Backend Web Development

by Hack Reactor (HR)

Bootcamp Curriculum

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Bootcamp Overview

Backend Development Curriculum

Target Audience

- This bootcamp is designed for beginners/career switchers/designers.

Prerequisites

- Basic HTML/CSS/JS (Backend web development).

Prerequisites

- No prior experience required
- No coding experience required

Duration

- 12 weeks (15 weeks)
- Monday - Friday (9am-7pm MDT) (9am-6PC)

Format

- Lectures and educative sessions including recorded sessions
- Hands-on assignments and real world projects
- One-on-one mentorship/career coaching
- Portfolio development (5 top-portfolio projects)

Outcome

- At the end of the bootcamp, participants will master key programming skills through real world projects and build a top-notch portfolio. They will confidently present their work in interviews and be equipped to pursue jobs in web development roles, with the tools and knowledge to advance in their careers.

Certificate

- Upon completion of the bootcamp, participants will present their portfolio for review by instructors and receive a certification from R. Hack Forge (GPT).

Learning Modules

Backend Development Curriculum

The following modules have been designed to take you through the essential technologies and concepts required for backend development. The curriculum focuses on a key area of backend development, progressing leading your skills from fundamental principles to advanced techniques. Throughout the curriculum, you will be exposed to industry-standard tools and practices that lay/create a strong foundation for your career in web development.

Module 1: Introduction to Backend Development

- **What is Backend Development?** Understand the role of backend development in web development.
- **Client Server Architecture:** Learn about the interaction between clients and servers.
- **Overview of HTTP/2 APIs:** Understand HTTP2 principles and why APIs are essential for web applications.

Mon-Friday, 9am-7pm (MT)(9am-6pm (PC)

Learning Modules

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Module 2: JavaScript Fundamentals

- **JavaScript Basics:** Refresh your knowledge of JavaScript, including variables, data types, functions, and control structures.
- **Asynchronous Programming:** Learn about callbacks, promises, and async/await.
- **Tools:** Build a simple JavaScript application to practice syntax and tools.

Mon-Friday, 9am-7pm (MT)(9am-6pm (PC)

Learning Modules

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Module 3: Getting Started with Node.js

Key Concepts

- **What is Node.js:** Understand the features and benefits of Node.js.
- **Node.js Modules and npm:** Learn how to set up your development environment.
- **Understanding the Node.js Runtime:** Explore the event loop, nonblocking I/O, and the Node.js architecture.

Projects

- Create a basic Node.js application that responds to HTTP requests.

Mon-Friday, 9am-7pm (MT)(9am-6pm (PC)

Learning Modules

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Module 4: Building Web Servers with Node.js

Key Concepts

- **Express.js:** Learn how to create a web server using Node.js's built-in HTTP module.
- **Routing:** Understand how to handle different routes in your application.
- **Middleware:** Learn about the concept of middleware in web applications.

Projects

- Build a simple web server that responds to different routes (e.g., '/', '/about', '/contact').

Mon-Friday, 9am-7pm (MT)(9am-6pm (PC)

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Module 5: Working with Express.js

Key Concepts

- **Introduction to Express:** Learn why Express is a popular framework for Node.js.
- **Setting up a Express Application:** Understand how to set up and configure an Express app.
- **Routing with Express:** Learn how to define routes and handle requests.

Projects

- Create a RESTful API using Express to manage a resource (e.g., books, users).

Mon-Friday, 9am-7pm (MT)(9am-6pm (PC)

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Module 6: Data Persistence with Data Bases

Key Concepts

- **Introduction to Databases:** Understand the differences between SQL and NoSQL databases.
- **Choosing a Database:** Learn how to work with MongoDB as a NoSQL database.
- **Mongoose:** Understand how to use Mongoose for object data modeling with MongoDB.

Projects

- Build a blog's CRUD using Express to manage a resource (e.g., books, users).

Mon-Friday, 9am-7pm (MT)(9am-6pm (PC)

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Module 7: Authentication and Authorization

Key Concepts

- **Authentication vs. Authorization:** Understand the differences and importance of both in web APIs. Debate: Tutorials: Learn how to implement authentication using JWT.
- **User Registration and Login:** Create secure endpoints for user registration and login.

Projects

- Secure your CRUD application to review role-authentication and authorization systems.

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Module 8: Working with ORMs

Key Concepts

- **Introduction to ORMs:** Learn how to make requests to third-party APIs (e.g., REST APIs).
- **Using ORMs:** Understand how to design and document your API using tools like Swagger.

Projects

- Refactor an application that fetches data from a public API and displays it.

Mon-Friday, 9am-7pm (MT)(9am-6pm (PC)

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Module 9: Testing NODE.JS Applications

Key Concepts

- **Importance of Testing:** Understand why testing is crucial for backend development.
- **Testing Frameworks:** Learn about popular testing frameworks like Mocha, Chai, and Jest.
- **Writing Unit and Integration Tests:** Learn how to write tests for your application.

Projects

- Write tests for your RESTful API endpoints.

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Module 10: Deployment and DevOps Basics

Key Concepts

- **Deploying Serving Applications:** Learn about different hosting platforms (e.g., Heroku, AWS, DigitalOcean).
- **Environment Variables:** Understand how to use environment variables for configuration.
- **Using Docker:** Get an introduction to containerization and how to use Docker for Node.js applications.

Projects

- Deploy your CRUD application to a cloud hosting platform.

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Module 11: Advanced Node.js Concepts

Key Concepts

- **Event-driven, non-blocking I/O:** Learn how Node.js handles asynchronous operations efficiently.
- **Streams and Buffers:** Understand how to handle large data sets and HTTP/2 APIs.
- **Microservices Architecture:** Explore how to build applications using microservices.

Projects

- Implement a simple microservices application using RabbitMQ.
- Build a real-time chat application using Socket.IO. Use Redis.

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Learning Modules

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Module 12: Performance and Security Best Practices

Key Concepts

- **Performance Optimization:** Learn techniques to optimize the performance of Node.js applications (caching, clustering, etc.).
- **Security Best Practices:** Understand common security threats and how to protect your applications (e.g., SQL injection, XSS, CSRF).

Projects

- Profile and improve the performance of your existing applications.
- Implement security best practices in your application.

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Module 13: Final Projects and Portfolio

Project Ideas

- **Ecommerce Backend:** Build a complete backend for an ecommerce platform with features like product management, user authentication, and payment processing.
- **Social Media API:** Create an API for a social media platform with user profiles, posts, and comments.
- **Real-time Collaboration Tool:** Develop a task management app with features like user authentication, task assignments, and notifications.

Mon-Friday, 9am-7pm (MT)(9am-6pm (PC)

Bootcamp Deliverables and Reference Guide

Backend Development Curriculum

Bootcamp Deliverables

- Fully developed job-ready portfolio with backend development case studies and personal projects.
- Resume and LinkedIn profile refined showcasing end to end skills.
- Interview preparation and practice.
- Job search strategy and preparation guidance as well as networking tips.
- Certificate from Coursemaker.

Reference Guide

Notes

Exclusive access to carefully curated books for bootcamp members.

Online Resources

Premium online resources are available exclusively to bootcamp members.