

Smart Timetable system

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ABSTRACT

The Smart Timetable System is a web-based academic scheduling platform designed to automate and streamline timetable management for engineering colleges. The system manages multiple departments, academic years, and sections while ensuring efficient allocation of faculty, classrooms, and subjects. It incorporates a centralized administrative structure with role-based access control to coordinate college-wide scheduling activities. The platform includes an intelligent, constraint-based rescheduling mechanism that dynamically adjusts timetables during holidays or academic events without creating faculty or classroom conflicts. By reducing manual effort and improving scheduling accuracy, the system aims to provide a scalable and reliable solution for modern academic timetable management.

1. INTRODUCTION:

A Smart Timetable System is an innovative scheduling solution that replaces traditional manual timetables with an automated, flexible, and user-friendly approach. It uses modern technologies like artificial intelligence and cloud integration to generate and manage schedules for students, teachers, and administrators. The system adapts instantly to changes such as rescheduled lectures or canceled sessions, ensuring that conflicts are minimized and resources like classrooms and faculty time are used efficiently. With features like personalized schedules, real-time updates, and integration with digital calendars, it reduces administrative workload, saves time, and enhances productivity. Overall, a Smart Timetable System provides transparency, accessibility, and efficiency in managing academic and organizational schedules, making it a valuable tool for institutions.

2. LITERATURE SURVEY:

Several research works and tools have been studied to understand the existing approaches to automated timetable generation and scheduling systems.

Timetable Generation (Devpost, 2024) proposed a deterministic constraint-based scheduling approach for generating academic timetables.

The system successfully produces conflict-free timetables while enforcing multiple constraints simultaneously. However, the approach suffers from high constraint complexity and requires highly accurate input data to deliver consistent and reliable results.

Time Table Generator using PHP + MySQL (PHPGurukul, 2023) implemented a web-based timetable generation system using PHP and MySQL with built-in rule constraints. The system automates the timetable generation process, significantly reducing manual effort and time. Despite its usefulness, the system offers only basic scheduling logic and provides limited support for advanced rescheduling scenarios.

UniTime Web Tool (2025) introduced an auto-scheduling mechanism with real-time constraint checking. The tool produces conflict-free timetables quickly by considering both teacher and room availability. A notable drawback is its paid and custom pricing model, along with limited open documentation of its underlying algorithm, making it less accessible for academic research.

Edutimer Timetable Software (2025) supports both automatic and manual scheduling with strict rule enforcement. It offers flexible teacher substitution and error-free schedule verification,

making it suitable for day-to-day school management. However, it is primarily designed for school-level use and is not fully customizable for the specific requirements of higher education institutions.

Timetable Generator using Constraint Satisfaction Problem — CSP (GitHub, 2024) applied a constraint satisfaction problem model to generate academic schedules based on user-defined constraints such as no class overlap. The system efficiently handles basic scheduling constraints. Its primary limitation is scalability, as the approach struggles to perform well in large institutions with a high number of courses, rooms, and faculty.

Research Gap: From the above survey, it is evident that existing systems either lack scalability, are limited to school-level use, or require paid licensing. Most systems also do not provide role-based access control for managing multiple departments dynamically. This gap motivates the development of the Smart Timetable System — a PHP/MySQL-based web application that automates academic scheduling with role-based access for Super Admin, Department Admin, Faculty, and Students, addressing the limitations identified above.

3. PROBLEM STATEMENT:

In most educational institutions, timetables are prepared manually, which is time-consuming, prone to human error, and often results in conflicts such as overlapping classes, improper allocation of faculty, or inefficient use of classrooms and resources. Traditional timetables are static and lack flexibility, making it difficult to accommodate sudden changes like rescheduled lectures, faculty unavailability, or special events. Students and teachers often face confusion due to delayed updates or miscommunication, which affects productivity and academic performance.

The absence of a centralized, automated system leads to inefficiency, increased administrative workload, and lack of transparency. Therefore, there is a need for a Smart Timetable System that can automatically generate, update, and manage

schedules in real-time, ensuring accuracy, adaptability, and accessibility for all stakeholders.

4. PROPOSED SYSTEM:

The proposed Smart Timetable System is designed to overcome the limitations of existing timetable management solutions by integrating advanced features such as dynamic adaptability, personalized scheduling, and seamless integration with external platforms. It leverages machine learning algorithms to optimize scheduling based on user preferences, resource availability, and real-time changes.

Key features of the proposed system include:

- Dynamic rescheduling to handle sudden changes in faculty availability or room assignments.
- Personalized timetable views and notifications tailored to individual users.
- Integration with external calendar platforms like Google Calendar and Microsoft Outlook for synchronization.
- Cloud-based accessibility ensuring availability across multiple devices.
- Efficient conflict detection and resolution mechanisms.
- User-friendly interface with role-based access for students, faculty, and administrators.

5. METHODOLOGY:

5.1 System Development Methodology

The Smart Timetable System was developed using the Waterfall Model of software development, which follows a sequential and structured approach. This methodology was chosen due to the well-defined requirements of academic timetable scheduling, where each phase is completed before the next begins.

The development was carried out in the following phases:

Phase 1– Requirement Analysis: The functional and non-functional requirements of the system were gathered by studying the existing manual timetable process followed in the IT department. Requirements such as role-based access, conflict-free scheduling, subject-faculty mapping, and department-wise timetable generation were identified.

Phase 2– System Design: The system architecture was designed using a three-tier model consisting of the Presentation Layer (HTML/CSS/JavaScript front-end), the Application Layer (PHP backend logic), and the Data Layer (MySQL database). An Entity-Relationship (ER) diagram and a nine-table relational schema were designed to represent all entities including users, departments, subjects, faculty, rooms, and timetable slots.

Phase 3– Implementation: The system was implemented using XAMPP (Apache + MySQL + PHP) as the local server environment. Role-based modules were developed for four user types: Super Admin, Department Admin, Faculty, and Student. Core modules include user management, subject-faculty assignment, room allocation, and automated timetable generation with conflict checking.

Phase 4– Testing: The system was tested using Black Box Testing to verify that all functional modules behave as expected. Test cases were designed for login authentication, timetable generation, conflict detection, and role-based access restrictions.

Phase 5– Deployment: The system was deployed on a local XAMPP server within the college network, making it accessible to authorized users through a web browser without the need for additional software installation.

5.2 System Architecture

The Smart Timetable System follows a Role-Based Access Control (RBAC) architecture with four hierarchical roles:

Super Admin – Manages all departments, users, and global settings

Department Admin – Manages subjects, faculty assignments, rooms, and generates timetables for their department

Faculty – Views their assigned timetable and weekly schedule

Student – Views the class timetable for their respective department and semester

The system uses a centralized MySQL database to store all scheduling data, ensuring data consistency and avoiding duplication across departments.

5.3 Timetable Generation Methodology

The timetable generation in this system follows a Constraint-Based Greedy Scheduling approach. The Department Admin initiates the generation process, and the system automatically assigns subjects to time slots by checking a set of hard constraints before every assignment.

Hard Constraints enforced by the system:

A faculty member cannot be assigned to two different classes at the same time slot

A classroom/room cannot be occupied by two different classes simultaneously

A subject cannot appear more than the allowed number of times per week

No time slot can be left with duplicate entries for the same section

Soft Constraints considered:

Faculty workload should be distributed evenly across the week

Subjects with labs should be scheduled in consecutive slots where possible

Morning slots are preferred for core subjects

6. ALGORITHM:

6.1 Timetable Generation Algorithm

The following algorithm describes the step-by-step process used by the Smart Timetable System to generate a conflict-free timetable:

Algorithm: Constraint-Based Greedy Timetable Generation

INPUT:

- List of Subjects (S) with weekly frequency
- List of Faculty (F) with subject assignments
- List of Time Slots (T) = {Monday to Saturday} × {Period 1 to Period 6}
- List of Rooms (R)
- Department and Semester

OUTPUT:

- Conflict-free Timetable for the given Department and Semester

STEPS:

Step 1: START

Step 2: Fetch all subjects assigned to the selected department and semester from the database.

Step 3: Fetch faculty-subject mapping for each subject.

Step 4: Initialize an empty timetable grid:
Timetable[Day][Period] = NULL
for all Days in {Mon, Tue, Wed, Thu, Fri, Sat}
for all Periods in {1, 2, 3, 4, 5, 6}

Step 5: For each Subject (s) in Subject List:
Set remaining_count = weekly_frequency[s]

Step 6: While remaining_count > 0:

Step 6a: Select next available Time Slot (day, period)
where Timetable[day][period] = NULL

Step 6b: CHECK CONSTRAINT 1 — Faculty Conflict:

If Faculty[s] is already assigned to another subject
at Timetable[day][period]:
→ Skip this slot, try next slot
Else → Continue

Step 6c: CHECK CONSTRAINT 2 — Room Conflict:

If Room assigned is already occupied at [day][period]:
→ Skip this slot, try next slot
Else → Continue

Step 6d: CHECK CONSTRAINT 3 — Subject Frequency:

If subject (s) already appears maximum allowed times in the current day:
→ Skip this day, try next day
Else → Continue

Step 6e: If all constraints are satisfied:
Assign: Timetable[day][period] = {Subject, Faculty, Room}
remaining_count = remaining_count - 1

Step 7: Repeat Step 5–6 for all subjects.

Step 8: If any slot remains NULL after all subjects are assigned:
Mark slot as "Free Period"

Step 9: Save the generated Timetable to the database.

Step 10: Display the Timetable to the Department Admin for review.

Step 11: STOP

6.2 Conflict Detection Algorithm

INPUT: Proposed assignment {Subject, Faculty, Room, Day, Period}

OUTPUT: CONFLICT FOUND / NO CONFLICT

Step 1: Query database:

```
SELECT * FROM timetable
WHERE day = input_day AND period
= input_period
```

Step 2: If Faculty already exists in result for same day and period:

```
RETURN "Faculty Conflict
Detected"
```

Step 3: If Room already exists in result for same day and period:

```
RETURN "Room Conflict Detected"
```

Step 4: If Subject count for this day $\geq$ max_per_day limit:

```
RETURN "Subject Frequency
Exceeded"
```

Step 5: RETURN "No Conflict — Slot Available"

6.3 Algorithm Complexity

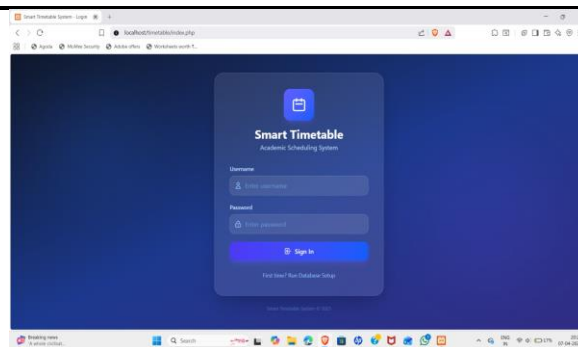
ParameterValueTimeComplexity $O(S \times T)$ where S = Subjects, T = Total Time Slots
SpaceComplexity $O(D \times P)$ where D = Days, P = Periods per day
Conflict Check per slot $O(1)$ using indexed DB queries
WorstCase $O(S \times D \times P)$ when backtracking is needed

6.4 Flowchart Description

The timetable generation process follows this flow:

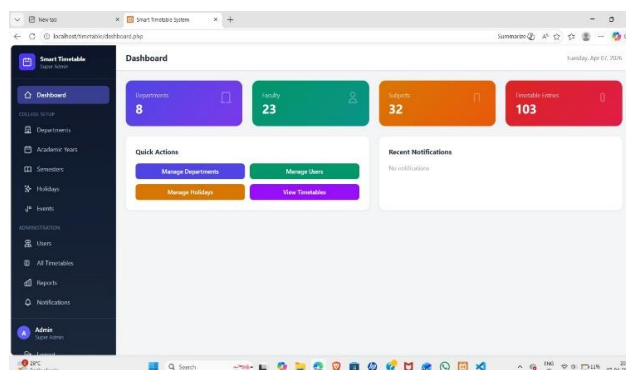
Start → Login as Dept Admin → Select Department & Semester → Fetch Subjects & Faculty → Initialize Empty Grid → For Each Subject: Check Faculty Conflict → Check Room Conflict → Check Frequency Limit → Assign Slot → All Subjects Done? → Save to DB → Display Timetable → End

7. RESULTS:

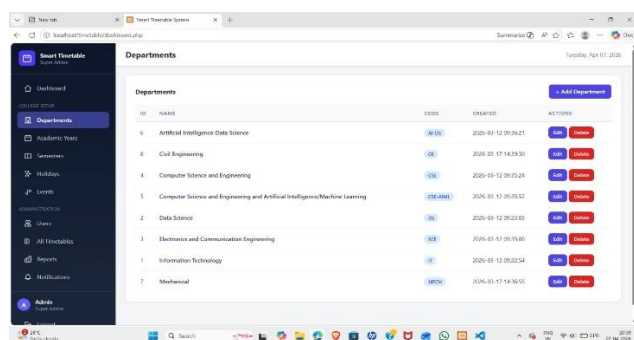


The Login Page is the entry point of the Smart Timetable Academic Scheduling System. It is displayed at the URL localhost/timetable/index.php and serves as the authentication gateway for all users. The screen features a centered login card on a dark blue gradient background. At the top of the card, a blue calendar icon represents the system branding, followed by the title "Smart Timetable" and the subtitle "Academic Scheduling System." Below the branding, there are two input fields — a Username field with a user icon placeholder and a Password field with a lock icon placeholder — for entering login credentials. A blue "Sign In" button is provided to submit the credentials. At the bottom of the card, a link reads "First time? Run Database Setup," which is used for the initial database configuration of the system. The page footer displays "Smart Timetable System © 2025."

This screen ensures that only authorized users such as Super Admin, Admin, or Faculty can access the system by verifying their credentials before granting entry to the dashboard.



The Dashboard is the main control panel of the Smart Timetable System, accessible after a successful login at localhost/timetable/dashboard.php. It is designed for the Super Admin and provides a centralized overview of the entire system. The screen is divided into a left navigation sidebar and a main content area. The sidebar displays the system logo and the logged-in user's name (Admin – Super Admin). It contains navigation links organized under two sections: College Setup (Departments, Academic Years, Semesters, Holidays, Events) and Administration (Users, All Timetables, Reports, Notifications), along with a Logout option at the bottom. The main content area displays four colorful statistics cards at the top showing key system counts: Departments (8), Faculty (23), Subjects (32), and Timetable Entries (103). Below the statistics, a Quick Actions panel provides four shortcut buttons — Manage Departments, Manage Users, Manage Holidays, and View Timetables — for fast navigation to frequently used modules. A Recent Notifications panel on the right side displays system alerts; it currently shows "No notifications." The current date (Tuesday, Apr 07, 2026) is shown in the top-right corner.



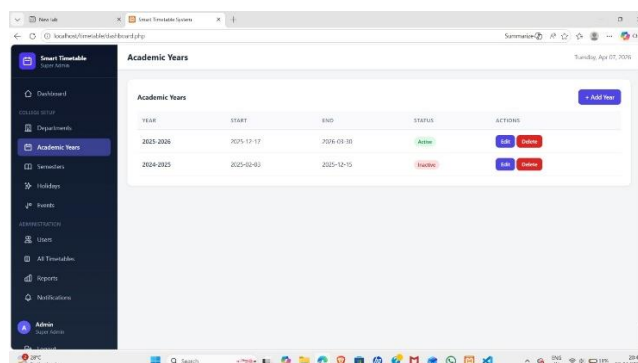
The Departments screen is part of the College Setup section and allows the Super Admin to view and manage all academic departments registered in the system. The screen displays a table listing all departments with the following columns: ID (unique numeric identifier), Name (full department name), Code (short alphabetic code displayed as a badge), Created (date and time the department was added), and Actions

(Edit and Delete buttons for modifying or removing a record). A blue "+ Add Department" button is available in the top-right corner to register a new department.

The following departments are currently registered in the system:

- ID 1 – Information Technology (IT), created on 2026-03-12
- ID 2 – Data Science (DS), created on 2026-03-12
- ID 3 – Electronics and Communication Engineering (ECE), created on 2026-03-12
- ID 4 – Computer Science and Engineering (CSE), created on 2026-03-12
- ID 5 – Computer Science and Engineering and Artificial Intelligence/Machine Learning (CSE-AIML), created on 2026-03-12
- ID 6 – Artificial Intelligence – Data Science (AI-DS), created on 2026-03-12
- ID 7 – Mechanical (MECH), created on 2026-03-17
- ID 8 – Civil Engineering (CE), created on 2026-03-17

This screen enables the administrator to maintain an up-to-date list of academic departments, with each department assigned a unique code that is used across timetables and reports.



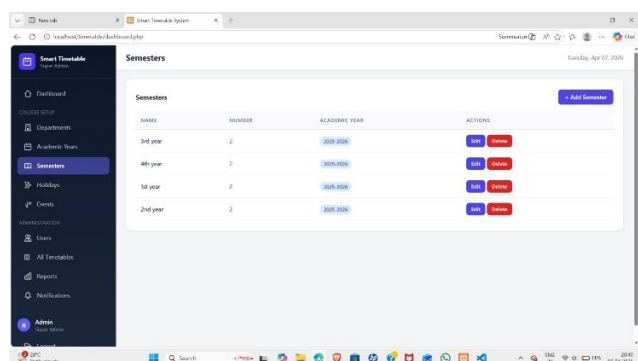
The Academic Years screen is part of the College Setup section and allows the Super Admin to manage the academic year records of

the institution. These records define the time periods during which timetables and schedules are active. The screen displays a table with the following columns: Year (academic year label), Start (start date of the year), End (end date of the year), Status (Active or Inactive badge), and Actions (Edit and Delete buttons). A blue "+ Add Year" button is available in the top-right corner to add a new academic year.

The following academic years are currently recorded in the system:

- 2025–2026: Start date 2025-12-17, End date 2026-03-30, Status — Active (currently running academic year)
- 2024–2025: Start date 2025-02-03, End date 2025-12-15, Status — Inactive (past academic year retained for records)

An Active status indicates the current running academic year under which timetables and schedules are being managed. An Inactive status indicates a past academic year that is no longer in use but is preserved for historical reference.



Name	Number	Academic Year	Actions
3rd year	2	2024-2025	Edit Delete
4th year	2	2025-2026	Edit Delete
1st year	2	2025-2026	Edit Delete
2nd year	2	2025-2026	Edit Delete

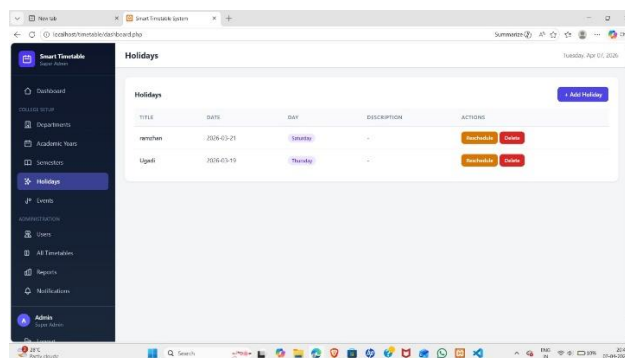
The Semesters screen is part of the College Setup section and allows the Super Admin to manage the semester records associated with each academic year. Semesters define the divisions within an academic year and are linked to timetable scheduling for each year of study. The screen displays a table listing all semesters with the following columns: Name (the year of study), Number (the semester number within that year), Academic Year (the academic year the semester belongs to, displayed

as a badge), and Actions (Edit and Delete buttons). A blue "+ Add Semester" button is available in the top-right corner to add a new semester.

The following semesters are currently configured for the academic year 2025–2026:

- 1st Year — Semester Number: 2, Academic Year: 2025-2026
- 2nd Year — Semester Number: 2, Academic Year: 2025-2026
- 3rd Year — Semester Number: 2, Academic Year: 2025-2026
- 4th Year — Semester Number: 2, Academic Year: 2025-2026

All four years are currently in Semester 2 of the academic year 2025–2026, meaning the second half of the academic year is currently in progress for all years of study.



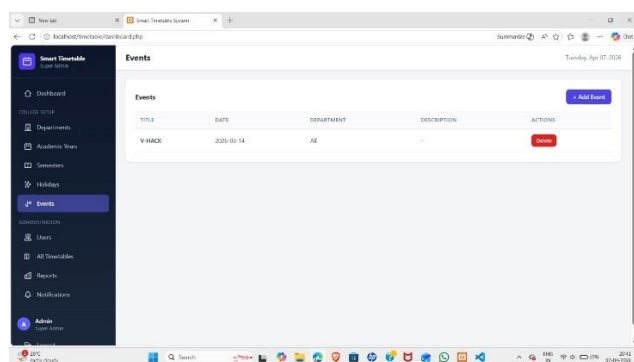
Title	Date	Day	Description	Actions
Ramadan	2024-02-27	Sunday		Reschedule Delete
Ugadi	2024-03-01	Thursday		Reschedule Delete

The Holidays screen is part of the College Setup section and allows the Super Admin to manage holiday records for the institution. These holidays are taken into account during timetable scheduling so that no classes are assigned on those days. The screen displays a table listing all holidays with the following columns: Title (name of the holiday), Date (the date on which the holiday falls), Day (the day of the week displayed as a colored badge), Description (additional details, if any), and Actions (Reschedule and Delete buttons). A blue "+ Add Holiday" button is available in the top-right corner to add a new holiday entry.

The following holidays are currently recorded in the system:

- Ramzan — Date: 2026-03-21, Day: Saturday — Actions: Reschedule / Delete
- Ugadi — Date: 2026-03-19, Day: Thursday — Actions: Reschedule / Delete

The Reschedule button allows the admin to reassign any classes that were originally scheduled on a holiday to an alternative date or time slot. The Delete button removes the holiday record from the system.

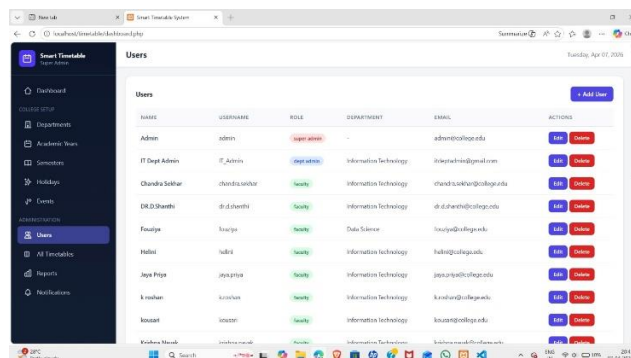


The Events screen is part of the College Setup section and allows the Super Admin to manage institutional events that may affect the regular class schedule. It helps the admin keep track of college-wide or department-specific events. The screen displays a table listing all events with the following columns: Title (name of the event), Date (the date on which the event is scheduled), Department (the department(s) for which the event applies), Description (additional details, if any), and Actions (Delete button). A blue "+ Add Event" button is available in the top-right corner to register a new event.

The following event is currently recorded in the system:

- V-HACK — Date: 2026-03-14, Department: All (applicable to all departments) — Action: Delete

The Department value "All" indicates that the event applies to every department in the institution, meaning the entire college is involved in the event on that day.



The Users screen is part of the Administration section and allows the Super Admin to view and manage all registered users of the Smart Timetable System. It controls who has access to the system and at what level of permission. The screen displays a table listing all users with the following columns: Name (full name of the user), Username (login ID used to access the system), Role (the user's access level displayed as a colored badge), Department (the department the user belongs to), Email (the user's registered email address), and Actions (Edit and Delete buttons). A blue "+ Add User" button is available in the top-right corner to register a new user.

The system supports three user roles:

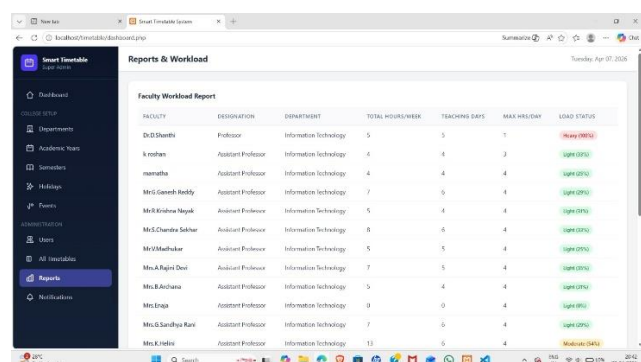
- Super Admin — Has full access to all modules of the system including College Setup, Administration, and Timetable management. There is one Super Admin in the system (Admin, username: admin, email: admin@college.edu).
- Dept Admin — Has administrative access limited to their own department. The current dept admin is IT Dept Admin (username: IT_Admin) for the Information Technology department (email: itdeptadmin@gmail.com).
- Faculty — Teaching staff who can view their own timetables. Multiple faculty

members are registered under various departments.

The following faculty members are visible in the current view, all belonging to the Information Technology department unless stated otherwise:

- Chandra Sekhar (username: chandra.sekhar) — Faculty, Information Technology
- DR. D. Shanthi (username: dr.d.shanthi) — Faculty, Information Technology
- Fouziya (username: fouziya) — Faculty, Data Science
- Helini (username: helini) — Faculty, Information Technology
- Jaya Priya (username: jaya.priya) — Faculty, Information Technology
- K Roshan (username: k.roshan) — Faculty, Information Technology
- Kousari (username: kousari) — Faculty, Information Technology
- Krishna Nayak (username: krishna.nayak) — Faculty, Information Technology (partially visible)

This screen enables the Super Admin to maintain user accounts, assign roles, and link each user to their respective department for proper access control within the system.



FACULTY	DESIGNATION	DEPARTMENT	TOTAL HOURS/WEEK	TEACHING DAYS	MAX WORKLOAD	LOAD STATUS
Dr.D Shanthi	Professor	Information Technology	5	5	1	Heavy (100%)
k roshan	Assistant Professor	Information Technology	4	4	4	Light (25%)
mamatha	Assistant Professor	Information Technology	4	4	4	Light (25%)
Mr.G Ganesh Reddy	Assistant Professor	Information Technology	7	7	4	Light (29%)
Mr.S Chandra Sekhar	Assistant Professor	Information Technology	5	5	4	Light (25%)
Mr.V Madhukar	Assistant Professor	Information Technology	5	5	4	Light (25%)
Mrs.A Rajini Devi	Assistant Professor	Information Technology	7	7	4	Light (29%)
Mrs.R Anitha	Assistant Professor	Information Technology	5	5	4	Light (25%)
Mrs.Enga	Assistant Professor	Information Technology	4	4	4	Light (25%)
Mrs.V. Madhukar	Assistant Professor	Information Technology	7	7	4	Light (29%)
Mrs.R. Indira	Assistant Professor	Information Technology	13	13	4	Medium (33%)

The Reports and Workload screen is part of the Administration section and provides the Super Admin with a detailed analysis of the teaching workload assigned to each faculty member. It helps the admin ensure that the teaching load is fairly and efficiently distributed across the

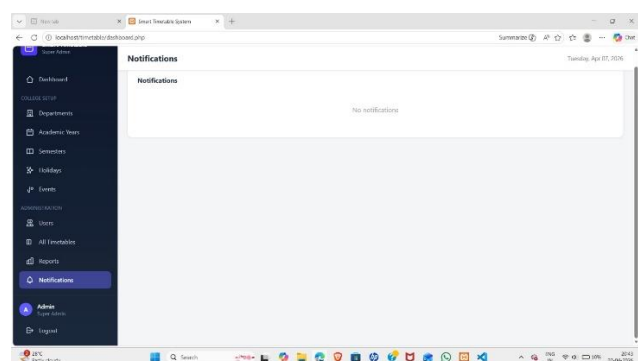
faculty. The screen displays a Faculty Workload Report in a tabular format with the following columns: Faculty (name of the faculty member), Designation (their academic rank), Department (the department they belong to), Total Hours/Week (total number of teaching hours assigned per week), Teaching Days (number of days per week the faculty teaches), Max Hrs/Day (the maximum number of hours the faculty teaches on any single day), and Load Status (a colored badge indicating the workload level — Heavy, Moderate, or Light — along with a percentage).

The following faculty members and their workload details are visible for the Information Technology department:

- Dr. D. Shanthi — Professor — 5 hrs/week, 5 teaching days, 1 max hr/day — Load Status: Heavy (100%)
- K Roshan — Assistant Professor — 4 hrs/week, 4 teaching days, 3 max hrs/day — Load Status: Light (33%)
- Mamatha — Assistant Professor — 4 hrs/week, 4 teaching days, 4 max hrs/day — Load Status: Light (25%)
- Mr. G. Ganesh Reddy — Assistant Professor — 7 hrs/week, 6 teaching days, 4 max hrs/day — Load Status: Light (29%)
- Mr. R. Krishna Nayak — Assistant Professor — 5 hrs/week, 4 teaching days, 4 max hrs/day — Load Status: Light (31%)
- Mr. S. Chandra Sekhar — Assistant Professor — 8 hrs/week, 6 teaching days, 4 max hrs/day — Load Status: Light (33%)
- Mr. V. Madhukar — Assistant Professor — 5 hrs/week, 5 teaching days, 4 max hrs/day — Load Status: Light (25%)
- Mrs. A. Rajini Devi — Assistant Professor — 7 hrs/week, 5 teaching days, 4 max hrs/day — Load Status: Light (35%)

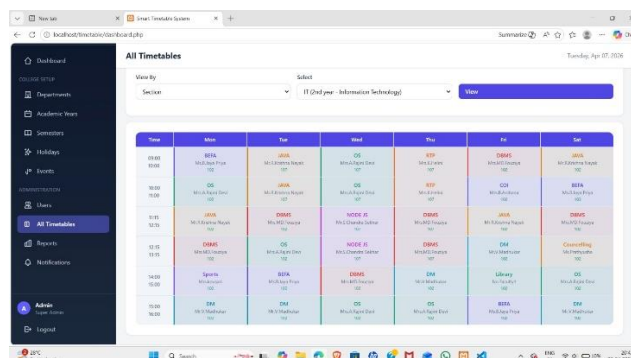
- Mrs. B. Archana — Assistant Professor — 5 hrs/week, 4 teaching days, 4 max hrs/day — Load Status: Light (31%)
- Mrs. Enaja — Assistant Professor — 0 hrs/week, 0 teaching days, 4 max hrs/day — Load Status: Light (0%)
- Mrs. G. Sandhya Rani — Assistant Professor — 7 hrs/week, 6 teaching days, 4 max hrs/day — Load Status: Light (29%)
- Mrs. K. Helini — Assistant Professor — 13 hrs/week, 6 teaching days, 4 max hrs/day — Load Status: Moderate (54%)

The Load Status badges use color coding to indicate workload levels: red for Heavy, orange for Moderate, and green for Light. This report helps the administrator identify overloaded or underutilized faculty members and make adjustments to the timetable accordingly to ensure a balanced distribution of teaching responsibilities.



The Notifications screen is part of the Administration section and serves as the system's alert and message center. It is designed to display important system-generated notifications to the Super Admin, such as scheduling conflicts, timetable updates, holiday reschedules, or any other system events that require attention. The screen currently displays the message "No notifications," indicating that there are no pending alerts or system messages at this time. This means the timetable is running without any conflicts or issues that require administrative action. This screen ensures that the admin is always informed of any important

changes or conflicts within the system, allowing for quick response and resolution when needed.



Time	Mon	Tue	Wed	Thu	Fri	Sat
08:00 - 09:00	BEFA Ms. B. Jaya Priya 101	JAVA Mr. R. Krishna Nayak 101	OS (Operating Systems) Mrs. A. Rajini Devi 101	RTP Mrs. K. Helini 101	DBMS Mrs. MD. Fouziya 101	JAVA Ms. B. Jaya Priya 101
09:00 - 10:00	OS (Operating Systems) Mrs. A. Rajini Devi 101	JAVA Mr. R. Krishna Nayak 101	BEFA Ms. B. Jaya Priya 101	RTP Mrs. K. Helini 101	DBMS Mrs. MD. Fouziya 101	JAVA Ms. B. Jaya Priya 101
10:00 - 11:00	BEFA Ms. B. Jaya Priya 101	JAVA Mr. R. Krishna Nayak 101	OS (Operating Systems) Mrs. A. Rajini Devi 101	RTP Mrs. K. Helini 101	DBMS Mrs. MD. Fouziya 101	JAVA Ms. B. Jaya Priya 101
11:00 - 12:00	OS (Operating Systems) Mrs. A. Rajini Devi 101	JAVA Mr. R. Krishna Nayak 101	BEFA Ms. B. Jaya Priya 101	RTP Mrs. K. Helini 101	DBMS Mrs. MD. Fouziya 101	JAVA Ms. B. Jaya Priya 101
12:00 - 13:00	BEFA Ms. B. Jaya Priya 101	JAVA Mr. R. Krishna Nayak 101	OS (Operating Systems) Mrs. A. Rajini Devi 101	RTP Mrs. K. Helini 101	DBMS Mrs. MD. Fouziya 101	JAVA Ms. B. Jaya Priya 101
13:00 - 14:00	OS (Operating Systems) Mrs. A. Rajini Devi 101	JAVA Mr. R. Krishna Nayak 101	BEFA Ms. B. Jaya Priya 101	RTP Mrs. K. Helini 101	DBMS Mrs. MD. Fouziya 101	JAVA Ms. B. Jaya Priya 101
14:00 - 15:00	BEFA Ms. B. Jaya Priya 101	JAVA Mr. R. Krishna Nayak 101	OS (Operating Systems) Mrs. A. Rajini Devi 101	RTP Mrs. K. Helini 101	DBMS Mrs. MD. Fouziya 101	JAVA Ms. B. Jaya Priya 101
15:00 - 16:00	OS (Operating Systems) Mrs. A. Rajini Devi 101	JAVA Mr. R. Krishna Nayak 101	BEFA Ms. B. Jaya Priya 101	RTP Mrs. K. Helini 101	DBMS Mrs. MD. Fouziya 101	JAVA Ms. B. Jaya Priya 101

The All Timetables screen is part of the Administration section and displays the complete weekly class schedule for a selected section or faculty. It is the core output screen of the Smart Timetable System, showing how subjects, faculty members, and classrooms are organized across the week. The screen provides two filter controls at the top: a "View By" dropdown (set to "Section") and a "Select" dropdown (currently showing "IT (2nd year - Information Technology)"), along with a blue "View" button to load the timetable. The timetable can also be viewed by Faculty by changing the "View By" filter. The timetable is displayed as a grid with time slots on the left and days of the week (Monday to Saturday) across the top. Each cell in the grid shows the subject name, the faculty member's name, and the classroom number. The currently displayed timetable is for the IT Department, 2nd Year section for the academic year 2025–2026.

The subjects and their assigned faculty visible in this timetable are:

- BEFA — Ms. B. Jaya Priya
- JAVA — Mr. R. Krishna Nayak
- OS (Operating Systems) — Mrs. A. Rajini Devi
- RTP — Mrs. K. Helini
- DBMS — Mrs. MD. Fouziya
- NODE JS — Mr. S. Chandra Sekhar
- COI — Mrs. B. Archana

- DM (Discrete Mathematics) — Mr. V. Madhukar
- Sports — Mrs. Kousari
- Library — No Faculty
- Counselling — Ms. Prathyusha

The time slots covered are 09:00–10:00, 10:00–11:00, 11:15–12:15, 12:15–13:15, 14:00–15:00, and 15:00–16:00, with classes scheduled Monday through Saturday. Classroom numbers such as 102 and 107 are displayed inside each cell, indicating the room assigned for that particular class. Different subjects are color-

ensures secure communication, efficient data storage, and real-time notifications, while thorough testing validates its functionality, performance, and usability. The project demonstrates how systematic planning, requirements gathering, and implementation can result in a scalable solution that enhances productivity and reduces scheduling conflicts. Overall, the Smart Timetable System achieves its objectives of automation, accuracy, and accessibility, making it a valuable tool for modern educational environments.

9. FUTURE SCOPE:

The Smart Timetable System has strong potential for expansion and improvement beyond its current implementation. Future scope includes:

- **Mobile Application Development:** Creating dedicated Android and iOS apps for easier access and real-time updates.
- **AI-Based Scheduling:** Integrating artificial intelligence to automatically resolve timetable conflicts and suggest optimized schedules.
- **Cloud Deployment:** Hosting the system on cloud platforms (AWS, Azure, Google Cloud) for scalability, reliability, and global accessibility.

coded in the timetable for easy visual identification.

8. CONCLUSION:

The Smart Timetable System has been successfully designed and implemented to address the challenges of manual scheduling in academic institutions. By integrating technologies such as PHP, MySQL, HTML, CSS, JavaScript, and Apache, the system provides a reliable and user-friendly platform for students, teachers, and administrators. The deployment architecture

- **Integration with Academic Portals:** Linking the timetable system with existing Learning Management Systems (LMS) and student portals.
- **Advanced Notifications:** Adding personalized reminders, calendar sync, and integration with messaging apps like WhatsApp or Teams.
- **Data Analytics:** Providing insights into class utilization, attendance trends, and resource allocation for administrators.
- **Multi-Language Support:** Expanding usability by offering interfaces in regional and international languages.
- **Enhanced Security:** Implementing biometric or two-factor authentication for secure access.
- **Cross-Platform Compatibility:** Ensuring seamless performance across desktops, tablets, and mobile devices.
- **Future Research & Upgrades:** Exploring machine learning, predictive analytics, and smart campus integration for continuous improvement.

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