Software Requirements Specification
for
Campus Space Scheduler
(Classroom / Hall / Lab Booking System)

Version 1.0 approved

Prepared by

GROUP – 3

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11-01-2026

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Revision History

Name	Date	Reason For Changes	Version
CSS	11-01-2026	Initial SRS document	1.0

Table of Contents

1. Introduction

1.1 Purpose

The purpose of this document is to specify the software requirements for **Campus Space Scheduler**, version 1.0. Campus Space Scheduler is a college-internal application designed to manage the booking of **classrooms, laboratories, and halls** in the CSED department. This SRS defines the system's functional and non-functional requirements to guide development, validation, and evaluation

1.2 Definitions, Acronyms and Abbreviations

- **LOR –** Letter of Recommendation
- **HOD –** Head of Department
- **Instructional Hours –** Official academic hours
- **Non-Instructional Hours –** Holidays, Non-Academic Hours

1.3 Intended Audience and Reading Suggestions

This document is intended for:

- Project developers
- Course instructors
- Teaching assistants
- Evaluators

Readers are advised to begin with Sections 1 and 2 for system context, followed by Section 4 for functional requirements and Section 5 for non-functional requirements.

1.4 Product Scope

Campus Space Scheduler replaces the existing manual booking process with a centralized digital system. It supports booking requests, hierarchical approvals, notifications, calendar integration, and audit logging to ensure transparency, discipline, and efficient utilization of departmental resources.

1.5 References

- IEEE Software Requirements Specification Guidelines
- Firebase Documentation

2. Overall Description

2.1 Product Perspective

Campus Space Scheduler is a standalone, college-internal application. It integrates with Google Authentication, Firebase backend services, email notification services, and Google Calendar APIs.

2.2 Product Functions

Major system functions include:

- User authentication and role identification
- Classroom booking and cancellation
- Laboratory booking with hierarchical approval
- Hall booking with hierarchical approval
- Calendar-based availability visualization
- Email and Google Calendar notifications
- Audit log generation and access

2.3 User Classes and Characteristics

- **Student:** Can request bookings, upload LOR (where required), view booking status
- **Faculty (Normal Faculty):** Can request bookings and view booking details; **cannot approve requests**
- **Approval Authorities (Role-based Faculty):**
    - Staff In-charge
    - Faculty In-charge
    - Hall In-charge
    - HOD Approval permissions depend strictly on role assignment
- **App Admin:** Manages users, roles, resources, and calendars; cannot perform bookings

2.4 Operating Environment

- College-internal application
- Backend & Database: **Firebase**

- Client platform: Mobile application

2.5 Design and Implementation Constraints

- Google Authentication is mandatory
- Firebase must be used as backend and database
- Instructional hours must be blocked automatically
- App Admin cannot override bookings
- Java is used to implement UI

2.6 User Documentation

2.6 User Documentation

The following user documentation shall be delivered with the system:

- User Manual for End Users (Students and Faculty)
- User Manual for Approval Authorities (Staff In-Charge, Faculty In-Charge, and HOD)
- System Administrator Manual
- Release Notes

The documentation shall be provided in digital formats including PDF . Documentation shall conform to task-based and role-based usage standards and shall describe system functions, workflows, and operating procedures.

2.7 Assumptions and Dependencies

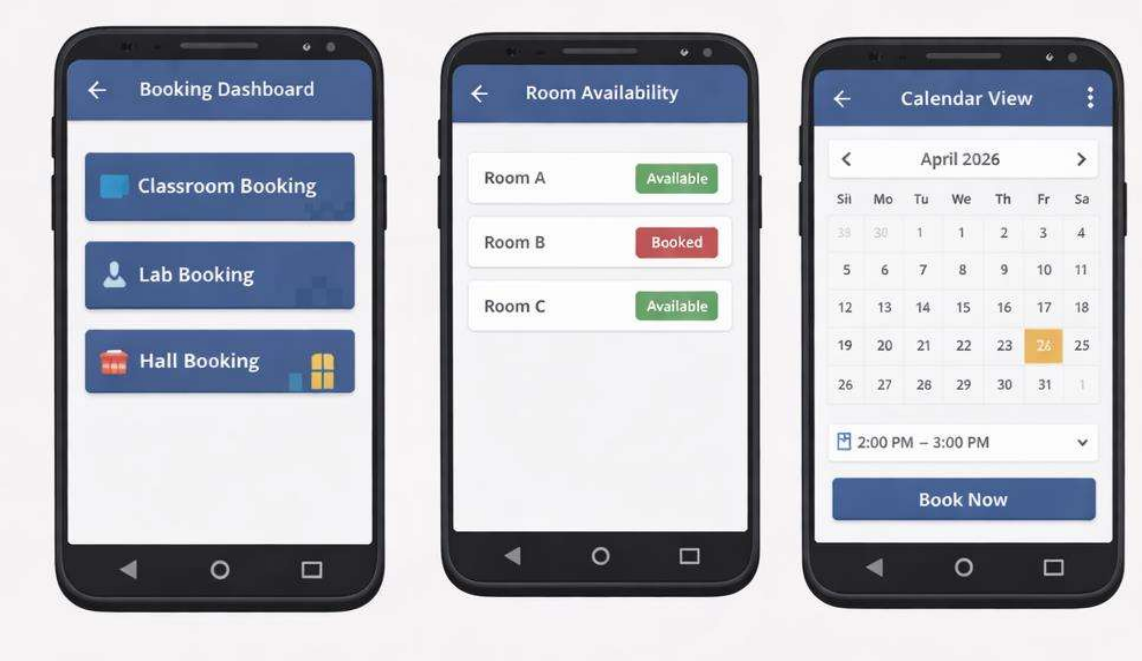
- Users possess institutional Google accounts
- Continuous internet connectivity is available
- Academic calendar is accurately maintained

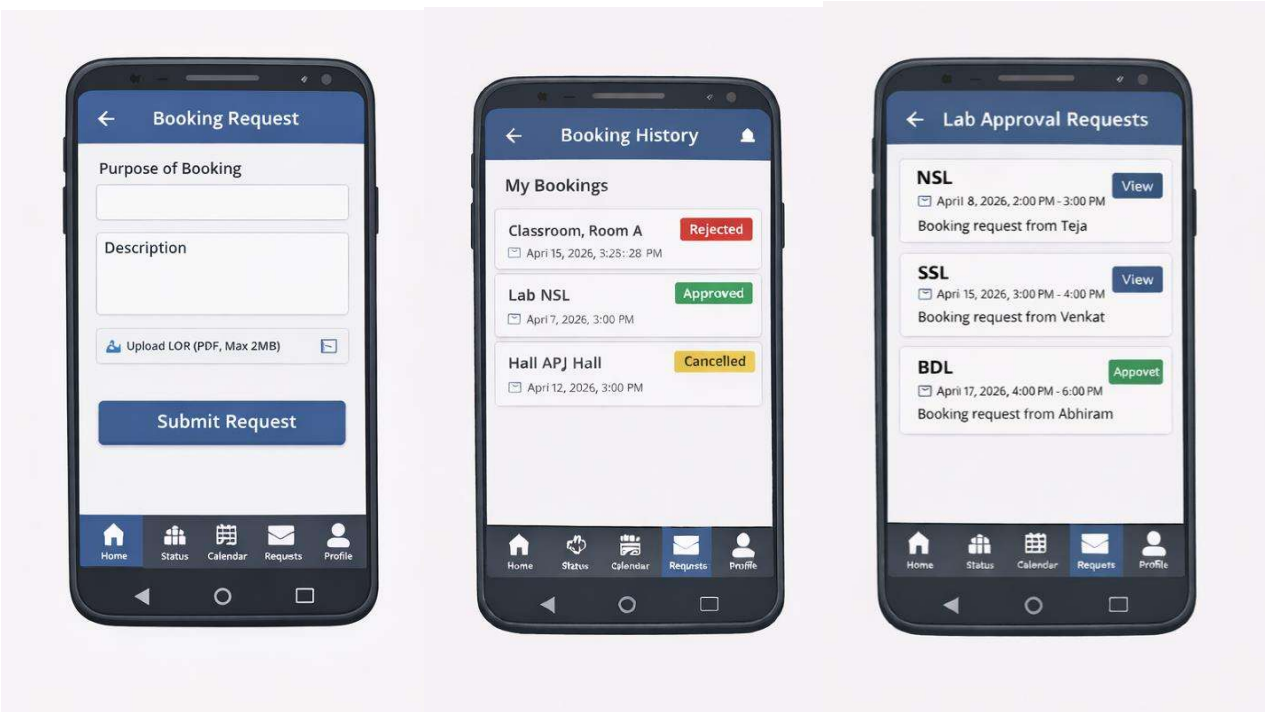
3. External Interface Requirements

3.1 User Interfaces

- Login interface (Google Authentication + CHL password)

- Dashboard interface (Classroom / Lab / Hall selection)
- Monthly calendar interface
- Booking request interface
- **Cancellation request interface**
- **User profile interface**
- Approval interface
- Booking history interface





3.2 Hardware Interfaces

No direct hardware interfaces are required.

3.3 Software Interfaces

- Firebase Authentication and Firestore
- Google Calendar API
- Email notification service

3.4 Communications Interfaces

- Secure HTTPS communication
- OAuth-based authentication

4. System Features

4.1 Student Booking

4.1.1 Description and Priority

Description:
This system feature enables a student to install and access the Campus Space Scheduler application, authenticate using institutional Google Authentication and a Campus Space Scheduler password, view available classrooms, halls and laboratories, submit booking requests during non-instructional hours, upload required documents for laboratory bookings, track booking status, request cancellations, and view personal booking history.

Priority: High

4.1.2 Stimulus/Response Sequences (Student)

- Student installs the application from the Play Store → System installs successfully and displays the login interface
- Student signs in using Google Authentication and sets Campus Space Scheduler password → System authenticates the student, assigns student role, and allows login
- Student selects Student role and chooses Classroom or Laboratory or Hall → System displays available Classroom or Laboratory or Hall with live status indicators
- Student selects a classroom and submits booking request → System validates non-instructional hours, records booking details, and sends confirmation email
- Student selects laboratory/hall booking option → System prompts for Letter of Recommendation (LOR) upload
- Student uploads LOR and submits laboratory/hall booking request → System validates LOR, records request, and sends system-generated email
- Student views calendar or booking history → System displays next 1 Month availability and personal booking history
- Student can cancel booking → System updates booking status and sets space as free

4.1.3 Functional Requirements

REQ-1.1: The system shall allow students to authenticate using institutional Google Authentication and set up a Campus Space Scheduler password.

REQ-1.2: The system shall automatically assign the student role upon successful authentication.

REQ-1.3: The system shall allow students to view available classrooms, halls and laboratories with live status indicators.

REQ-1.4: The system shall restrict students to book only non-instructional hours.

REQ-1.5: The system shall allow students to submit classroom / hall / lab booking requests by providing name, purpose, date, and time slot.

REQ-1.6: The system shall require students to download and upload a valid Letter of Recommendation for laboratory / hall bookings.

REQ-1.7: The system shall allow students to submit laboratory / hall booking requests only after successful LOR upload.

REQ-1.8: The system shall generate system emails for booking submission, approval, rejection, and cancellation of events.

REQ-1.9: The system shall allow students to view booking availability for the next 1 month.

REQ-1.10: The system shall allow students to view their own booking history and booking status.

REQ-1.11: The system shall allow students to cancel bookings and booking requests and set that time slot status as free.

REQ-1.12: The system shall display appropriate error messages for invalid inputs or missing documents.

4.2 Faculty Booking

4.2.1 Description and Priority

Description:
This system feature enables a normal faculty member to access the Campus Space Scheduler application, authenticate using institutional Google Authentication and a Campus Space Scheduler password, view available laboratories and halls, submit booking requests without requiring a Letter of Recommendation, track booking status, request cancellations, and view personal booking history.

Faculty members are permitted to book **laboratories and halls**.

Priority: High

4.2.2 Stimulus → Response Sequences (Faculty)

- Faculty installs the application from the Play Store → System installs successfully and displays the login interface
- Faculty signs in using Google Authentication and sets Campus Space Scheduler password → System authenticates faculty, assigns faculty role, and allows login
- Faculty selects Faculty role and chooses Laboratory or Hall → System displays available spaces with live status indicators
- Faculty selects laboratory and submits booking request → System validates availability, records booking details, and sends system-generated email
- Faculty selects hall and submits booking request → System validates availability, records booking details, and sends system-generated email
- Faculty views calendar or booking history → System displays availability and personal booking history of entire semester
- Faculty can cancel booking → System updates booking status and set space as free

4.2.3 Functional Requirements

REQ-2.1: The system shall allow faculty members to authenticate using institutional Google Authentication and set up a Campus Space Scheduler password.

REQ-2.2: The system shall automatically assign the faculty role upon successful authentication.

REQ-2.3: The system shall allow faculty members to view available laboratories and halls with live status indicators.

REQ-2.4: The system shall allow faculty members to submit laboratory booking requests without requiring a Letter of Recommendation.

REQ-2.5: The system shall allow faculty members to submit hall booking requests by providing name, purpose, date, and time slot.

REQ-2.6: The system shall allow faculty members to view booking availability for the entire semester.

REQ-2.7: The system shall allow faculty members to view their own booking history and booking status.

REQ-2.8: The system shall allow faculty members to cancel bookings and booking requests and set space status as free.

REQ-2.9: The system shall generate system emails for booking submission, approval, rejection, and cancellation of events.

REQ-2.10: The system shall display appropriate error messages for invalid inputs or booking conflicts.

4.3 Staff In-Charge Approval & Scheduling

4.3.1 Description and Priority

Allows Staff In-Charge to review booking requests, approve/reject them, modify schedules, and verify proofs.

Priority: High

4.3.2 Stimulus/Response Sequences

- Staff signs in → System authenticates the user, assigns Staff In-Charge role, and grants access
- Staff In-Charge opens the dashboard → System displays pending requests, schedules, and live status indicators

- Staff views pending requests → System displays details and attachments
- Staff approves/rejects request → System updates status and notifies requester
- Staff edits lab schedule → System updates availability
- Staff verifies utilization proof → System displays uploaded evidence
- Faculty requests departmental usage slot → Staff In-Charge approves directly

4.3.3 Functional Requirements

REQ-3.1: System shall allow Staff to login.

REQ-3.2: System shall allow Staff to accept or reject requests and add remarks for rejections.

REQ-3.3: System shall allow Staff to forward requests to Faculty In-Charge.

REQ-3.4: System shall allow Staff to edit lab schedules.

REQ-3.5: System shall display current lab status and upcoming bookings.

REQ-3.6: System shall display booking history.

REQ-3.7: System shall allow Staff to view uploaded LoR images (if present).

REQ-3.8: System shall allow Staff to verify proofs uploaded by the lab admins.

REQ-3.9: The system shall provide Staff Incharge the ability to enter and modify the Lab Admin's schedule.

REQ-3.10: The system shall allow the staff Incharge to cancel the booking with providing remark.

REQ-3.11: The system shall allow the staff Incharge to block user(students) if they misused or not used the booked labs.

4.4 Faculty In-Charge Approval Flow

4.4.1 Description and Priority

Enables Faculty In-Charge to handle forwarded requests, approve/reject, and escalate to HOD.

Priority: High

4.4.2 Stimulus/Response Sequences

- Faculty In-Charge signs in → System authenticates the user and grants access
- Faculty In-Charge opens the Laboratory module → System displays forwarded requests, schedules, and live status indicator
- Faculty opens forwarded request → System displays details and attachments
- Faculty approves/rejects → System updates booking status
- Faculty adds remarks → System stores remarks
- Faculty verifies proof → System displays images
- Faculty escalates request → System forwards to HOD approval queue

4.4.3 Functional Requirements

REQ-4.1: System shall allow Faculty to login.

REQ-4.2: System shall allow Faculty to accept or reject requests and add remarks for rejections.

REQ-4.3: System shall allow Faculty to edit lab schedules.

REQ-4.4: System shall allow Faculty to view current lab status.

REQ-4.5: System shall allow Faculty to view request history.

REQ-4.6: System shall allow Faculty to view uploaded LoR.

REQ-4.7: System shall allow Faculty to verify proofs uploaded by the lab admins

REQ-4.8: System shall allow Faculty to forward requests to HOD.

REQ-4.9: The system Shall allow the Faculty Incharge to cancel the booking and sends notifications to user who booked that slot .

4.5 HOD

4.5.1 Description and Priority

Allows HOD to perform final acceptance/rejection of escalated bookings and review associated documentation.

Priority: High

4.5.2 Stimulus/Response Sequences

- HOD signs in → System authenticates the user, assigns HOD role, and grants access
- HOD opens Lab module → System displays escalated requests, approval history, and utilization proofs
- HOD reviews escalated request → System displays full context and attachments
- HOD approves/rejects → System finalizes status and sends notifications
- HOD reviews history → System displays logs and proofs

4.5.3 Functional Requirements

REQ-5.1: The system shall provide a login interface for the HOD and shall allow the HOD to view the live status of laboratories and halls.

REQ-5.2: The system shall allow the HOD to approve or reject booking requests and shall allow the HOD to add remarks in case of rejection.

REQ-5.3: System shall allow HOD to view lab status and Hall status.

REQ-5.4: System shall allow HOD to view request history.

REQ-5.5: System shall allow HOD to view uploaded LoR (if applicable).

REQ-5.6: System shall allow HOD to verify uploaded by the lab admins.

REQ-5.7: The system Shall allow the HOD to cancel the booking.

4.6 Hall In-Charge Management

4.6.1 Description and Priority

The Hall In-Charge manages hall booking requests by reviewing, approving, rejecting, forwarding requests, and maintaining the hall schedule and details.

Priority: High

4.6.2 Stimulus/Response Sequences

- Hall In-Charge opens request list → System displays all pending, approved, and rejected booking requests
- Hall In-Charge selects a request → System displays booking details and student LOR
- Hall In-Charge approves request → System updates booking status to Approved
- Hall In-Charge rejects request → System updates booking status to Rejected
- Hall In-Charge forwards request → System forwards the request to the next authority
- Hall In-Charge edits schedule → System updates the hall timetable
- Hall In-Charge modifies approved booking → System saves the updated booking details
- Hall In-Charge updates hall details → System stores the new hall information

4.6.3 Functional Requirements

REQ-6.1: The Hall In-Charge shall be able to view all booking requests.

REQ-6.2: The Hall In-Charge shall be able to approve booking requests.

REQ-6.3: The Hall In-Charge shall be able to forward booking requests to the next authority

REQ-6.4: The Hall In-Charge shall be able to reject booking requests.

REQ-6.5: The Hall In-Charge shall be able to edit the hall schedule.

REQ-6.6: The Hall In-Charge shall be able to modify approved bookings.

REQ-6.7: The Hall In-Charge shall be able to view the student's Letter of Recommendation (LOR).

REQ-6.8: The Hall In-Charge shall be able to update hall details.

4.7 Lab Admin Management

4.7.1 Description and Priority

The Lab Admin manages approved lab sessions by recording attendance, uploading proof, viewing booking details, reassigning the admin role, and reporting issues.

Priority: High

4.7.2 Stimulus/Response Sequences

- Lab Admin is assigned → System grants lab admin access
- Lab Admin opens session details → System displays student or faculty booking information
- Lab Admin uploads photo proof → System stores the session image
- Lab Admin reassigns admin role → System updates the new lab admin
- Lab Admin reports an issue → System logs the issue for review

4.7.3 Functional Requirements

REQ-7.1: The Lab Admin shall be automatically assigned when a lab booking is approved.

REQ-7.2: The Lab Admin shall be able to view the details of the student or faculty who booked the lab.

REQ-7.3: The Lab Admin shall be able to reassign the admin role to another student.

REQ-7.4: The Lab Admin shall be able to upload photo proof of the session.

REQ-7.5: The Lab Admin shall be able to report issues during the lab session.

4.8 App Administration

4.8.1 Description and Priority

Description: The App Admin is responsible for managing the overall functioning of the application. This includes managing spaces, schedules, users, and permissions, and handling exceptional situations such as conflicts or manual overrides. The App Admin ensures that the system runs smoothly and remains consistent.

Priority: High

4.8.2 Stimulus/Response Sequences

- App Admin logs in → System displays admin dashboard
- App Admin adds or edits a space → System validates details and updates space data
- App Admin initializes or modifies schedule → System updates schedule and reflects changes system-wide
- App Admin adds a user or updates roles → System saves changes and applies permissions immediately
- App Admin updates approval hierarchy → System updates request forwarding flow
- App Admin views bookings or logs → System displays complete booking and action history
- App Admin resolves a conflict or overrides a booking → System updates status and records the action

4.8.3 Functional Requirements

REQ-8.1: The system shall allow the App Admin to create, edit, and delete spaces and define their basic details.

REQ-8.2: The system shall allow the App Admin to initialize and modify schedules when required.

REQ-8.3: The system shall allow the App Admin to add users and manage their roles and permissions.

REQ-8.4: The system shall allow the App Admin to manage approval flows and hierarchies.

REQ-8.5: The system shall allow the App Admin to view all bookings and resolve conflicts or exceptional cases.

4.9 CSED Office Room

4.9.1 Description and Priority

This feature enables the CSED Office Staff to view classroom booking schedules, booked slots, historical booking data, and booked user details for administrative reference.

Priority: Medium

4.9.2 Stimulus/Response Sequence

- Office Staff views classroom schedule → System displays current timetable and slot availability
- Office Staff views booked slots → System displays booking entries with timings
- Office Staff views history → System displays past bookings with purpose and duration
- Office Staff checks booked person details → System displays requester information

4.9.3 Functional Requirements

REQ-9.1: The system shall allow Office Staff to view classroom schedules.

REQ-9.2: The system shall allow Office Staff to view currently booked slots.

REQ-9.3: The system shall allow Office Staff to view booking history records.

REQ-9.4: The system shall allow Office Staff to view requester details including name, role, and booking purpose.

5. Others:

Nonfunctional Requirements

5.1 Performance Requirements

- The system shall support up to **100 concurrent users**
- Booking availability checks shall be near real-time

5.2 Safety Requirements

- The system shall prevent double booking for overlapping time periods
- The system shall ensure atomic booking transactions to avoid inconsistent reservation states.

5.3 Security Requirements

- Google Authentication shall be mandatory
- Role-based access control shall be enforced
- Users shall not access other users booking data

5.4 Software Usability Requirements

- User interface shall be simple and self-explanatory
- Calendar-based booking interaction shall be supported
- The system shall be usable without training by first-time users

5.5 Maintainability Requirements

- The system shall be modular to support future extension to other departments
- The system shall maintain clear documentation for code and APIs
- The system shall allow new labs or resources to be added without modifying core logic.

6. Other Requirements

- Audit logs shall be retained for **one semester**
- Penalty rules shall be clearly instructed beforehand
- Rule violations shall be handled by **Faculty In-charges**
- Session timeout policy: **To Be Determined**

Appendix A: Glossary

Refer to Section 1.4.

Appendix B: To Be Determined List

1. Session timeout duration

2. Automated penalty enforcement rules