

ONLINE LEARNING PLATFORM

JUNIOR BACKEND DEVELOPER COURSE



GROUP 5

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ABSTRACT

The Online Learning Management System Development project is a comprehensive initiative challenging students to create a sophisticated online learning platform that integrates frontend and backend development skills. This project aims to provide hands-on experience in building a user-friendly learning system using HTML, CSS, JavaScript, ASP.NET, C#, and Microsoft SQL Server for database management.

The primary objective of this project is to develop an interactive online learning platform that meets modern e-learning standards. It allows users to explore various courses, engage with course content, manage their profiles, and enroll in courses aligned with their interests and career goals. Robust user authentication and role management ensure secure access, and instructors have a dedicated dashboard for effortless course creation, management, and analytics.

Throughout the project, students follow a structured process, including project planning, database design, user authentication and role definition, course creation and management, and the implementation of student-facing features. The ultimate goal is to deliver a fully functional, responsive, and visually appealing Learning Management System tailored to the needs of students and instructors.

In addition to the technical aspects, this project emphasizes the importance of version control using Git for efficient collaboration and encourages adaptability in database schema design to accommodate unique project requirements.

Upon completion, the project will yield a comprehensive online learning platform that serves as a valuable resource for students searching for courses and instructors seeking to share their knowledge. It equips students with practical skills and prepares them for real-world challenges in web development.

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PROJECT DESCRIPTION

The Online Learning Management System is a web-based platform that serves as an interactive portal for instructors to upload and manage their courses and for students to enroll in or purchase courses after registration. The user interface is designed to be user-friendly, featuring a login screen where users can also register if they haven't already.

ROLES AND FEATURES

The application supports three primary roles:

1. Instructor

Any registered user can become an instructor. Instructors can create their own courses, upload course materials, update course details, and disable courses as needed

2. Student

Students can sign up for the web application, and upon logging in, they are presented with a homepage displaying the courses they've purchased. Students can explore a variety of courses offered by different instructors.

3. Admin

Admins have overarching authority within the Learning Management System (LMS). They can manage user accounts, assign roles, control content, manually enroll or remove users from courses, generate reports on user activity, course progress, and more.

SOFTWARE STACK

Our Online Learning Management System (LMS) project utilizes a robust software stack to deliver a dynamic and user-friendly e-learning platform. This comprehensive software stack comprises the following key components:

1. ASP.NET

We leverage ASP.NET, a popular web application framework developed by Microsoft, as the foundation for our platform. ASP.NET provides powerful tools for building secure, scalable, and high-performance web applications.

2. C# (C Sharp)

C# serves as our primary programming language, seamlessly integrated with ASP.NET. It allows us to create efficient and maintainable server-side logic, ensuring the smooth operation of our LMS.

3. Microsoft SQL Server

Our chosen relational database management system (RDBMS) is Microsoft SQL Server. This robust database platform offers excellent data management capabilities, ensuring the integrity and reliability of our application's data.

4. HTML, CSS, and JavaScript

These fundamental web technologies are employed for crafting the user interface (UI) and enhancing the interactivity of our LMS. HTML structures content, CSS styles it, and JavaScript adds dynamic functionality to create an engaging user experience.

5. Git

We utilize Git as our version control system to facilitate seamless collaboration among team members. Git enables effective code management, branching, and merging, ensuring a structured and organized development process.

By combining these components, our software stack empowers us to develop a modern, scalable, and secure online learning platform that aligns with contemporary e-learning standards. It allows us to deliver a dynamic and user-friendly educational experience while maintaining robust data management and security measures.

PROJECT STEPS



During the construction phase of our Online Learning Management System (LMS) project, we diligently worked on various essential components to create a robust and user-friendly platform. We began with meticulous project planning, where we defined core functionalities, brainstormed UI/UX design ideas, and gathered educational requirements. We chose a technology stack comprising ASP.NET, C#, Microsoft SQL Server, and Git for efficient version control and collaboration.

Our next step involved database design and setup. We carefully identified crucial database entities, established relationships between them, and crafted a detailed ER diagram. After configuring the chosen database management system (DBMS), we created data schemas for courses, users, and assignments. We conducted rigorous testing and documented our database design to ensure data integrity and alignment with our project goals.

For user authentication and role management, we designed a secure user registration page and implemented a login mechanism with robust error handling. We defined user roles, including Admin, Instructor, and Student, and established role-based access control logic. Extensive testing and thorough code reviews ensured the security and reliability of our authentication system.

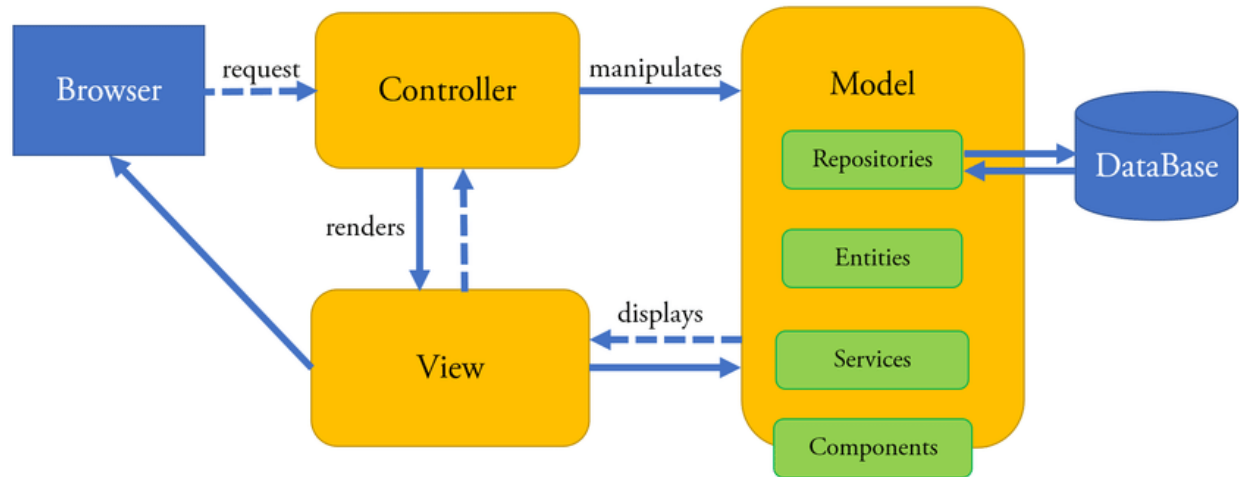
Our efforts then shifted to course creation and management. We designed an intuitive instructor dashboard for seamless course administration, allowing instructors to add courses and upload course thumbnails. We developed a user-friendly course catalog with filters and sorting options, and we implemented validation rules to maintain data integrity. Enrollments and progress tracking were added, with stringent access controls in place to ensure that only authorized users could enroll and review progress.

Finally, we focused on creating a student-friendly interface. We designed an engaging homepage to showcase courses and integrated a search bar for easy course discovery. Navigation links, individual course pages, and a smooth learning experience were developed and rigorously tested for usability. Any identified user experience issues were promptly addressed, ensuring an enjoyable learning journey for our students.

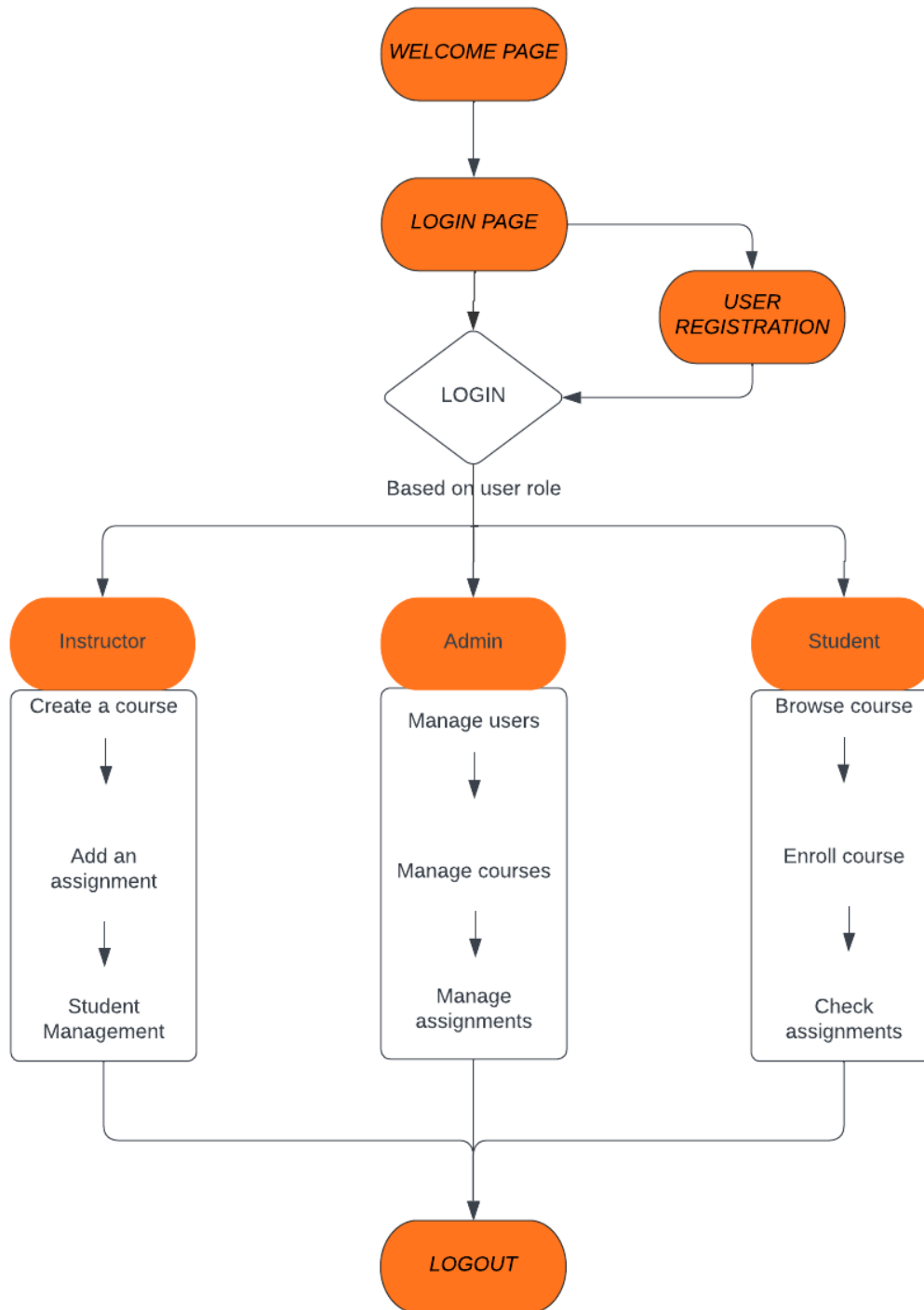
Throughout these construction phases, our project team maintained close collaboration and adapted as needed to stay aligned with our project's goals, scope, and timeline. The result is a sophisticated online learning platform that adheres to modern e-learning standards, providing an enriching educational experience for our users.

APPLICATION ARCHITECTURE

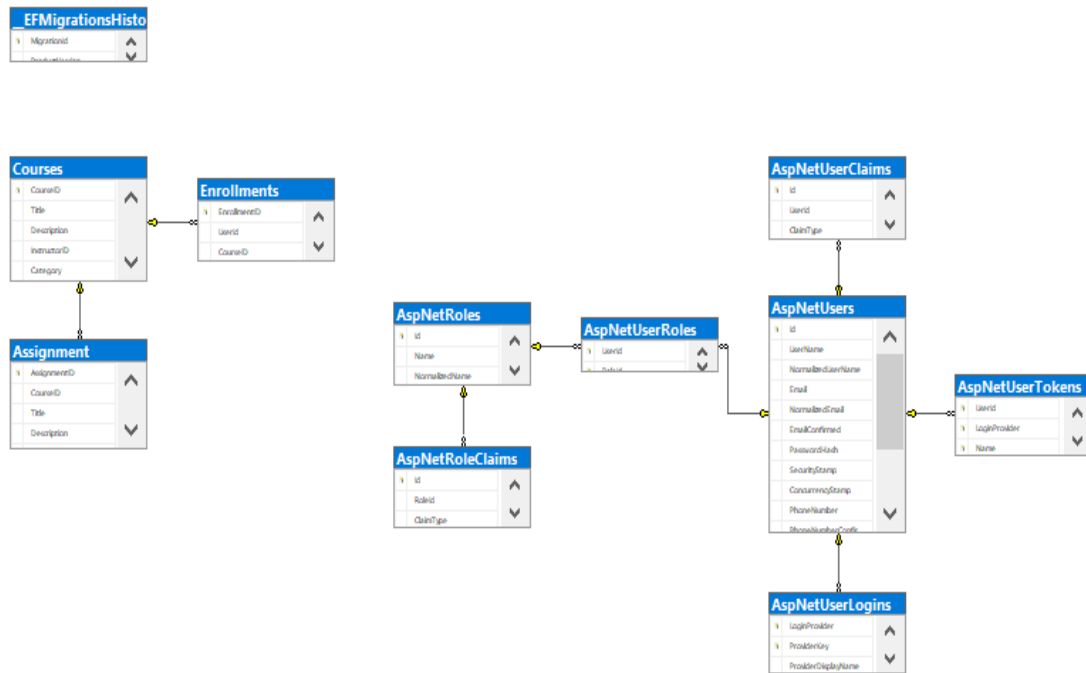
Our Online Learning Management System (LMS) project adopts the Model-View-Controller (MVC) architectural pattern to structure and organize our application.



APPLICATION INFORMATION FLOW



ER DIAGRAM



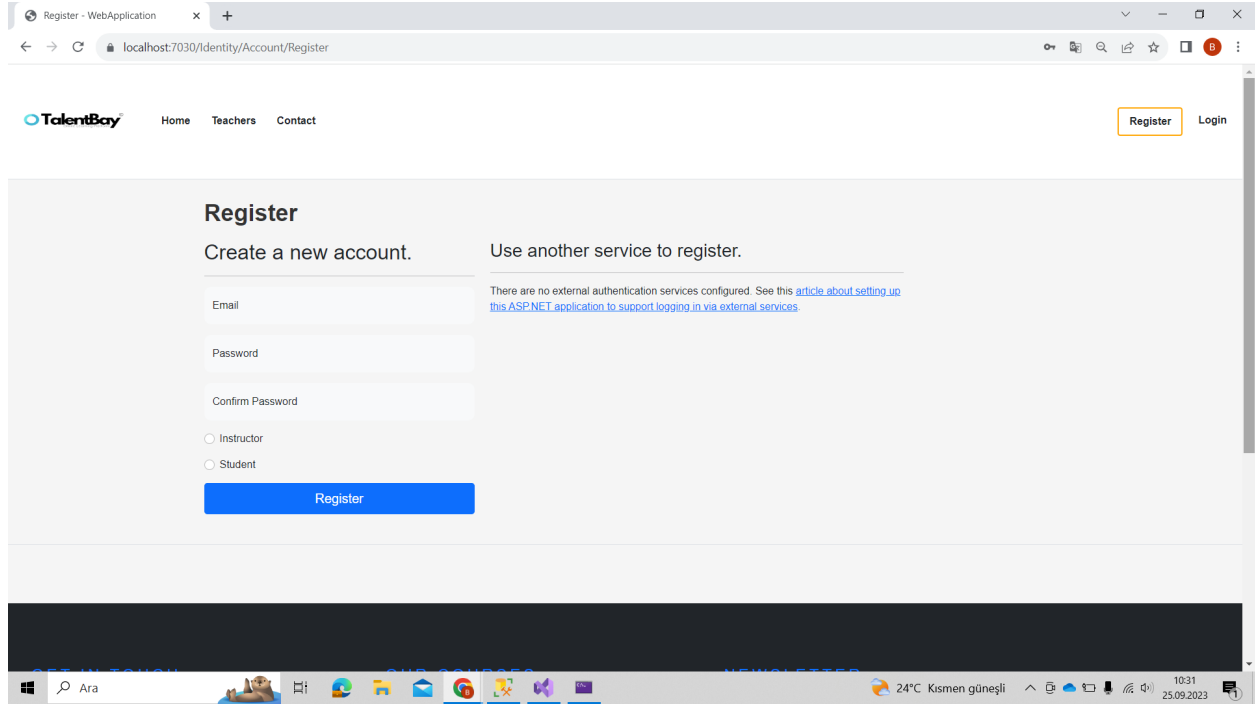
RISK ASSESSMENT AND MANAGEMENT

There exists a notable risk of potential abuse and misuse of the application, including the creation of fake accounts and the sale of valueless courses. To mitigate these risks, the following solutions are proposed:

- Implementation of captcha verification to prevent automated scripts from generating fake data or users.
- Imposing time restrictions on users for course creation.
- Introducing two-factor authentication for login, purchase transactions, and course creation to enhance security and authenticity.

WEB APPLICATION PAGES

REGISTER PAGE



The screenshot shows the TalentBay Register page in a web browser. The browser's address bar displays 'localhost:7030/Identity/Account/Register'. The page features a navigation bar with the TalentBay logo, 'Home', 'Teachers', and 'Contact' links, and 'Register' and 'Login' buttons. The main content area is titled 'Register' and is divided into two sections. The left section, 'Create a new account.', contains a form with fields for 'Email', 'Password', and 'Confirm Password', followed by radio buttons for 'Instructor' and 'Student', and a blue 'Register' button. The right section, 'Use another service to register.', contains a message stating that no external authentication services are configured and provides a link to an article about setting up external services. The Windows taskbar at the bottom shows the system clock as 10:31 on 25.09.2023.

Register - WebApplication x +

localhost:7030/Identity/Account/Register

TalentBay Home Teachers Contact Register Login

Register

Create a new account.

Email

Password

Confirm Password

☐ Instructor

☐ Student

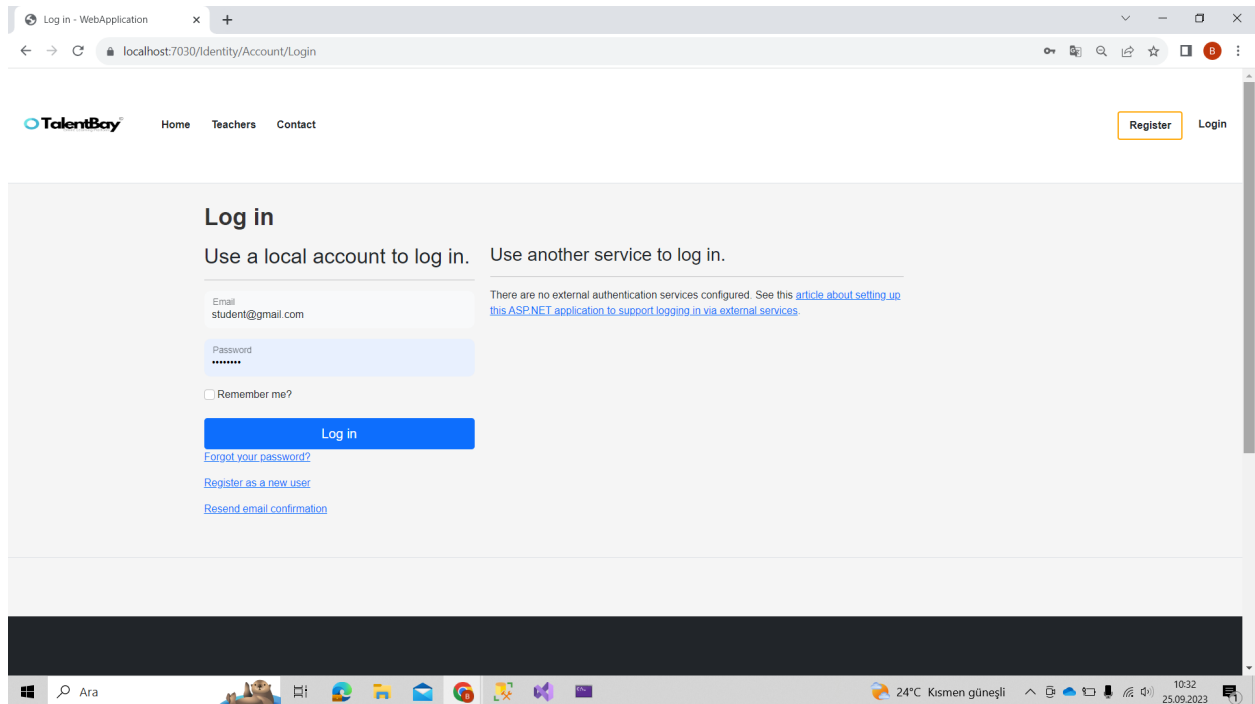
Register

Use another service to register.

There are no external authentication services configured. See this [article about setting up this ASP.NET application to support logging in via external services](#).

10:31 25.09.2023

LOGIN PAGE



The screenshot shows the TalentBay Login page in a web browser. The browser's address bar displays 'localhost:7030/Identity/Account/Login'. The page features a navigation bar with the TalentBay logo, 'Home', 'Teachers', and 'Contact' links, and 'Register' and 'Login' buttons. The main content area is titled 'Log in' and is divided into two sections. The left section, 'Use a local account to log in.', contains a form with fields for 'Email' (pre-filled with 'student@gmail.com') and 'Password', a 'Remember me?' checkbox, and a blue 'Log in' button. Below the 'Log in' button are three links: 'Forgot your password?', 'Register as a new user', and 'Resend email confirmation'. The right section, 'Use another service to log in.', contains a message stating that no external authentication services are configured and provides a link to an article about setting up external services. The Windows taskbar at the bottom shows the system clock as 10:32 on 25.09.2023.

Log in - WebApplication x +

localhost:7030/Identity/Account/Login

TalentBay Home Teachers Contact Register Login

Log in

Use a local account to log in.

Email
student@gmail.com

Password

☐ Remember me?

Log in

[Forgot your password?](#)

[Register as a new user](#)


[Resend email confirmation](#)

Use another service to log in.

There are no external authentication services configured. See this [article about setting up this ASP.NET application to support logging in via external services](#).

10:32 25.09.2023

ADMIN USER PANEL PAGE

 [Home](#) [Teachers](#) [Contact](#) [User List](#) [Create User](#) [Course List](#) [Create Course](#)


Hello admin! [Logout](#)

User List

[Create New](#)

Email	
basak@gmail.com	Edit Details Delete
student2@gmail.com	Edit Details Delete
instructor2@gmail.com	Edit Details Delete
instructor@gmail.com	Edit Details Delete
student1@gmail.com	Edit Details Delete
student@gmail.com	Edit Details Delete
instructor4@gmail.com	Edit Details Delete
berkberk@gmail.com	Edit Details Delete
bekoxy@outlook.com	Edit Details Delete
berksunduni@gmail.com	Edit Details Delete
ilayda@gmail.com	Edit Details Delete
berk@gmail.com	Edit Details Delete
alo@gmail.com	Edit Details Delete
instructor3@gmail.com	Edit Details Delete
berk_2000@live.com	Edit Details Delete

ADMIN COURSE PANEL PAGE

 [Home](#) [Teachers](#) [Contact](#) [User List](#) [Create User](#) [Course List](#) [Create Course](#)


Hello admin! [Logout](#)

Index

[Create New](#)


Title	Description	InstructorID	Category	EnrollmentCount	ImageURL	
Introduction to Python	Learn the basics of Python programming language and start your journey into the world of software development.	3ea50b2c-86e7-49d7-9f3f-a555c4581c7	Programming	4	/images/c1bc2e4d-26c4-41fa-8213-9c5cba3be9ac_FREE-Python-Course-For-Beginners.png	Edit Details Delete Add Assignment
Web Development Fundamentals	Explore the foundational concepts of web development, including HTML, CSS, and JavaScript.	3ea50b2c-86e7-49d7-9f3f-a555c4581c7	Programming	1	/images/76699a9b-4a88-4d7b-91dd-ee73276d995a_web.jpg	Edit Details Delete Add Assignment
Data Analysis with R	Dive into data analysis using R and learn how to manipulate, analyze, and visualize data effectively.	14d1be1c-9633-49c5-b639-2983487323e9	Data Science	0	/images/da39452c-302f-4f96-b34f-57a6674efd39_Data-Analytics.jpg	Edit Details Delete Add Assignment
Machine Learning Essentials	Gain a solid understanding of machine learning principles and algorithms to build predictive models.	14d1be1c-9633-49c5-b639-2983487323e9	Data Science	0	/images/ee78bd96-fb4e-4704-b869-49d379a66537_machine-learning.jpg	Edit Details Delete Add Assignment
Graphic Design Fundamentals	Learn the essential principles and techniques of graphic design to create visually appealing designs.	e4def116-7957-402b-a96c-5b97bee8fb8	Design	1	/images/a656d189-7207-4eb4-8a8a-d9f13c9a738e_graphic-design.jpg	Edit Details Delete Add Assignment
User Experience (UX) Design	Understand the importance of UX design and learn how to create seamless and user-friendly digital experiences.	e4def116-7957-402b-a96c-5b97bee8fb8	Design	0	/images/62d32a07-9829-4743-8c47-932d7f952f01_UX-design-courses.jpg	Edit Details Delete Add Assignment
Electronics	Explore the fundamentals of electronics and learn how to design and build electronic circuits.	6d47b244-b348-402b-a96c-5b97bee8fb8	Business	0	/images/7c5077abb-009-464-879d-932d7f952f01_electronics.jpg	Edit Details Delete Add Assignment

INSTRUCTOR COURSE LIST PAGE


 [Home](#) [Teachers](#) [Contact](#) [Add a Course](#) [List of Courses](#) [List of Assignments](#)

Hello instructor2! [Logout](#)

Edit Your Courses




Data Analysis with R
Dive into data analysis using R and learn how to manipulate, analyze, and visualize data effectively.
Category: Data Science
Enrollment Count: 0
[View Details](#) [Edit](#) [Delete](#)



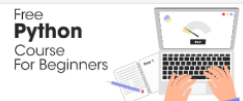
Machine Learning Essentials
Gain a solid understanding of machine learning principles and algorithms to build predictive models.
Category: Data Science
Enrollment Count: 0
[View Details](#) [Edit](#) [Delete](#)

STUDENT COURSE VIEW PAGE


 [Home](#) [Teachers](#) [Contact](#) [Browse Courses](#) [Your Courses](#)

Hello student1! [Logout](#)


Available Courses






Free Python Course For Beginners
Introduction to Python
Learn the basics of Python programming language and start your journey into the world of software development.
Category: Programming
Enrollment Count: 4
[View Details](#)
[Enroll](#)
You are already enrolled in this course.



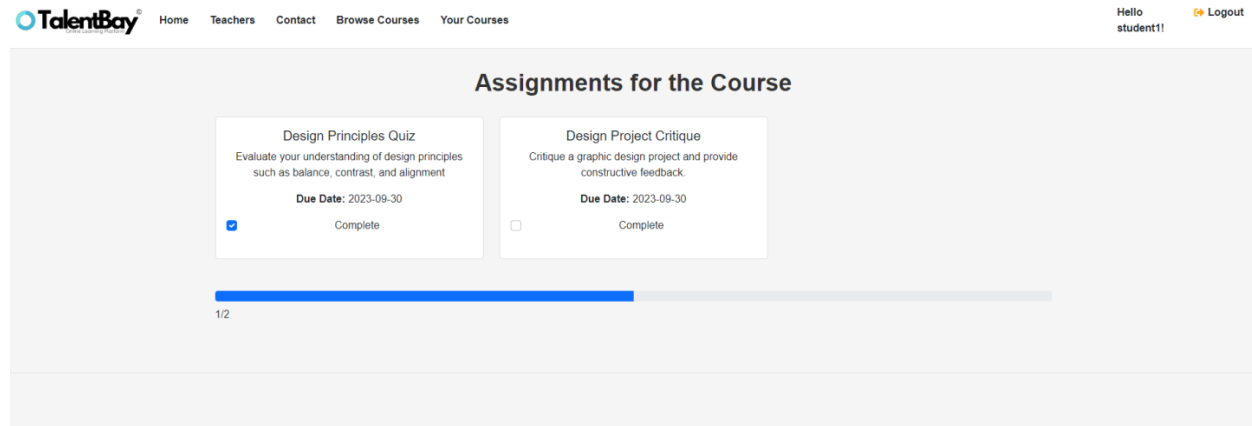
Web Development Fundamentals
Explore the foundational concepts of web development, including HTML, CSS, and JavaScript.
Category: Programming
Enrollment Count: 1
[View Details](#)
[Enroll](#)
You are already enrolled in this course.



Data Analysis with R
Dive into data analysis using R and learn how to manipulate, analyze, and visualize data effectively.
Category: Data Science
Enrollment Count: 0
[View Details](#)
[Enroll](#)



STUDENT ASSIGNMENT VIEW



CONCLUSION

In summary, the Junior Backend Web Developer team has successfully undertaken the development of an Online Learning Management System (LMS) project, showcasing their skills in web development technologies such as ASP.NET, C#, SQL Server, HTML, CSS, JavaScript, and Git. The project's structured approach encompassed core functionalities, database design, user authentication, course management, and student-facing features, resulting in a comprehensive and user-friendly e-learning platform. By emphasizing security and proposing risk mitigation measures, the team ensured a safe and valuable learning environment. This project not only equips students with practical skills but also contributes to modern e-learning standards, making it a significant achievement in the field of web development.

The selected software stack, including ASP.NET, C#, and SQL Server, forms a robust foundation for a dynamic and secure platform. The project's architecture follows the MVC pattern, providing a structured framework for development. Overall, the Junior Backend Web Developer team's LMS project exemplifies their dedication, creativity, and commitment to delivering an interactive and valuable resource for both students and instructors in the ever-evolving world of online education.

REFERENCES

<https://learn.microsoft.com/en-us/>

<https://www.youtube.com/watch?v=Z7713GBhi4k&list=PL6n9fhu94yhUPBSX-E2aJCnC-R3-6zBZx>

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