# Design Document

## Benefits of a Design Document

A well-structured design document provides numerous benefits to the team and the project:  
- \*\*Knowledge Transfer\*\*: Helps mitigate the "Bus Factor" by ensuring continuity if a key team member becomes unavailable. It also serves as an onboarding resource for new members.  
- \*\*Learning and Development\*\*: Acts as an educational tool, enabling team members to learn from the project’s design. Additionally, it offers mentorship opportunities where experienced engineers can guide less experienced members.  
- \*\*Clarity and Direction\*\*: Provides a clear, defined project plan that reduces ambiguity and sets expectations. Encourages collaboration by gathering input early in the project.  
- \*\*Documentation\*\*: Serves as a valuable reference and historical record, capturing decisions, changes, and design rationale.  
- \*\*Feedback Loop\*\*: Facilitates early feedback from stakeholders, allowing for proactive risk mitigation by identifying potential issues and strategies.

## Section 1 - Project Description

1.1 Project: The project name

1.2 Description: Brief overall description of the project

### 1.3 Revision History

Track changes over time with Date, Comment, and Author fields.

## Section 2 - Overview

2.1 Purpose: Describe the focus of this module and its intended audience.

2.2 Scope: Define the boundaries and scope of the module.

### 2.3 Requirements

- \*\*2.3.1 Functional Requirements\*\*: Specify what the system should accomplish in terms of features and behavior.  
- \*\*2.3.2 Non-Functional Requirements\*\*: Describe how the system should perform, including performance, reliability, and scalability aspects.  
- \*\*2.3.3 Technical Requirements\*\*: List technical constraints, such as hardware, software, or platform requirements.  
- \*\*2.3.4 Security Requirements\*\*: Outline measures to ensure data protection and system security.  
- \*\*2.3.5 Estimates\*\*: Provide a breakdown of estimated hours per task.  
- \*\*2.3.6 Traceability Matrix\*\*: Map each requirement to relevant design components to ensure traceability.

## Section 3 - System Architecture

3.1 Overview: Summarize the system architecture and interactions between key components.  
3.2 Architectural Diagrams: Include diagrams such as Component, Sequence, Data Flow, and Deployment diagrams to illustrate the architecture. Clearly indicate where this module fits in.

## Section 4 - Data Dictionary

Provide a description of data elements, or link to a detailed data dictionary. Use a table format for fields where necessary.

## Section 5 – Data Design

5.1 Persistent/Static Data: Define and illustrate data that will be stored long-term or used between modules.  
5.1.1 Dataset: Describe persisted objects or datasets using entity-relationship diagrams or similar models.

## Section 6 - User Interface Design

6.1 User Interface Design Overview: Provide high-level requirements, mockups, or screenshots.  
6.2 User Interface Navigation Flow: Map the navigation from one screen to another.  
6.3 Use Cases / User Function Description: Outline use cases or user functions in detail.

## Section 7 - Testing

7.1 Test Plan Creation: Develop a detailed test plan covering strategy, scope, resources, schedule, and testing activities.  
- \*\*Objective\*\*: Define testing goals, such as validating features or ensuring stability.  
- \*\*Scope\*\*: Specify what is included and excluded in testing.  
- \*\*Resources\*\*: List personnel, tools, and environments required.  
- \*\*Test Cases\*\*: Outline tests, including inputs, expected outcomes, and results for each test case.

## Section 8 - Monitoring

Define the monitoring metrics to ensure system health, performance, and security. Key metrics include:  
- \*\*Performance\*\*: Monitor response times, throughput, server load.  
- \*\*Error Rates\*\*: Track error types and affected users.  
- \*\*Availability\*\*: Monitor uptime, downtime, and overall system availability.

## Section 9 - Other Interfaces

Describe any external interfaces involved, including technology, protocols, and formats.

## Section 10 - Extra Design Features / Outstanding Issues

Include any additional information or open issues that don't fit in other sections.

## Section 11 - References

List any reference documents or resources that provide context or background information.

## Section 12 - Glossary

Include definitions of terms and acronyms used throughout the document.