

Multi-Location Classroom Management System - Feature Specification

Tech Stack

Frontend: React (JavaScript) with Axios for HTTP requests

Backend: Node.js with Express

Database: MongoDB (local)

Authentication: JWT with refresh tokens

Primary & Secondary Users

Primary: Admin, Teachers, Students

Secondary: Parents/Guardians (receive notifications)

1. User & Role Management

- Admin: full control of data, approvals, reporting
- Teacher: manage assigned classes, materials, attendance, fees
- Student: view schedule, materials, report cards, fee status
- Parent/Guardian: receives email/SMS notifications

Sidebar navigation is dynamic based on role.

2. Authentication & Security

- JWT authentication with access & refresh tokens
- Forgot-password and reset via email
- Session expiry and bcrypt password hashes

3. Onboarding Flow

Teachers and Students self-register. Admin reviews requests, approves or rejects, and assigns users to classes and locations. Parent email is mandatory for students.

4. Locations & Classes

Admin creates multiple locations and classes. Each class stores: title, level, location, teacher, schedule (RRULE), capacity, and fee configuration.

5. Scheduling & Upgrading

Students upgrade only after 9 months of enrollment and all fees paid up to November. Holiday

months (April, August, December) are excluded from scheduling calculations.

6. Attendance & Exams

Teachers mark attendance (present, absent, excused) and enter marks per exam. PDF report cards are auto-generated and emailed to parents.

7. Teaching Materials

Teachers upload files and links for their classes. Students view and search materials by topic or date.

8. Fee Management

Teachers record payments manually. System tracks fee status (paid, partial, overdue) and provides summaries per class and location.

9. Invoice Generation

Monthly fee invoices in PDF per student with customizable template, emailed to parents.

10. Notice Board & Messaging

Location-specific or global notices using a rich-text editor. Optional acknowledgement flow. Email/SMS alerts for critical announcements.

11. Dashboards

Admin: KPIs, trends, upcoming schedules, pending approvals.

Teacher: My classes, weekly calendar, fee alerts.

Student: Timetable, materials, fee status, report cards.

12. In-App Notifications

Notification bell with real-time alerts for approvals, uploads, fee reminders. Stored activity log for each user.

13. Bulk Import / Export

CSV import/export for users, attendance, marks, and payments. Excel downloads for reports.

14. Branding Customization

Upload logo, customize colors, location-specific branding, and custom email footer.

15. UI / UX Design

Responsive light-theme design with card layouts, modals, global search, data tables (search, filter, pagination), and palette: rgb(191,250,243), rgb(242,119,131), rgb(132,215,97).

Additional Reports

Administrative Reports

1. Student Master Report - full list with contact and status
2. Teacher Master Report - classes, joining date, status
3. Location Summary - counts of students, teachers, classes, fees
4. Classroom Occupancy - capacity vs enrollment with demographics

Finance & Fees Reports

1. Monthly Fees Collection - totals by location/class
2. Outstanding Payments - unpaid and partially paid lists
3. Payment History (per student) - receipts, balance

Performance & Academic Reports

1. Class-wise Attendance - monthly percentage per student
2. Student Attendance History - trend across months
3. Exam Results - scores, averages, top/bottom performers
4. Report Cards - individual PDFs with marks and attendance

Operational & Misc Reports

1. Pending Approvals - teacher/student sign-up queue
2. System Activity Log - audit of key actions
3. Issue Tracker - open vs resolved issues
4. Inactive Users - users with no activity for N days

Scheduling & Calendar Reports

1. Upcoming Class Schedule - next sessions by location/class
2. Holiday & Event Calendar - official breaks and events

Analytical Reports (with charts)

1. Enrollment Trend - new vs dropped students over time
2. Fee Collection Trend - income trend by month/year