

PROJECT REPORT ON STUDENT MANAGEMENT SYSTEM



Submitted To:
Prof. Tej Singh
(Department of BCA &
PGDCA)

Submitted By:
Devansh Bhardwaj (6220180015)
Vishal Bhatia (6220180062)
Akshay Kumar (6220180004)
Gautam Singh (6220180019)
Rohit Kaushal (6220180039)

**Govt. Post Graduate College
Bilaspur (H.P.) 174001**

CERTIFICATE BY PROJECT GUIDE

I hereby declare that the report entitled "Student Management System" submitted to Department of Computer Application in Government Post Graduate College Bilaspur in partial fulfilment of the requirement for the award of the degree of BCA is an authentic report of our own work carried out during a period of 6th Semester under the supervision of Prof. Tej Singh.

This is to certify that the above statement made by the candidates is correct to the best of my/our knowledge.

(Signature)

Prof. Tej Singh

DECLARATION

We, Devansh Bhardwaj, Vishal Bhatia, Akshay Kumar, Gautam Singh, and Rohit Kaushal, students of Bachelor of Computer Applications (BCA), hereby declare that the work presented in this project titled “Student Management System” is our original work.

This project is the result of our own efforts and is correct to the best of our knowledge. We confirm that this work has not been previously published or submitted elsewhere for the award of any degree or diploma. The project has been developed with due diligence and in accordance with academic and professional standards.

We have appropriately cited all sources and references wherever required. Any similarities with existing work are purely coincidental and unintentional.

ABSTRACT

The *Student Management System* is a web-based application designed to streamline student record management, enhance accessibility, and improve administrative efficiency. This system provides a centralized platform for students, faculty, and administrators to manage academic records, attendance, course details, and authentication securely.

Built using Node.js and Express.js for backend development, the application ensures efficient data handling and performance. The frontend is developed using HTML, CSS, JavaScript, and EJS (Embedded JavaScript Templates) for dynamic content rendering. MongoDB serves as the database, storing student records, authentication details, and course-related information.

Key features of the system include:

- **Student Record Management:** Handles student registration, profile updates, and academic data.
- **Attendance & Course Management:** Faculty can update attendance, upload grades, and manage syllabus details.
- **OTP-Based Authentication:** Secure user login and verification using OTP (One-Time Password) services.
- **JWT-Based Authentication & Security:** Secure user sessions with JSON Web Tokens (JWT) and bcrypt encryption.
- **Express.js Routers & Middleware:** Organized API structure for managing authentication and user interactions.

The project utilizes the MongoDB, Express.js, Node.js for its scalability, flexibility, and efficiency in handling dynamic student data. MongoDB was chosen as the database due to its ability to store and retrieve large amounts of unstructured data efficiently. Node.js and Express.js provide a fast, event-driven backend capable of handling multiple requests simultaneously, ensuring smooth system performance. The frontend leverages EJS (Embedded JavaScript Templates) to dynamically generate HTML pages while maintaining a

clean and maintainable code structure. JWT (JSON Web Tokens) and bcrypt are implemented for secure authentication, ensuring data privacy and integrity. OTP-based authentication further enhances security, providing an extra layer of user verification.

By integrating these modern full-stack web technologies, the *Student Management System* enhances student engagement, simplifies academic operations, and ensures a secure, scalable, and efficient management solution.

TABLE OF CONTENTS

• Introduction -	Page 1
• Profile of the Problem -	Page 2
• Feasibility Analysis -	Page 3
◦ Economic Feasibility -	Page 4
◦ Technical Feasibility -	Page 4
◦ Operational Feasibility -	Page 4
• Software System Analysis -	Page 5
• Data Flow Diagrams -	Page 7
• ER Diagrams -	Page 11
• System Design -	Page 13
• Screenshots -	Page 15
• Database Design -	Page 22
• System Analysis -	Page 25
• Project Testing -	Page 28
• Project Implementation -	Page 32
• Maintenance -	Page 35
• Project Legacy -	Page 34
• Conclusion	Page 35