

Layer	Framework / Tool	Purpose				
Frontend	React.js (with Vite)	A fast, modern library for building the user dashboard and chat interface.				
Backend	FastAPI (Python)	High-performance asynchronous framework to handle API requests and AI logic.				
Database (SQL)	PostgreSQL	To store structured data like student profiles, room bookings, and schedules.				
Database (Vector)	Pinecone or ChromaDB	Specialized database to store "Vector Embeddings" of your university PDFs for the AI.				
AI Framework	LangChain	The "glue" that connects FastAPI, your Vector DB, and OpenAI to create the RAG pipeline.				
ORM	SQLAlchemy or SQLModel	To interact with your PostgreSQL database using Python classes instead of raw SQL.				
Styling	Tailwind CSS	To make the UI look professional and responsive with minimal CSS effort.				
Auth	FastAPI OAuth2 + JWT	To handle secure student logins and protected routes.				