

PROJECTS

# Techne

## Concept-Driven Coding Education Platform

Architect / Developer · 2026

*Techne is a concept-driven coding education platform: learners drill concepts through real, sandboxed code execution, get Socratic AI tutoring that guides toward understanding without ever handing over the answer, and finish by defending capstone projects through LLM questioning to earn a credential.*

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### 1. Overview

Techne teaches programming the way a craft is taught — by doing, under guidance, with proof of mastery at the end. Rather than passive lessons, learners write real code that is really executed and graded, are tutored Socratically toward the answer instead of being handed it, and finish each track by defending a capstone project through LLM questioning. It is a server-authoritative web application built to scale from a single learner toward a commercial product.

### 2. Key Features

- **Real Graded Execution** Learner code runs in Docker-isolated sandboxes for JavaScript, Python and React, then is graded against concept-specific test suites — not self-reported.
- **Socratic AI Tutor** An AI tutor built on the Anthropic Claude Agent SDK guides toward understanding with a hard “never give the answer” guardrail and prompt fencing.
- **Concept-Graph Curriculum** A planner sequences concepts (intake → feasibility → sequencing) against a mastery state machine, so the path adapts to what the learner has actually mastered.

- **Capstone Defense & Credential** Each track ends with a generated capstone the learner submits and defends through LLM questioning, earning a verdict and credential.
- **Spaced-Repetition Review** A review queue resurfaces concepts on a spaced cadence to consolidate retention over time.

### 3. Architecture

Techne is a server-authoritative Next.js 16 / React 19 application: pages call actions and APIs that flow through a service layer and data-access boundary onto a Prisma data layer, with a Monaco-based code editor on the client. Code execution and grading are isolated in Docker runners, and the AI tutor and capstone defense run through the Claude Agent SDK. The platform is being taken from a single-user local app toward a multi-tenant SaaS with signed native macOS and Windows desktop builds.

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#### TECH STACK

Next.js 16 · React 19 · TypeScript · Claude Agent SDK · Prisma · Monaco · Docker · Vitest

#### LINKS

<https://www.jonathandumitru.com/projects/techne>