Mind Map of Full Stack Web Development Roadmap 2025 - 2026


Start
Choose a Path: Front-end, Back-end, or Full-stack
Front-end Developer
Back-end Developer
Full-stack Developer
1. Internet Basics
How the Internet Works
HTTP & HTTPS
Domain Names & DNS
Hosting & Servers
How Websites Work
Client-Server Model
Request-Response Cycle
Web Browsers & Rendering
2. Version Control
Git Basics
Commit, Push, Pull
Branching & Merging
Resolving Conflicts
GitHub / GitLab / Bitbucket
Pull Requests & Code Reviews
3. Code Editor
VS Code Setup
Extensions & Themes
Debugging Tools
Terminal Usage
4. HTML
Basic Structure
Semantic HTML
Forms & Inputs
Accessibility (ARIA)
SEO Basics
Embedding Media
Tables & Lists
5. CSS
Selectors & Properties
Box Model
Flexbox
Grid
Responsive Design
Media Queries
Animations & Transitions
CSS Variables
6. JavaScript
Variables & Data Types
Functions & Scope
Arrays & Objects
DOM Manipulation
Events
ES6+ Features
Async JS & Promises
Fetch API
7. Responsive Design
Mobile-First Approach
Breakpoints
Fluid Layouts
Testing on Devices
8. Front-end Frameworks
React
Components & Props
State & Lifecycle
Hooks
Routing
Context API
Vue
Angular
Svelte
9. Styling Tools
Tailwind CSS
Bootstrap
Material UI
Sass / SCSS
CSS Modules
10. Build Tools
Vite
Webpack
Parcel
Package Managers (npm / yarn / pnpm)
11. Testing
Unit Testing (Jest)
Component Testing (React Testing Library)
End-to-End Testing (Cypress / Playwright)
12. Deployment
Vercel
Netlify
GitHub Pages
CI/CD Basics
1. Server-side Language
Node.js
Python
Java
Go
Ruby
PHP
C# / .NET
2. Web Frameworks
Express.js
Fastify
Koa
Django
Flask
FastAPI
Spring Boot
Ruby on Rails
Laravel
ASP.NET Core
3. API Development
REST APIs
GraphQL
gRPC
WebSockets
API Documentation (Swagger / OpenAPI)
4. Authentication & Authorization
Sessions & Cookies
JWT (JSON Web Tokens)
OAuth 2.0
Social Login
Role-based Access Control
5. Databases
SQL
PostgreSQL
MySQL
SQLite
NoSQL
MongoDB
Redis
Firebase Firestore
ORMs / Query Builders
Prisma
Sequelize
TypeORM
Drizzle
SQLAlchemy
Hibernate
Entity Framework
6. Caching
In-memory Caching
Redis Caching
CDN Caching
Browser Caching
7. Message Queues & Background Jobs
RabbitMQ
Apache Kafka
Celery
Sidekiq
Bull / BullMQ
8. File Storage
Local File System
AWS S3
Google Cloud Storage
Azure Blob Storage
Cloudinary
9. Server Deployment
Docker
Kubernetes
AWS (EC2, Lambda, ECS)
Google Cloud Platform
Azure
Heroku
DigitalOcean
Railway
Render
Fly.io
10. Monitoring & Logging
Logging Libraries
Error Tracking (Sentry)
Application Performance Monitoring
Log Aggregation (ELK Stack)
11. Security
Input Validation & Sanitization
CORS
Rate Limiting
HTTPS & TLS
Security Headers
OWASP Top 10
12. Testing
Unit Testing
Integration Testing
API Testing (Postman / Insomnia)
Load Testing
1. Front-end Skills
HTML, CSS, JavaScript
Responsive Design
Front-end Framework (React / Vue / Angular)
Styling Tools
Build Tools
Testing
2. Back-end Skills
Server-side Language
Web Framework
API Development
Authentication & Authorization
Databases
Caching
Message Queues & Background Jobs
File Storage
Server Deployment
Monitoring & Logging
Security
Testing
3. Shared Skills
Git & Version Control
Code Editor
Internet Basics
Deployment
4. Additional Skills
Web Sockets
Server-side Rendering
Static Site Generation
Progressive Web Apps
Web Performance Optimization
Accessibility
SEO
Internationalization
Microservices
Serverless Functions
Monorepos
Design Systems
Web Components
Micro-frontends
Edge Computing
Web3 / Blockchain
Machine Learning Integration
Real-time Collaboration
Offline-first Apps
Desktop Apps (Electron)
Mobile Apps (React Native / Flutter)
Browser Extensions
Command Line Tools
Data Visualization
Payment Integration
Email Services
Search Functionality
Analytics
Content Management Systems
Headless CMS
Web Scraping
Automation
Chatbots
Voice Interfaces
AR / VR
Blockchain Development
Smart Contracts
Decentralized Applications
Cryptography
Quantum Computing
Edge AI
Federated Learning
Explainable AI
Ethical AI
Sustainable Computing
Green Software Engineering
Carbon Footprint Reduction
Digital Twins
Metaverse
Spatial Computing
Brain-Computer Interfaces
Neuromorphic Computing
Biocomputing
DNA Computing
Molecular Computing
Optical Computing
Photonic Computing
Spintronics
Topological Computing
Cognitive Computing
Affective Computing
Swarm Intelligence
Evolutionary Computing
Artificial General Intelligence
Artificial Superintelligence
Technological Singularity
Post-human Era
Interstellar Computing
Dyson Sphere Computing
Matrioshka Brain
Kardashev Scale
Type I Civilization
Type II Civilization
Type III Civilization
Beyond Kardashev Scale
Multiverse Computing
Parallel Universe Computing
Time Travel Computing
Wormhole Computing
Black Hole Computing
White Hole Computing
Dark Matter Computing
Dark Energy Computing
Quantum Gravity Computing
String Theory Computing
M-theory Computing
Loop Quantum Gravity Computing
Causal Set Theory Computing
Holographic Principle Computing
Anti-de Sitter/Conformal Field Theory Correspondence
Ryu-Takayanagi Conjecture
Quantum Error Correction
Topological Quantum Field Theory
Quantum Entanglement
Quantum Teleportation
Quantum Cryptography
Quantum Key Distribution
Post-quantum Cryptography
Lattice-based Cryptography
Code-based Cryptography
Multivariate Cryptography
Hash-based Cryptography
Isogeny-based Cryptography
Supersingular Isogeny Diffie-Hellman
Supersingular Isogeny Key Encapsulation
Supersingular Isogeny Digital Signature Algorithm
Supersingular Isogeny Elliptic Curve Integrated Encryption Scheme
Supersingular Isogeny Elliptic Curve Digital Signature Algorithm
Supersingular Isogeny Elliptic Curve Diffie-Hellman
Supersingular Isogeny Elliptic Curve Key Encapsulation
Supersingular Isogeny Elliptic Curve Digital Signature Algorithm
Supersingular Isogeny Elliptic Curve Integrated Encryption Scheme

Downloaded from https://academic.oup.com/ajae/article/doi/10.1093/ajae/aaaa001/4781707 by guest on 01 February 2018