🎯 What it covers:

- Fundamental **design concepts** in software engineering:
    - Abstraction
    - Modularity
    - Encapsulation
    - Patterns
    - Separation of concerns
    - Cohesion and coupling
    - Refactoring

Key insights:

- **Abstraction**: hide details, show only essential features.
- **Modularity**: break a system into manageable parts.
- **Cohesion**: how tightly related tasks are within a module.
- **Coupling**: how dependent modules are on each other. Low coupling is desirable.
- **Patterns**: reusable solutions for common problems.
- **Refactoring**: improving code structure without changing functionality.

Why it matters:

- Good design ensures:
    - Maintainability
    - Scalability.
    - Reusability.
- Sets the groundwork for advanced topics like architectural styles and patterns.
- For AI:
    - Helps organize complex codebases (data pipelines, ML services).
    - Important for making models maintainable and testable.