P4M4: The Structure of

Dr.Cho's ASE Courses

Characteristics

1. **Build Real Applications**

2. **Integrated Curriculum**

3. **Theory Emerges from Practice**

4. **Problem Solving with Proven Methods**

1. Build Real Applications

- Each course centers on hands-on projects

- Students develop working software, not just abstract concepts

2. Integrated Curriculum

- Core ideas are revisited across courses

- Learning is deepened through varied perspectives

3. Theory Emerges from Practice

- Principles and patterns are discovered through experience
- Students understand the value of theory through real-world examples

4. **Problem Solving with Proven Methods**

- Focus on solving problems using time-tested tools, techniques, and SWE principles

- Students become systematic and confident problem solvers

The Four Learning Levels: M4

- **M1: Magic** – At first, everything feels like magic

- **M2: Machine** – As we learn the theory, things become systems we understand

- **M3: Master** – With practice, we gain mastery

- **M4: Make** – By creating, we internalize what we've learned

The Four Activities: P4

- **P1: Principles** – The truths behind the "Machine"

- **P2: Patterns** - Reusable solutions by "Masters"

- **P3: Practices** – The repeated actions that develop mastery

- **P4: Projects** – What we make to truly learn and integrate everything

Understanding Theory vs Practice from P4

- Theories: Principles & Patterns

- Application: Practices & Projects

🧠 Theories (P1/P2)

- **Principles** – Timeless truths and rules that guide software design

- **Patterns** – Proven solutions to recurring problems

> Theories help us **understand why** things work.

🛠️ **Application (P3/P4)**

- **Practices** – Repeated actions that develop skills

- **Projects** – Real-world applications that integrate everything

Practice helps us **know how** to make things work.

🗺️ Analogy

- **Theories** are like a **map** — they guide us through the terrain

- **Application** is the **journey** — walking the path, learning by doing

> - *You need both the map (theories) and the journey (application) to reach your destination.*
> - *Research shows that starting with the application leads to a deeper understanding of theories.*

P4M4 Model

P4	M4
P4: Project	M4: Make
P3: Practice	M3: Master
P2: Pattern	M2: Machine
P1: Principle	M1: Magic

- We can solve any problem when we **know** the principles and patterns—and **understand** how to apply them to create solutions.

Three Phases of the Course

- 📘 Phase 1 (**Weeks 1–2**)
  - Introduction & Setup
- 🛠️ Phase 2 (**Weeks 3–10**)
  - Skill Building through Practice
- 🚀 Phase 3 (**Weeks 11–16**)
  - Capstone Project

📘 Phase 1 (**Weeks 1–2**): Introduction & Setup

- Set up tools and development environment
- Learn basic concepts and workflows

P3M1 (Practice + Magic)

P4	M4
P4: Project	M4: Make
P3: Practice	M3: Master
P2: Pattern	M2: Machine
P1: Principle	M1: Magic

🛠️ Phase 2 (**Weeks 3–10**): Skill Building through Practice

- Emphasizes the transformation from early intuition to structured knowledge.

- Highlights preparation for the final project.

P13/M12 (Magic/Machine + Practice/Principle)

🚀 Phase 3 (**Weeks 11–16**): Capstone Project

- Apply what you've learned in a full project

- Work individually or in teams

Start week may be adjusted based on class progress

P24/M34 (Master/Make + Pattern/Project)