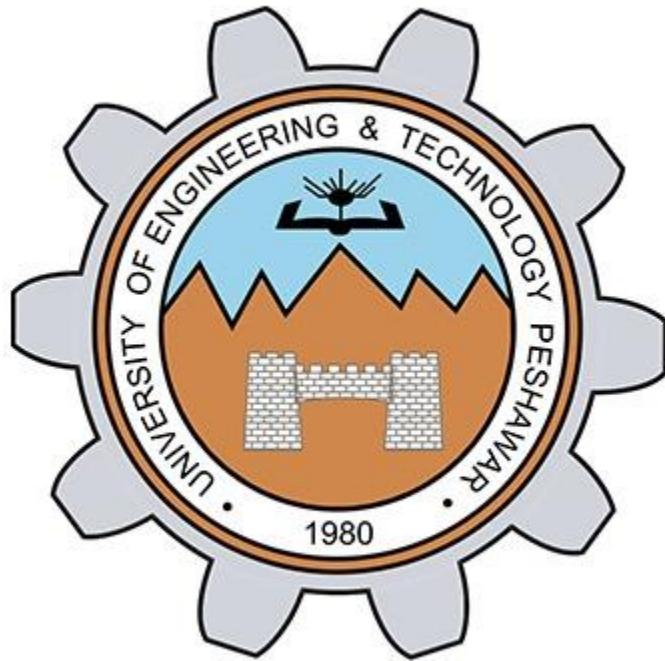


# Project Proposal: Student Management System (CRUD-Based Application)



## Project Title

**Student Management System**

## Submitted By

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**Program:** BS/ Computer Science

**Semester:** 2<sup>nd</sup> (C)

**Institution:** UET Peshawar

## Project Overview

The *Student Management System* is a **Java-based desktop application** developed using **Java Swing** for the front-end and **MySQL** for the backend database. This system allows administrators to **perform full CRUD operations**—Create, Read, Update, and Delete—on student data.

It provides a user-friendly graphical interface to manage student records efficiently. The system is lightweight, functional, and ideal for academic institutions or training centers looking to digitize their student record-keeping.

## Objectives

- To create a fully functional desktop-based application for managing student data.
- To implement essential CRUD operations using Java and MySQL.
- To apply object-oriented programming concepts and database connectivity (JDBC).
- To develop a GUI using Java Swing that enhances user experience.
- To gain hands-on experience in real-world software development.

# Technical Specifications

## Frontend

- **Technology:** Java Swing
- **Components Used:** JFrame, JTable, JTextField, JButton, JLabel, JPanel

## Backend

- **Database:** MySQL
- **Tables:** Students (id, name, age, course)
- **Connector:** JDBC (Java Database Connectivity)

# Functional Requirements

Feature	Description
Add Student	User can add a new student with name, age, and course.
View Students	Displays all student records in a table format.
Update Student	Allows updating student details by selecting a record.
Delete Student	Deletes a selected student from the database.
Validation	Ensures no empty or invalid data is entered (e.g., age must be a number).

## Tools & Libraries

- Java SE (JDK 8+)
- MySQL Server / Terminal
- IntelliJ IDEA / VSCode

- MySQL JDBC Driver (Connector/J)
- Swing GUI Designer

## Database Schema

```
CREATE TABLE Students (
    id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(100),
    age INT,
    course VARCHAR(100)
);
```

## Benefits and Impact

- **Improved Efficiency:** Easy to store, update, and delete student data.
- **User-Friendly Interface:** No command line required.
- **Foundational Learning:** Demonstrates knowledge of OOP, databases, GUI development, and exception handling.
- **Scalable:** Can be extended to include login, reports, and search functionality.

## Timeline

Week	Tasks Completed
1	UI Design and JFrame Setup MySQL Table Creation and JDBC Setup Implement Add, Read Functionalities Implement Update and Delete Functionalities
2	Testing, Exception Handling, and UI Polish Final Report and Submission

## Conclusion

This project provides a simple yet effective demonstration of how to manage data using Java Swing and MySQL. It builds the foundation for future projects involving desktop or even web-based management systems. The Student Management System is a strong addition to any academic portfolio, especially for those pursuing careers in software engineering or database management.

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## Screenshots/Modules

Student Management System

\*\*\* CRUD \*\*\*

Student Information

All Students			
ID	Name	Age	Course
8	sayyed taimoor	23	computer science
101	zohailb	25	medical

Name:

Age:

Course:

## Student Information

Name:

Age:

Course:

Add

Update

Delete

## All Students

ID	Name	Age	Course
8	sayyed taimoor	23	computer science
101	zohaib	25	medical

```
Database changed
mysql> show tables;
+-----+
| Tables_in_crud_db |
+-----+
| Students           |
+-----+
1 row in set (0.00 sec)
```

```
mysql> select * from students;
+----+-----+----+-----+
| id | name          | age | course        |
+----+-----+----+-----+
|  8 | sayyed taimoor | 23 | computer science |
| 101 | zohaib        | 25 | medical         |
+----+-----+----+-----+
2 rows in set (0.00 sec)
```