Software Requirements Specification

for

<Student Registration,

Account, & Profile >

Version 1.0 approved

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Table of Contents

**Table of Contents**……………………………………………………………………………………………………….…..ii

1. **Introduction**…………………………………………………………………………………………………………….....1

1.1 Purpose……………………………………………………………………………………………………………….1

1.2 Document Conventions……………………………………………………………………...…………………1

1.3 Intended Audience and Reading Suggestions…………………………………………………………1

1.4 Project Scope……………………………………………………………………………………………………….1

1.5 References…………………………………………………………………………………………………………...2

2. **Overall Description**……………………………………………………………………………………………………2

2.1 Product Perspective……………………………………………………………………………………………..2

2.2 Product Features………………………………………………………………………………………………….2

2.3 User Classes and Characteristics…………………………………………………………………………...3

2.4 Operating Environment………………………………………………………………………………………..3

2.5 Design and Implementation Constraints………………………………………………………………..3

2.6 User Documentation…………………………………………………………………………………………….3

2.7 Assumptions and Dependencies……………………………………………………………………………3

3. **System Features**………………………………………………………………………………………………………....4

3.1 User Registration and Profile Management..………………………………………………………….4

3.2 User Login………………………….………………………………………………………………………………..4

3.3 Course Browsing by Semester ………………….…………………………………………………………..4

3.4 Course Enrollment …….……….………………………………………………………………………………..5

3.5 Waitlist Management ……………….…………...……………………………………………………………..5

3.6 Enrollment Cancellation …………………………………………………………………………………..…..5

4. **External Interface Requirements**……………………………………………………………………………....6

4.1 User Interfaces …………………………………………………………………………………………………….6

4.2 Hardware Interfaces…………………………………………………………………………………………….6

4.3 Software Interfaces………………………………………………………………………………………………6

4.4 Communications Interfaces…………………………………………………………………………………..6

5. **Other Nonfunctional Requirements**…………………………………………………………………………..6

5.1 Performance Requirements………………………………………………………………………………….7

5.2 Safety Requirements…………………………………………………………………………………………….7

5.3 Security Requirements…………………………………………………………………………………………7

5.4 Software Quality Attributes…………………………………………………………………………………..7

6. **Other Requirements**…………………………………………………………………………………………………..7

# 1. Introduction

## 1.1 Purpose

The purpose of this Software Requirements Specification (SRS) is to define the functional and nonfunctional requirements for the Online Course Enrollment System. This system will enable students to register an account, create a profile, browse course offerings, enroll in available courses, join waitlists for full courses, and manage their enrollments. This document is intended to guide the design, development, and testing phases, ensuring the final product meets the needs of both students and administrators. The scope of this document is limited to the student-facing functionality for account management, course browsing, enrollment, waitlisting, and cancellation with automated notifications for waitlisted students.

## 1.2 Document Conventions

This SRS document follows professional software engineering documentation conventions. Section headings are clearly labeled and numbered. Paragraph text uses a standard serif font for readability, and all requirements are uniquely numbered (e.g., REQ-1, REQ-2) for easy reference. Boldface is used for section titles and subheadings, while italics are used for emphasis when necessary. Numbered and bulleted lists are used to present multiple related requirements or features.

## 1.3 Intended Audience and Reading Suggestions

The intended audience for this SRS includes software developers, project managers, testers, system administrators, and other stakeholders involved in the design, implementation, and deployment of the Online Course Enrollment System. Additionally, as this project is part of an academic program, academic evaluators and instructors are also key audience members. Readers seeking an overview should begin with Section 1 (Introduction) and Section 2 (Overall Description), while developers and testers may wish to focus on Section 3 (System Features) and Section 5 (Nonfunctional Requirements).

## 1.4 Project Scope

The Online Course Enrollment System is designed to streamline the process of registering for online courses. The system will allow students to create an account with a unique ID and secure password, maintain a personal profile containing key information such as full name, phone number, and email address, log in to view and manage course enrollments, and view courses offered during specific semesters (spring, summer, fall) with availability varying by semester. Students will be able to enroll in courses up to the maximum capacity, join a waitlist for full courses, and receive automatic notifications when a seat becomes available. The system will also allow students to cancel enrollments, automatically notifying the next waitlisted student. By implementing these features, the system aims to improve the course registration experience, reduce administrative workload, and ensure fair and organized enrollment management.

## 1.5 References

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# 2. Overall Description

## 2.1 Product Perspective

The Online Course Enrollment System is a new, self-contained web-based application designed to manage the registration and enrollment process for online courses. It is intended to replace manual or ad hoc enrollment methods with a centralized, automated platform accessible through standard web browsers. The system will be hosted on a secure, cloud-based server environment to ensure scalability, availability, and ease of maintenance. It will operate as a standalone system but may be integrated in the future with institutional learning management systems (LMS) or student information systems (SIS) for expanded functionality.

## 2.2 Product Features

Key features of the system include:  
- User registration with unique ID validation and secure password creation.  
- Profile management with required contact information.  
- Secure login and authentication.  
- Course browsing by semester (spring, summer, fall).  
- Real-time enrollment management with capacity limits.  
- Waitlist functionality with automatic notifications.  
- Enrollment cancellation with automated waitlist updates.

## 2.3 User Classes and Characteristics

The primary user classes for this system are:  
- Students: Individuals enrolling in online courses, with varying levels of technical skill. Must be able to create accounts, browse courses, enroll, and manage their enrollments.  
- Administrators: Personnel responsible for managing course offerings, capacities, and enrollment policies. Requires access to administrative functions not available to students.  
Students will generally require an intuitive interface with minimal training, while administrators may require additional functionality and training for system configuration and maintenance.

## 2.4 Operating Environment

The system will operate as a web-based application accessible via modern web browsers such as Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari. It will be compatible with both desktop and mobile devices. The application will be hosted on a secure cloud infrastructure running a standard web server and relational database management system, with an internet connection required for access.

## 2.5 Design and Implementation Constraints

The system must adhere to common web development standards, security best practices, and accessibility guidelines (such as WCAG 2.1). It must use secure communication protocols (HTTPS) and comply with applicable privacy regulations, such as FERPA, when handling student data. No specific programming language or framework is mandated, allowing flexibility for development, but the final product must be maintainable and scalable.

## 2.6 User Documentation

The project deliverables will include a user manual, an online help system, and a quick-start guide for students. Administrator documentation will include configuration and course management instructions. Tutorial videos or interactive walkthroughs may be provided as supplementary materials.

## 2.7 Assumptions and Dependencies

Assumptions:  
- Users will have access to a stable internet connection.  
- Users will have access to compatible devices and web browsers.  
- Institutional policies for course capacities and scheduling will be established prior to implementation.  
  
Dependencies:  
- Availability of cloud hosting services.  
- Reliable email service for notifications.  
- Potential future integration with institutional systems (e.g., LMS or SIS).

# 3. System Features

## 3.1 User Registration and Profile Management

### Description and Priority

Enables new users to create accounts with unique IDs, secure passwords, and personal profiles containing required contact details. Priority: High.

### Stimulus/Response Sequences

Stimulus: User submits registration form with all required fields. Response: System validates uniqueness of ID, stores profile, and confirms registration.

### Functional Requirements

REQ-1: The system shall allow creation of a unique user ID and password for each account.

REQ-2: The system shall prevent duplicate IDs during registration.

REQ-3: The system shall require and store full name, phone number, email address, and other necessary profile information.

## 3.2 User Login

### Description and Priority

Allows registered users to authenticate using their unique ID and password to access the system. Priority: High.

### Stimulus/Response Sequences

Stimulus: User enters credentials and clicks 'Login'. Response: System authenticates and grants access to the user dashboard.

### Functional Requirements

REQ-4: The system shall validate user credentials against stored data.

REQ-5: The system shall provide appropriate error messages for incorrect credentials.

## 3.3 Course Browsing by Semester

### Description and Priority

Enables users to view available courses for a selected semester. Priority: High.

### Stimulus/Response Sequences

Stimulus: User selects a semester from the available list. Response: System displays the courses offered in that semester.

### Functional Requirements

REQ-6: The system shall display a list of available courses for the selected semester.

REQ-7: The system shall display course details including course name, capacity, and current enrollment.

## 3.4 Course Enrollment

### Description and Priority

Allows users to enroll in courses with available seats, respecting course capacity limits. Priority: High.

### Stimulus/Response Sequences

Stimulus: User clicks 'Enroll' for a course with available seats. Response: System confirms enrollment and updates capacity.

### Functional Requirements

REQ-8: The system shall prevent enrollment if the course has reached maximum capacity.

REQ-9: The system shall update enrollment counts in real time.

## 3.5 Waitlist Management

### Description and Priority

Enables students to join a waitlist for full courses and receive notifications when seats become available. Priority: High.

### Stimulus/Response Sequences

Stimulus: User clicks 'Join Waitlist' for a full course. Response: System adds the user to the waitlist and confirms.

### Functional Requirements

REQ-10: The system shall maintain a queue for waitlisted students.

REQ-11: The system shall notify the first waitlisted student when a seat becomes available.

## 3.6 Enrollment Cancellation

### Description and Priority

Allows users to cancel their enrollment, triggering waitlist updates and notifications. Priority: High.

### Stimulus/Response Sequences

Stimulus: User clicks 'Cancel Enrollment'. Response: System removes the user from the course, updates capacity, and notifies the next waitlisted student.

### Functional Requirements

REQ-12: The system shall allow users to cancel enrollment in any course.

REQ-13: The system shall automatically notify the next waitlisted student upon seat availability.

# 4. External Interface Requirements

## 4.1 User Interfaces

The Online Course Enrollment System will feature a web-based user interface designed for intuitive navigation and ease of use. The interface will be responsive, adapting to both desktop and mobile devices. Key elements will include:  
- Registration and login forms with validation and error messaging.  
- Profile management screens for updating user information.  
- Semester-based course listings with filtering options.  
- Enrollment and waitlist buttons for each course entry.  
- Notifications panel for enrollment updates.  
Standard web design conventions will be followed to ensure a consistent and accessible user experience.

## 4.2 Hardware Interfaces

As a web-based system, the application will not directly interface with specialized hardware components. It will be accessible via any standard computing device, including desktop computers, laptops, tablets, and smartphones, that meet minimum browser compatibility requirements.

## 4.3 Software Interfaces

The system will run on a standard web server environment and interact with a relational database management system (RDBMS) to store and retrieve data. It will not connect to external institutional systems or third-party services within the scope of this project. Supported browsers will include Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari.

## 4.4 Communications Interfaces

All communication between the client and server will be conducted over HTTPS to ensure secure data transmission. The system will utilize the Simple Mail Transfer Protocol (SMTP) for sending enrollment and waitlist notifications via email. The hosting environment must support encrypted network protocols and standard web server communication methods.

# 5. Other Nonfunctional Requirements

## 5.1 Performance Requirements

The system shall provide responsive performance under normal operating conditions. Web pages should load within two seconds for standard operations when accessed over a stable broadband connection. The system should support a minimum of 100 concurrent users without degradation in performance. Database queries shall be optimized to return results within one second for typical data retrieval requests.

## 5.2 Safety Requirements

The system shall incorporate safeguards to prevent loss or corruption of student and course data. Regular data backups will be performed on the server to ensure recovery in case of failure. Validation checks will be implemented to prevent accidental over-enrollment or enrollment in unavailable courses. Error-handling mechanisms will ensure that system failures do not result in permanent data loss.

## 5.3 Security Requirements

The system shall enforce secure authentication using hashed passwords and encrypted connections via HTTPS. User sessions will be managed securely to prevent unauthorized access. Role-based access controls will restrict administrative functions to authorized personnel only. All personal and academic data will be protected in compliance with generally accepted academic data privacy standards, including principles similar to those outlined in FERPA.

## 5.4 Software Quality Attributes

The system shall exhibit the following quality attributes:  
- Usability: The interface will be intuitive and require minimal training.  
- Reliability: The system will maintain high availability and recover gracefully from failures.  
- Maintainability: The codebase will be structured to allow efficient updates and bug fixes.  
- Scalability: The system architecture will support increased loads with minimal modification.  
- Availability: The system will target 99% uptime during operational periods.  
- Security: The system will protect data against unauthorized access and cyber threats.

# 6. Other Requirements

The following additional requirements apply to the Online Course Enrollment System:

- Database Requirements: The system shall use a relational database management system (RDBMS) to store all user, course, and enrollment data. The database shall support ACID (Atomicity, Consistency, Isolation, Durability) properties to ensure data integrity and reliability. Regular backups will be performed to enable recovery from failures or data corruption.

- Accessibility Requirements: The system shall conform to Web Content Accessibility Guidelines (WCAG) 2.1 Level AA to ensure accessibility for users with disabilities.

- Legal and Compliance Requirements: The system shall comply with applicable academic privacy and data protection standards, including principles similar to the Family Educational Rights and Privacy Act (FERPA).

- Future Enhancements: The system shall be designed with flexibility to allow for future integration with learning management systems (LMS) or student information systems (SIS), expansion of notification options (e.g., SMS), and advanced reporting features for administrators.

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