



AmaliTech Training

Back-End
Specialization

Overview

The Back-End Engineering Specialization is specifically designed to introduce the trainees to the hidden processes that run behind the scenes, building APIs and databases that power the front-end. Upon completion, trainees will be equipped with the unique skills required to write back-end code for web applications and gain competencies in database design and DevOps.

Course Outcomes

After this completing this specialization, you will be able to:

- Set up your own dev environment and version control your work with Git/GitHub
- Have a working understanding of front-end technologies
- Write client-side and server-side JavaScript code
- Build and deploy Node/Express back-ends
- Design and build PostgreSQL databases
- Use software design and development principles, like OOP, KISS, YAGNI, and DRY
- Design and document APIs with OpenAPI and Swagger tooling
- Implement security practices to prevent attacks on software applications
- Explain common software scaling and caching techniques
- Explain common DevOps techniques and strategies
- Explain the core concepts behind operating systems theory
- Implement common data structures and algorithms in JavaScript
- Pass a JavaScript whiteboard interview

Curriculum

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Back-End Engineer Career Path

1. Welcome to the Back-End Engineer Path
2. Setting Up Your Dev Environment
3. Web Development Fundamentals
4. JavaScript Syntax, Part I
5. JavaScript Syntax, Part II
6. Building Interactive Websites with JavaScript
7. JavaScript Syntax, Part III
8. Git and Github, Part I
9. Portfolio Project: Mixed Messages
10. Basics of Back-End Development
11. Async JavaScript and HTTP Requests
12. Build a Back-End with Express.js
13. Git and GitHub, Part II
14. Portfolio Project: Personal Budget I
15. Database Basics
16. Working with Databases
17. Designing Relational Databases
18. Advanced PostgreSQL
19. Connecting Database to a Server
20. Deploying Your Server
21. Javascript Testing
22. Software Design Principles
23. API Development with Swagger & OpenAPI
24. Portfolio Project: Personal Budget II
25. Web Security Fundamentals
26. User Authentication & Authorization
27. Data Security
28. Common Attacks on Web Applications
29. Fundamentals of Operating Systems
30. Caching & CDNs
31. Scalability
32. DevOps Fundamentals
33. Portfolio Project: Photo Caption Contest
34. Linear Data Structures
35. Complex Data Structures
36. Algorithms
37. Search & Graph Search Algorithms
38. What To Expect in a Technical Interview
39. Interview Skills
40. Portfolio Project: Open-Ended Project

Learn Python 3

1. Hello World
2. Control Flow
3. Lists
4. Loops
5. Functions
6. Code Challenges
7. Strings
8. Modules
9. Dictionaries
10. Files
11. Classes
12. Code Challenges II

Learn Intermediate Python 3

1. Function Arguments
2. Namespaces and Scope
3. Functions Deep Dive
4. Object-Oriented Programming
5. Unit Testing'Iterators &

Learn Advanced Python 3

1. Logging
2. Functional Programming
3. Database Operations

Build Python Web Apps with Django

1. Introduction to the Web
2. Introduction to Django
3. Templates in Django
4. Data in Django
5. Views in Django

Learn Build Tools

1. Introduction to Build Tools
2. Browser Compatibility and Transpilation

Generators

6. Specialized Collections
7. Resource Management

4. Concurrent Programming
5. Deployment

6. Forms in Django
7. Accounts and Authentication in Django
8. Deploying a Django Project

3. Building Apps with Webpack
4. Building Apps with Esbuild, Parcel, and Vite

Training Projects

The curriculum includes multiple projects, and you are encouraged to complete all of them. However, you must submit these graded projects in particular.

Chapter Title	Project Title
Web Development Fundamentals	Healthy Recipes
JavaScript Syntax, Part I	Number Guesser
JavaScript Syntax, Part II	Credit Card Checker
JavaScript Syntax, Part II	Mysterious Organism
Building Interactive Websites with JavaScript	Piano Keys
Building Interactive Websites with JavaScript	Form a Story
Building Interactive Websites with JavaScript	Piano Keys
JavaScript Syntax, Part III	WorkAround Explorer
JavaScript Syntax, Part III	Build a Library
Basics of Back-End Development	Message Mixer
Async JavaScript and HTTP Requests	Wanderlust
Build a Back-End with Express.js	Quote API
Working with Databases	Trends in Startups
Working with Databases	Lyft Trip Data
Designing Relational Databases	Build A Menu For Bytes Of China
Designing Relational Databases	Database Triggers

Chapter Title	Project Title
Advanced PostgreSQL	Database Normalization at Fred's Furniture
Advanced PostgreSQL	Intermediate Book Store Indexes
Advanced PostgreSQL	Book Store Indexes
Advanced PostgreSQL	Traffic Analytics
JavaScript Testing	Quote Keeper: Server Layer
Data Security	Securing School Data: Data Security
Common Attacks on Web Applications	Trey Coding: Defense Coding in JavaScript
Common Attacks on Web Applications	Restreview: Preventing Cross Site Scripting (XSS) Attacks
Common Attacks on Web Applications	Codey's Confectionery: Preventing SQL Injection Attacks
Common Attacks on Web Applications	Codey's Confectionery: Preventing Cross-Site Request Forgery (CSRF) Attacks
Linear Data Structures	Web Navigator
Website Development Fundamentals	Olivia Woodruff Portfolio
Website Development Fundamentals	Form a Story

Chapter Title	Project Title
Accounts and Authentication in Django	Weekly Dessert
Templates in Django	Tourist Attractions with Templates
Forms in Django	Tourist Attractions with Forms
Views in Django	The Django Djitney
Introduction to Django	Fortune Teller
Data in Django	Djaunty Rent-a-Bike
Database Operations	Analyzing Hotel Databases with Python
Concurrent Programming	Concurrent Programming
Browser Compatibility and Transpilation	Transpilation

Training Assessments

The various assessments required in the Front-end specialization are outlined in this section. You must complete all assessments as you progress through the course.

Moreover, each assessment can be taken twice, with the highest score being recorded. You must usually wait 2 to 3 days after your initial attempt before making a second attempt.

Category	Assessment Title	Assessment URL
Agile SCRUM	The Agile Methodology	https://app.codesignal.com/public-test/9LqixyLSFJkF9yKAS/BCGcYzEcbFiBoQ
Algorithms & Data Structures	Practice General Coding Test 1	https://app.codesignal.com/public-test/QkrkpCZ6JNEtQEhLf/yjYjrsDWridutN
Algorithms & Data Structures	Practice General Coding Test 2	https://app.codesignal.com/public-test/QkrkpCZ6JNEtQEhLf/yjYjrsDWridutN
Algorithms & Data Structures	Practice General Coding Test 3	https://app.codesignal.com/public-test/QkrkpCZ6JNEtQEhLf/yjYjrsDWridutN
API	Api Test	https://app.codesignal.com/public-test/bngwhatygdCXdmC4Q/X6L26hhpL9iP4D
API	JSON REST API Challenge	https://app.codesignal.com/public-test/9GbpHwKPH7RyZbHYg/3JaZLKZ4cnZsXp
Architecture	Software design test	https://app.codesignal.com/public-test/CmoYwbR2D4NoCv4Et/rrPWk4GuptiuRh
Databases	Advanced SQL Test	https://app.codesignal.com/public-test/Hs963cRmzQbSBAZaa/c9ZB9Bq7hjz6Zs
Databases	MongoDB test	https://app.codesignal.com/public-test/DXohhWLzrKuPYYjM9/i9rSjYetFDtb2x
Databases	PostgreSQL Test 1	https://app.codesignal.com/public-test/q4wkdTebDpjWGjAWn/tAe2XT8QNAyR4v
Databases	PostgreSQL Test 2	https://app.codesignal.com/public-test/ixfnFJFtaHiwQzZAd/yLF2GasL8FmhHn
Databases	SQL Test	https://app.codesignal.com/public-test/ALz4Y27HEint6dNYD/EJFcnAyAw4K9Xo
DevOps	Version Control with Git	https://app.codesignal.com/public-test/AySX7CwDxnpAxxRMP/wA4FH4MWYC8ufm
DevOps	Version Control with Git	https://app.codesignal.com/public-test/AySX7CwDxnpAxxRMP/wA4FH4MWYC8ufm

Category	Assessment Title	Assessment URL
DevOps	Devops (windows) test	https://app.codesignal.com/public-test/5Pp5f4hMe6iJHXKgG/wF28y7W5Yd97eF
DevOps	Docker Quiz	https://app.codesignal.com/public-test/Q3s3mekmLverNfgah/mQ3JdJYwdajmLf
Django	Django Authentication	https://app.codesignal.com/public-test/Qt6nPddGCmsrr6gKz/tJom6xjGwNE3Co
Django	Django Basic Setup	https://app.codesignal.com/public-test/twusjAGPN2WHwG2s3/RdC2uN52rSgdRZ
Django	Django Challenge	https://app.codesignal.com/public-test/tz8Q8x57MNMnMnQ3xw/rssfZEpiAMs9Ro
Django	Django Forms	https://app.codesignal.com/public-test/pMxPYFqAN9M8edCqD/4GmiA5BwpANaEJ
Django	Django General Knowledge	https://app.codesignal.com/public-test/Ldg4JLKRHyFydDF5a/iHmRN5pwdCjQ37
Django	Django Models	https://app.codesignal.com/public-test/jEj35N4kzaLEg9Yqu/6afcntTArpoPna
Django	Django Templates	https://app.codesignal.com/public-test/XGgGA58qWSxEq8Bzi/x3jPsqtMXMXbNW
Django	Django URLs	https://app.codesignal.com/public-test/gyGQdj5Ht6imRmYdi/YMMspXz3wrScnK
Django	Django Views	https://app.codesignal.com/public-test/Mv4kHcgANC52byPvK/aXNYj2QxyKgWAE
HTML/CSS	CSS Test: Control Panel	https://app.codesignal.com/public-test/ZQNT63A4zWZaPqGTS/LdMMCAEwmL6ift
HTML/CSS	CSS Test: Stats Preview	https://app.codesignal.com/public-test/7mCDogXKECQd98wgh/HTjRopwkCww89Q
HTML/CSS	CSS Test: Testimonial Grid	https://app.codesignal.com/public-test/rG2EYXKbAWMgeKqDv/Nqxj5mvauosZed
JavaScript	JavaScript Basic to Advanced Test	https://app.codesignal.com/public-test/MXhTBTuuF8KRG8kbr/6Tyfyzj8McFGnd
JavaScript	JavaScript Syntax Test	https://app.codesignal.com/public-test/hPk6ktH2j6RCAH5PQ/4bmiF49zgFnREa
JavaScript	Js: Demo Frontend Dynamic	https://app.codesignal.com/public-test/4sYWNEyz4LSwNteZ6/P6XrwzzegE3Hvb
JavaScript	Js: Quiz_1	https://app.codesignal.com/public-test/ShJXqpLMPfxgev3jY/8DLSMj8pgqmuCN
JavaScript	Js: Quiz_2	https://app.codesignal.com/public-test/QN3eHAZP683cSLkeN/xAPRWEgPug8v78
JavaScript	Js: Quiz_3	https://app.codesignal.com/public-test/S4Wyg5WW4PDxK8ecW/cQQraDcCY34nWs
JavaScript	Simple Functions	https://app.codesignal.com/public-test/9ZRBxp4ZQKjNwAhjm/LWf45eBJkD6jtH

Category	Assessment Title	Assessment URL
JavaScript	Credit Card Provider	https://app.codesignal.com/public-test/gQFv3skW55vKi6MB7/8njNjtjJEfcFzN
JavaScript	Host Allocation Challenge	https://app.codesignal.com/public-test/K4GSAYFejF6sXTHfT/8GBWrvihkcpQCJ
JavaScript	JavaScript Specialized Assessment	Request for assessment link via mail to salami.suleiman@amalitech.org
JavaScript	Js: Book Management	https://app.codesignal.com/public-test/ahMcqyFhw9BiAeMsAD2FcaJ3uxzSt2C
JavaScript	Js: Evaluate Expressions	https://app.codesignal.com/public-test/fnLNaXYqMBgw3E74E/5A5nYxiihRaBYM
JavaScript	Js: Job Progress bar	https://app.codesignal.com/public-test/4aPPoJALJidYaYPjE/yMkaYTrnkzEMfc
JavaScript	Js: Launch Counter Timer	https://app.codesignal.com/public-test/7iMvdym9sjvS6JP9/z3SwPR5hN5JrG2
JavaScript	Js: Quiz_4	https://app.codesignal.com/public-test/3PeBRWiCojftoiYNd/TwLvJ9Md4ZR63P
JavaScript	Js: Song Management	https://app.codesignal.com/public-test/gDpGoGxwSxpZXJNDh/sRchoenDjdZ8P6
Node	Node.js Test	https://app.codesignal.com/public-test/bMptbJTCq8P8zKoyT/NCtzBgN7L2NsEe
Node	Node_JS: Quiz_1	https://app.codesignal.com/public-test/FFjzxFhhLqBQmw3WM/BwMaS2Zpgepae4
Node	Node_JS: Quiz_2	https://app.codesignal.com/public-test/rZTffmaYePdQhKo28/p22KxzxEvNRPpy
Operating Systems	Operating Systems Test	https://app.codesignal.com/public-test/DFmzG4xvm4gYXQMcn/nPuX8i477jcwDC
Python	Python Conditional Expressions	https://app.codesignal.com/public-test/YRmKeSxFhSB79HkiT/42BKam6myWTNwW
Python	Python Expressions	https://app.codesignal.com/public-test/cnqz4Sb3qQr3w6n/z5GrmBMxmHg9R4
Python	Python Functions 1	https://app.codesignal.com/public-test/Pawu8iXG42tBc69p2/BzymGxbQSs3dJn
Python	Python Functions 2	https://app.codesignal.com/public-test/KcokuFqNhrjgm7eXa/AvzCpicpLe7pZm
Python	Python Lists 1	https://app.codesignal.com/public-test/ZNyM7Ejk3Z8ZrsGYu/gFGGFSj7CXCuXS
Python	Python Lists 2	https://app.codesignal.com/public-test/gdyKjbZfC29HTERDN/jY6diGriPt8hDa
Python	Python Variables	https://app.codesignal.com/public-test/LCBARTNaTWe6fLKZD/vh4arsEftqtQMY
Python	Python While Loops	https://app.codesignal.com/public-test/RXNX9a2eCmbvzADin/thGgSas89pKQbS

Category	Assessment Title	Assessment URL
JavaScript	Classes Challenge	https://app.codesignal.com/public-test/Bk2d9qmTdofayKF45/zHiaXdnb4AyaHM
JavaScript	String Implementation Challenge	https://app.codesignal.com/public-test/XQFLAqhi2msxhZp/NH6sGKMdrW3Jo5
Node	Greedy Strings and Arrays Challenge	https://app.codesignal.com/public-test/FwXySvpGnLSGZPnJj/iJqw8b7Sq7ML33
Python	Python Classes 1	https://app.codesignal.com/public-test/xDM8GCFZWE7gCqmdo/Xdf42QjZXED2KR
Python	Python Classes 2	https://app.codesignal.com/public-test/9SmP4GfCayvbrmW4Xj/iAKBFLKPzhrTsM
Python	Python Dictionary 1	https://app.codesignal.com/public-test/rZ5zz3jRNwMybJSWy/Ns43u8qGmarEPG
Python	Python Dictionary 2	https://app.codesignal.com/public-test/8gjiaZG9Ekq9CuPcn/4Hcnyg3WNCfE9k
Python	Python Files	https://app.codesignal.com/public-test/KTPEQcmYsNYPPPLZS/rBApG6EJ95pGTs
Python	Python Modules	https://app.codesignal.com/public-test/ixGdXWmjz9pHrRJJi/SggykZxmvDGG5w
Python	Python Strings	https://app.codesignal.com/public-test/CR9HyKqtvruSAnksZ/aHrKMcG65ThYBj
Software Testing	General Software Testing	https://app.codesignal.com/public-test/YxFabfAGfJ2tPKcxm/CSRoMpEYjQHsjn