Design 2 Report Outline (Component-Level Detailed Design Spring Semester)

Objective: Perform detailed design, modeling, and analysis of a selected critical component within the system.

The following structure is not limited to its exact state, may be expanded and adjusted according to the project at hand.

REPORT 1

1. Title Page

- Project title
- Course name (Design 2)
- Student names, ID numbers, affiliations
- Instructor name and semester

2. Abstract (150–250 words)

- Short summary of the component focus, methodology, design details, and outcomes

3. Introduction

- Recap of **Design 1** system and identified key component
- Motivation for selecting this component for detailed design
- Objectives of this report

4. Literature Review (Component-Focused)

- State-of-the-art designs for similar components
- Material, manufacturing, and design considerations
- Industry standards / design codes relevant to component

5. Component Design Requirements

- Functional requirements
- Performance targets
- Design constraints (size, weight, cost, efficiency, safety, sustainability, etc.)

REPORT 2

6. Detailed Design Process

- Concept sketches / CAD models
- Material selection and justification
- Design calculations (strength, thermal, fluid, etc.)
- Manufacturing considerations
- Safety, reliability, and sustainability aspects

7. Modeling and Simulation

- 3D modeling and CAD drawings
- Structural analysis (FEA if applicable)
- Fluid/thermal analysis (CFD if applicable)
- Performance validation of the component within system context

REPORT 3

8. Results and Discussion

- Performance results of the component
- Comparison against targets and requirements
- Trade-offs (cost vs. performance, weight vs. strength, etc.)
- Possible improvements

9. Prototype and Testing Plan (if feasible)

- Suggested method for prototype development
- Testing strategy (experimental validation, scale model, etc.)

10. Conclusions and Recommendations

- Final component design summary
- Integration into the full system
- Future work / optimization potential

11. References

12. Appendices

- CAD drawings / blueprints
- Detailed simulations
- Material datasheets
- Standards/codes followed