

## Final Project Report

# UniGuide – A Comprehensive Digital Tuition Platform for Collegians

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### Title Page

**Project Title:** UniGuide – A Comprehensive Digital Tuition Platform for Collegians

**Group No.:** Y1-2024-25-G189

**Submitted By:**

- Adit Ghosh (2401350016) – Backend Developer (Team Lead)
- Subhrajeet Dash (2401350018) – Frontend Developer
- Harsh Panchal (2401350007) – UI Designer
- Manju (2401350014) – Frontend Developer

**Industry Mentor:** Ms. Shayani Sharma

**Faculty Mentor:** Dr. Surabhi Shanker

**Department:** School of Engineering and Technology (SOET)

**College:** K. R. Mangalam University

**Date of Submission:** 30 April 2025

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### Acknowledgment

We express our heartfelt appreciation to our industry mentor, Ms. Shayani Sharma, and our faculty mentor, Dr. Surabhi Shanker, for their consistent support, encouragement, and valuable guidance throughout this project. Their mentorship provided direction and depth to our research and development process. We also extend sincere thanks to all survey participants, classmates, and faculty members whose insights and feedback played a vital role in refining our concept and implementation of UniGuide.

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### Abstract

UniGuide is an advanced tuition platform built specifically for the academic needs of college students. In an age where educational resources are widely scattered across the internet, students often face challenges in accessing relevant and reliable content. UniGuide addresses this issue by curating educational materials through technologies such as web scraping, smart PDF filtering, and content recommendation algorithms. The platform also features tools for personalized study planning, progress tracking, interactive roadmaps, and real-time user feedback integration. With a strong emphasis on usability, adaptability, and responsiveness, UniGuide creates a cohesive academic environment that empowers students to learn more efficiently, organize their learning strategies, and engage in self-paced academic growth.

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## 1. Introduction

### 1.1 Industry Context

The global education landscape has undergone a massive digital shift, driven largely by rapid advancements in technology and the growing need for flexible, accessible learning. The EdTech sector is one of the fastest-growing industries, with platforms incorporating AI, machine learning, and cloud computing to deliver personalized and scalable learning experiences. However, despite this progress, many students still face fundamental challenges: disorganization of content, inconsistent quality of learning resources, and the lack of personalized academic guidance. UniGuide emerges as a response to these problems, offering an integrated solution that prioritizes the real needs of students in higher education.

### 1.2 Project Summary

UniGuide is a digital tuition solution designed for collegiate learners, combining curated educational content, strategic planning tools, and interactive learning features into a single platform. It simplifies academic workflows by reducing the time and effort spent searching

for quality resources. The system provides students with structured learning roadmaps tailored to their curriculum, generates personalized content recommendations based on academic interests and progress, and allows users to monitor their growth through intuitive dashboards. As a centralized academic hub, UniGuide improves learning outcomes by making study planning smarter and more data-driven.

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## 2. Objectives

The project aims to:

- Curate trustworthy and high-quality academic resources from credible platforms and integrate them into a structured library.
- Design dynamic, course-specific learning roadmaps that guide students through topics in an organized sequence.
- Enhance personalization by providing recommendations based on student preferences, course enrollment, and performance history.
- Track academic progress through visual indicators and performance analytics.
- Promote student engagement by integrating suggestion and feedback systems to evolve with user needs.
- Foster independent learning by offering project suggestions and topic-based learning expansions.

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## 3. Scope

While the platform's initial target audience comprises undergraduate students in technical and engineering disciplines, its modular and scalable architecture allows for expansion into various academic streams including business, humanities, and interdisciplinary studies. The scope of UniGuide includes long-term plans to develop mobile applications, incorporate peer review mechanisms, introduce collaborative features for group learning, and eventually create an AI-driven mentor system that simulates academic advising. The adaptability of the platform makes it suitable for integration with institutional learning management systems (LMS) in the future.

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## 4. Research Methodology

### 4.1 Identifying the Problem

Students often experience difficulties in finding organized, reliable, and course-relevant academic content. With most learning resources scattered across platforms like YouTube, PDFs, forums, and course websites, the lack of centralized curation hinders academic productivity. Furthermore, students lack clear guidance on what to study and when, which contributes to anxiety and poor academic planning. UniGuide seeks to bridge this gap by delivering structure and relevance within a single educational interface.

## 4.2 Methodology

To understand student behavior, needs, and expectations, we designed a mixed-method research approach.

- **Target Audience:** College students enrolled in undergraduate programs across disciplines.
- **Sample Size:** 50 students participated in surveys and short interviews.
- **Sampling Method:** Convenience sampling was employed due to limited time and accessibility.
- **Data Collection:** A combination of online surveys, informal interviews, and observational data collection.
- **Analysis Techniques:** Responses were coded and analyzed for common themes, while basic statistical tools were used to assess the relevance and demand for various features.

## 4.3 Survey Access

Survey used for primary research: <https://forms.gle/tXyRBWnZtHqhMzW7>

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## 5. Tools and Techniques

To ensure a seamless and efficient development process, we adopted a variety of tools and frameworks:

- **Web Scraping Tools:** Used Python and BeautifulSoup for scraping publicly available educational resources.

- **PDF Filtering Algorithms:** Developed custom logic to extract relevant content from large documents.

- **Machine Learning Models:** Used basic content-based filtering techniques for generating personalized recommendations.

- **Data Visualization:** Employed Chart.js and D3.js libraries for creating interactive dashboards.

- **Version Control:** GitHub was used for code management and collaborative development.

- **UI/UX Design:** Designed using Figma and Adobe XD to ensure a smooth and responsive user experience.

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## 6. Features of UniGuide

UniGuide provides a wide array of features designed to address the diverse needs of students:

- **Centralized Content Repository:** Well-structured and categorized educational content library.

- **Course Roadmaps:** Modular breakdown of each subject, including core concepts, suggested timelines, and checkpoints.

- **Smart Recommendations:** System-generated suggestions based on user behavior, preferences, and progress.

- **Visual Analytics:** Dashboards displaying course completion status, content engagement, and feedback trends.

- **Feedback Integration:** Continuous collection of user opinions and suggestions for iterative platform updates.
  - **Project Suggestions:** Lists of relevant mini and major projects aligned with academic levels and subjects.
  - **Mobile Responsiveness:** UI tailored for mobile, tablet, and desktop use for accessibility on all devices.
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## 7. Implementation

The development of UniGuide followed agile practices with weekly sprints and peer reviews.

- **Frontend:** Built using HTML5, CSS3, JavaScript, and React.js for a modular and component-based structure.
  - **Backend:** Implemented with Node.js and Express for lightweight server operations and RESTful APIs.
  - **Database:** Used MongoDB for storing user profiles, course content metadata, and progress data.
  - **Deployment:** Hosted initial versions on Netlify and Render for free tier testing.
  - **Testing:** Performed unit testing and user acceptance testing (UAT) with iterative bug fixes and optimizations.
  - **Documentation:** Maintained via Markdown and Git for easy collaboration.
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## 8. Results and Discussion

User testing revealed overwhelmingly positive feedback regarding the clarity and usability of the platform. Students noted that having a centralized platform for study resources significantly reduced time spent on inefficient searches. The course roadmaps were highlighted as particularly useful in helping students structure their revision and preparation. Analytics revealed strong engagement with the progress tracker, indicating its usefulness in motivating users. Some areas for improvement include expanding course variety and integrating peer discussion features.

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## 9. Conclusion

UniGuide demonstrates the value of applying digital innovation to academic learning. It brings together the essential elements of resource aggregation, roadmap creation, and user-driven personalization in a single system. As a student-centric initiative, it not only supports academic goals but also encourages self-directed and strategic learning habits. The platform's performance in its pilot phase proves its capability to address real-world challenges faced by college students and sets the stage for future scaling and evolution.

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## 10. Future Prospects

Looking ahead, we envision UniGuide growing into a full-fledged academic ecosystem.

Upcoming features may include: - AI-driven academic mentoring chatbots

- Real-time peer discussion boards
  - In-app note-taking and collaborative study spaces
  - Instructor onboarding and verified course certifications
  - API integrations with university LMS systems
  - Expansion into postgraduate and professional certification courses
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## 11. References

1. Taylor & Francis (2020), "Technology in Education"
  2. Cardiff University (2018), "Best Practices in Online Content Curation"
  3. ResearchGate (2020), "Learning Roadmap Studio"
  4. Goyal, R.C. (2008), *Hospital Administration and Human Resource Management*
  5. Journal of Healthcare Management (2009), "Consumer-Driven Healthcare Marketing"
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**End of Report**