



Software Requirements Specification for EduROOM

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Version: 2.0

1. Introduction

This section provides an overview of the EduROOM Classroom Reservation System and this Software Requirements Specification (SRS) document.

1.1 Purpose

This SRS defines the functional and non-functional requirements of the EduROOM Classroom Reservation System, Version 2.0. It serves as a formal reference for developers, stakeholders, testers, and administrators, describing:

- the intended behavior of the system
- its limitations and constraints
- performance expectations
- user classes and interactions
- security and operational requirements

The document guides the development, validation, and maintenance of the system.

1.2 Scope

EduROOM is a classroom reservation and scheduling platform for Camarines Sur Polytechnic Colleges (CSPC), specifically designed for classrooms within Academic Building IV. The system integrates with the official academic schedule to ensure that reservation requests do not conflict with existing classes.

For Students and Faculty

- Students may view classroom information and availability.



- Faculty users may search available rooms and submit reservation requests specifying date, time, and purpose.
- Both roles may view their complete reservation history and monitor approval status.

For Administrators

- Review, approve, or reject reservation requests.
- Create, update, disable/activate, and delete user accounts.
- Maintain academic schedules to ensure accurate room availability.
- Access analytics dashboards and system activity logs.

General System Features

- Viewing room descriptions, availability, and reservation records
- Preventing conflicts with academic schedules
- Real-time notifications for reservation approval/updates
- Secure authentication, role-based access control, and session management
- User management and audit logging

The system does not modify official CSPC academic timetables, grading systems, or faculty-class assignments. It only references official schedules to validate room availability.

1.3 Definitions, Acronyms, and Abbreviations

Term	Definition
SRS	Software Requirements Specification
UI	User Interface



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CSPC	Camarines Sur Polytechnic Colleges
Admin	Authorized personnel managing schedules, reservations, and user accounts
Faculty/Student User	Authenticated CSPC user with applicable permissions
System	EduROOM web and desktop application
RBAC	Role-Based Access Control
NFR	Non-Functional Requirement

1.4 References

- **ISO/IEC/IEEE 29148:2018 — Systems and Software Engineering — Requirements Engineering**
- **Republic Act No. 8293 — Intellectual Property Code of the Philippines**
- **Republic Act No. 10173 — Data Privacy Act of 2012**
- **CSPC ICT Infrastructure Guidelines and Policies**
- **Bcrypt Documentation for Secure Password Hashing**

1.5 Overview



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This SRS document is organized into the following sections:

- **Section 1:** Introduction, system purpose, definitions, and context
 - **Section 2:** Overall description, user classes, operational environment, constraints
 - **Section 3:** Detailed functional and non-functional requirements
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2. Overall Description

This section presents the general system context, user roles, operational constraints, and design considerations.

2.1 Product Perspective

EduROOM is an independent reservation and scheduling system intended to streamline the management of classroom usage within CSPC. It operates as a standalone web/Flet application but relies on CSPC's academic schedule data to validate availability.

The system supports:

- browsing and viewing classroom schedules
- submitting reservation request
- administrative oversight and user management
- analytics and real-time notifications

EduROOM provides a multi-role environment consisting of students, faculty, and administrators.

2.2 Product Functions

Major system functions include:



- **User Authentication:** Login using CSPC email, ID number, and password (with hashing, lockout, and session timeout).
 - **Role-Based Access Control (RBAC):** Feature visibility and system privileges differ for students, faculty, and administrators.
 - **Room Search and Viewing:** Browse and filter available classrooms with real-time schedule validation.
 - **Reservation Management:** Faculty users submit reservation requests for available rooms.
 - **Administrative Review:** Admins approve or reject reservations and view request history.
 - **User Management:** Admins create, edit, disable/activate, reset passwords, and delete user accounts.
 - **Academic Schedule Management:** Admins maintain classroom schedules to prevent overlapping reservations.
 - **Reservation Tracking:** Users view past and upcoming reservations with approval status.
 - **Analytics Dashboard:** Visual reports on usage, peak hours, approval ratios, and popular rooms.
 - **Real-Time Notification System:** WebSocket-based notifications for approvals, new requests, and updates.
 - **Activity Logging:** Records key system events such as login, user creation, approvals, and deletions.
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2.3 User Characteristics

- **Student**
 - Must have a valid CSPC email and Student ID
 - Familiar with basic application navigation
 - Primarily uses the system for classroom viewing
- **Faculty**
 - Must have an official CSPC Faculty ID and email
 - Frequently submits reservation requests
 - Expected to understand scheduling constraints
- **Administrator**
 - Manages reservations, schedules, and user accounts
 - Should be detail-oriented and familiar with CSPC classroom policies
 - Utilizes analytics and log dashboards for oversight



2.4 Constraints

- Access requires valid CSPC credentials.
 - All sensitive data (passwords, sessions) must be securely handled and encrypted.
 - Admins are responsible for maintaining academic schedules.
 - Only classrooms within Academic Building IV are supported in this version.
 - Compliance with CSPC ICT policies and the Data Privacy Act of 2012 is mandatory.
 - Real-time notifications require stable WebSocket server operation.
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2.5 Assumptions and Dependencies

- Users have stable internet access.
- CSPC maintains an accurate and updated academic schedule.
- Email or internal CSPC communication channels are available for notifications (if enabled).
- The system depends on correct operation of authentication servers and database services.
- The WebSocket server remains active for real-time communication.

3. Specific Requirements

This section defines the detailed requirements of the system.

3.1 Functional Requirements

FR-001: User Authentication

The system shall authenticate usekrs using CSPC email, ID number, and password.
The system shall validate credentials against hashed values stored using bcrypt.

FR-001.1 Login Lockout Mechanism

- The system shall enforce throttling after five (5) failed login attempts within ten (10) minutes.



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- During lockout, authentication attempts shall be denied even with correct credentials.
- Successful login resets the failed attempt counter.

FR-002: Session Management

The system shall maintain a secure session for each authenticated user.

FR-002.1 Inactivity Timeout

- User sessions shall expire after 15 minutes of inactivity.
- Expired sessions redirect to the login screen with a notice.
- Protected views shall check session validity before rendering.

FR-003: Role-Based Access Control

The system shall enforce access restrictions based on roles:

Role	Permissions
Admin	Full system access including user management, reservation approvals, analytics settings
Faculty	May view classrooms, create reservations, track history
Student	May only view room availability and reservation status

UI visibility and backend functions both enforce RBAC.

FR-004: Profile Management

The system shall allow users to:

- View personal profile
- Update display name
- Upload profile photo
- Change their password (with current password validation)



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FR-005: User Account Administration (Admin Only)

Admins shall be able to:

- Create new users
- Edit user profiles
- Change user roles
- Disable or activate user accounts
- Reset passwords for users

FR-006: Classroom Viewing and Search

Same as existing FR-002 but improved:

- Filter rooms by date, time, capacity, and building
- Display availability, capacity, and pending reservations

FR-007: Reservation Request

Faculty users shall create reservation requests indicating:

- Room
- Date
- Start and end time
- Purpose
 - Requests default to *Pending*.

FR-008: Reservation Approval Workflow

Admins shall:

- View all pending reservation requests
- Approve or reject requests with remarks
- Automatically prevent overlaps with academic schedules

Approved reservations shall immediately block the timeslot.



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FR-009: Reservation History

Users shall view:

- Past reservations
- Ongoing reservations
- Upcoming reservations
- Approval status (Pending, Approved, Rejected)

FR-010: Activity Logging

The system shall record actions including:

- Login success/failure
- User creation, update, deletion
- Password resets
- Account activation/deactivation
- Reservation approvals/rejections

Logs are stored for administrative monitoring.

FR-011: Analytics Dashboard

Admins shall access system-level analytics:

- Total reservations
- Popular rooms
- Peak usage hours
- Approval vs rejection rate
- Reservation volume per department

FR-012: Real-Time Notification System

The system shall use WebSockets to:

- Notify admins of new reservation requests
- Notify users of approval or rejection events
- Deliver updates without requiring page reloads



FR-013: CSRF-Style Action Protection

The system shall generate a unique per-session action token to protect destructive operations such as:

- Delete user
- Deactivate user
- Approve/reject reservation

3.2 Non-Functional Requirements

NFR-001: Performance

- Room searches must complete within 3 seconds.
- Reservation submission must complete within 2 seconds.
- WebSocket messages must be delivered within 500 ms.

NFR-002: Security

- All passwords shall be hashed using bcrypt with salt.
- Session data shall not include plaintext passwords.
- Authentication and authorization checks must execute for every protected request.
- System shall enforce login throttling and inactivity timeout.
- CSRF-style per-session tokens shall secure destructive operations.

NFR-003: Reliability

- The system shall maintain 99.5% uptime during academic periods.
- No overlapping reservations may exist for the same room and timeslot.
- If WebSocket connection fails, the system shall gracefully retry.

NFR-004: Maintainability

- Modular Flet view structure
- Centralized DB query module
- Configuration via `.env` files



- Log entries identifiable by user and timestamp

NFR-005: Usability

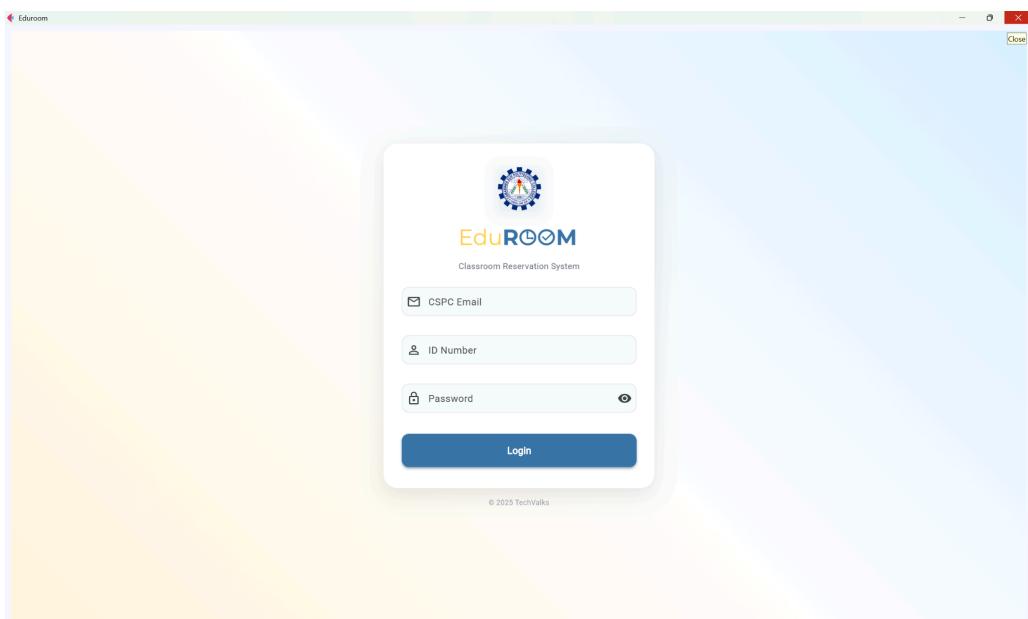
- Users must complete a reservation in < 3 steps.
- System must display readable errors and feedback.

4. System Interface Documentation

This section provides a visual walkthrough of the EduROOM Classroom Reservation System interface for each user role.

4.1 Authentication Interface

Figure 4.1.1: Login Page





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4.2 Student Interface

Students have read-only access to the system. The student interface provides classroom viewing capabilities without reservation permissions.

Figure 4.2.1: Available Classrooms View

The screenshot shows the 'Available Classrooms' section of the EduROOM platform. It lists 11 classrooms:

- CS Lab (2nd Floor • Capacity: 30) Available
- ERP Lab (3rd Floor • Capacity: 25) Available
- IT Lab 1 (2nd Floor • Capacity: 35) Available
- IT Lab 2 (2nd Floor • Capacity: 35) Available
- Lecture Room 1 (1st Floor • Capacity: 50) Available
- Lecture Room 2 (1st Floor • Capacity: 45) Available
- LIS Lab (4th Floor • Capacity: 20) Available
- MAC Lab (3rd Floor • Capacity: 30) Available

Figure 4.2.2: Classroom Schedule

The screenshot shows a modal window titled 'Schedule for IT Lab 1' overlaid on the main 'Available Classrooms' view. The modal displays the following schedule:

Date	Time	Purpose	Reserved By
Dec 10, 2025	08:00 - 10:00	Network Configuration Lab	Ms. Fortuno
Dec 10, 2025	13:00 - 15:00	Cybersecurity Essentials	Mr. Ibo



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Figure 4.2.3: Search Interface

The screenshot shows the 'Available Classrooms' section of the EduROOM platform. It displays two classroom options:

- Lecture Room 1**: 1st Floor • Capacity: 50 Available. Includes a 'View Schedule' and 'Reserve' button.
- Lecture Room 2**: 1st Floor • Capacity: 45 Available. Includes a 'View Schedule' and 'Reserve' button.

Figure 4.2.4: Filter Options

The screenshot shows the 'Available Classrooms' section of the EduROOM platform with filters applied. It displays six classroom options:

- IT Lab 2**: 2nd Floor • Capacity: 35 Available. Includes a 'View Schedule' and 'Reserve' button.
- Lecture Room 2**: 1st Floor • Capacity: 45 Available. Includes a 'View Schedule' and 'Reserve' button.
- LIS Lab**: 4th Floor • Capacity: 20 Available. Includes a 'View Schedule' and 'Reserve' button.
- MAC Lab**: 3rd Floor • Capacity: 30 Available. Includes a 'View Schedule' and 'Reserve' button.
- Open Lab**: 2nd Floor • Capacity: 40 Available. Includes a 'View Schedule' and 'Reserve' button.
- RISE Lab**: 4th Floor • Capacity: 15 Available. Includes a 'View Schedule' and 'Reserve' button.



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Figure 4.2.5: Settings Drawer

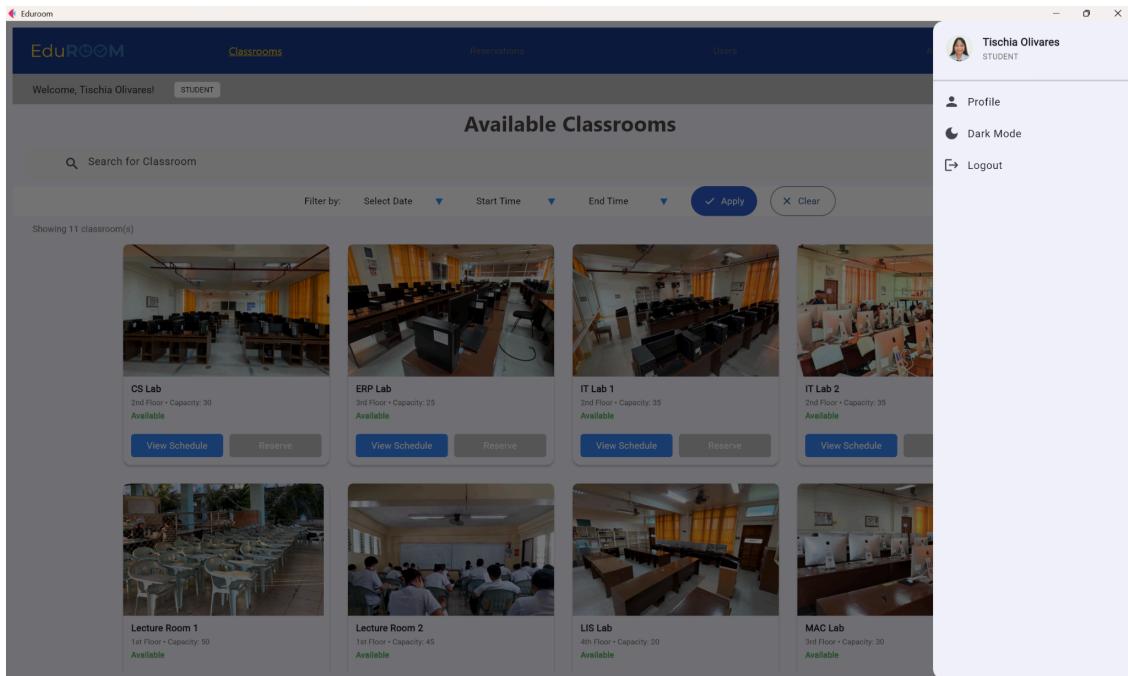
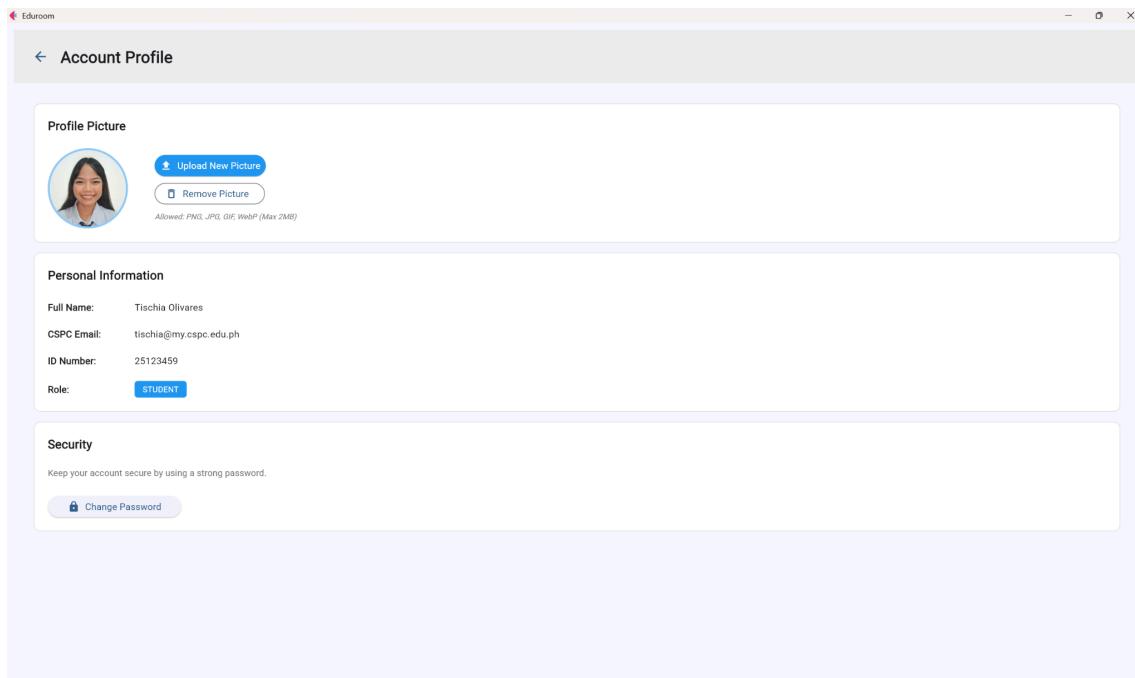


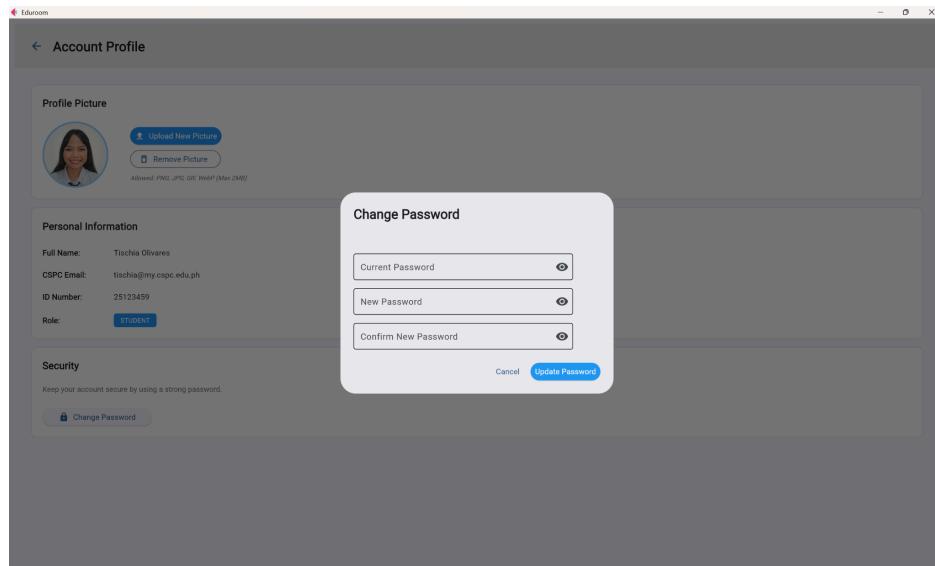
Figure 4.2.6: User Profile





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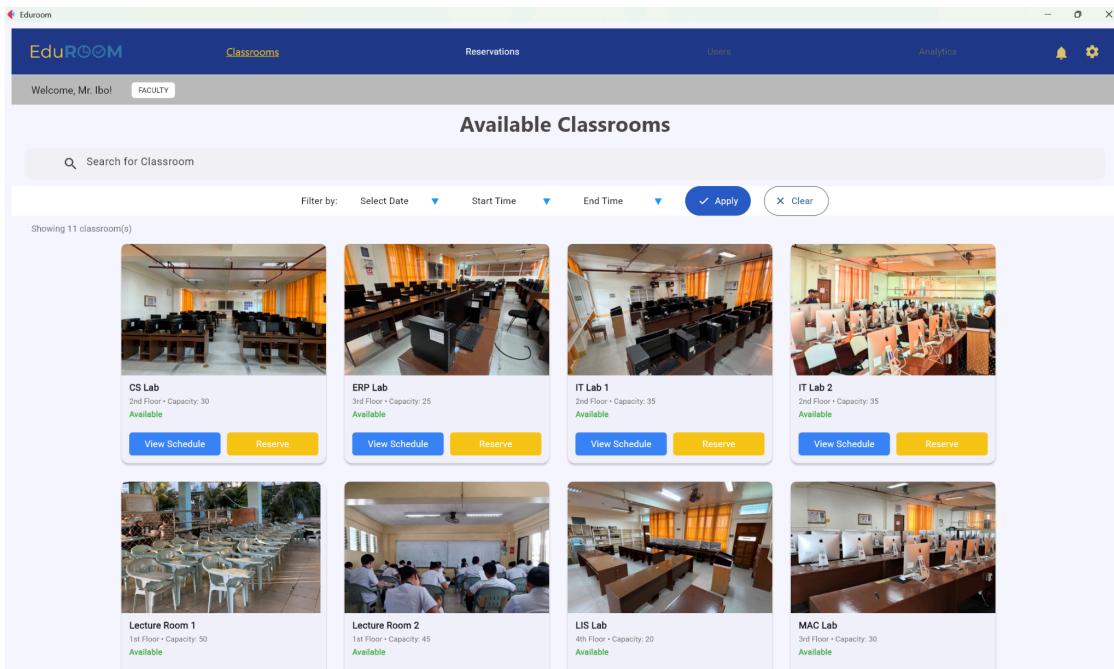
Figure 4.2.7: Change Password Interface



4.3 Faculty Interface

Faculty members have access to all student features plus reservation creation and management capabilities.

Figure 4.3.1: Faculty Classroom View with Reserve Button





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Figure 4.3.2: Reservation Form

Reserve CS Lab
2nd Floor • Capacity: 30
⚠ Reservation requires admin approval

Date *
December 11, 2025

Reserved Time Slots
8:00 - 10:00

Time Range *
12:00:00 - 13:00:00

✓ Time slot is available for booking

Purpose *
Purpose
Automata Theory Exam BSCS 3A

Reserve ERP Lab
3rd Floor • Capacity: 25
⚠ Reservation requires admin approval

Date *
December 11, 2025

Reserved Time Slots
No reservations on this date - all slots available!

Time Range *
08:00:00 - 09:00:00

✓ Time slot is available for booking

Purpose *
Purpose
Methods of Research Lecture

Submit Reservation

Figure 4.3.3: My Reservations Page

Upcoming (6)		Past (4)	
	CS Lab Building: 2nd Floor Duration: 9:00 - 11:00 Date: 12/12/2025 Purpose: Advanced Programming	X PENDING	Edit Cancel
	IT Lab 2 Building: 2nd Floor Duration: 14:00 - 16:00 Date: 12/11/2025 Purpose: Mobile App Development	X PENDING	Edit Cancel
	NAS Lab Building: 3rd Floor Duration: 13:00 - 15:00 Date: 12/11/2025 Purpose: AI Research Session	✓ APPROVED	Cancel
	CS Lab Building: 2nd Floor Duration: 12:00 - 13:00 Date: 12/11/2025	X PENDING	Edit Cancel



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Figure 4.3.4: Edit/Cancel Reservation Options

The figure consists of two side-by-side screenshots of the EduROOM software interface. Both screenshots show a 'My Reservations' page with a list of upcoming and past reservations.

Screenshot 1 (Left): Edit Reservation

A modal window titled 'Edit Reservation: CS Lab' is open. It shows the following details:

- Room: CS Lab
- Date: 2025-12-12
- Start Time: 9:00
- End Time: 11:00
- Purpose: Advanced Programming

Buttons at the bottom of the modal include 'Edit' (blue), 'Cancel' (red), and 'Save Changes' (green). A note below the modal states: 'Editing will reset status to pending'.

Screenshot 2 (Right): Cancel Reservation

A modal window titled 'Cancel Reservation?' is open. It shows the following details:

- Room: NAS Lab
- Date: 2025-12-11
- Time: 13:00 - 15:00

The note 'This action cannot be undone.' is displayed. Buttons at the bottom include 'Keep Reservation' (light blue) and 'Yes, Cancel It' (red).

Reservations List

The main list shows several reservations:

- CS Lab (Building: 2nd Floor, Duration: 12:00 - 13:00, Date: 12/11/2025, Purpose: AI Research Session, Status: APPROVED)
- NAS Lab (Building: 3rd Floor, Duration: 13:00 - 15:00, Date: 12/11/2025, Purpose: AI Research Session, Status: APPROVED)
- CS Lab (Building: 2nd Floor, Duration: 12:00 - 13:00, Date: 12/11/2025, Purpose: AI Research Session, Status: APPROVED)
- CS Lab (Building: 2nd Floor, Duration: 12:00 - 13:00, Date: 12/11/2025, Purpose: AI Research Session, Status: APPROVED)

Figure 4.3.5: Real-Time Notification Display

The figure shows a screenshot of the EduROOM interface with a notification sidebar.

Notifications Sidebar

The sidebar is titled 'Notifications' and shows two recent events:

- Reservation for CS Lab rejected (Dec 10, 15:22)
- Reservation for CS Lab approved (Dec 10, 13:40)

A 'View All' button is located at the bottom of the sidebar.

Main Interface: My Reservations

The main area displays a list of reservations:

- CS Lab (Status: REJECTED)
- IT Lab 2 (Status: PENDING)
- NAS Lab (Status: APPROVED)
- CS Lab (Status: APPROVED)



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4.4 Admin Interface

Admins have full system access including reservation management, user administration, and analytics viewing.

4.4.1 Reservation Management Dashboard

Figure 4.4.1: Pending Reservations View

The screenshot shows the EduROOM Classroom Reservation System interface. The top navigation bar includes 'Classroom Reservation System', 'EduROOM' logo, 'Classrooms', 'Reservations' (highlighted in yellow), 'Users', 'Analytics', and a notifications icon with 3 notifications. The main content area is titled 'Manage Reservations' and shows three pending reservations:

- Lecture Room 1**: Reserved by Mr. Ibo, Duration: 20:00:00 - 21:00:00, Date: 12/10/2025, Purpose: Makeup class for Application Development. Buttons: Approve (green) and Reject (red).
- RISE Lab**: Reserved by Mrs. Onesa, Duration: 20:00:00 - 22:30:00, Date: 12/10/2025, Purpose: Final Project Presentation. Buttons: Approve (green) and Reject (red).
- ERP Lab**: Reserved by Ms. Pandes, Duration: 20:19:00 - 22:19:00, Date: 12/10/2025. Buttons: Approve (green) and Reject (red).

A sidebar on the right titled 'Notifications' lists four new reservations:

- New Reservation for Lecture Room 1 Dec 10, 20:26
- New Reservation for RISE Lab Dec 10, 20:23
- New Reservation for ERP Lab Dec 10, 20:20
- New Reservation for CS Lab Dec 09, 04:08

[View All →](#)

Figure 4.4.2: Approved Reservations

The screenshot shows the EduROOM Classroom Reservation System interface, similar to Figure 4.4.1 but with 'Approved' reservations selected. The top navigation bar and main content area are identical, showing three approved reservations:

- CS Lab**: Reserved by Mr. Ibo, Duration: 9:00:00 - 11:00:00, Date: 12/10/2025, Purpose: Advanced Programming. Status: APPROVED.
- ERP Lab**: Reserved by Mr. Colle, Duration: 13:00:00 - 15:00:00, Date: 12/10/2025, Purpose: Business Intelligence Workshop. Status: APPROVED.
- Lecture Room 2**: Reserved by Ms. Fortuno, Duration: 10:00:00 - 12:00:00, Date: 12/10/2025. Status: APPROVED.



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Figure 4.4.3: Rejected Reservations

The screenshot shows the 'Manage Reservations' page with the 'Rejected' tab selected. There are two entries:

- CS Lab**: Reserved by: Mr. Colle, Duration: 13:00:00 - 15:00:00, Date: 12/07/2025, Purpose: Database Management. Status: REJECTED.
- Lecture Room 2**: Reserved by: Ms. Fortuno, Duration: 13:00:00 - 15:00:00, Date: 12/07/2025, Purpose: Academic Writing Workshop. Status: REJECTED.

Figure 4.4.4: Ongoing Reservations

The screenshot shows the 'Manage Reservations' page with the 'Ongoing' tab selected. There are three entries:

- Lecture Room 1**: Reserved by: Mr. Ibo, Duration: 20:00:00 - 21:00:00, Date: 12/10/2025, Purpose: Makeup class for Application Development. Status: ONGOING.
- RISE Lab**: Reserved by: Mrs. Onesa, Duration: 20:00:00 - 22:30:00, Date: 12/10/2025, Purpose: Final Project Presentation. Status: ONGOING.
- ERP Lab**: Reserved by: Ms. Pandes, Duration: 20:19:00 - 22:19:00, Date: 12/10/2025. Status: ONGOING.



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Figure 4.4.5: Completed Reservations

The screenshot shows the 'Manage Reservations' page of the EduROOM system. At the top, there are tabs for Pending (2), Approved (3), Ongoing (0), Done (22), and Rejected (0). The 'Done (22)' tab is selected. Below the tabs, three completed reservations are listed in cards:

- LIS Lab**
Reserved by: Mr. Ibo
Duration: 10:00:00 - 12:00:00
Date: 12/06/2025
Purpose: iOS Development Workshop (circle with checkmark) DONE
- NAS Lab**
Reserved by: Mr. Colle
Duration: 8:00:00 - 10:00:00
Date: 12/06/2025
Purpose: Open Lab Session (circle with checkmark) DONE
- NAS Lab**
Reserved by: Ms. Fortuno
Duration: 15:00:00 - 17:00:00
Date: 12/06/2025
Purpose: Student Hackathon (circle with checkmark) DONE

4.4.2 User Management Interface

Figure 4.4.6: User Management Dashboard

The screenshot shows the 'User Management' page of the EduROOM system. At the top, there is a search bar with placeholder text 'Search by Name, Email, or ID Number' and a '+ Create New User' button. Below the search bar, there are filter options: All Users (12), Active (12), Inactive (0), Admin (1), Faculty (7), and Student (4). The 'All Users (12)' option is selected.

Total: 12 user(s)

	Mr. Ibo CSPC Email: ibo@my.cspc.edu.ph ID: 20231001	FACULTY	Active	Edit	Details	Delete	Archive
	Ms. Fortuno CSPC Email: fortuno@my.cspc.edu.ph ID: 20231003	FACULTY	Active	Edit	Details	Delete	Archive
	Ms. Pandes CSPC Email: pandes@my.cspc.edu.ph ID: 20231004	FACULTY	Active	Edit	Details	Delete	Archive
	Mrs. Onesa						



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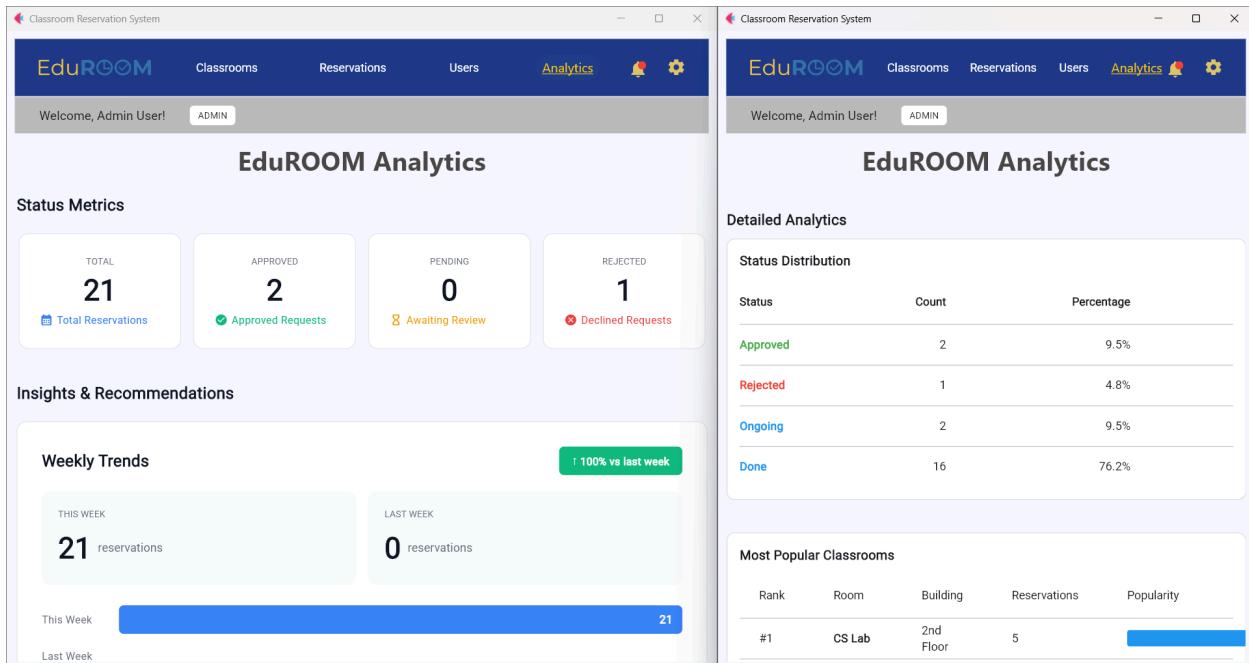
Figure 4.4.7: Create New User Form

The screenshot shows the 'Create New User' dialog box over a list of existing users. The user input is as follows:

Full Name	Jessica Mae Lanuzo
Email	jess@my.cspc.edu.ph
ID Number	25123456
Password	*****
Role	Student

A red error message 'X ID Number already exists' is displayed above the ID number input field.

Figure 4.4.8: Analytics Dashboard - Status Metrics and Trends





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Figure 4.4.9: Popular Classrooms and Faculty Activity

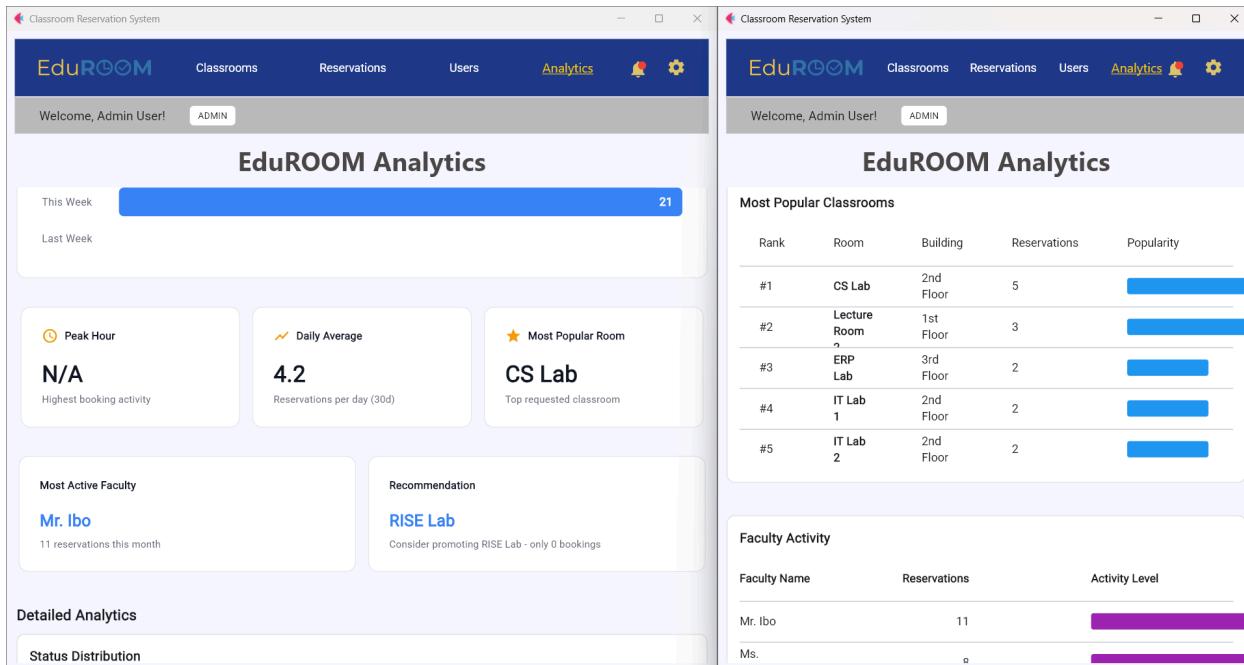


Figure 4.4.10: Recent Trends and Utilization Statistics

