

# Core Tech Stack

## Learning Goal

Become a AI-native full-stack product engineer  
— starting from absolute JavaScript  
fundamentals.

## Tech Stack Overview

### Core Stack

Layer	Technology
Frontend Framework	<code>Next.js 14</code> (App Router)
Language	<code>TypeScript</code> (strict mode)
Styling	<code>Tailwind CSS</code> , <code>shadcn/ui</code>
State Management	<code>tRPC</code> , React Query (skip Redux)
Forms	<code>react-hook-form</code> , <code>zod</code>
Backend	<code>tRPC</code> , <code>Next.js Server Actions</code> , <code>Edge/Serverless</code>

Layer	Technology
DB Layer	<a href="#">Prisma</a> (ORM), <a href="#">PostgreSQL</a> (db)
Auth	<a href="#">Auth.js</a> , Clerk/Auth0 (later)
DevOps	<a href="#">GitHub Actions</a> , <a href="#">CI/CD</a> , <a href="#">Vercel</a> , <a href="#">Docker</a> (light)
Testing	<a href="#">Vitest</a> , <a href="#">Playwright</a> , <a href="#">Mock Service Worker (MSW)</a>
Code Quality	<a href="#">ESLint</a> , <a href="#">Prettier</a> , <a href="#">Husky</a> , <a href="#">lint-staged</a>
Package Mgr	<a href="#">pnpm</a>
Deployment	<a href="#">Vercel</a> (main), <a href="#">Render</a> , <a href="#">Railway</a>
AI/LLM	<a href="#">OpenAI API</a> , <a href="#">LangChain</a> , <a href="#">RAG</a> , <a href="#">vector dbs (e.g. Pinecone)</a>


## Tooling & Workflows

Type	Tool
Editor	<a href="#">VS Code</a> with custom dotfiles
Git Workflow	<a href="#">GitHub</a> , Feature branches, PRs, squash merges
Docs	<a href="#">README.md</a> , <a href="#">DEV_LOG.md</a> , <a href="#">Notion</a> , <a href="#">Changelogs</a>
Issue Mgmt	GitHub Issues, Projects (Kanban), Labels
Design	Figma (community kits), <a href="#">dribbble.com</a> clones
Browser Dev	<a href="#">Chrome DevTools</a> , <a href="#">Lighthouse</a> , <a href="#">React DevTools</a>

## Core Projects (Across Phases)

Each project is real-world focused and scales in complexity. Projects are designed to simulate a startup sprint cycle with README-first + PR-driven workflow.

### Phase 0 – JavaScript + Git Bootcamp

Project	Description
 Git Crime Scene	Forensics on popular repos (analyze Git history, blame, PRs)

Project	Description
🧠 TypeScript Jailbreak	Refactor a JS project into strict-mode TS
🇺🇸 DOM Wars	Rebuild UI components (accordion, modal, toast) with raw JS
📅 Dev Diary Setup	Create <code>DEV_LOG.md</code> , GitHub profile README, Notion logs

## 📌 Phase 1 – Modern Frontend (React + Next.js)

Project	Description
🔒 Auth App	Email/password login, protected routes, loading states
📦 Product Catalog	Fetch from fake store API, add pagination, filters, error states
❤️ Feedback Board	Full CRUD with optimistic updates, react-query, toasts
🎨 Figma to Code	Pick a Figma file and build the exact pixel-perfect replica
🔧 Testing Playground	Add Vitest, MSW, basic component and e2e tests




## 📌 Phase 2 – Full-Stack with tRPC + DB

Project	Description
🛒 E-commerce MVP	Cart, checkout, auth, orders, Stripe integration
🏢 SaaS Dashboard	Multi-tenant app: user roles, analytics, subscriptions
🔄 API-first Blog	CMS-style app with tRPC, markdown editor, preview mode
🔗 DevLink	"Linktree clone" with user accounts and metrics
🔧 Feature Sprints	Ship 1 new feature per week, like a real dev (changelog, PR, deploy)

## 📌 Phase 3 – AI-Native Product Engineering

Project	Description
🤖 AI Chat Support	RAG app with OpenAI, LangChain, Pinecone/Weaviate
🧠 AI Tutor	Upload notes, ask questions, get context-aware answers
🔍 AI Job Reviewer	Upload resume, get insights & matching job roles
📦 Dev Tools Clone	AI code explainer or PR reviewer using OpenAI API

## Bonus Projects (Job/Resume Focused)

Project	Description
 Resume Builder	Real-world resume UI (PDF download, save templates)
 Interview Prep App	Flashcards, Leetcode tag filters, AI-based Q&A
 Dashboard Analytics	Integrate <code>recharts</code> , <code>next-auth</code> , <code>trpc</code> , <code>postgres</code>

## After Projects (Job Prep Layer)

Area	Focus
Resume	Live link + GitHub repo + project writeup for each major app
LinkedIn	Publish retros, write blog posts, comment on dev threads
Mock Interviews	Start peer or AI-based mocks weekly (front + system design)
Freelance Open Source	Fix issues, contribute to modern TS repos
Job Tracker	Notion board for outreach, referrals, followups