this sprint? How did you figure it out? What was the total number of story points you a) planned for and b) completed during this sprint? How does your team’s velocity compare to the previous sprint’s velocity (if applicable)? What does it tell you about meeting the project’s deadline? Provide a burndown chart that shows the team’s current trajectory as well as the ideal trajectory. (*1 pts*).

User manual (10 pts, due Nov. 27, 2021)

Submit the user manual document (*PDF, 2 pages minimum not including the screenshots*) as described below:

- Describe all of the steps required to deploy/install your system. Provide all technical specifications that are needed. *(2 pts)*
- Explain the system's main features to a potential user who is unfamiliar with it. *(3 pts)*
- Provide a walkthrough of your system's main scenario; As needed, include screenshots. *(3 pts)*
- Include walkthroughs for at least two additional scenarios with additional/alternative functionality, as well as screenshots as needed. *(2 pts)*

Project demonstration (45 pts, due Nov. 22 – Nov. 26, 2021)

All solutions engineered as part of this project must be *pitched* and *demonstrated* successfully in a 5-10mins video, well-edited and of excellent quality and clarity (*480p minimum*). The team should create an *Unlisted Video link* from the uploaded video on the Team's Youtube channel and include it in the *PPT presentation* submitted through the Sakai course site. Submission deadline: *Midnight, Monday, Nov. 22, 2021, at 00:00GMT*

Each demonstration must be accompanied by a brief presentation explaining the nature/specifics of the project. Teams will be scheduled from Monday, Nov. 22, 2021, to Friday, Nov. 26, 2021, to answer individual student *questions with a representative from each team's client forming part of the panel*.

Grading and final survey

All deliverables will be graded as a result of the entire team's efforts. Individual students, however, may receive varying grades based on the extent and quality of their participation in the project. To ensure objectivity in grading, each student will be asked to complete a confidential survey about the project participation of other members of their team. These polls will be kept strictly confidential. *Students who do not complete this survey will receive a 0 on the course project as a whole.*