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Grow With Us

Course: Back-End Web Development

Course Description:

This course provides a comprehensive introduction to Back-End Web Development, focusing on the technologies and tools used to build server-side components and handle data storage and retrieval. Students will learn programming languages, frameworks, and databases commonly used in back-end development.

Course Objectives:

- Understand the core concepts and principles of back-end web development.
- Gain proficiency in a programming language commonly used for back-end development.
- Learn how to work with databases and handle data storage and retrieval.
- Develop skills to build secure and scalable server-side components.
- Explore best practices and industry standards for back-end development.

Course Outline:

Week 1: Introduction to Back-End Development with Programming Language

- Overview of back-end web development and its role in web applications.
- Introduction to the client-server architecture.
- Understanding the HTTP protocol and RESTful APIs.
- Introduction to a back-end programming language (e.g., Python, Node.js, Ruby).
- Syntax, variables, data types, and control structures.
- Working with functions, Weeks, and libraries.

Week 2: Server-Side Frameworks

- Introduction to back-end frameworks (e.g., Express.js, Django, Ruby on Rails).
- Routing and handling HTTP requests.
- Templating engines and server-side rendering.

Week 3: Database Management Systems & Database Integration

- Introduction to relational and non-relational databases.
- Database models, tables, and relationships.
- SQL fundamentals and querying databases.
- Connecting back-end applications to databases.
- Object-Relational Mapping (ORM) frameworks.
- Performing CRUD operations on databases.

Week 4: RESTful API Development along with Authentication and Security

- Designing and implementing RESTful APIs.
- Handling authentication and authorization.
- API documentation and testing.
- Techniques for user authentication and session management.
- Introduction to encryption and secure communication.
- Protecting against common security threats (e.g., SQL injection, cross-site scripting).

Week 5: Caching and Performance Optimization as well as Error Handling and Logging

- Caching strategies for improving application performance.
- Optimizing database queries and indexing.
- Performance testing and profiling.
- Implementing error handling and logging mechanisms.
- Debugging and troubleshooting techniques.
- Error monitoring and reporting.

Week 6: Deployment and Scalability along with Testing and Quality Assurance

- Deployment strategies and hosting options.
- Containerization and orchestration (e.g., Docker, Kubernetes).
- Scaling web applications to handle increased traffic.
- Introduction to unit testing and test-driven development (TDD).
- Writing automated tests for back-end components.
- Code review and quality assurance techniques.

Week 7: Industry Best Practices and Trends

- Exploring current trends and advancements in back-end development.
- Best practices for code organization, documentation, and version control.
- Keeping up with evolving web standards and technologies.

Grading Criteria:

- Quizzes and Assignments: 40%
- Back-End Development Projects: 50%
- Class Participation: 10%