

Software Requirements Specification

Version 1.0

July 6, 2025

Secure Online Examination System

Team Members:

Kakanuru Haritha-12308068

Sami reddy Jagadeesh-12304777

The Secure Online Examination System (SOES) addresses the growing need for conducting fair, efficient, and scalable examinations through the internet. With the rise of online education, institutions are seeking reliable tools that prevent cheating and provide smooth user experiences. This SRS aims to detail the requirements of such a system to facilitate successful development and deployment.

1.0 Introduction

1.1 Purpose The system supports user registration, secure login, randomized question presentation, result analysis, and automatic grading. Additional functionalities such as webcam proctoring, IP monitoring, browser locking, and logging ensure that exams are secure and trustworthy. The SOES is designed to scale for institutions of varying sizes and to support remote learners without compromising integrity.

The purpose of this document is to present a detailed description of the Secure Online Examination System. It explains the system's purpose, functionalities, user interactions, and constraints. The system is intended for educational institutions to conduct examinations securely over the internet. This SRS serves as a communication medium between stakeholders and developers.

1.2 Scope of Project

This project develops a secure web-based platform for conducting online examinations. Key features include user authentication, role-based access (Admin, Examiner, Student), question management, exam scheduling, real-time monitoring, and result evaluation.

1.3 Glossary

Admin: Manages system users, schedules exams.

Examiner: Creates and evaluates exams.

Student: Takes exams through the system.

SRS: Software Requirements Specification.

1.4 References

IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications.

1.5 Overview of Document

Section 2 provides an overall description of the system. Section 3 details functional and non-functional requirements. Section 4 presents interface and security specifications.

2.0 Overall Description

2.1 Product Perspective

The Secure Online Examination System is a standalone web-based application built to manage and conduct exams securely. It integrates with authentication systems and supports video proctoring and plagiarism checks.

2.2 User Classes and Characteristics

- Admin: Manages users and system settings
 - Examiner: Prepares questions, schedules exams, reviews results
 - Student: Takes exams within defined time limits
- The backend will be developed using Node.js and Express, while the frontend will utilize ReactJS for a dynamic and responsive interface. The database system will use PostgreSQL, and deployment will occur on a cloud platform like AWS or Azure for scalability. Security measures such as SSL encryption, input validation, and access controls are implemented.

2.3 Operating Environment

Web application accessible via modern browsers. Backend server runs on Linux with PostgreSQL and Node.js.

2.4 Design and Implementation Constraints

Follows OWASP standards for web security. Exams must be accessible even on low-bandwidth connections.

3.0 Functional Requirements

- Secure login and role-based access
- Create/manage exams
- Take timed exams
- Auto-submit after time ends
- Proctoring (e.g., camera, screen lock)
- Result computation and download

4.0 Non-Functional Requirements

- System must support up to 1000 concurrent users.
- Data should be encrypted in transit and at rest.
- Audit logs must be maintained.
- High availability and fault tolerance.
- The user interface should be intuitive and mobile-friendly.
- System should support localization for multiple languages.
- Minimal downtime with auto-recovery in case of server failure.

5.0 Security Requirements

- All communications use HTTPS.
- Two-factor authentication for Admin and Examiner.
- Automatic logout on inactivity.
- IP restrictions for exam sessions.
- Webcam access for identity verification.
- System logs should include user IP address, login time, and actions performed.
- Webcam snapshots should be taken at random intervals during exams.
- Any attempt to switch browser tabs must trigger an alert or disqualification.

3.1 Use Case Scenarios

Use Case 1: Student Login and Exam

1. Student navigates to the login page and enters credentials.
2. System authenticates and redirects to the dashboard.
3. Student selects an active exam.
4. System validates webcam and starts the timer.
5. After completing the exam, results are submitted automatically.

Use Case 2: Examiner Creates Exam

1. Examiner logs in and accesses the exam creation module.
2. They define exam details (title, date, duration).
3. Examiner adds questions (MCQ, essay, true/false).
4. System saves the configuration and publishes it for assigned students.