A Project Report

On

"SkillSage-A learning platform"

with

Front-End Engineering

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ABSTRACT

The advent of digital technology has ushered in a new era of education, transcending traditional boundaries and revolutionizing the way people learn. Our project, a React-based educational learning platform akin to Udemy, emerges as a beacon of innovation and accessibility in this dynamic landscape. At its core, our platform is designed to democratize education by providing learners worldwide with unfettered access to high-quality learning resources and interactive multimedia content. Leveraging the power of modern web technologies such as React.js, Node.js, and AWS, we've built a scalable and user-friendly platform that caters to the diverse needs of learners at every stage of their educational journey.

With a relentless focus on innovation, user-centric design, and social impact, our project seeks to empower lifelong learners, drive positive change, and reshape the future of education. Through collaborative learning communities, personalized learning experiences, and a commitment to educational equity, we aim to unlock the full potential of learners worldwide and inspire a new generation of innovators, creators, and leaders.

Join us on this transformative journey as we harness the power of technology to unlock the boundless possibilities of education and create a brighter, more inclusive future for learners everywhere.

Index

S.no	Topics	Page No.			
1.	Introduction	6-8			
2.	Scope	8-9			
3.	Applicability	9-11			
4.	Problem Statement	11-12			
5.	Planning and Scheduling	12-13			
6.	Hardware and Software Requirements	13-15			
7.	Goals	15-16			
8.	Proposed Solution	16-18			
9.	Purpose	18-20			
10.	Workflow & Tech-Stack of the project	23-27			
11.	Snapshots of project	37-50			

Introduction

Our platform offers a plethora of features and functionality designed to enhance the learning experience for users. From interactive video lectures and quizzes to discussion forums and peer-to-peer collaboration, every aspect of the platform is meticulously crafted to foster engagement, comprehension, and retention. Additionally, our intuitive user interface and responsive design ensure seamless navigation across devices, making learning accessible anytime, anywhere. At the core of our project lies a robust and scalable technology stack that powers the platform's functionality and performance. Built on React.js, a popular JavaScript library for building user interfaces, our platform offers a rich and dynamic user experience. Leveraging Node.js on the backend enables us to handle concurrent connections efficiently and deliver real-time updates to users. Furthermore, our platform utilizes AWS services for hosting, storage, and content delivery, ensuring reliability, security, and scalability.

In a rapidly evolving world driven by technological advancements, the traditional boundaries of education are being redefined. Our project emerges as a response to this shifting landscape, aiming to create an immersive and accessible online learning platform that transcends geographical constraints and empowers learners worldwide. The emergence of digital learning platforms has catalyzed a paradigm shift in education, offering learners unprecedented access to a wealth of knowledge and resources. With our project, we seek to harness the transformative potential of technology to democratize education and break down the barriers that hinder learning.

Scope

The scope of this project is comprehensive, aiming to create an online learning platform that serves a diverse range of users with varying educational needs and backgrounds. This platform, designed as an Udemy-like clone, will incorporate key features that address the challenges of traditional education while embracing the benefits of technology. Here's an outline of the project's scope:

1. Diverse Course Offerings

The platform will provide a wide variety of courses across different domains, including technology, business, arts, health, personal development, and more. This diversity will attract learners from different backgrounds and with varying interests, making it a comprehensive educational hub.

2. Flexible Learning Paths

One of the key advantages of online learning is flexibility. The platform will offer customizable learning paths, allowing users to choose courses based on their interests, goals, and schedules. Learners can progress at their own pace, accommodating both full-time students and working professionals.

3. Multimedia Course Content

Courses will feature multimedia content, including video lectures, interactive quizzes, assignments, and supplementary resources. This variety in content presentation ensures engagement and accommodates different learning styles, providing a rich educational experience.

4. Robust Backend Infrastructure

The platform will rely on a robust backend infrastructure to ensure scalability, security, and reliability. It will leverage modern technologies for data storage, user authentication, and course management. This infrastructure will support a growing user base and ensure a seamless user experience.

5. Integration with External Services

The project scope includes the ability to integrate with external services such as payment gateways, social media platforms, and other educational resources. This integration will enhance the platform's functionality and expand its reach, enabling users to share their achievements and connect with a

broader audience.

6. Continuous Improvement and Expansion

Finally, the project scope encompasses a commitment to continuous improvement and expansion. The platform will evolve with user feedback, industry trends, and technological advancements. New courses, features, and enhancements will be added over time, ensuring the platform remains relevant and valuable to its users.

Overall, the scope of this project is designed to create a comprehensive, flexible, and engaging online learning platform that addresses the needs of modern learners while maintaining high standards of quality and reliability.

Applicability

In today's fast-paced world, the demand for accessible and high-quality education has never been higher. With the advent of digital technology, online learning platforms have emerged as a key solution to meet this demand. Our project, a Udemy-like clone, aims to contribute to this space by providing a versatile and user-friendly platform for online education. Online learning has witnessed exponential growth in recent years, driven by factors such as the proliferation of internet access, the need for lifelong learning, and the rise of remote work and education. However, traditional online learning platforms often lack the flexibility, interactivity, and personalization desired by learners. Our project seeks to address these shortcomings by offering a platform that combines comprehensive course offerings with engaging learning experiences. Our platform caters to a diverse audience, including students seeking supplementary learning resources, professionals looking to acquire new skills or certifications, and educators interested in sharing their expertise. By targeting such a broad demographic, we aim to create a vibrant community of learners and instructors, fostering knowledge exchange and collaboration. One of the most compelling aspects of online education is its ability to transcend geographical boundaries. Our project leverages this advantage by providing access to educational content from anywhere in the world. Whether you're located in a bustling metropolis or a remote village, our platform ensures that quality education is just a few clicks away.

Education is not one-size-fits-all, and our platform reflects this understanding. We offer a wide range of courses spanning diverse topics, including academic subjects, professional skills, and personal development. From coding and data science to photography and yoga, there's something for everyone on our platform. Additionally, our flexible learning formats accommodate different learning styles and preferences, ensuring that each learner can tailor their educational journey to suit their needs. Beyond its commercial potential, our project has significant social implications. By democratizing access to education, we empower individuals from all walks of life to pursue their educational aspirations. This includes underserved communities, marginalized groups, and individuals with limited access to traditional educational resources. Moreover, by promoting lifelong learning and skill development, we contribute to the overall prosperity and well-being of society.

In summary, our project represents a forward-thinking approach to online education, combining technological innovation with a deep commitment to accessibility, inclusivity, and social impact. As we continue to refine and expand our platform, we look forward to making a positive difference in the lives of learners around the globe. Our project not only benefits learners but also empowers instructors

and content creators to share their knowledge and expertise with a global audience. Through our platform, educators, industry professionals, and subject matter experts can create and publish their own courses, reaching learners far beyond the confines of a traditional classroom. By providing a platform for instructors to monetize their expertise, we foster a culture of lifelong learning and knowledge sharing. The field of education is constantly evolving, driven by advancements in technology, changes in industry demands, and shifts in societal needs. Our project recognizes the importance of adaptability in this dynamic landscape and is committed to staying abreast of emerging trends and best practices. Whether it's integrating cutting-edge learning technologies, partnering with industry leaders, or incorporating feedback from our user community, we are dedicated to ensuring that our platform remains relevant and responsive to the evolving needs of learners and educators alike.

Today's learners have diverse needs and preferences, ranging from on-the-go microlearning to in-depth, immersive courses. Our project recognizes this diversity and endeavors to cater to the multifaceted needs of modern learners. Whether it's a busy professional looking to upskill during their lunch break or a stay-at-home parent seeking to explore a new hobby, our platform offers a wide array of courses tailored to suit every learner's schedule, learning style, and proficiency level. In conclusion, our project represents more than just a clone of existing online learning platforms—it embodies a vision for the future of education. By harnessing the power of technology, accessibility, and community, we aspire to empower individuals from all walks of life to unlock their full potential and pursue their educational aspirations. As we embark on this journey, we invite learners, instructors, and stakeholders to join us in shaping the future of online learning.

Problem Statement

In many parts of the world, access to quality education is limited by geographical, financial, and social barriers. Traditional educational institutions often require students to attend classes in person, which can be a significant obstacle for those living in remote areas or lacking transportation. Furthermore, the fixed schedules of traditional education don't always align with the realities of modern life, where many individuals juggle work, family, and other commitments. Tuition fees, textbooks, and other educational expenses have risen dramatically, making traditional education prohibitively expensive for many. This financial burden can deter prospective students from pursuing higher education or force them into debt, which can have long-term repercussions on their financial stability and career choices. Traditional education systems often struggle to keep pace with rapidly changing industries and technologies. The curriculam can be rigid, with limited flexibility to adapt to emerging trends and technologies. This rigidity may result in graduates who are not adequately prepared for the demands of the modern workforce. The objective of this project is to create a comprehensive online learning platform that addresses these challenges, providing an experience akin to traditional education while offering the flexibility and accessibility of online learning. This platform aims to bridge the gap by offering a diverse range of courses, personalized learning paths, interactive features, and a vibrant community for learners to connect and grow. By addressing the core issues outlined in this problem statement, we aim to revolutionize the way people learn and empower them to achieve their educational and career goals.

Planning and Scheduling

1. User Registration/Authentication:

- Determine the scope of user registration: Decide which user details are necessary for registration, such as name, email, password, and any additional information.
- Plan the authentication flow: Outline how users will verify their identities, whether through email verification, SMS authentication, or social media login.
- Consider security measures: Identify potential security risks and plan measures to mitigate them, such as encryption for passwords and protection against account takeover attacks.
- Design phase: Allocate time for designing the user registration and authentication interfaces, including wireframing and prototyping.
- Development phase: Set deadlines for implementing registration and authentication functionalities, including backend logic for storing user data and frontend components for user interaction.
- Testing phase: Plan for thorough testing of the registration and authentication processes, including unit tests, integration tests, and security assessments.
- Deployment: Schedule deployment of the registration and authentication features, ensuring smooth integration with the overall platform.

2. Main Dashboard:

- Define dashboard features: Determine which features will be available on the main dashboard, such as course recommendations, progress tracking, and user profile management.
- Consider customization options: Plan for user preferences and customization settings, allowing users to tailor their dashboard experience to their needs.
- Design user interface: Sketch out the layout and visual elements of the dashboard, ensuring a user-friendly and intuitive design.
- UI/UX design: Allocate time for designing the dashboard interface, including mockups, user flows, and interactive prototypes.

- Frontend development: Set milestones for developing frontend components, such as navigation menus, content modules, and user profile sections.
- Backend integration: Plan for integrating backend services, such as user data retrieval and course recommendations, into the dashboard.
- Iteration and feedback: Schedule regular reviews and iterations based on user feedback, refining the dashboard interface to improve usability and functionality.

3.List of Courses:

- Structure course listings: Decide how courses will be categorized and organized, such as by subject, difficulty level, or instructor.
- Plan search functionality: Determine the search criteria and filters available to users when browsing courses, such as keyword search, filter by price, or sort by ratings.
- Define course details: Identify the information to be displayed for each course, including title, description, instructor name, duration, and ratings.
- Database design: Allocate time for designing the database schema to store course information, ensuring efficient retrieval and scalability.
- Backend development: Set deadlines for implementing backend APIs to fetch and filter course data based on user queries.
- Frontend integration: Plan for integrating course listings into the frontend interface, including designing course cards, pagination, and navigation.
- Performance optimization: Schedule time for optimizing course listing performance, such as caching frequently accessed data and implementing lazy loading for images and content.

4.Live Tutors:

- Selecting tutors: Define criteria for selecting live tutors, such as expertise in specific subjects, teaching experience, and availability for live sessions.
- Scheduling mechanisms: Plan how users can schedule live sessions with tutors, including calendar integration, availability checks, and booking confirmation.
- Communication tools: Decide on communication channels for live sessions, such as video conferencing platforms, chat interfaces, or virtual classrooms.
- Backend development: Allocate time for implementing backend services to manage tutor availability, session scheduling, and communication channels.

- Frontend integration: Set milestones for integrating tutor scheduling features into the frontend interface, including booking forms, availability calendars, and session notifications.
- User feedback loop: Plan for gathering user feedback on live tutor sessions to improve the selection process and enhance the overall tutoring experience.
- Continuous improvement: Schedule regular updates and enhancements to live tutor features based on user feedback and performance metrics.

Hardware and Software Requirements

Hardware Requirements

1. Development Workstations

Developers and designers require high-performance workstations with the following specifications:

Processor: At least an Intel Core i5 or AMD equivalent.

Memory (RAM): A minimum of 8 GB, though 16 GB or more is recommended for smoother multitasking and virtualization.

Storage: Solid State Drives (SSD) with at least 256 GB capacity for fast read/write speeds. Additional storage for large files or assets might be needed.

Graphics: A dedicated graphics card (like NVIDIA GeForce or AMD Radeon) for rendering complex UI components and design work.

Operating System: Windows 10/11, macOS, or a popular Linux distribution like Ubuntu, depending on team preference.

2. Servers

Backend servers for hosting the platform and handling user requests need robust configurations for scalability and reliability:

Processor: Intel Xeon or AMD EPYC with multiple cores for parallel processing.

Memory (RAM): At least 32 GB to support multiple concurrent users.

Storage: SSDs for the operating system and critical data. Consider network-attached storage (NAS) or cloud storage for scalability.

Networking: High-speed Ethernet connections and reliable Internet connectivity.

Backup Systems: External storage for backups or a cloud-based backup solution to ensure data recovery in case of failure.

3. Testing and Staging Environments

Separate environments are required for testing, staging, and production to avoid disrupting the live platform during development:

Testing Servers: Smaller-scale servers similar to production, but used for unit and integration testing. Staging Servers: Mirror the production environment for final testing and quality assurance before deployment.

4. User Devices

Ensure the platform is compatible with a range of user devices, including:

Desktops and Laptops: Running Windows, macOS, or Linux.

Mobile Devices: Smartphones and tablets running iOS and Android.

Browsers: Chrome, Firefox, Safari, and Edge to ensure cross-browser compatibility.

Software Requirements

1. Development Tools and Frameworks

Developers need a range of tools and frameworks to build the platform:

Integrated Development Environments (IDEs): Popular IDEs like Visual Studio Code

Version Control: Git with a repository hosting service like GitHub, GitLab, or Bitbucket.

Front-End Frameworks: React for building the user interface, with additional libraries like React Router for routing.

Back-End Frameworks:React.js , Node.js for server-side development, with for building RESTful APIs.

2. Collaboration and Project Management

Effective collaboration tools and project management software are crucial for team coordination:

Communication Tools: Slack, Microsoft Teams, or Discord for real-time communication.

Project Management Tools: Trello, Asana, or Jira to manage tasks and track project progress.

Documentation: Confluence, Notion, or Google Docs for maintaining project documentation.

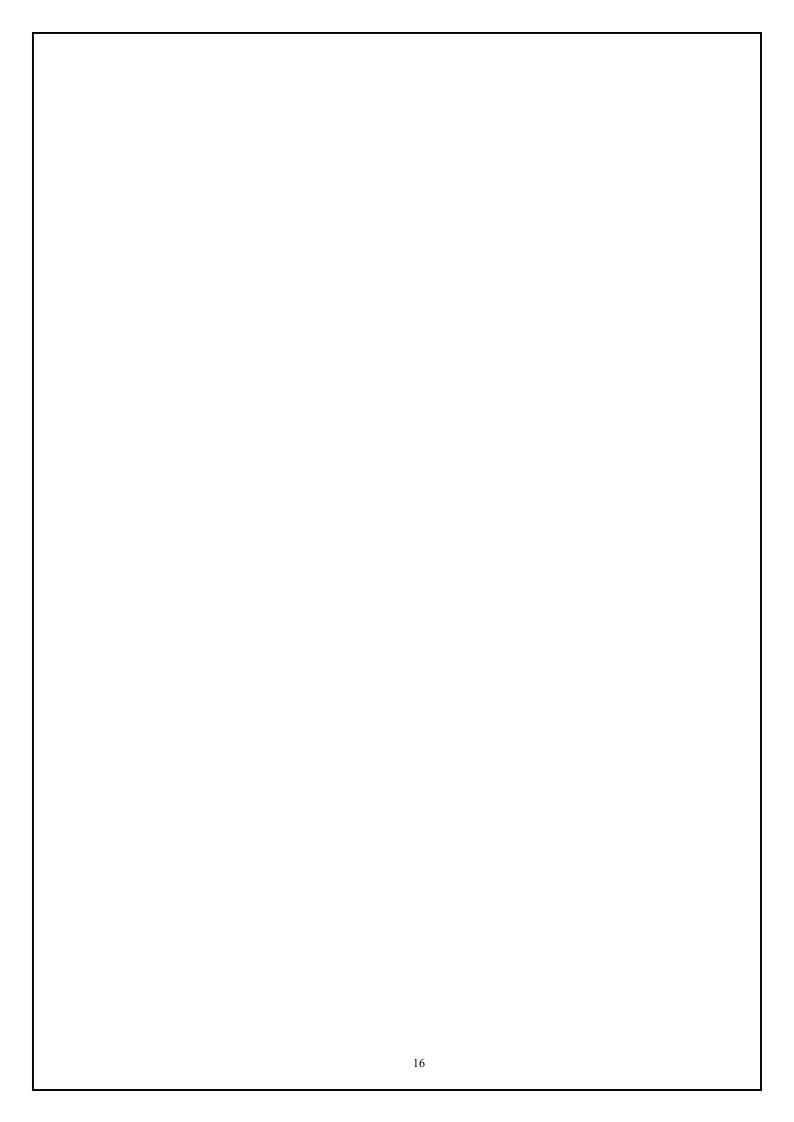
3. Cloud Services

For hosting and deploying the platform, cloud services offer scalability and flexibility:

Hosting Services: Amazon Web Services (AWS), Google Cloud Platform (GCP), or Microsoft Azure for scalable infrastructure.

Continuous Integration/Continuous Deployment (CI/CD): Jenkins, CircleCI, or GitHub Actions for automated testing and deployment.

Content Delivery Networks (CDNs): To distribute content efficiently and ensure fast load times for users worldwide.



Goals

The goals of this project are focused on creating an online learning platform that delivers high-quality educational experiences while offering flexibility and accessibility to learners. By clearly defining these goals, we set a clear direction for the project, aligning efforts across development, design, and business teams. Here are the key goals of this project:

1. Create a Comprehensive Online Learning Platform

The primary goal is to develop a platform that can serve as a comprehensive educational hub, offering a wide range of courses across multiple domains, including technology, business, design, health, personal development, and more. The platform should cater to learners of all levels, from beginners to experts, providing content that meets their educational and professional growth needs.

2. Foster Flexibility and Accessibility

The platform should offer flexibility in learning, allowing users to progress at their own pace and access content from any location and device. This includes providing a responsive design for web-based access and a mobile-friendly experience to accommodate users on smartphones and tablets. Flexibility also encompasses the ability to choose learning paths and schedules that align with individual needs and lifestyles.

3. Provide High-Quality Educational Content

Quality is a central goal for the platform. This involves ensuring that all courses are developed by qualified instructors and meet high educational standards. Content should be engaging, accurate, and up-to-date, with a mix of multimedia elements like video lectures, interactive quizzes, assignments, and supplementary resources. The platform should maintain a consistent quality across all courses.

4. Promote Interactivity and Community Building

An important goal is to create an interactive learning environment where users can engage with instructors, participate in discussions, and collaborate with peers. This includes features like live Q&A sessions, discussion forums, and group projects, fostering a sense of community and encouraging collaborative learning. The platform should provide tools for users to connect with each other and build networks.

5. Implement Personalization and Customization

Personalization is a key aspect of modern education. The platform should allow users to customize their learning experience based on their interests, goals, and learning styles. This includes personalized course recommendations, flexible learning paths, and options for adjusting course content to meet individual preferences. Personalization enhances user engagement and leads to better learning outcomes.

6. Ensure Robust Security and Privacy

Security and privacy are critical goals for any online platform. This project aims to implement robust security measures to protect user data and ensure secure communication. This includes secure user authentication, encryption of sensitive information, and compliance with data protection regulations. The platform should also respect user privacy and provide clear guidelines on data usage.

7. Achieve Scalability and Reliability

As the platform grows, it should maintain scalability and reliability. This goal involves designing a robust backend infrastructure that can handle a large number of concurrent users and support future expansion. The platform should also ensure high availability, minimizing downtime and providing a seamless experience for users.

Proposed Solution

To address the challenges and goals outlined for the online learning platform, the proposed solution encompasses a comprehensive approach that combines technology, user experience, and innovative features. This solution is designed to meet the needs of learners, instructors, and stakeholders, providing a robust and scalable platform for education. Here's a detailed explanation of the proposed solution:

=>This project is a user interface for a platform called SkillSage, which appears to be a website for learning and sharing knowledge about various skills, including Artificial Intelligence and Machine Learning (AI/ML). The UI is designed using the React framework, a popular JavaScript library for building user interfaces, especially single-page applications.

Header Section: This personalized greeting indicates that the user, is logged in. Profile Icon (Top Right Corner): Likely a user profile section where Kamya Jindal can access her account details or settings.

Sidebar Navigation (Left):

- SkillSage Logo: The branding for the platform.
- Dashboard: A link to the main dashboard page where users can view their main content.
- Search: A feature that allows users to search for specific courses or topics.
- Favourites: A section where users can save and quickly access their favorite courses or materials.
- Upload: This feature probably allows users to upload their own content or courses to the platform.
- Light Mode: A toggle to switch between light and dark themes for the website.
- Log Out: An option for the user to log out of their account.

Main Content Area:

Most Popular Section: Displays the most popular courses or content on the platform.

Course Cards: Each card represents a course or piece of content related to AI/ML.

Thumbnail: An image representing AI/ML.

Title (AI/ML): Indicates the subject matter of the course.

Category (Artificial Intelligence): Specifies the broader category under which the course falls.

Author: The creator of the content, such as Rishav Chanda, Rishav, and Upasana.

Views: The number of views each course has received, indicating its popularity.

Favourite Icon (Heart): Allows users to mark the course as a favorite for easy access later.

Show All Link:

Located at the top right of the "Most Popular" section, this link takes users to a page where they can view all popular courses, not just the top three displayed on the dashboard.

React Implementation

Components:

The page consists of multiple React components, such as Header, Sidebar, CourseCard, and MainContent. Each component is responsible for rendering a specific part of the UI.

For example, the CourseCard component is responsible for rendering the information about each course, including the title, category, author, views, and favorite icon.

State Management:

React's state management (possibly using useState or useContext hooks) is used to manage the user's data (like username, favorite courses) and UI states (like dark mode).

Routing:

React Router might be used for navigation between different pages like the dashboard, search results, favorites, and upload pages.

Data Fetching:

Data for the courses could be fetched from an API and stored in the state. This could be handled using React's useEffect hook to fetch data when the component mounts.

Theming:

The light/dark mode toggle is likely implemented using state to switch between different CSS classes or styles dynamically.

By leveraging React's component-based architecture, this webpage can provide a dynamic and responsive user experience, ensuring that different parts of the page update efficiently as the user interacts with the platform.

Purpose

The purpose of this project is to create an innovative online learning platform that provides accessible, flexible, and high-quality educational experiences to a global audience. The platform aims to address the limitations of traditional education by offering a comprehensive and engaging environment for learning, where users can access a wide range of courses, interact with instructors and peers, and tailor their learning paths to suit their unique needs. Here's a detailed breakdown of the project's purpose:

The primary purpose of this project is to democratize education, making high-quality learning resources available to anyone, regardless of their location, financial situation, or other barriers. By providing an online platform, the project removes geographical constraints and allows learners from around the world to access educational content that can enhance their knowledge and skills.

Traditional education often comes with rigid schedules and structures. This project seeks to offer flexibility, allowing learners to study at their own pace and choose courses that align with their interests and goals. This flexibility is crucial for working professionals, parents, and others with busy lifestyles who need an adaptable learning environment. The platform aims to be a comprehensive learning ecosystem, covering a diverse range of subjects and catering to learners of all levels. Whether it's technology, business, arts, or personal development, the platform should offer courses that meet a variety of learning needs. This comprehensive approach ensures that users can find the right content for their personal and professional growth.

Recognizing that every learner is unique, the project aims to support personalization and customization. Users should be able to create their own learning paths, set personal goals, and choose courses that align with their career aspirations or personal interests. This personalized approach to education encourages greater engagement and leads to better learning outcomes. Safety and security are paramount in any online platform. The purpose of this project is to ensure a safe and secure learning environment for all users. This includes robust user authentication, data encryption, and compliance with data protection regulations. The platform should also provide tools for users to manage their privacy and control their personal information.

Overall, the purpose of this project is to create an online learning platform that not only meets the current needs of learners but also adapts to their future requirements. By focusing on

accessibility, flexibility, interactivity, quality, and security, the platform aims to transform the way people learn and create opportunities for personal and professional development.
22

Tech Stack of the Project

The technology stack refers to the combination of technologies used to build, deploy, and operate a software project. For an online learning platform similar to Udemy, the tech stack encompasses a wide range of tools, frameworks, and services. This stack is designed to ensure the platform is scalable, secure, and provides a seamless user experience. Below is an outline of the technology stack for this project, divided into key categories.

#Front-End Technologies

The front-end is responsible for the user interface and user experience. The tech stack for the front-end includes:

- JavaScript Framework: React is a popular framework for building dynamic and responsive user interfaces. It uses a component-based architecture, allowing developers to create reusable components and manage complex interactions.
- Routing: React Router is a common choice for managing client-side routing, allowing navigation between different parts of the platform.
- Build Tools: Webpack for bundling JavaScript and other assets. Babel for transpiling modern JavaScript features to ensure compatibility with a broader range of browsers.

#Back-End Technologies

The back-end is responsible for server-side logic, database interactions, and serving data to the front-end. The tech stack for the back-end includes:

- Node.js: A JavaScript runtime that enables server-side development. Node.js is lightweight and efficient, making it ideal for scalable applications.
- Database Management Systems: MongoDB (a NoSQL database) or PostgreSQL/MySQL (relational databases) for storing course data, user information, and other platform-related content.

•	Authentication authentication permissions.					

Snapshots

