Software Engineering Lab – Project Details

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Project Title : *Campus Kernel*

Problem Statement : A unified ecosystem designed to help students organize their academic life, monitor progress, and collaborate effectively with others.

MODULE 1: Personal Academic Space (The "ME" Space)

Purpose : Provides a private, personalized environment for students to manage their academic activities and performance.

Sub-Module 1.1: Dynamic Timetable Manager

Description : A calendar-based interface for scheduling and managing academic events.

Inputs : Course names, class timings, exam dates, assignment deadlines, recurring events.

Outputs : Weekly and monthly calendar view, schedule conflict alerts, notifications 15 minutes before scheduled events, deadline reminders.

Constraints : A user cannot schedule overlapping classes or exams, all times must follow a standard time zone format, notifications require user permission.

Sub-Module 1.2: Academic Task Tracker (To-Do List)

Description : A task management system focused on academic assignments and personal learning goals.

Inputs : Task title, deadline, priority level (High/Medium/Low), associated subject.

Outputs : Task list sorted by deadline, progress indicators (Not Started / In Progress / Completed), overdue tasks highlighted in red.

Constraints : Each task must have a valid deadline, priority levels are limited to predefined values, completed tasks cannot be edited, tasks are visible only to the owner.

Sub-Module 1.3: Performance Tracker

Description : A dashboard for recording grades and monitoring academic performance.

Inputs : Subject name, credit value, grade secured.

Outputs : Automated CGPA calculation, semester-wise performance graphs, trend analysis of academic progress.

Constraints : Grades must follow the institute's grading scheme, credit values must be positive integers, CGPA updates automatically on data entry, users cannot modify past semester data once finalized.

MODULE 2: Global Collaboration Hub (The "WE" Space)

Purpose : Enables peer interaction, collaboration, and real-time communication using networking technologies.

Sub-Module 2.1: Peer Discovery and Matching

Description : Connects students based on active academic needs and shared goals.

Inputs : User profile tags (e.g., Software Engineering, Machine Learning), institute of study, academic year, current workload context.

Outputs : List of recommended peers, online users with compatible academic goals.

Constraints : Matching is restricted within the same institution, recommendations update dynamically based on workload changes, users can opt out of discovery, maximum recommendation limit per session is enforced.

Sub-Module 2.2: Virtual Study Rooms

Description : Real-time collaborative spaces for group study and focused discussions.

Inputs : Room topic, maximum participant limit.

Outputs : Active voice/video communication, shared whiteboard, collaborative coding editor, integrated group chat.

Constraints : Participant limit cannot be exceeded, rooms expire automatically after inactivity, only invited or matched users can join, content shared is not permanently stored.

Sub-Module 2.3: Real-Time Social Chat

Description : Provides private and group messaging features for connected users.

Inputs : Text messages, emojis, image attachments.

Outputs : Message bubbles, read receipts, typing indicators, notification badges.

Constraints : File size limits apply to attachments, messages are end-to-end encrypted, blocked users cannot send messages, spam detection limits excessive messaging.

WORKFLOW (End-to-End System Flow)

- User registers and logs into Campus Kernel.
- User configures personal academic data in the **ME Space**.
- Timetable, tasks, and performance data are continuously updated.
- System analyzes the user's current academic workload.
- Active Context data is sent to the **WE Space** matching engine.
- Peer Discovery module recommends suitable study partners.
- Users join or create Virtual Study Rooms for collaboration.
- Real-time chat supports communication during and after sessions.
- Academic progress feeds back into the system for improved matching.

Final Outcome

Campus Kernel creates an integrated academic ecosystem that combines personal productivity, real-time collaboration, and context-aware peer matching, resulting in improved learning efficiency and meaningful student interactions.