COMP6226: **Software Modelling Tools and Techniques for Critical Systems**

Coursework 1

Assignment:	Software Modelling and Design	**Lecturer:**	Ra3	**Weighting:**	25%
Deadline:	28/11/2024, **16:01**	**Feedback:**	10/01/2025	**Effort:**	37.5 hours per person

Instructions

This assignment is group coursework. The group allocation will appear on the course website. It is expected that each team member contributes equally to the project work. A Mark Distribution Form is provided on the module website to record each member's contribution, which should be signed by all members and submitted as the first page of your report. If you have any issues within your group that you cannot manage, please let me know as soon as possible.

System Specification

This coursework is about analysis and modelling of a Club Management System.
The club management tool is designed to help club managers engage with their members and provide club members with the best experience possible.

The club management software solutions include functionalities like:

- Online registration and membership management
  - Members can join, login, renew, pause current memberships, or update their details
- Payments management for memberships and events.
  - Members can make secure payments
  - Notify members when their payment is received
  - Renewal and expiry notices are sent automatically.
- Event Management:
  - Admins can create an event listing and customise registration forms
    - Events are classified by type.
    - Single events or series.
    - Any duration, including multi-day.
    - Venue location can be displayed on a map.
    - A full-formatted HTML description of the events with images can be created.
  - Members can register and pay for events online.
  - Members' attendance can be recorded by a coach or admin at an event or session.
  - An easy-to-update club website with an event calendar that lists all current and future events
  - Admins can review or download historic attendance records for all groups. Others, such as coaches, can only see the records for their team.

- Communication with members via personalised email
  - automated invoices, notification emails, and newsletters
  - Email confirmations and reminders
  - Members who registered for an event can provide a review after the event and rate their experience.
- Membership management for managers
  - Managers can create one or more membership levels for individuals.
  - A contact database of members and events that is easy to search, filter, and update.
  - Quick member lookup
  - New members can be asked to pay a joining fee or send their details for approval before payment.
  - Create one or more mailing lists from your membership database.

  - Issue a club membership card with personal details, a photo, and emergency contact details to carry during club activities.
- Financial reports, analytics, and membership summaries

Note:

The above specification should be considered as a partial specification. It is your group responsibility to analyse this partial specification and produce a comprehensive requirements list for this system. You are allowed to make reasonable assumptions about aspects which are not covered by this brief specification, but you are required to provide your justification for the choices that you have made. The payment and financial transaction management are not in the scope of this system.

Your task consists of two parts:

1) Your first step is to produce a good **problem statement**/proposal for this system; clearly stating what kind of gap/issues this system can address. The next step involves identifying the boundaries of the system and identifying all potential stakeholders. Next, you must determine the features that users and stakeholders anticipate from this system. You must present a clear rationale and compelling justification for the decisions you make in this section. Based on this, you should construct and present a clear and **coherent requirements specification** for the product, which makes appropriate use of the tools such as goals, capabilities and features using tools such as impact maps. This specification should present relevant aspects of the system, in terms of **functional** and **non-functional** requirements. It is advisable to use an appropriate style that makes tracking your requirements easy. Your report should be divided into appropriate sections. The first page of your report should have an appropriate title, stating **your group number** and provide **a list of your group members (including email and student IDs)**. Your report should be presented in a clear and sensible format with headings that are appropriately prominent and have sensible margins and page numbering. The **body text** should be no smaller than **12 points.**

2) Working from your requirements specification, you should produce a design for the system. Similar to the requirements specification section, divide the design into sections and make appropriate use of diagrams and tools. Your design should closely align with your requirements specification and encompass all design elements, including architectural, detailed, database, and user interface designs. You can also use visual modelling methods such as **UML**, **ER diagram** and **wireframes** to represent the different aspects of your system.

The main body of the report should not exceed 15 pages in total, excluding the title page, contents pages and references. Reports that exceed this limit may be subject to penalty.

Students' attention is drawn to the ***University regulations regarding academic integrity*** that discusses the originality of work.

Documentation - A suggested structure for your report:

Title page (includes module information, group information, project name ...)

Completed mark distribution form.

Abstract

Contents

1. Introduction/problem statement

2. Requirements (identifying various stakeholders, their business and domain goals, capabilities, user stories, functional/non-functional requirements, scope, constraints...)

3. Design (architecture, detailed design, database design, user interface design...)

4. Conclusion

5. References

If you have any questions regarding this assignment, please ask them in the lectures.

Submission

There should be **one electronic submission** (via the **hand-in system**) of work **per team**. Each team should designate a single member to submit the work on their behalf. Make sure the front page of your reports clearly displays your **group number** and the **names of the group members**. Submit your work to the **Hand-in system** as a **Word** or a **Pdf** document. (Not both!).

You must also submit a **completed mark distribution form**, accessible on the module website, where you propose a **distribution of marks among your group members**. Each group member should sign the form, indicating agreement with the proposed distribution. You should Include the form in your report after the title page. In the absence of exceptional circumstances, group members should **contribute equally** to the coursework. We reserve the right to investigate significant deviations from the equal distribution of marks and to impose a mark distribution. If you have difficulty completing the mark distribution form, please contact me.

Relevant Learning Outcomes (LOs)

1. Acquire experience working in groups and recognising interpersonal dynamics in small teams.
2. Understand the importance of requirement elicitation and analysis activities in software development. Reflect and think critically as a component of practice, independent learning, and professional development.
3. Generate a requirements document and conduct an object-oriented analysis/design exercise as part of a small group. Integrate and synthesise knowledge from academic, professional and practical case studies into constructive action plans.
4. Effective adaptation of UML and other modelling tools.
5. Preparation of high-quality documentation. Evaluate the outcome of implementing a solution to a problem.

Please see the Marking Scheme on the Following Page

Marking Scheme

Criterion	*Description*	*LOs*	*Total*
Problem Statement/Proposal	A clear statement of purpose, goals, constraints, scope of the project, and so on.	1,2,3	10
Requirements	A detailed analysis including stakeholder, goals, capabilities, features, and functional and non-functional requirements. Precision, clarity and accuracy of requirements.	1,2,3	20
Overall Design	Architecture, detailed design, an outline of database design; user interface design (effective use of coloured block diagrams, class diagrams, activity diagrams, interaction diagrams, E-R diagrams, etc.). Also, explain your approach to fulfilling non-functional requirements, such as security, performance, and so on.	1,2,3	40
Consistency and Justification	Are your requirements and design fit for the purpose? Traceability of requirements, completeness, low coupling/high cohesion, and other criteria relating to good design. Reasons why particular choices were made. Is this a sensible approach that aligns with best practice?	2,3	10
Quality and accuracy of the Diagrams	Use the diagrams (i.e., impact maps, E-R diagrams, coloured block diagrams, class diagrams, activity diagrams, interaction diagrams, etc.) accurately and appropriately.	4	10
Presentation	The quality of English, the layout, the clarity of the purpose, the connection between the diagrams and the report's text, and the readability and clarity of the diagrams are all important factors to consider.	5	10

Late submissions will be penalised at 10% per working day. No work can be accepted after feedback has been given. Please note the University regulations regarding academic integrity. The marking scheme is indicative, and all marks returned to students are for feedback purposes. These marks will be prior to moderation and before late penalties are applied.