**Secure Software Development**

**Group Project**

### Weight: 25%

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**Introduction**

Secure software development course objectives are to:

1. integrate security at the early stages of SDLC;
2. introduce students to defensive security measures when developing software

The main objectives of the project are to:

1. Identify the different stages of secure software development
2. Comply with data privacy and security requirements when designing a software system
3. Design a software solution for secure access and data protection
4. Work as a team

**Team Formation**

All the students in the course will be divided into teams. The number of members in a team can be up to 4 people. Students are free to form teams. An instructor will form teams for the students who have difficulty joining some team.

**Problem Statement**

Develop a system for "As-Shifa Secure Healthcare Management System." The system aims to manage patient records securely, including registration, medical history, prescriptions, and appointments, while ensuring compliance with privacy regulations.

The system information document is posted in Appendix A of this document.

**Programming Environment**

Students are free to use any suitable programming environment for the coding phase of the project.

**Deliverables**

The project will be completed in phases. The phases of the project will be:

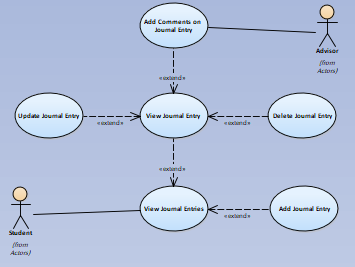
**Phase 1. Software Requirements Specifications (35% marks) due date 8 March 2025 midnight**

1. Identify requirements separately for each of the six core concepts of secure software.
2. Identify all actors and use cases of the system. Using the results of the use cases, identify misuse case actors, misuse cases, and develop a use case and misuse case model of the system (i.e., use case and misuse diagrams together).

(c) Add use cases (mitigation use cases) to mitigate misuse cases identified in section (b).

(d) Write a description for all identified use cases/misuse cases, etc.

You can use the following template for the use case model



You can use the following template for a use case documents/ description

|  |  |
| --- | --- |
| UC-01: Use Case/Mis-Use Case Name | |
| Description: |  |
| Actors: |  |
| Main Flow: |  |
| Alternative(s): |  |

You can use the following template for a mis-use case documents/ description

|  |  |
| --- | --- |
| UC-01: Use Case/Mis-Use Case Name | |
| Description: |  |
| Actors: |  |
| Main Flow: |  |
| Alternative(s): |  |
| Mitigation Points |  |

**Phase 2. Software design (30% marks) due 25 March 2025 midnight**

1. User Interface Design: High-fidelity prototypes for three mitigation use cases and three related use cases.
2. Database Design: Entity-Relationship Diagram (ERD) highlighting primary keys, foreign keys, and alternative keys for selected use cases.
3. Describe which design principle will be implemented (choose at least 2 design principles)

**Phase 3. Implementation (30% marks) due (all groups will present their implementation online during the week starting 27 April 2025 – week 14)**

1. Implement all use cases described in phase 2 of the project using any programming language.

**Phase 4. Testing (5% marks) due week 15 midnight**

1. Design and conduct black-box testing for all modules developed in phase 3

**Phase 5. Final report should be submitted in week 15 and that shold include all the phases. For phase 3 (coding) only submit the screen shorts of the programs. Only pdf format reports will be accepted**

Appendix A: As-Shifa Secure Healthcare Management System  
  
The As-Shifa Secure Healthcare Management System is designed to address the growing need for secure and efficient management of healthcare records. The system aims to ensure the safety, privacy, and accuracy of sensitive patient information while facilitating seamless interactions between patients, healthcare providers, and insurance entities.   
  
**Key Features of the System:**  
  
1. Secure Patient Registration and Record Management

* Patients can register with their basic information, such as name, date of birth, and contact details.
* Unique patient IDs will be generated for secure identification.
* Medical records, including history, test results, and prescriptions, will be securely stored and accessible only to authorized personnel.

2. Appointment Scheduling and Tracking

* Patients can schedule, reschedule, and cancel appointments through the system.
* Doctors can manage their availability and view their schedule efficiently.
* Reminders will be sent to both patients and doctors regarding upcoming appointments.

3. Secure Sharing of Medical Information

* Doctors can securely access and update patient medical records during consultations.
* Patients can authorize the sharing of their medical history with specific healthcare professionals or facilities.

4. Integration with Insurance Providers

* Secure processing of insurance claims and payments for medical services.
* Verification of insurance details before appointment confirmation.
* Automated claims submission and tracking for patients and providers.

5. Database

* A database should be created in the back end to store information on patient’s IDs, passwords, Insurance information, treatment histories, etc.