Phase 2: System Design (Week 1–2)

This phase answers one simple question: **"Hum system ko kaise design karenge takay development smooth rahe aur AI control mein rahe?"**

Is phase mein coding ka pressure nahi hota. Yahan hum *soch* ko lock karte hain.

2.1 High-Level Architecture (System ka Blueprint)

Objective

System ke major parts decide karna aur unka role clear karna.

Technology Stack (Already Approved)

- **Frontend:** React (UI + user interaction)
- **Backend:** Node.js + Express (logic, rules, API handling)
- **Database:** MongoDB (user data, roadmap, progress)
- **AI:** LLM API as a service (content + feedback generation)

Design Principle (MOST IMPORTANT)

> **System is boss. AI is helper.**

Matlab: - System decide karega: - flow - rules - progression - AI sirf: - content - feedback - suggestions dega

Architecture Flow (Simple Words)

1. User frontend se request karta hai
2. Backend rules check karta hai
3. Agar AI ki zarurat ho → backend AI ko call karta hai
4. AI response deta hai (text / JSON)
5. Backend response validate karta hai
6. Data database mein store hota hai
7. Frontend ko clean data milta hai

2.2 Data Design (Simple & Practical)

Objective

Decide karna: - kya data store hoga - kis form mein store hoga

Important: - Abhi tables / schemas detail mein nahi - Sirf logical entities

Core Entities (Readable Design)

1. User

Stores basic user info. - name - email - age - interests - city - preferredLanguage

2. Skill

User ne jo skill define ki. - originalSkillText - canonicalSkillName

3. Roadmap

AI se aane wala structured plan. - roadmapJSON - createdDate

4. Module

Roadmap ka major part. - moduleName - milestone

5. Task

Daily learning task. - taskText - references - expectedOutcome

6. Progress

User ka learning record. - currentModule - currentWeek - currentDay - completedTasks - examScores - weakPoints

Design Rule

> **No over-normalization**

Matlab: - data ko tod-phod ke complex mat banao - MongoDB mein readable JSON rakho

---

2.3 Roadmap Skeleton Design (Heart of the System)

Objective

Roadmap ka *fixed structure* define karna jisme AI sirf content bhare.

Roadmap Stored as JSON

High-level structure: - Skill - Modules[] - Weeks[] - Days[] - Lesson Slot - Task Slot

Fixed Rules (System Defined)

- Mon–Fri: Learning + tasks

- Saturday: Revision (weak points)
- Sunday: Gatekeeper exam

Pass / Fail Logic

- Task fail → same topic re-explained
- Exam fail → exam retry (not full module reset)

AI Role Inside Roadmap

AI **sirf yeh fill karega**: - lesson explanation - tasks - reference links - feedback text

AI **yeh nahi karega**: - roadmap flow change - rules decide - progression control

Example (Conceptual JSON)

```
{
  "module": "HTML Basics",
  "weeks": [
    {
      "week": 1,
      "days": [
        { "day": "Monday", "topic": "Intro to HTML" },
        { "day": "Tuesday", "topic": "Tags & Elements" }
      ]
    }
  ]
}
```

(Actual schema later banega)

Phase 2 Deliverables (End of Week 2)

By the end of this phase, team ke paas yeh hona chahiye: - Clear architecture diagram (box-level) - Entity list + responsibilities - Roadmap JSON structure finalized - AI boundaries clearly written

Coding **abhi nahi**, thinking **complete**.

Phase 2 ka Golden Rule

> **Agar system design clear ho, development 70% easy ho jata hai.**

Is phase ke baad hum confidence ke sath Phase 3 (Development) mein jayenge.