FuseLearn-AN E-LEARNING PLATFORM

A PROJECT REPORT

Submitted by

Ranita Das [Reg No: RA2111027010023] Arunima Mishra [Reg No: RA2111027010017]

Under the Guidance of

Dr. T. Veeramakali

(Associate Professor, Department of Data Science and Business Systems)

In partial fulfillment of the Requirements for the Degree of

BACHELOR OF TECHNOLOGY

COMPUTER SCIENCE ENGINEERING with specialization in Big Data Analytics



DEPARTMENT OF DATA SCIENCE AND BUSINESS SYSTEMS

FACULTY OF ENGINEERING AND TECHNOLOGY SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Under Section 3 of UGC Act, 1956) SRM NAGAR, KATTANKULTATHUR – 603203 CHENGALPATTU DISTRICT

NOVEMBER 2024



SRM INSTITUTE OF SCIENCE AND TECHNOLOGY KATTANKULATHUR-603203

BONAFIDE CERTIFICATE

Certified that this project report titled "FuseLearn-AN E-LEARNING PLATFORM" is the bonafide work of "Ranita Das [Reg No: RA2111027010023] and Arunima Mishra [Reg No: RA2111027010017] who carried out the project work under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion for this or any other candidate.

Dr. T. Veeramakali **GUIDE**Associate Professor
Dept. of DSBS

Dr. V. Kavitha **HEAD OF THE DEPARTMENT**Dept. of DSBS

Signature of Internal Examiner

Signature of External Examine



Department of Data Science and Business Systems SRM Institute of science and technology Own Work Declaration Form

Degree/ Course : B.Tech CSE with Big Data Analytics

Student Name : Arunima Mishra, Ranita Das

Registration Number : **RA2111027010017**, **RA2111027010023**

Title of Work : FuseLearn-AN E-LEARNING PLATFORM

We hereby attest that the evaluation complies with the requirements set out by the Education Committee, the University Website, and the Rules and Regulations against academic misconduct and plagiarism.

We certify that, with the exception of the places mentioned, everything of the work in this evaluation is original to me or us and that we have complied with the requirements listed below:

- Clearly cited all relevant sources and listed them all
- All quoted content (from books, the internet, etc.) was referenced and inserted inverted commas.
- Identified the origins of any images, data, etc. that I do not own
- Never used any of the previous or current reports or essays written by any other student.
- Acknowledged assistance from others (such as fellow students, technologists, statisticians, and outside sources) where appropriate.
- Compiling any additional standards for plagiarism listed on the university website or course handbook.

I am aware that any fraudulent claim made for this work will be punished in line with the rules and norms of the university.

DECLARATION:

I certify that, with the exception of the places where referencing is given, this evaluation is my or our own work and that I have adhered to the above-mentioned good academic practices. I am also aware of and understand the university's policy on academic misconduct and plagiarism.

If you are working in a group, please write your registration numbers and sign with the date for every student in your group.

ACKNOWLEDGEMENT

We sincerely appreciate **Dr. C. Miltonizihchevgan**, our esteemed Vice Chancellor, for serving as our guiding light in all of our undertakings.

We would like to thank **Dr. S. Ponnusamy**, our registrar, from the bottom of our hearts for his support.

We would like to sincerely thank **Dr. T. V. Gopal**, our dean of the College of Engineering and Technology, for bringing innovation to every execution.

We would like to sincerely thank **Dr. Revathi Venkataraman**, the Chairperson of the School of Computing, for giving us the courage to finish our course projects.

We would like to thank the course coordinators and professor **Dr.V. Kavitha**, head of the department of Data science and business systems, for their unwavering encouragement and support.

We are very appreciative of the help, timely suggestions, and direction provided by our course project instructor, **Dr. T. Veeramakali**, Associate Professor, Department of DSBS, during the project.

We would like to express our appreciation to the Department of DSBS, our HoD, Professor **Dr. V. Kavitha**, and my departmental colleagues for their support.

Finally, we would like to express our gratitude to our parents and close friends for their direct and indirect contributions to the accomplishment of our project. Above all, I am grateful to God for granting me the ability to finish my course assignment.

Ranita Das Arunima Mishra

ABSTRACT

FuseLearn is a product designed to create an educational website serving as a centralized hub for computer science students. It consolidates various learning resources such as lecture notes, quizzes, and videos in one place, addressing the difficulties students face when trying to locate reliable materials. The platform aims to make learning more engaging and accessible, enhancing retention and comprehension. This project involves multiple sprints to develop and implement various features, including user authentication, a learning repository, and interactive tools.

TABLE OF CONTENTS

TABLE OF CONTENTS

CHA	APTER N	NO. TITLE	PAGE NO
	ABST	ΓRACT	IV
1.	INTR	ODUCTION	
	1.1	GENERAL	1
	1.2	MOTIVATION	2
	1.3	SDG	3
	1.4	PRODUCT VISION STATEMENT	4
	1.5	PRODUCT GOAL	5
	1.6	PRODUCT BACKLOG	5
2		PRODUCT RELEASE PLAN HNICAL HITECHTURE	6
	2.1	FRONT END LAYER	7
	2.2	BACK END LAYER	7
	2.32	DATA BASE LAYER	7
	2.4	APIS AND MICROSERVICES	8
	2.5	DATA ANALYTICS AND REPORTING	8
	2.6	CLOUD DEPLOYMENT AND HOSTING	8
	2.7	SECURITY AND COMPLIANCE	8
3	SPRI	NT PLANNING AND EXECUTION	
	3.1	SPRINT 1	9
	3.1.1	SPRINT GOAL WITH USER STORIES OF SPRINT 1	9
	3.1.2	FUNCTIONAL DOCUMENT	9
	3.1.3	ARCHITECTURE DOCUMENT	9
	3.1.4	UI DESIGN	10
	3.1.5	FUNCTIONAL TEST CASES	10
	3.1.6	DAILY CALL PROGRESS	11
	3.1.7	COMMITTED VS COMPLETED USER STORIES	11
	3.1.8	SPRINT RETROSPECTIVE	11
	3.2	SPRINT 2	11
	3.2.1	SPRINT GOAL WITH USER STORIES OF SPRINT 2	11

	3.2.2 FUNCTIONAL DOCUMENT	12
	3.2.3 ARCHITECTURE DOCUMENT	12
	3.2.4 UI DESIGN	12
	3.2.5 FUNCTIONAL TEST CASES	12
	3.2,6 DAILY CALL PROGRESS	12
	3.2.7 COMMITTED VS COMPLETED USER STORIES	12
	3.2.8 SPRINT RETROSPECTIVE	13
	3.3 SPRINT 3	13
	3.3.1 SPRINT GOAL WITH USER STORIES OF SPRINT 3	13
	3.3.2 FUNCTIONAL DOCUMENT	13
	3.3.3 ARCHITECTURE DOCUMENT	13
	3.3.4 UI DESIGN	14
	3.3.5 FUNCTIONAL TEST CASES	14
	3.2,6 DAILY CALL PROGRESS	14
	3.2.7 COMMITTED VS COMPLETED USER STORIES	14
	3.2.8 SPRINT RETROSPECTIVE	14
4	RESULTS AND DISCUSSIONS	
	4.1 PROJECT OUTCOMES	15
	4.2 COMMITTED VS COMPLETED USER STORIES	15
5	CONCLUSIONS & FUTURE ENHANCEMENT	16
	APPENDIX	17
	UI/UX DESIGN	17
	PAPER PUBLICATION STATUS	21

LIST OF FIGURES

3.1.4 U1 Diagram for FuseLearn	
--------------------------------	--

CHAPTER 1

INTRODUCTION

1.1 General

In today's education landscape, computer science students face a vast and scattered array of resources, making it challenging to locate comprehensive and cohesive study materials. Traditional educational methods often rely on disconnected resources, leading to inefficiencies and gaps in learning. As fields like software development, data science, and machine learning evolve rapidly, a more integrated and flexible learning solution is essential to meet students' needs effectively.

Spotting this gap, FuseLearn introduces a centralized, web-based educational platform tailored specifically for computer science students. FuseLearn consolidates essential learning materials—including lecture notes, interactive quizzes, and video tutorials—into a single platform. By gathering these resources in one place, it simplifies the learning process, reducing the time students spend searching for materials and allowing them to focus on mastering the concepts they need to excel in their studies. FuseLearn's combination of real-time feedback, personalized learning, and up-to-date resources makes it a comprehensive, adaptable solution for computer science students. By creating a centralized learning hub, FuseLearn empowers students to focus on acquiring the skills needed for both current and future success in the technology industry.

Rather than relying on static materials, FuseLearn continuously updates its resources to reflect new advancements and best practices in computer science. This approach allows students to stay informed about cutting-edge developments without needing to seek additional sources.

FuseLearn fosters a sense of community, offering discussion boards and forums where students can ask questions, share insights, and collaborate with peers. This sense of connection enhances the learning experience by enabling students to engage in meaningful discussions and group learning.

1.2 Motivation

The development of FuseLearn is rooted in addressing the common struggles faced by engineering students, particularly in accessing reliable, well-organized study resources. For many students, preparing for exams, projects, and internships requires navigating a disorganized and scattered web of information. Educational resources are often spread across multiple websites and platforms, with some materials being incomplete, outdated, or lacking depth. This scattered nature of resources leads to inefficiencies, with students spending significant time searching for materials instead of focusing on learning and understanding core concepts.

- 1) Traditional study approaches, often involving static textbooks or disjointed online resources, tend to lack interactivity, which can make learning feel passive and uninspiring. Without engaging, hands-on elements, students struggle with retaining complex technical information, which can hinder their understanding of essential engineering principles and problem-solving skills. The need for a more interactive learning experience has become especially crucial in fields like engineering, where applying knowledge is as important as understanding theory.
- 2) FuseLearn's primary function is to consolidate a wide range of educational materials—such as lecture notes, quizzes, video tutorials, and coding exercises—into one cohesive platform. This centralization saves students from the hassle of navigating multiple sites, allowing them to access everything they need in a single, well-organized environment.
- 3) Recognizing that every student has unique learning needs and goals, FuseLearn offers personalized recommendations based on individual performance and areas for improvement. The platform adapts to students' learning progress, offering tailored suggestions on topics that require more focus. Additionally, structured learning paths guide students through concepts in a logical sequence, ensuring a smoother and more cohesive learning journey.
- 4) FuseLearn transforms learning into an active process by incorporating engaging, interactive features such as quizzes, coding challenges, and hands-on projects. These elements reinforce the theoretical knowledge gained from notes and lectures, making it easier for students to retain information and apply it in

- practical scenarios. This approach fosters a deeper, more meaningful learning experience that goes beyond memorization.
- 5) FuseLearn incorporates community features like discussion boards and forums, allowing students to connect with peers, ask questions, and participate in group problem-solving. This collaborative environment builds a sense of support and motivation, making learning more enjoyable and less isolating.
- 6) FuseLearn transforms learning into an active process by incorporating engaging, interactive features such as quizzes, coding challenges, and hands-on projects. These elements reinforce the theoretical knowledge gained from notes and lectures, making it easier for students to retain information and apply it in practical scenarios. This approach fosters a deeper, more meaningful learning experience that goes beyond memorization.

1.3 Sustainable Development Goal of the Project

FuseLearn directly contributes to Sustainable Development Goal by providing an openaccess platform designed to make quality educational resources available to all, irrespective of financial status or location. By democratizing education through this free, digital approach, FuseLearn addresses educational disparities and empowers students from diverse backgrounds. This platform not only breaks down geographical and economic barriers to learning but also promotes a culture of lifelong learning. FuseLearn's commitment to inclusive education supports SDG 4's vision of expanding opportunities and fostering equal access, ultimately working towards a future where education global standard quality Through its digital-first approach, FuseLearn addresses key issues of educational inequality, empowering students from diverse socio-economic backgrounds. This platform offers an extensive range of high-quality resources designed to meet the varied needs of learners across subjects and skill levels, ensuring that students from remote areas, low-income households, or underserved communities can access the same quality of education as those in more privileged circumstances.

By eliminating traditional barriers to education, FuseLearn promotes a culture of lifelong learning and supports individuals in continually developing their skills. The platform encourages curiosity, self-paced learning, and the acquisition of knowledge that extends beyond traditional academic boundaries. This culture aligns with SDG 4's

vision of creating sustainable, equitable educational systems that foster personal and professional growth throughout a person's life.

1.4 Product Vision Statement

The vision of **FuseLearn** is to establish itself as a comprehensive, all-in-one platform that addresses the educational needs of computer science students. In today's digital learning environment, students face the challenge of locating, organizing, and efficiently utilizing resources scattered across multiple websites, applications, and formats. FuseLearn aims to solve this issue by creating a centralized hub that offers high-quality educational content tailored to the curriculum and real-world demands of computer science fields. By providing an intuitive and seamless learning experience, the platform reduces the time students spend on gathering materials, allowing them to focus on mastering concepts.

FuseLearn goes beyond mere content aggregation; it is designed to be a transformative learning tool. Through its engaging, interactive, and user-friendly interface, the platform seeks to make studying an active, enjoyable, and productive experience. By including features such as quizzes, progress tracking, and interactive video tutorials, FuseLearn allows students to deepen their understanding in ways that enhance retention and comprehension. The platform's carefully structured design encourages a step-by-step learning process, where each resource is aligned with a specific learning outcome, ensuring that students can learn efficiently and effectively.

The vision for FuseLearn also includes fostering a sense of achievement and continuous progress for students. With personalized dashboards, students have a clear view of their learning journey, from goals to accomplishments. FuseLearn's commitment to quality education aligns with the broader vision of democratizing learning, ensuring that knowledge is accessible and empowering for all students, irrespective of background or resources. As FuseLearn grows, its vision will evolve to support students in more diverse disciplines, ultimately becoming a sustainable, all-encompassing educational tool that empowers future generations to excel in their studies and careers.

The vision of FuseLearn is to become a one-stop solution for all educational needs of computer science students. The platform seeks to simplify the learning process through an engaging and easy-to-use interface that enhances comprehension and retention.

1.5 Product Goal

The primary goal of FuseLearn is to create a centralized hub for educational resources, making high-quality materials accessible to students from all backgrounds. This platform is built with the mission to provide accessible, equitable, and engaging learning tools that cater to the diverse needs of students. FuseLearn is designed to:

- a) FuseLearn prioritizes the curation of trusted and well-researched content, ensuring students have access to accurate and comprehensive study materials. This includes resources across various subjects and levels, carefully selected to support students in achieving academic success. By organizing these resources in a single platform, FuseLearn simplifies the learning journey, enabling students to focus on their studies rather than searching for credible materials.
- b) FuseLearn enhances engagement through tools such as quizzes, a personalized student dashboard, and progress tracking features. These interactive elements help make learning more enjoyable and immersive, encouraging students to engage actively with the material. Through gamified quizzes and real-time feedback, students can test their knowledge, reinforce concepts, and identify areas needing improvement. The student dashboard also provides a personalized experience, where learners can track their progress, set goals, and monitor their achievements.

In summary, FuseLearn's goal is to bridge gaps in educational access by providing a comprehensive, accessible, and engaging learning environment. Through high-quality materials, interactive tools, and a focus on retention, FuseLearn empowers students to reach their academic potential, contributing to a more educated and capable society.

1.6 Product Backlog (Key User Stories with Desired Outcomes)

- User Story 1: As a student, I want to log in securely so that I can access my personalized dashboard.
- User Story 2: As a student, I want access to quizzes so that I can test my understanding of each topic.

1.7 Product Release Plan

Phase 1: Develop the core platform with login functionality, lecture notes, and basic quizzes.

Phase 2: Introduce quizzes, and user progress tracking. Phase 3: Expand content to include multiple engineering disciplines and collaborative learning features.

CHAPTER 2

TECHNICAL ARCHITECHTURE

2.1. Frontend Layer

- Technologies: HTML, CSS, JavaScript
- Functionality: The frontend will handle user interface components like the login page, dashboard, course content, quizzes, and progress tracking.
 JavaScript libraries (e.g., React or vanilla JavaScript) can manage interactivity, form validations, and session storage for logged-in status.
- Responsive Design: Ensure that the platform is accessible across devices (mobile, tablet, desktop) using responsive CSS frameworks like Bootstrap or custom CSS media queries.

2.2. Backend Layer

- Technologies: Java (Spring Boot or another Java-based framework)
- Functionality: The backend will handle user authentication, database operations, and API endpoints. The backend will expose RESTful APIs to manage:
 - o User authentication and session management
 - o CRUD operations for resources (notes, quizzes, videos)
 - Student progress tracking (quiz scores, course completion status)
- Security: Implement secure authentication (JWT tokens) and user data validation.

2.3. Database Layer

- Database: MySQL, PostgreSQL, or MongoDB (for flexibility with unstructured data)
- Data Models:
 - o User: Stores user profiles, authentication details, and roles.
 - o Course Content: Stores metadata about notes, quizzes, and videos.
 - Progress Tracking: Logs quiz scores, watched videos, and other user interactions.

 Data Access: Use ORM (e.g., Hibernate with Spring Boot) for database interactions

2.4. APIs and Microservices

- REST APIs: RESTful endpoints for frontend-backend communication, allowing the frontend to retrieve and update data. Consider modularizing APIs for each feature (e.g., /auth, /quizzes, /content).
- Microservices (Future Scope): For a scalable solution, break down features
 into microservices to handle authentication, course management, and progress
 tracking independently.

2.5. Data Analytics and Reporting (Future Scope)

- Purpose: Track student performance metrics and platform engagement data.
- Technologies: Analytics tools like Google Analytics or custom reports via SQL queries for insights into student usage and progress.

2.6. Cloud Deployment and Hosting

- Cloud Provider: Use AWS, Azure, or Google Cloud for hosting.
- Containerization: Use Docker to package the application, making it easy to deploy and scale.
- CI/CD Pipeline: Implement CI/CD for automated testing, building, and deployment (e.g., GitHub Actions or Jenkins).

2.7. Security and Compliance

- Authentication and Authorization: Use HTTPS, JWT tokens, and role-based access control.
- Data Encryption: Encrypt sensitive data, both in transit and at rest.
- Compliance: Ensure compliance with data privacy regulations like GDPR if targeting users in applicable regions.

CHAPTER 3

SPRINT PLANNING AND EXECUTION

3.1 Sprint 1

3.1.1 Sprint Goal with User Stories of Sprint 1

Goal: Establish the foundational framework for user interaction by implementing user authentication and providing access to basic learning resources.

User Stories:

Story 1: As a user, I want to securely sign up with my email and password to access the platform.

Story 2: As a user, I want to retrieve lecture notes for my enrolled courses to access study materials seamlessly.

3.1.2 Functional Document

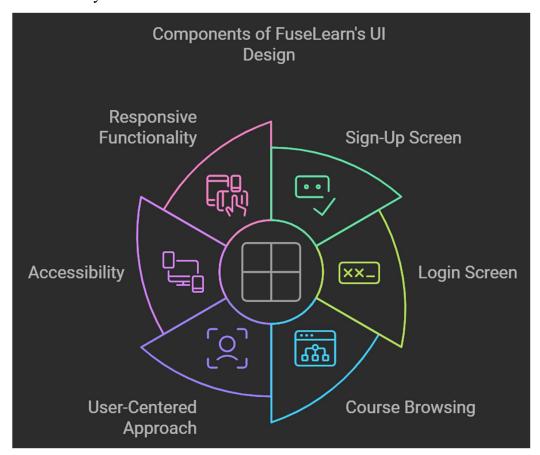
This document outlines the main functions implemented in Sprint 1, focusing on user authentication and secure access to course material. Functional details include the form validation for sign-up, data encryption for password storage, and database schema design for user data management.

3.1.3 Architecture Document

The architectural setup for Sprint 1 includes three layers: the front-end (web interface), the back-end (server-side logic for authentication and data retrieval), and the database (user data storage). Diagrams illustrate how data flows securely between these layers, focusing on user session management and data encryption.

3.1.4 UI Design

The initial user interface design involves simple, intuitive screens for the sign-up, login, and course browsing pages. Designs adhere to a user-centered approach, optimizing for ease of use, accessibility, and responsive functionality on various devices.



3.1.5 Functional Test Cases

Test cases for Sprint 1 include verification of successful user registration, login, and data retrieval. Each test case covers functionality, error handling (such as invalid login attempts), and boundary conditions.

3.1.6 Daily Call Progress

Daily calls monitored progress, identified blockers, and set daily goals. The team provided updates on tasks such as setting up the database, front-end form validation, and back-end security configurations.

3.1.7 Committed vs Completed User Stories

All committed user stories for Sprint 1 were completed. Authentication features and course retrieval functionalities were successfully implemented, validated, and approved by the team.

3.1.8 Sprint Retrospective

During the retrospective, the team discussed the efficient flow of communication, timely completion of tasks, and areas for improvement. Notably, suggestions for optimizing API calls were noted for future sprints.

3.2 Sprint 2

3.2.1 Sprint Goal with User Stories of Sprint 2

Goal: Enhance the educational content repository and introduce quizzes for student self-assessment.

User Stories:

- Story 1: As a student, I want to access quizzes for each course to test my knowledge.
- Story 2: As a student, I want to navigate through detailed course notes easily.

3.2.2 Functional Document

This document highlights the addition of quiz functionalities. It covers database schema modifications to include quiz questions and answers and describes the data retrieval mechanism for displaying quizzes.

3.2.3 Architecture Document

The updated architecture incorporates the quiz data storage and handling mechanisms, demonstrating how quiz questions and answers are stored in the database and served to the front end.

3.2.4 UI Design

New screens for quiz selection, question answering, and feedback are introduced. The design emphasizes clarity, interactivity, and feedback mechanisms for user responses.

3.2.5 Functional Test Cases

Test cases include verification of quiz loading, answer submission, and score calculation. Each case ensures that quizzes function smoothly, with clear feedback provided for correct or incorrect answers.

3.2.6 Daily Call Progress

Progress was tracked daily, with updates on quiz module development, front-end integrations, and back-end API adjustments. Challenges in quiz data handling were discussed and resolved.

3.2.7 Committed vs Completed User Stories

Committed user stories for Sprint 2 were completed with the integration of quizzes and detailed course notes.

3.2.8 Sprint Retrospective

The team discussed successes in the quiz module implementation and identified improvements in data handling that could speed up quiz loading times.

3.3 Sprint 3

3.3.1 Sprint Goal with User Stories of Sprint 3

Goal: Introduce simulation-based learning for advanced topics and enhance overall UI/UX.

User Stories:

- Story 1: As a student, I want access to simulations to better understand complex algorithms.
- Story 2: As a student, I want an enhanced user interface for a smoother experience.

3.3.2 Functional Document

Focus in this sprint was on building the simulation feature. It includes specifications for interactive, animation-based simulations, designed to explain core computer science algorithms and concepts.

3.3.3 Architecture Document

Architecture modifications support the additional processing power needed for rendering simulations, with optimizations on both front and back ends for smooth interactive experiences.

3.3.4 UI Design

Updates to the UI accommodate simulation pages with interactive controls and descriptive content. Usability and aesthetic improvements were made to the existing UI.

3.3.5 Functional Test Cases

Test cases ensure simulations load without latency, interactions are responsive, and content is displayed accurately. Testing also covered usability aspects, ensuring ease of understanding.

3.3.6 Daily Call Progress

Updates on simulation feature development, UI/UX testing, and API optimizations were shared in daily calls, resolving any blockers in real-time.

3.3.7 Committed vs Completed User Stories

All user stories for Sprint 3 were successfully completed. Simulations were deployed and tested for performance, and UI improvements received positive feedback from test users.

3.3.8 Sprint Retrospective

The team identified successful aspects, including simulation performance and user engagement, and highlighted areas for potential scaling in future sprints.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Project Outcomes

The FuseLearn platform successfully met its goals by providing students with a centralized resource hub. The platform includes secure authentication, a functional learning repository, and engaging quizzes that improve retention.

4.2 Committed vs Completed User Stories

The majority of user stories were completed successfully during each sprint, with a few stories postponed for future implementation.

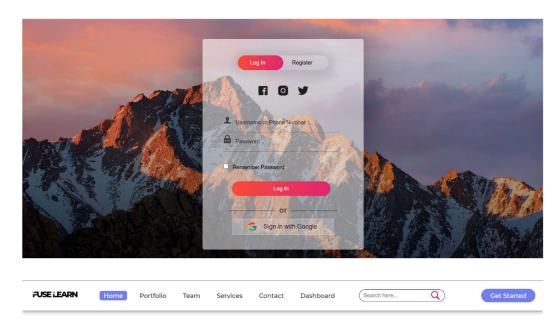
CHAPTER 5

CONCLUSIONS & FUTURE ENHANCEMENT

In conclusion, the FuseLearn platform serves as an invaluable resource for engineering students, addressing the challenge of fragmented study materials and providing a centralized hub for academic resources. By consolidating essential content such as study guides, quizzes, interview preparation materials, and interactive visualizations, FuseLearn not only enhances the learning experience but also fosters a structured approach to academic growth.

Looking forward, there are several key areas for enhancement that will broaden FuseLearn's impact. First, expanding the platform to cover additional disciplines beyond engineering will allow a wider range of students to benefit from its resources, catering to diverse academic backgrounds and career aspirations. Additionally, incorporating collaborative learning tools, such as group study forums, live sessions with experts, and peer-to-peer mentoring, will create an interactive and supportive community that encourages engagement and knowledge sharing among users. These future developments will further solidify FuseLearn's role as a comprehensive and collaborative educational platform, empowering students to excel in their academic and professional journeys.

APPENDIX UI/UX DESIGN

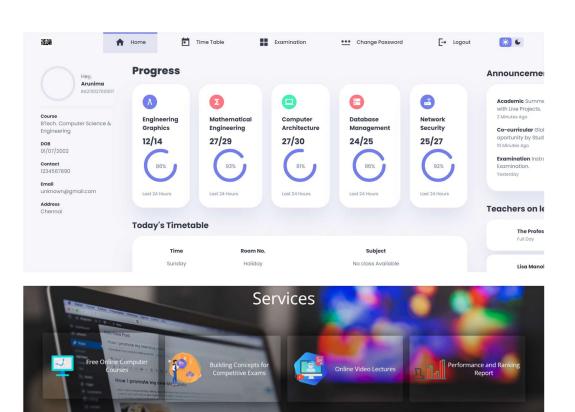


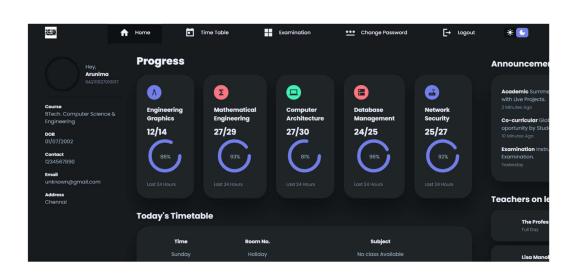
The beautiful thing about learning is that nobody can take it away from you

Education is the process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits. Educational methods include teaching, training, storytelling, discussion and directed research!

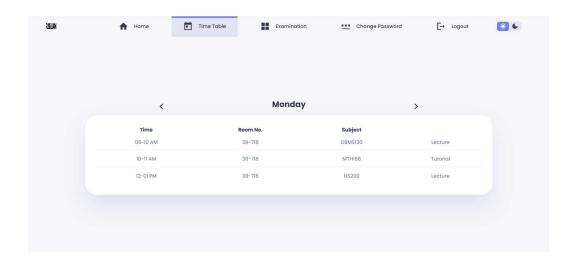


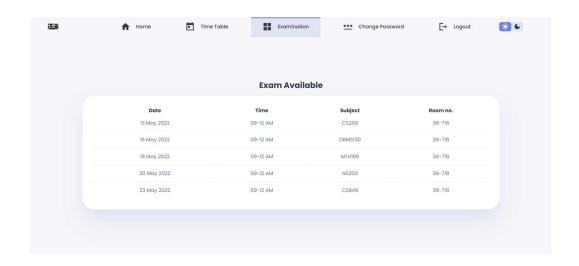


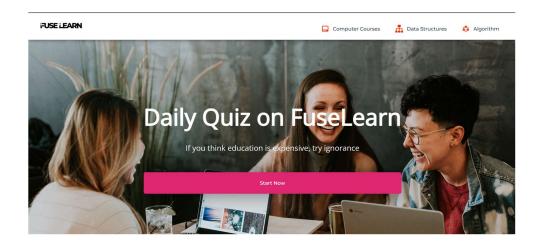


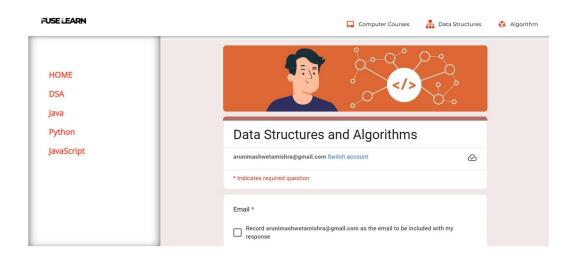


24x7 Online Support









PATENT STATUS

The publication process not yet started