

Institution Name

Bachelor Degree – Course Name

# Project Title

Software Engineering and Databases

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December 2025

## Abstract

This report presents *[project name]*, a system designed to *[short purpose]*. The main objective is to *[objective 1]* while ensuring *[objective 2]*. The solution is based on *[brief architecture]* and a relational database model that enforces integrity through constraints and normalized design. Evaluation includes functional validation and database-oriented testing, complemented by a basic performance analysis of the critical queries. Results show *[main outcome]*, with limitations related to *[key limitation]*.

**Keywords:** databases, software engineering, data modelling, relational design, testing

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# Chapter 1

## Introduction

### 1.1 Context and Motivation

### 1.2 Problem Statement

### 1.3 Objectives

- Objective 1: [...]
- Objective 2: [...]
- Objective 3: [...]

### 1.4 Scope and Limitations

### 1.5 Document Structure



# Chapter 2

## Background and Related Work

### 2.1 Core Concepts

### 2.2 Related Systems / Approaches

### 2.3 Positioning of This Work

# Chapter 3

## Requirements Analysis

### 3.1 Stakeholders and Users

### 3.2 Functional Requirements

FR1 **[Feature name]**: *[requirement description]*

FR2 **[Feature name]**: *[requirement description]*

FR3 **[Feature name]**: *[requirement description]*

### 3.3 Non-Functional Requirements

NFR1 **Security**: *[e.g., role-based access control for ...]*

NFR2 **Performance**: *[e.g., critical search queries under  $X$  ms for  $N$  rows]*

NFR3 **Usability**: *[e.g., key workflow in  $\leq K$  steps]*

NFR4 **Maintainability**: *[e.g., modular structure, documentation, tests]*

### 3.4 Use Cases / User Stories

Table 3.1: Representative Use Cases

UC ID	Description
UC1	User logs in and accesses the dashboard.
UC2	User creates a new <i>[entity]</i> and the system validates required fields.
UC3	User searches <i>[entity]</i> using filters and sorting.

### 3.5 Acceptance Criteria (Optional)

# Chapter 4

## System Design

### 4.1 Architecture Overview

Placeholder: Architecture diagram (components and interactions)

Figure 4.1: High-level architecture of the system.

### 4.2 Main Components and Responsibilities

### 4.3 Key Interactions (Optional)

### 4.4 Design Decisions and Trade-offs

# Chapter 5

## Database Design

### 5.1 Conceptual Model (ER Diagram)

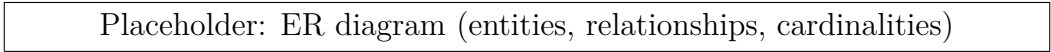


Figure 5.1: Entity-Relationship diagram.

### 5.2 Logical Model (Relational Schema)

Table 5.1: Example Schema Summary (adapt to your project)

Table	Notes (PK/FK/Constraints)		
users	PK(user_id),	UNIQUE(email),	NOT NULL(password_hash)
orders	PK(order_id),	FK(user_id → users),	CHECK(status in ...)
order_items	PK(order_item_id),	FK(order_id),	FK(product_id), CHECK(quantity > 0)

### 5.3 Normalization Discussion

### 5.4 Constraints and Integrity

### 5.5 Physical Design (Indexes and Performance Rationale)

# Chapter 6

## Implementation Overview

### 6.1 Technology Stack

### 6.2 Feature Mapping (Requirements to Modules)

Table 6.1: Traceability Example

Req	Implementation	Evidence
FR1	<i>[module/functionality]</i>	<i>[screenshot/test]</i>
FR2	<i>[module/functionality]</i>	<i>[screenshot/test]</i>
NFR1	<i>[security mechanism]</i>	<i>[test/cfg]</i>

### 6.3 Security Considerations

# Chapter 7

## Testing and Evaluation

### 7.1 Test Strategy

### 7.2 Test Results

Table 7.1: Testing Summary

Area	What was tested	Result
Business logic	<i>[rule validations, edge cases]</i>	Pass
Database constraints	<i>[FK integrity, CHECK constraints]</i>	Pass
API / UI flows	<i>[UC1, UC2, UC3]</i>	Pass

### 7.3 Performance Evaluation (Basic but Real)

# Chapter 8

## Results and Discussion

### 8.1 Key Results

### 8.2 Limitations

### 8.3 Trade-offs



# Chapter 9

## Conclusion and Future Work

### 9.1 Conclusion

### 9.2 Future Work

- *[feature improvement]*
- *[performance improvement]*
- *[security improvement]*

# Appendix A

## Appendix A: Full Schema Listing

## Appendix B

### Appendix B: Representative Queries

## Appendix C

### Appendix C: Additional Test Evidence