PGP – Product Engineering Capstone Project

Design Documentation: High-Level and Low-Level Design Overview

Week 1: High-Level Design (HLD)

High-Level Design (HLD)

- **System Architecture Diagram:** Create a high-level system architecture diagram showing the main components, such as front-end, back-end, databases, and third-party integrations.
- **Use Case Diagram:** Develop a use case diagram to illustrate key user interactions with the system, such as browsing products, adding to cart, and checkout.
- **Data Flow Diagram (DFD):** Create a Level 0 and Level 1 Data Flow Diagram to show how data moves through the system.
- **Technology Stack:** Define the technology stack (e.g., React for front-end, Node.js for back-end, MongoDB for database) and justify the choices based on project requirements.

Week 2: Low-Level Design (LLD) Part 1

Detailed Module Design

- **Class Diagrams:** Create class diagrams to define the structure of key modules (e.g., Product Management, Order Management, User Management).

- **Component Diagrams:** Develop component diagrams to show how different parts of the system interact and integrate.

- **Database Schema:** Design the database schema, including tables for products, users, orders, and transactions. Include relationships and constraints.

User Interface Design

- Design high-fidelity mockups for key pages based on the previously created wireframes.
- Ensure consistency with the design system and style guide.

Week 3: Low-Level Design (LLD) Part 2 and Prototyping

Sequence Diagrams

- Develop sequence diagrams to detail interactions between different system components during critical processes (e.g., user registration, product checkout, payment processing).

State Diagrams and Activity Diagrams

- Create state diagrams for key objects (e.g., Order, Product) to show their lifecycle.
- Develop activity diagrams for complex user interactions, like the checkout process.

Interactive Prototyping

- Create interactive prototypes using tools like Figma or Adobe XD to simulate user interactions with the design.
- Prepare for usability testing in the following week.

Week 4: Validation, Iteration, and Final Handoff

Usability Testing

- Conduct usability tests with the interactive prototypes on a small group of users.
- Collect feedback on design, user flow, and overall experience.

Design Iteration and Finalization

- Refine the design based on usability testing feedback.
- Finalize all diagrams and design documentation.

Final Design Handoff

- Compile all design assets, including HLD and LLD documentation, diagrams, and UI designs.
- Conduct a final review and handoff to the development team.

Deliverables:

- High-Level Design: System Architecture, Use Case, Data Flow Diagrams
- Low-Level Design: Class, Component, Sequence, State, and Activity Diagrams
- Database Schema
- High-Fidelity Mockups and Interactive Prototypes
- Usability Testing Report
- Final Design Documentation for Development Handoff