

# Software Requirements Specification

for

## JU Exam Office Management System

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# Chapter 1

## Introduction

### 1.1 Purpose

The purpose of this project is to develop an **online-based examination management system** that streamlines the entire exam process. This system encompasses various functionalities, including:

- User authentication,
- Exam scheduling,
- Exam registration,
- Management of exam materials,
- Result creation,
- Teacher remuneration, and more.

The system aims to provide a **user-friendly and efficient platform** for the following users:

- Exam Controllers,
- Exam Officers,
- Faculty Members, and
- Students.

The main goal of the project is to create a **hassle-free digitalized system** that saves time and effort for all stakeholders involved. By simplifying and automating various processes, the system enhances overall efficiency and effectiveness in managing and participating in exams.

### 1.2 Intended Audience

#### 1.2.1 Exam Office Representative

The **Exam Office Representative** has comprehensive control over the exam office system. They are responsible for:

- Publishing exam results,

- Providing registration forms for student exam enrollment,
- Posting the defined exam schedules on the website's homepage.

Additionally, the Exam Office Representative:

- Oversees teacher remuneration,
- Distributes exam materials,
- Monitors the attendance of both students and teachers.

The Exam Office Representative holds **full authority** over the system's operations, ensuring that all exam-related activities are efficiently managed.

### 1.2.2 Department

The **Department** is responsible for managing the exam committees for specific exams. Their responsibilities include:

- Assigning members to the exam committees for each exam,
- Appointing one of the committee members as the **Chairman** of the exam committee,
- Organizing exam committees within their respective discipline,
- Ensuring that all exams are conducted in accordance with university regulations.

### 1.2.3 Teacher

**Teachers** are responsible for:

- Accepting invitations to become exam committee members.
- If appointed as the exam committee member, compiling and submitting the final marks to the Exam Office Representative.

Teachers may also interact with the system to track exam-related tasks assigned to them.

### 1.2.4 Student

**Students** can:

- Register for exams,
- Collect certificates and grade sheets,
- View their individual results once logged into the system.

Students can also track their upcoming exams and review exam-related details through their accounts.

### 1.2.5 Developers

**Developers** use this SRS document to understand the system's functional and non-functional requirements. They are responsible for:

- Implementing the system according to these specifications,
- Ensuring the system meets the needs of all users.

### 1.2.6 Testers/QA Team

The **Testers/QA Team** ensures that the system:

- Meets the specified requirements,
- Functions as expected and is free from defects.

They will validate the system's performance, usability, and reliability through a structured testing process.

## 1.3 Intended Use

The system is designed to serve as an **efficient, centralized platform** for managing all aspects of exam administration within **Jahangirnagar University (JU)**.

By automating and simplifying various processes, the platform aims to:

- Save time and effort for administrators, faculty, and students,
- Ensure accuracy and consistency across all exam-related activities.

This solution enhances the overall efficiency of the JU examination management, allowing stakeholders to focus on **delivering quality education**.

## 1.4 Product Scope

The **Exam Office Management System** is a comprehensive software solution designed to streamline and automate various exam-related activities within an educational institution. The system aims to:

- Efficiently manage exam schedules,
- Track student attendance,
- Facilitate result publication,
- Provide special accommodations for physically disabled and sick students,
- Handle student applications for marksheets and certificates.

### 1.4.1 Purpose

The primary purpose of the product is to improve the **accuracy, efficiency, and transparency** of exam-related processes. The software serves as a centralized platform for the exam office to manage multiple tasks, including:

- Creating and publishing exam schedules,
- Handling student results,
- Approving special accommodations,

Additionally, it provides students with a seamless interface to:

- Access their results,
- Apply for marksheets and certificates,
- Register for upcoming exams.

### 1.4.2 Benefits

- **Increased Efficiency:** Automation of administrative tasks, such as result processing and exam schedule management, reduces manual errors and saves time.
- **Improved Accessibility:** Students can access and manage their exam-related activities from a single platform, including applications for special services like scribes and sickbeds.
- **Transparency and Accountability:** The system ensures accurate result reporting, fair exam management, and real-time access to information, fostering trust between the exam office and students.
- **Data Security:** The system securely handles sensitive student data and provides role-based access to ensure privacy and security.

### 1.4.3 Objectives

- To automate and centralize exam management processes.
- To reduce manual errors and improve data accuracy.
- To provide students with easy access to their results, certificates, and marksheets.
- To ensure timely publication of exam schedules and results.
- To streamline the process of approving special accommodations for students in need.

### 1.4.4 Goals

The software aligns with the institution's broader goals of:

- Enhancing operational efficiency,
- Improving the student experience,
- Ensuring data security.

By automating exam processes, the institution can allocate resources more effectively, reduce administrative workload, and focus on providing quality education.

## 1.5 Risk Definition

The following risks have been identified for the Exam Office Management System:

### 1.5.1 Exam Registration for a Particular Semester or Year

**Analysis:** Incomplete understanding of registration workflows; missed edge cases.

**Design:** Poor UI and data validation; registration errors.

**Implementation:** System performance issues; security vulnerabilities.

### 1.5.2 Publishing Exam Schedule by the Exam Office

**Analysis:** Miscommunication with departments; missing holidays.

**Design:** Inefficient scheduling algorithm; inflexibility for updates.

**Implementation:** Bugs in scheduling tools; system crashes during data updates.



### 1.5.3 Publishing Results

**Analysis:** Undefined review process; no mechanism for contesting results.

**Design:** Scalability issues; inadequate security.

**Implementation:** Calculation errors; slow performance during peak access.

### 1.5.4 Viewing the Published Results

**Analysis:** Misinterpretation of detail level; unclear navigation.

**Design:** Non-intuitive UI; slow result retrieval.

**Implementation:** Query errors; downtime during heavy traffic.

### 1.5.5 Applying for Marksheet

**Analysis:** Misunderstanding the application process.

**Design:** Poor UI for document submission.

**Implementation:** Processing failures; lack of document validation.

### 1.5.6 Applying for Certificates

**Analysis:** Unclear certificate types and processing times.

**Design:** Poor workflow design leading to confusion.

**Implementation:** Errors in certificate generation; delays in tracking.

### 1.5.7 Managing Exam Materials

**Analysis:** Incomplete capture of material types and workflows.

**Design:** Poor material management and access control.

**Implementation:** Data loss during uploads; version control errors.

### 1.5.8 Preparing Exam Calendar

**Analysis:** Missing input from departments; overlooked dependencies.

**Design:** Rigid calendar design; inefficient scheduling algorithms.

**Implementation:** Bugs in scheduling; failure to notify about changes.

### 1.5.9 Approval Applications for Physically Disabled and Sick Students

**Analysis:** Misunderstanding the approval process.

**Design:** Complicated application process; poor system integration.

**Implementation:** Approval delays; incorrect processing of applications.

### 1.5.10 Tracking Teachers' and Students' Attendance During Exams

**Analysis:** Incomplete tracking process definition; overlooked edge cases.

**Design:** Faulty check-in system; lack of data validation.

**Implementation:** System failures; inaccurate attendance reporting.

### 1.5.11 Managing Answer Scripts for Exams

**Analysis:** Incomplete understanding of script tracking; missing lifecycle details.

**Design:** Poor physical script tracking; weak grading system integration.

**Implementation:** Errors in script tracking; delays in digital script processing.

### 1.5.12 Teachers' Billing for Exam-Related Tasks

**Analysis:** Incomplete billing criteria; missed exceptions.

**Design:** Inaccurate billing calculations; lack of transparency.

**Implementation:** Billing errors; missed payments due to task tracking issues.

## Chapter 2

# Overall Description

### 2.1 User Classes and Characteristics

#### 2.1.1 Exam Office Representative (Exam Controller)

**Characteristics:** The Exam Controller holds the highest level of authority within the system. They have full control over all operations and are responsible for:

- Managing user roles and permissions,
- Overseeing the entire exam management process,
- Ensuring smooth operation and compliance with institutional policies.

#### 2.1.2 Department

**Characteristics:** The Department manages departmental exam processes and is responsible for:

- Coordinating with exam committees, teachers, and students,
- Submitting exam-related documents such as syllabi and question papers,
- Tracking and managing departmental student progress,
- Facilitating communication between teachers, students, and the exam office.

#### 2.1.3 Teacher

**Characteristics:** Teachers ensure smooth exam execution and are involved in:

- Reviewing and approving exam schedules, question papers, and marking schemes,
- Managing and overseeing grading and result finalization,
- Addressing and resolving any examination-related disputes or issues.

### 2.1.4 Students

**Characteristics:** Students use the system primarily for academic purposes and are responsible for:

- Online exam registration, including browsing available exams, selecting desired subjects, and completing the registration process,
- Accessing their exam results through the system, making it a comprehensive tool for managing their academic journey.

## 2.2 User Needs

### 2.2.1 Students

1. Students need a user-friendly interface to easily register for upcoming examinations. This includes provide exam schedule in time and notify exam registration deadline.
2. Students require a simple interface to apply for grade sheets.
3. Students require a straightforward interface to apply for certificates.
4. Students need an intuitive interface to view their results for a specific year or semester.
5. Students need a convenient interface to check the exam schedule for a particular year or semester.

### 2.2.2 Teachers

1. Teachers should be able to easily accept invitations to serve as an exam committee member or chairman.
2. Exam committee members need a platform to submit in-course marks, final marks, and exam schedules for a specific course and semester.
3. The exam committee chairman should be able to provide the list of first, second, and third examiners, along with the question setter and moderator, for each course in a given semester or year.

### 2.2.3 Department

1. Departments should have a convenient method to submit exam committee lists to the exam office.

### 2.2.4 Exam Office Representative

1. Exam office representatives need an efficient platform to publish results for a particular year or semester.
2. Exam office representatives need a system to manage exam materials effectively.
3. Exam office representatives need a platform to organize and manage answer scripts.
4. Exam office representatives need a platform to manage teacher remuneration.
5. Exam office representatives need a platform to manage student applications for grade sheets and certificates.
6. Exam office representatives need a platform to manage student registrations for upcoming exams.

## 2.3 Operating Environment

### 2.3.1 Hardware Platform

- **Desktops/Laptops:** Intel Core i3 processor or equivalent capacity, 4GB RAM, 128GB SSD or higher.
- **Mobile Devices/Tablets:** Android (running Android 8.0 or above), iOS (iPhone 6S or above).

### 2.3.2 Software Components and Applications

- **Google Chrome:** Latest Stable Version
- **Microsoft Edge:** Latest Stable Version
- **Mozilla Firefox:** Latest Stable Version
- **Safari:** Latest Stable Version

### 2.3.3 Operating Systems

- **Windows:** Windows 10 (64-bit), Windows 11 (64-bit)
- **Linux:** Ubuntu 22.04 LTS / CentOS 8
- **macOS:** 12+
- **Mobile:** iOS 13 or above, Android 8.0 or above

### 2.3.4 Database Compatibility

- **MySQL:** 8.0
- **PostgreSQL:** 13
- **MongoDB:** Version 4

### 2.3.5 Network Environment

- Reliable high-speed internet connectivity for remote access.

## 2.4 Constraints

### 2.4.1 Budget and Resource Constraints

- Limited budget for acquiring and maintaining infrastructure, such as servers and databases.
- Constraints on human resources available for development, testing, and maintenance.
- Restrictions on licensing costs for any third-party tools or software components.

### 2.4.2 Time Constraints

- The system must be operational before the next exam cycle.
- Deadlines for features such as registration, schedule publishing, and result announcements must align with academic timelines.
- Limited time available for testing and bug-fixing phases due to tight academic schedules.

### 2.4.3 Integration with Existing Systems

- Must integrate seamlessly with existing university systems, including student information systems, finance, and attendance tracking.
- Compatibility with existing authentication and access control systems is necessary to ensure secure data exchange.

### 2.4.4 Data Security and Privacy Constraints

- Must comply with data privacy regulations such as FERPA and GDPR.
- Ensure security for sensitive data, including student records, exam materials, and results, through encryption and secure access controls.

### 2.4.5 Scalability and Performance Constraints

- The system should be scalable to handle a large number of users during peak times, such as exam registration and result publication.
- Ensure minimal downtime, particularly during critical periods like exam registration and result viewing.

### 2.4.6 User Accessibility Constraints

- The system must be accessible to all students, including those with physical disabilities, and comply with accessibility standards.
- Provide mobile-friendly and cross-platform access to accommodate various user devices and preferences.

## 2.5 Assumptions

The following assumptions are made regarding the use and operation of the exam office system:

1. Users, including the exam office representative, department, students, and teachers, will not be able to access the system without an active internet connection.
2. All users are expected to possess basic computer literacy and have access to the internet.
3. It is assumed that users will know how to connect to the internet and navigate to the system's website.
4. The system will undergo thorough testing and quality assurance processes to ensure functionality, reliability, and security.
5. Users are expected to adhere to ethical standards and maintain academic integrity while using the system for exam-related activities.
6. It is assumed that the exam office representative, department, and teachers will promptly update the system's database to reflect any necessary changes for conducting exam-related tasks.
7. Students are expected to regularly check the system for published exam schedules and results.
8. Teachers are assumed to submit exam marks to the exam committee chairman in a timely manner, who will forward them to the exam office representative for further processing.
9. The exam office representative is responsible for tracking all registered examinees and ensuring that the database is regularly updated and maintained.

## Chapter 3

# Requirements

### 3.1 Functional Requirements

#### 3.1.1 Publish Exam Schedule

**As an Exam Office representative, I want to input and publish exam schedules from different exam committees of particular departments, so that students, faculty, and staff can view, access and plan accordingly for upcoming exams.**

**Confirmation:**

1. Exam office will have a notification from an exam committee of a particular department who wants to send an exam schedule.
2. The exam office will allow the exam committee of a particular department to input the following details for each exam:
  - Exam batch
  - Session of the batch
  - Exam date for each course
  - Invigilator and examiners' names for each course
  - Question creator, moderator, and translator details
3. The exam office will store the input data from the department in an exam schedule table:
  - (a) The exam office receives all the data from the department.
  - (b) The exam office opens their exam table and inputs the newly received schedule.
  - (c) After completing the input, the exam office creates a schedule for the particular department for that particular exam.
4. The exam office will allow the publication of the exam schedule in a user-friendly format.
5. The exam office sends a copy of the published schedule to the respective departments and the specific students of that department.

6. The exam office also notifies departments about the deadline for publishing results according to university rules.
7. The exam office is notified by the exam committee of a particular department to change a particular exam date.
8. The exam office changes the date in their exam table.
9. The exam office sends a copy of the modified schedule to the department.
10. The exam office will publish the modified exam schedule.

### 3.1.2 Register for Upcoming Exam

**As a student, I want to register for upcoming exams of a particular year or Semester so that I can give exams.**

**Confirmation:**

1. The system provides a list of upcoming exams based on the student's department or institute.
2. The student is able to view all the relevant details of the upcoming exams, including exam schedules and registration timelines (Start and End dates).
3. The system displays available exams for registration, and the student identifies the exam for which they need to register.
4. The student fills out the registration form based on:
  - (a) Regular Students form fill-up: Students fill up a registration form with required details such as selecting courses for regular exams, and the rest of the form will auto-fill from existing student data.
  - (b) Retake Students form fill-up: Students fill up a registration form with required details such as selecting courses for retake exams, and the rest of the form will auto-fill from existing student data.
5. The form is submitted by the regular students or retake students, and the system verifies the student's eligibility based on hall clearance, library clearance, selection of 50% of courses, or if the student has been expelled from the university.
  - (a) The submitted registration form is rejected due to failure in the verification process (e.g., missing hall clearance, library clearance, incomplete course selection, or expulsion from the university).
  - (b) If hall clearance and library clearance are done by the students but the hall office or library didn't update these clearance information in their database, then the system will also reject their registration process, stating that hall clearance or library clearance is not updated until the exam registration deadline. If the deadline for exam registration is missed and the student is still unregistered, the student will be requested to contact the exam office on-site to resolve the issue.
6. After successful verification, the student will be provided with available payment methods.



7. The student completes payment through the selected payment method, and the registration is finalized.
8. Upon successful payment, the system displays a confirmation message, generates the admit card, and sends a confirmation notification via email.

### 3.1.3 Publish Result

**As an exam office representative, I want to create and manage exam results for students, so that we can ensure accurate and timely reporting of their performance.**

**Confirmation:**

1. The exam office selects the exam for which results need to be entered for publishing.
2. The system allows the administrator to input individual student results or upload results in bulk (e.g., via CSV or Excel).
3. The system validates the entered results, checking for completeness, acceptable score ranges, and duplicate entries.
4. If the difference between 1st and 2nd examiner marks is within the threshold value, the system averages the marks from both.
5. If the difference exceeds the threshold, the system flags the student's answer script for review by a 3rd examiner.
6. After receiving the 3rd examiner's marks, the system averages the marks with the closest mark given by the 1st and 2nd examiners.
7. The system checks the attendance sheet to ensure marks are present for all attendees and no absent students are marked.
8. The exam officer reviews the results summary, makes any necessary adjustments, and finalizes the results.
9. The system compares faculty-created results with system-generated results and checks for anomalies, prompting for human intervention if needed.
10. The exam office publishes the finalized results and maintains a record for future reference.

### 3.1.4 View Result

**As a student, I want to view my result of a particular semester or year so that I can know about my current result.**

**Confirmation:**

1. After successfully authenticating, students will request to view their results for a particular semester or year.
2. Students will provide their respective department, year, and semester to access the results.

3. Students can view the overall batch result, which shows only the CGPA of all students, or their personal result, which includes the course-wise results.
4. For viewing personal results, students will provide their registration number and specify the type of exam (regular or retake).
5. Students will have the option to print their results for further use.

### 3.1.5 Apply for Marksheet

**As a student, I want to apply for my mark sheet so that I can receive an official document reflecting my academic performance.**

**Confirmation:**

1. After entering in the system, the student will see a section named "Apply for Marksheet".
2. After using the "Apply for Marksheet" option, the student will see a list of exams for which the results have already been published.
3. After selecting an exam, the student will be provided with a form to claim the marksheet for that particular exam.
4. The form will automatically populate with the student's necessary information, including student ID, registration number, name, session, and department. The student will need to manually fill out additional fields including contact information, purpose of claim, and a digital signature.
5. After submitting the form, the system will verify the submitted form and check if the student meets the criteria for obtaining the marksheet.
  - (a) If verification is successful, the system will show payment methods to the student.
  - (b) If verification is unsuccessful, the system will show a message indicating that the student is not eligible to receive the marksheet. The message will state the cause of the failure.
6. A valid student will then select a suitable payment method and complete the payment to complete the process of claiming marksheet.
  - (a) Upon successful payment, the system will confirm the transaction and provide a unique token to the student and will notify them to collect the marksheet on a specified date.
  - (b) If the payment is unsuccessful, the system will display a message to the student indicating that the transaction has failed and will prompt them to retry the payment. The message will include details such as the possible reasons for failure (e.g., insufficient funds, incorrect payment details, or network issues).
7. The student collects the marksheet on the specified date by showing the token, and the marksheet is issued to that student.

### 3.1.6 Apply for Certificate

**As a student, I want to apply for a certificate for a particular degree (e.g., Honours', Regular Masters', Professional Masters', PhD) so that I can receive official documentation of my academic achievements.**

**Confirmation:**

1. The student submits a request to withdraw a certificate for a particular degree to the exam office.
2. The exam office provides the student with a form listing the degrees for which results have already been published.
3. The student completes the form by selecting the appropriate degree and submits it to the exam office.
4. The student selects a suitable payment method and completes the payment for the certificate.
5. Upon successful payment, the system or exam office confirms the transaction and provides a unique token to the student and notifies them to collect the certificate on a specified date.
6. The student collects the certificate on the specified date by showing the token, and the certificate is issued accurately reflecting the degree and student details.

### 3.1.7 Remunerate Teachers

**As an exam office representative, I want to create bills for teachers according to their work so that they can take their remuneration.**

**Confirmation:**

1. The exam office will receive the list of exam committee members, question setters, question modulators, question translators, invigilators, and examiners (1st, 2nd, and 3rd) for each course of a particular year from the departments/institutes.
2. The exam office will receive the marksheets of tutorial exams for different courses from the exam committee.
3. The exam office will verify invigilators based on the attendance taken during the exams.
4. The exam office will create bills for teachers according to their work and send them to the accounts section.

### 3.1.8 Manage Exam Materials

**As an Exam Office Representative, I want to manage exam materials so that I can ensure answer scripts and other essential supplies are provided in exam halls on time.**

**Confirmation:**

1. The Exam Office Representatives are allowed to effectively maintain a real-time inventory of exam materials, tracking answer scripts quantity and other essential supplies.
2. The system monitors stock levels of answer scripts and generates an alert when the stock falls below the predefined threshold.
  - (a) The threshold is dynamically adjusted based on historical data, reflecting the average number of students per semester or year.
3. The system accurately estimates the number of answer scripts required for upcoming exams, using both current registration data and number of valid students.
4. The system sends timely automated reminders to the Exam Office Representative with details of the number of answer scripts needed for each course of a particular year or semester.
5. The Exam Office Representative tracks the distribution of answer scripts to exam halls and ensures the correct quantity is delivered to each location before the exam starts.
  - (a) The system raises alerts for any discrepancies in the distribution process.
6. The Exam Office Representative records all issued materials for each exam session, and the data is stored for auditing and future reference.

### 3.1.9 Publish Exam Calendar

**As an Exam Office representative, I want to create and manage an exam calendar so that departments can plan their final exams within designated time frames.**

**Confirmation:**

1. The exam office successfully initiates the preparation of the exam calendar for the academic year.
2. The exam office accurately distinguishes between semester and yearly systems, assigning appropriate time frames:
  - (a) For semester systems: Allocates 4 months for classes and activities, and 2 months for final exams, ensuring the academic year totals 12 months.
  - (b) For yearly systems: Allocates 9 months for classes and activities, and 3 months for final exams, ensuring the academic year totals 12 months.
3. The exam office clearly defines the time frames for final exams but does not include details of other academic activities.
4. The exam calendar is prepared in line with the specified guidelines and time frames for each system.
5. The exam office submits the prepared calendar to the Pro Vice Chancellor of the Education section. The Pro Vice Chancellor reviews and approves the calendar without requiring significant revisions.
6. Upon approval, the exam office distributes the calendar to all departments in a timely manner.

7. The exam office sends a notification to all departments informing them of the new exam calendar and its guidelines.
8. The approved calendar is published in the public notice section, making it accessible to students, faculty, and staff.
9. Departments follow the calendar as outlined, and the final exams are conducted within the designated time frames.

### 3.1.10 Manage Answer Scripts

**As an exam office representative, I want to manage the answer scripts of students during the exam evaluation process, so that we can ensure a streamlined, accurate, and secure process for grading.**

**Confirmation:**

1. The exam office can select the exam for which answer scripts need to be managed.
  - (a) A list of students who have attended the exam, along with their corresponding answer script details (exam roll, Department, Session), is provided.
  - (b) The exam office will handover answer scripts to examiners (1st, 2nd, and 3rd examiners) and track their status.
2. The exam office processes the grading of all answer scripts within the defined time frame.
  - (a) If the evaluation is incomplete or delayed, automated reminders are sent to the examiners.
  - (b) The exam office logs which examiner evaluates each script and records their respective marks.
3. Discrepancies between examiners' grading are notified.
  - (a) If the difference between the 1st and 2nd examiner's marks exceeds a predefined threshold, the script is flagged for a 3rd examiner.
  - (b) The 3rd examiner's marks are compared to those from the 1st and 2nd examiners, and the marks are averaged with the closest value.
  - (c) The exam office tracks flags and discrepancies for reporting purposes.
4. The exam office reviews the evaluation status to ensure all answer scripts have been processed.
  - (a) The exam office checks the attendance list to ensure every student's answer script is accounted for.
  - (b) If any student's answer script is missing or there are mismatches, follow-up actions are taken.
5. The exam office finalises the management of answer scripts after all scripts have been evaluated and marked appropriately.
  - (a) The status of each answer script is updated to "Evaluated" once the final grades are recorded.
  - (b) The exam office archives the answer script records for future reference or audits.

### 3.1.11 Track Students' and Teachers' Attendance During Exam

**As an exam office representative, I want to track and record the attendance of both students and teachers during exams, so that I can confirm the attendance of a student in the exam and process remuneration for the teachers accordingly.**

**Confirmation:**

1. During the exam, an exam office officer will distribute a sheet to each student, where they will provide their exam code, answer script number, course code, course title, and the date of the exam.
2. The officer will also distribute a separate sheet to the teachers involved, where they will record their names and roles for that specific exam.
3. The officer will ensure that all students present in the exam have filled out the attendance sheet and confirm the same for the teachers.
4. The exam office will cross-check the information to ensure that the answer scripts match the details provided by the students.
5. After verifying the data, the exam office representative will record the information in the system post-exam, with all necessary details.
6. These attendance records will assist the exam office in verifying student participation in case of any disputes or issues.
7. The collected attendance of the invigilators will also facilitate bill generation to remunerate the teachers.
8. The system will automatically generate detailed statistics on exam participation, providing the total number of students registered for the exam, the number of students who attended, and the number of absentees. Additionally, it will offer insights such as the percentage of attendance and absence, helping the exam office quickly analyse participation trends.

### 3.1.12 Approve Application for Physically Disabled and Sick Students

**As a physically disabled or sick student, I want to apply for a scribe or sick-bed so that I can participate in the exams.**

**Confirmation:**

1. After successful authentication, a student fills and submits an exam application form, including a request for a scribe or sick-bed along with the necessary medical documents.
2. The Exam Office receives and reviews the application and documents provided by the student.
3. If the Exam Office determines that the student needs a scribe or sick-bed based on the documents, it sends a notification to the department to appoint a scribe or manage a sick-bed for the student.

4. The student receives a notification confirming the approval of their application.
5. The department appoints a scribe or manages a sick-bed for the student, ensuring they can participate in the exams.

### 3.2 Non Functional Requirements

1. The system can be halted for maintenance from 10 pm to 8 am if needed.
2. The system will send notification if the number of examinees and answer sheets don't match.
3. The system will handle conflicts and overlapping exam schedules.
4. The system will show the current time and date.
5. The system will show a countdown timer for upcoming exam registration.
6. The system will ensure that the exam office will send exam materials.
7. There will be Frequently Asked Questions (FAQ) with answers in the system for the users.
8. The system will have a fast response time for system operations and data retrieval and will minimize response times for critical operations.
9. The system will be scalable to handle simultaneous user requests and growing data volume.
10. The system will provide high availability with minimal server downtime.
11. The system will have backup and recovery mechanisms to ensure data integrity.
12. The system will ensure secured user authentication and access control mechanisms.
13. The system will ensure encryption of sensitive data in transit and in storage.
14. The system will ensure protection against unauthorized access, data breaches, and system vulnerabilities.
15. The system will be compatible with different operating systems, web browsers, and devices.
16. The system can be integrated with other larger systems and databases using standard protocols.
17. The system will have modular and well-structured codebase for ease of maintenance and future enhancements.
18. The system will ensure optimized system performance to handle large user loads efficiently.