

KnowledgeNest: An e-learning video platform

Internship Report

Submitted for the partial fulfillment of the degree of

Bachelor of Technology

In

Computer Science & Engineering

Submitted By

Anusha Raghuwanshi

0901CD211009

UNDER THE SUPERVISION AND GUIDANCE OF

Prof. Mahesh Parmar

Assistant Professor

Department of Computer Science & Engineering



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA
माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत
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January-May 2025

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I further declare that the work reported in this report has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university.



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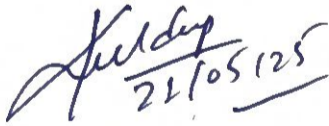
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Mentored By:



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Approved by HoD



Dr. Manish Dixit
Professor & Head
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Anusha Raghuwanshi

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Prof. Mahesh Parmar
Assistant Professor
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MITS, Gwalior

ABSTRACT

The rapid evolution of digital education has highlighted the need for accessible, user-friendly e-learning platforms that cater to self-paced learners. *KnowledgeNest* is a web-based application designed to bridge this gap by providing a simplified environment where students can register, explore curated video-based courses, and track their progress. The platform includes essential features such as secure user authentication, an interactive course management system for administrators, and a responsive interface suitable for both desktop and mobile devices.

Developed using a beginner-friendly stack—HTML, CSS, JavaScript, Bootstrap for the frontend, Flask (Python) or Express (Node.js) for the backend, and SQLite for data storage—the project emphasizes clarity, usability, and modular design. Core functionalities include video playback via YouTube integration, profile management, and dynamic data fetching from the database. The system also incorporates Git for version control, promoting collaborative development.

The project showcases the foundational principles of full-stack web development, with future scalability in mind. It offers a strong base for incorporating advanced features such as quizzes, certification, and instructor-student interaction. Through *KnowledgeNest*, the project demonstrates how structured, incremental development can lead to the creation of meaningful, real-world applications in the education sector.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to **Crystaltech Services Private Limited** for providing me with the opportunity to undertake this enriching internship, which has significantly contributed to my learning and professional development in front-end web development.

I am especially thankful to **Mr. Gourav Mourya** for his invaluable guidance, constant support, and mentorship throughout the internship. His insights and feedback played a crucial role in enhancing my understanding of real-world development practices and refining my technical skills.

I would also like to extend my heartfelt thanks to my faculty mentor, **Prof. Mahesh Parmar**, for his encouragement and continuous support during this internship.

This experience has been a significant step in my journey as a web developer, and I am truly grateful to everyone who contributed to its success.


Anusha Raghuwanshi

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CHAPTER 1: INTRODUCTION

1.1 Project Overview:

KnowledgeNest is a beginner-friendly e-learning platform developed to provide students with easy access to video-based learning content. It allows users to register, log in, browse courses, and track progress in a user-friendly environment.

1.2 Objectives:

1. To build a functional learning platform with basic user and admin features.
2. To support video lesson delivery in a responsive design.
3. To manage course content through an admin dashboard.
4. To lay the foundation for further expansion (quizzes, certification, etc.).

1.3 Scope of the Project:

The current scope includes user authentication, video course management, and a basic user profile system. The platform is scalable and can integrate more features in the future.

1.4 Motivation:

In a digital learning era, accessible and intuitive e-learning platforms are essential. This project aims to contribute a simplified solution, especially beneficial for students and educators with minimal technical resources.

CHAPTER 2: LITERATURE SURVEY

2.1 Introduction

The evolution of e-learning platforms has transformed the way educational content is consumed, delivered, and managed. With increasing demand for self-paced and remote learning, a variety of e-learning systems have been developed worldwide. This literature survey explores the existing solutions, technologies commonly used, design patterns in such systems, and the gaps that justify the development of a new, simplified e-learning platform like *KnowledgeNest*.

2.2 Study of Existing E-Learning Platforms:-

1. Coursera

Coursera is a massive open online course (MOOC) platform that partners with universities and organizations to offer courses, specializations, and degrees. It features structured video lectures, quizzes, peer-graded assignments, and certifications. However, the platform is complex, and course creation is only available to partnered institutions.

2. Udemy

Udemy allows independent instructors to create and sell courses to a global audience. The backend of Udemy supports robust content management, user engagement metrics, and promotional tools. While versatile, the platform's monetization and course approval policies are not suited for smaller educational groups or beginners looking to build private or custom-use platforms.

3. Khan Academy

Focused on free educational content, Khan Academy offers video lessons and exercises with a strong emphasis on K-12 learning. Its personalized dashboards and gamified progress tracking make it very engaging, but its architecture is complex, requiring a large development team for maintenance and updates.

4. Moodle (Modular Object-Oriented Dynamic Learning Environment)

Moodle is an open-source Learning Management System (LMS) used by schools and universities. It supports quizzes, grading, forums, and SCORM-compliant content. However, it is resource-heavy and demands a steeper learning curve for customization, especially for beginners.

2.3 Technological Landscape:-

The following technologies are commonly used in developing e-learning platforms and were critically reviewed before selecting the tech stack for *KnowledgeNest*:

- **Frontend:** HTML, CSS, JavaScript are universal in web development, providing structure, styling, and interactivity. Bootstrap simplifies responsive design, making it suitable for mobile users.
- **Backend:** Flask (Python) and Express (Node.js) are widely adopted micro-frameworks that are lightweight and ideal for developing REST APIs for small to medium applications.
- **Database:** SQLite is a file-based, zero-configuration database engine suitable for initial stages of web projects. Unlike MySQL or PostgreSQL, SQLite requires minimal setup and can be easily integrated with Python or Node.js applications.
- **Authentication:** JWT (JSON Web Tokens) and session-based login systems are the two leading methods of user authentication. JWT is stateless and often used in scalable web apps, while session-based auth is simpler and ideal for basic platforms.
- **Version Control:** Git and GitHub are standard for code collaboration, backup, and project tracking.

2.3 Gap Identified:-

Most existing solutions are built for large audiences and are often over-engineered for small-scale academic or classroom use. A lightweight alternative is needed that's customizable and easy to maintain.

CHAPTER 3: WORK DONE

3.1 Initial Setup:

- Installed development tools like Python/Node.js, Flask/Express, and VS Code.
- Structured project directories and initialized Git for version control.

3.2 Frontend Development:

- Designed homepage, login/registration forms, and course listing pages.
- Created responsive layouts using Bootstrap to support mobile and desktop.

3.3 Backend Development:

- Set up server routes for login, registration, and course display.
- Implemented basic admin functionalities (add, edit, delete courses).
- Integrated session-based user authentication.

3.4 Database Integration:

- Created SQLite tables for users and course details.
- Fetched course data dynamically and displayed it on the frontend.

3.5 Testing and Finalization:

- Conducted functionality testing for all features.
- Verified mobile responsiveness and ensured stable navigation between routes.

CHAPTER 4: GOALS

The *KnowledgeNest* e-learning platform project offered a comprehensive learning experience in full-stack web development, encompassing both technical and personal growth.

- **Frontend Development:** Learned to design responsive interfaces using HTML, CSS, JavaScript, and Bootstrap. Built user-friendly pages such as login, registration, course listings, and video playback.
- **Backend Development:** Gained hands-on experience with Flask/Express for route handling, user sessions, and authentication logic. Implemented CRUD operations for course management.
- **Database Integration:** Created and connected a SQLite database to store user credentials and course data. Practiced fetching dynamic content and structuring normalized tables.
- **Authentication:** Implemented secure user login, registration, password hashing, and session handling using JWT/session-based methods.
- **Version Control:** Used Git and GitHub for project tracking and collaborative development.
- **Understood how to plan a modular web application from scratch.**
- **Gained experience in requirement analysis, MVP (Minimum Viable Product) planning, and prioritizing features.**
- **Practiced iterative development and debugging for better code quality.**
- **Improved problem-solving skills through real-time error handling and debugging.**
- **Strengthened time management by adhering to weekly goals and structured development.**
- **Enhanced technical writing and presentation skills through documentation, report writing, and preparing a final presentation.**

CHAPTER 5: SKILLS GAINED

1. Technical Skills

- **Web Development (Full Stack):**
Developed both the frontend and backend of a responsive e-learning platform. Built user interfaces using HTML, CSS, JavaScript, and Bootstrap, and backend services using Flask (Python) or Express (Node.js).
 - **Database Management:**
Learned to design and manage a SQLite database. Created normalized schemas to store and retrieve user data and course information efficiently.
 - **User Authentication:**
Implemented secure session-based or JWT authentication, including user registration, login, and password reset functionalities.
 - **CRUD Operations:**
Gained experience in implementing Create, Read, Update, Delete operations for managing courses through admin functionality.
 - **Responsive Design:**
Built a mobile-friendly platform using Bootstrap, ensuring accessibility across different screen sizes.
 - **Version Control with Git:**
Gained practical experience using Git and GitHub for tracking progress, maintaining versions, and ensuring safe backup of project files.
-

2. Analytical & Problem-Solving Skills

- Tackled challenges during debugging and development independently.
- Optimized workflows by analyzing user requirements and translating them into functional modules.
- Adapted to errors by researching documentation and troubleshooting issues logically.

CHAPTER 6: OVERALL BENEFITS ACHIEVED

The *KnowledgeNest* e-learning platform was designed not only as a technical endeavor but also as a socially impactful project. In today's digital era, education is undergoing a transformation, and projects like this directly contribute to making learning more accessible, inclusive, and flexible for students across all backgrounds.

Many students, especially in remote or underprivileged areas, face barriers to accessing quality education. An online learning platform like *KnowledgeNest* allows these students to access structured video lessons at their own pace, removing geographical and financial constraints. It promotes **educational equity** by making learning opportunities available to anyone with an internet connection.

Traditional classroom setups don't always accommodate the diverse learning speeds of students. This platform empowers users to **learn at their own pace**, revisit concepts, and track their individual progress. This model reduces pressure, builds confidence, and encourages lifelong learning habits.

In a fast-changing job market, the need for constant upskilling is critical. Platforms like *KnowledgeNest* can be extended in the future to include certification, quizzes, and interactive instructor support — all aimed at supporting professionals and students who want to gain new skills alongside their jobs or education.

Certificate ID: 1a2

CIN U72900MP2019PTC050487



CERTIFICATE OF INTERNSHIP

This certificate awarded to
Anusha Raghuwanshi

HAS SUCCESSFULLY COMPLETED AN INTERNSHIP AS

Web Developer Intern

Conducted from 04 Jan 2025 – 12 May 2025

We appreciate your Hard Work & Contributions.



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12-MAY-2025

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GOURAV MOURYA

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Fortnightly Progress Report (FPR) From Industry Mentor

Name of student	Anusha Raghuwanshi	Department	IT		
Industry/Organization	Crystaltech Services Private Limited	Date/Duration	5/01/2025 – 17/02/2025		
Criterion	Poor	Average	Good	Very Good	Excellent
Punctuality/Timely completion of assigned work					✓
Learning capacity / Knowledge upgradation				✓	
Performance / Quality of work					✓
Behavior/Discipline/Team work					✓
Sincerity/Hard work					✓
Comment on the nature of work done /Area/Topic	Backend working on joining projects. CMS Updation with API's Working and Training				
<u>OVERALL GRADE</u>	POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT ✓				
<u>Name of Industry Mentor</u>	Gourav Mourya				
<u>Signature of Industry Mentor</u>					


Receiving Date	15/02/2025	Name of Faculty Mentor	Mahesh Parmar	Sign	
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MONTHLY PROGRESS REPORT (MPR) FROM FACULTY MENTOR

Name of student	Anusha Raghuwanshi	Department	IT		
Industry/Organization	Crystaltech Services Pvt. Ltd.	Date/Duration	18/02/2025 – 17/03/2025		
Criterion	<u>Poor</u>	<u>Average</u>	<u>Good</u>	<u>Very Good</u>	<u>Excellent</u>
Punctuality/Timely completion of assigned work				✓	
Learning capacity/Knowledge up-gradation				✓	
Performance/Quality of work					✓
Behavior/Discipline/Teamwork					✓
Sincerity/Hard work					✓
Comment on nature of work done/Area/Topic	<ul style="list-style-type: none"> • While loops • For loops • Foreach loops • Continue • Break • Understanding array pointers • Common problems • Warnings and errors • Debugging and troubleshooting • If statements • Else and else if statements • Logical operators • Switch statements • Embedding PHP code on a page • Outputting dynamic text • The operational trail 				
<u>OVERALL GRADE (Anyone)</u>	<u>POOR/ AVERAGE/ GOOD/ VERY GOOD/ EXCELLENT ✓</u>				
<u>Name of Industry Mentor</u>	Gourav Mourya				
<u>Signature of Industry Mentor</u>					


<u>Receiving Date</u>	15/03/2025	<u>Name of Faculty Mentor</u>	Mahesh Parmar	<u>Sign</u>	
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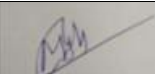
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MONTHLY PROGRESS REPORT (MPR) FROM FACULTY MENTOR

Name of student	Anusha Raghuwanshi	Department	IT		
Industry/Organization	Crystaltech Services Pvt. Ltd.	Date/Duration	18/03/2025 – 17/04/2025		
Criterion	<u>Poor</u>	<u>Average</u>	<u>Good</u>	<u>Very Good</u>	<u>Excellent</u>
Punctuality/Timely completion of assigned work				✓	
Learning capacity/Knowledge up-gradation					✓
Performance/Quality of work					✓
Behavior/Discipline/Teamwork					✓
Sincerity/Hard work					✓
Comment on nature of work done/Area/Topic	<ul style="list-style-type: none"> • Defining functions • Function arguments • Returning values from a function • Multiple return values • Scope and global variables • Setting default argument values • Links and URLs • Using GET values • Encoding GET values • Encoding for HTML • Including and requiring files • Modifying headers • Page redirection • Output Buffering 				
<u>OVERALL GRADE (Anyone)</u>	<u>POOR/ AVERAGE/ GOOD/ VERY GOOD/ EXCELLENT✓</u>				
<u>Name of Industry Mentor</u>	Gourav Mourya				
<u>Signature of Industry Mentor</u>					


<u>Receiving Date</u>	15/04/2025	<u>Name of Faculty Mentor</u>	Mahesh Parmar	<u>Sign</u>	
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Fortnightly Progress Report (FPR) From Industry Mentor

Name of student	Anusha Raghuwanshi	Department	IT		
Industry/Organization	Crystaltech Services Private Limited	Date/Duration	18/04/2025 – 12/05/2025		
Criterion	Poor	Average	Good	Very Good	Excellent
Punctuality/Timely completion of assigned work					✓
Learning capacity / Knowledge upgradation					✓
Performance / Quality of work				✓	
Behavior/Discipline/Team work					✓
Sincerity/Hard work					✓
Comment on the nature of work done /Area/Topic	Backend working on joining projects. CMS Updation with API's Working and Training				
<u>OVERALL GRADE</u>	POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT ✓				
<u>Name of Industry Mentor</u>	Gourav Mourya				
<u>Signature of Industry Mentor</u>					

Receiving Date	15/05/2025	Name of Faculty Mentor	Mahesh Parmar	Sign	
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Internship Offer Letter

Date: 01-Jan-2025

Document ID: uhgfd

Dear Anusha Raghuwanshi,

We are pleased to offer you an internship as a **Web Development Intern** with **Crystaltech Services Private Limited** in **Indore**, Madhya Pradesh. You will be part of our Technical Team Department, and your internship will begin on **Jan 04 2025, to May 12 2025**. This opportunity will allow you to gain practical experience and industry insights, bridging the gap between your academic knowledge and a real-world professional environment.

Throughout your internship, you will work closely with experienced professionals who will mentor and support you in developing critical skills while enhancing your understanding of our business operations. We will ensure flexibility with your academic commitments, so you can seamlessly balance your studies and professional growth. Please note that this internship includes a stipend of **Rs. 6,000/- INR Monthly Internship**. Your guidance name is **Gourav Mourya, Project Title, after joining the assignment**.

Responsibilities and Expectations:

During your time with us, we expect you to uphold Crystaltech Services Private Limited's values, adhere to all company policies, and demonstrate professionalism, punctuality, and dedication to your assigned tasks. Your commitment to excellence will significantly contribute to your personal growth and the success of our projects.

To accept this offer, please sign and return this letter before the joining date. We look forward to your contributions and are excited to see the impact you will make as part of our team.

Please feel free to reach out if you have any questions or require further clarification.

Thank you

Intern Signature

Sincerely,
Gourav Mourya



Founder & Director

Crystaltech Services Private Limited.

*Note:- Verify the document on our website using the provided ID. If not found, it's fake.

Website: www.crystaltechservices.com

Contact Number: +919826067554, +917898460275

Email: info@crystaltechservices.com | hr@crystaltechservies.com

Address: Scheme No 78 Main Road 1st Floor, Front of Union Bank,

Nearby Utsah Restaurant & Mahindra Showroom, Indore, Madhya Pradesh 452010, INDIA

CHAPTER 7: CONCLUSION

The *KnowledgeNest* project was a comprehensive and enriching journey that combined the technical intricacies of web development with a strong vision for social impact. Over the course of 15 weeks, the platform was designed and developed to provide an intuitive, accessible, and flexible e-learning environment where users can register, log in, browse video-based courses, and track their progress. From setting up the development environment to building responsive frontends, implementing secure authentication, managing backend databases, and ensuring smooth course integration — each phase contributed significantly to building a functional and scalable application.

Beyond technical growth, this project also emphasized the importance of educational accessibility. By enabling self-paced learning and supporting a mobile-friendly, video-first experience, *KnowledgeNest* addresses modern educational challenges and stands as a step forward toward digital inclusion.

The internship not only helped solidify core programming and design concepts but also nurtured a deeper understanding of user needs, project planning, problem-solving, and collaboration. With a strong foundation laid, the platform has immense potential for future enhancements, including quizzes, certifications, and real-time teacher-student interactions.


Overall, *KnowledgeNest* is a promising initiative that reflects both technical competence and a commitment to making education more inclusive and future-ready.

Anusha Raghuwanshi

Internship at Crystaltech Services Private Limited

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