**Software Development Bootcamp: "Gig Ready Developer Program"**

**Complete 16-Week Intensive Syllabus**

**Duration:** 400 Hours over 16 Weeks  
**Schedule:** Monday-Thursday (6.5 hours/day) + Friday (4 hours/day)  
**Format:** Full-Time Intensive with Agile Sprint Structure  
**Languages:** JavaScript & Python (Equal Focus)

**MONTH 1: FOUNDATIONS & PROFESSIONAL TOOLS (100 Hours)**

**Week 1: "Setting Up Your Gear" - Professional Development Environment**

**Feb 17-21, 2025 | 30 hours**

**Learning Objectives:**

* Master professional development environment setup
* Understand Git workflows used in professional teams
* Learn Agile/Scrum as real workplace communication
* Establish professional identity and online presence

**Daily Topics:**

* **Mon:** "Gig Ready" introduction, command line mastery, professional identity setup
* **Tue:** Git fundamentals - repos, commits, branching, collaboration
* **Wed:** IDE optimization (VS Code), productivity tools, professional shortcuts
* **Thu:** Agile methodology, standups, sprints, user stories
* **Fri:** Project management tools (Jira, GitHub Issues), estimation basics

**Assignment:** Set up complete professional development environment

* Create GitHub account with professional profile
* Configure IDE with professional extensions for both JavaScript and Python
* Create first repository with proper README
* Write "My Developer Journey" blog post
* Set up project management board for course work

**Professional Skills Focus:** Environment setup, tool mastery, professional communication

**Week 2: "Learning Your Instruments" - Programming Fundamentals (JavaScript & Python)**

**Feb 24-28, 2025 | 30 hours**

**Learning Objectives:**

* Understand programming paradigms and their professional applications
* Write clean, professional code in both JavaScript and Python
* Apply systematic debugging approaches
* Compare and contrast two modern languages

**Daily Topics:**

* **Mon:** Programming paradigms, setting up Node.js and Python environments, REPL exploration
* **Tue:** Variables, data types, operators - side-by-side JS/Python examples
* **Wed:** Control structures (if/else, loops) - both languages, highlighting differences
* **Thu:** Functions and scope - comparing function syntax and behavior
* **Fri:** Introduction to testing mindset, running simple tests in both languages

**Assignment:** "Dual Language Programming Challenge"

* Solve 10 programming challenges, implementing each in BOTH JavaScript AND Python
* Each solution must include: problem statement, approach, code with comments
* Document language differences you discovered
* Conduct peer code review with at least 2 classmates
* Present one solution explaining why you might choose one language over the other

**Professional Skills Focus:** Multi-language thinking, clean code, systematic problem-solving

**Week 3: "Understanding Data Architecture" - Database & Data Fundamentals**

**Mar 3-7, 2025 | 30 hours**

**Learning Objectives:**

* Understand fundamental data concepts before diving into code
* Learn how data is structured, stored, and accessed
* Grasp relational vs. non-relational data models
* Understand data flow in modern applications

**Daily Topics:**

* **Mon:** What is data architecture? Data types, structures, and why they matter
* **Tue:** Introduction to SQL databases - tables, relationships, basic queries
* **Wed:** Introduction to NoSQL concepts - documents, key-value stores
* **Thu:** Data modeling fundamentals - designing schemas, normalization basics
* **Fri:** Data in real applications - API responses, JSON, CSV, how apps consume data

**Assignment:** "Data Architecture Foundation Project"

* Design a simple database schema for a real-world scenario (library, e-commerce, etc.)
* Write basic SQL queries (using online SQL sandbox)
* Create JSON data structures representing the same data
* Document trade-offs between different data models
* Present one data architecture decision with professional reasoning

**Professional Skills Focus:** Systems thinking, data modeling, architectural decision-making

**Week 4: "Data Structures & Storage" - Connecting Code to Data**

**Mar 10-14, 2025 | 30 hours**

**Learning Objectives:**

* Work with arrays/lists and objects/dictionaries in both languages
* Understand how programming data structures map to real-world data storage
* Learn relational database concepts using Excel as a mental model
* Work with CSV and JSON files programmatically
* Understand algorithmic thinking and apply data structures to solve real problems

**Daily Topics:**

* **Mon:** Arrays (JS) vs Lists (Python) - methods, iteration, comprehensions; how they relate to spreadsheet columns
* **Tue:** Objects (JS) vs Dictionaries (Python) - key-value data; Excel as database metaphor; CSV file processing
* **Wed:** JSON: structured data beyond tables; reading/writing JSON; converting between CSV and JSON
* **Thu:** Relational database concepts - Excel sheets as tables, primary/foreign keys, basic SQL
* **Fri:** Algorithm basics - searching, sorting, filtering data; Month 1 Sprint Review & Retrospective

**Assignment:** "Data Management System - Excel to Code"

* Create Excel workbook with 3 related sheets (Customers, Orders, Products)
* Build data processing application in BOTH JavaScript and Python that reads CSV files
* Implement filtering, sorting, and aggregation operations
* Convert data between CSV and JSON formats
* Simulate database JOIN operations programmatically
* Write technical blog post: "From Excel to Databases: Understanding Data Storage"
* Professional Git workflow with tests and documentation

**Professional Skills Focus:** Data literacy, file I/O, practical database thinking, understanding data formats

**Month 1 Deliverables:**

* Professional development environment (dual-language)
* Understanding of data architecture fundamentals
* Practical experience with CSV, JSON, and relational concepts
* Excel-to-code data processing skills
* GitHub portfolio with multi-language projects
* Code review participation portfolio
* Sprint retrospective documentation

**MONTH 2: WEB DEVELOPMENT & LANGUAGE MASTERY (125 Hours)**

**Week 5: "Soundcheck & Setup" - Web Fundamentals**

**Mar 17-21, 2025 | 30 hours** *(Note: Mar 19 is holiday - Josefstag)*

**Learning Objectives:**

* Understand client-server architecture professionally
* Build accessible, semantic HTML
* Write maintainable CSS with professional standards
* Use browser developer tools as debugging instruments
* Understand how JavaScript fits into web applications

**Daily Topics:**

* **Mon:** How the web works - HTTP, requests/responses, client-server model
* **Tue:** Semantic HTML, accessible CSS, professional standards
* **Wed:** Package management - npm (JavaScript) and pip (Python)
* **Thu:** Project: Build professional portfolio site with Git workflow
* **Fri:** Code review session, documentation standards

**Assignment:** "Professional Portfolio Website v1.0"

* Build responsive portfolio site using HTML/CSS
* Must include: semantic HTML, accessible design, mobile-responsive
* Host on GitHub Pages
* Complete Git workflow: feature branches, pull requests, code reviews
* Write professional README with setup instructions
* Include section highlighting both JavaScript and Python skills

**Professional Skills Focus:** Web standards, accessibility, Git workflows, documentation

**Week 6: "JavaScript for the Web" - DOM & Interactivity**

**Mar 24-28, 2025 | 30 hours**

**Learning Objectives:**

* Manipulate DOM professionally with performance in mind
* Handle events using professional patterns
* Build interactive UIs that enhance user experience
* Understand JavaScript's role in the browser

**Daily Topics:**

* **Mon:** JavaScript in the browser - the Document Object Model (DOM)
* **Tue:** Element selection, manipulation, professional DOM patterns
* **Wed:** Event handling, event delegation, form validation
* **Thu:** Accessibility considerations, keyboard navigation
* **Fri:** Professional project work and code review

**Assignment:** "Interactive Dashboard Project"

* Build data dashboard with dynamic content (weather simulation, task tracker, etc.)
* Must include: form handling, data visualization, user feedback
* Professional error handling and accessibility features
* Performance optimization documentation
* Load data from JSON/CSV files (building on Week 4 knowledge)

**Professional Skills Focus:** User experience, performance, accessibility as professional responsibilities

**Week 7: "Python for the Web" - Backend Basics with Flask**

**Mar 31 - Apr 4, 2025 | 30 hours**

**Learning Objectives:**

* Understand backend development with Python
* Build simple REST APIs with Flask
* Connect frontend JavaScript to backend Python
* Compare Node.js and Flask approaches

**Daily Topics:**

* **Mon:** Introduction to Flask, routing, handling requests
* **Tue:** Working with JSON, building API endpoints
* **Wed:** Connecting frontend to backend - CORS, fetch API
* **Thu:** Data persistence with files and SQLite
* **Fri:** Full-stack integration workshop

**Assignment:** "Full-Stack Application (JS Frontend + Python Backend)"

* Build application with JavaScript frontend and Flask backend
* Backend must provide at least 3 RESTful endpoints
* Frontend consumes these endpoints
* Include data persistence (SQLite or CSV files)
* Professional error handling on both ends
* Complete API documentation and environment variable management

**Professional Skills Focus:** Full-stack thinking, API design, debugging across stack

**Week 8: Easter Break & Async Learning**

**Apr 7-11, 2025 | Self-Study** *(Note: Easter Holiday Week - Apr 14-21)*

**Self-Directed Learning:**

* Complete online courses on async JavaScript and Python
* Read professional development blogs and documentation
* Contribute to open-source project (documentation, small bug fix)
* Review and refactor previous projects based on new learning
* Prepare for Month 2 capstone project

**Assignment:** "Open Source Contribution"

* Find and contribute to an open-source project (any language)
* Document the contribution process
* Reflect on professional collaboration in OS community
* Present contribution and learning in sprint review

**Professional Skills Focus:** Self-directed learning, open-source community engagement

**Week 9: "Asynchronous Programming" - Async in JavaScript & Python**

**Apr 22-25, 2025 | 35 hours**

**Learning Objectives:**

* Master async/await in both languages
* Handle asynchronous operations professionally
* Work with real external APIs
* Manage concurrency and parallel operations

**Daily Topics:**

* **Mon:** Callbacks and Promises (JavaScript), async foundations
* **Tue:** async/await in JavaScript, error handling
* **Wed:** Python asyncio, async/await in Python, comparing approaches
* **Thu:** Working with real APIs - authentication, rate limiting, error handling
* **Fri:** Sprint Review - async project demonstrations

**Assignment:** "Dual-Language API Integration"

* Build two versions of an API integration project (JavaScript/Node.js and Python/Flask)
* Both must consume at least 2 external APIs
* Include: authentication, error handling, loading states, rate limiting
* Write technical comparison document
* Deploy both versions

**Professional Skills Focus:** Asynchronous programming, API integration, comparative analysis

**Month 2 Deliverables:**

* Working web applications in JavaScript and Python
* Full-stack project portfolio
* API integration experience
* Professional documentation across all projects

**MONTH 3: ADVANCED DEVELOPMENT & TESTING (100 Hours)**

**Week 10: "Testing & Quality" - Professional Testing Practices**

**Apr 28 - May 2, 2025 | 30 hours** *(Note: May 1 is holiday - Staatsfeiertag)*

**Learning Objectives:**

* Write testable, maintainable code
* Implement professional testing strategies in both languages
* Practice Test-Driven Development (TDD)
* Use testing frameworks professionally

**Daily Topics:**

* **Mon:** Testing fundamentals - unit, integration, e2e tests
* **Tue:** JavaScript testing with Jest, writing effective tests
* **Wed:** Python testing with pytest, comparing testing approaches
* **Thu:** Test-Driven Development (TDD) workshop
* **Fri:** Code quality tools - linting, formatting, CI/CD basics

**Assignment:** "Test-Driven Development Project"

* Build calculator/converter application using TDD approach in both languages
* Write tests first, then implementation
* Achieve 80%+ code coverage in both versions
* Professional CI/CD setup (GitHub Actions)
* Document testing strategy and comparisons
* Performance benchmarking

**Professional Skills Focus:** Testing culture, TDD, professional refactoring, CI/CD basics

**Week 11: "Modern Frontend" - React Fundamentals**

**May 5-9, 2025 | 30 hours** *(Note: May 9 is holiday - Christi Himmelfahrt)*

**Learning Objectives:**

* Build modern web applications with React
* Understand component-based architecture
* Manage state professionally
* Apply React best practices

**Daily Topics:**

* **Mon:** React fundamentals, JSX, component architecture
* **Tue:** State and props, lifting state up, component communication
* **Wed:** Hooks - useState, useEffect, custom hooks
* **Thu:** React with TypeScript introduction
* **Fri:** Professional React patterns and project work

**Assignment:** "React + Python Backend Application"

* Build full-stack app: React frontend + Flask/FastAPI backend
* Must include: complex state management, multiple components
* API integration with your Python backend
* Professional project structure
* Deployed to cloud platform
* Complete user documentation

**Professional Skills Focus:** Modern frontend development, component thinking, full-stack integration

**Week 12: "Advanced Backend & Databases" - Deep Dive**

**May 12-16, 2025 | 30 hours**

**Learning Objectives:**

* Build production-ready backend applications
* Work with PostgreSQL beyond basic SQL
* Implement authentication and authorization
* Understand database optimization

**Daily Topics:**

* **Mon:** Advanced Flask/FastAPI - middleware, authentication, security
* **Tue:** PostgreSQL deep dive - complex queries, joins, transactions
* **Wed:** SQLAlchemy (Python ORM) vs Sequelize (Node.js ORM)
* **Thu:** Database optimization - indexes, query performance, N+1 problems
* **Fri:** Professional backend architecture patterns

**Assignment:** "Production-Grade Backend API"

* Build RESTful API with either Node.js/Express or Python/FastAPI
* Include: JWT authentication, role-based authorization
* PostgreSQL database with proper relationships
* Comprehensive test suite
* API documentation (Swagger/OpenAPI)
* Deployed with proper environment management

**Professional Skills Focus:** Backend architecture, security, database design, API design

**Week 13: "Month 3 Integration" - Full-Stack Capstone**

**May 19-23, 2025 | 30 hours**

**Learning Objectives:**

* Integrate all Month 3 learnings
* Build comprehensive full-stack application
* Practice professional delivery
* Prepare for final capstone

**Daily Topics:**

* **Mon:** Sprint planning, architecture design
* **Tue:** Backend implementation, database setup
* **Wed:** Frontend development, integration
* **Thu:** Testing, deployment, documentation
* **Fri:** Sprint Review, demonstrations, retrospective

**Assignment:** "Full-Stack Professional Application"

* React frontend with complex UI
* Python or Node.js backend with authentication
* PostgreSQL database with proper schema
* Comprehensive testing (frontend and backend)
* Deployed to production with CI/CD pipeline
* Professional documentation and performance monitoring

**Professional Skills Focus:** End-to-end project delivery, integration skills, professional presentations

**Month 3 Deliverables:**

* Comprehensive full-stack application
* Testing portfolio across both languages
* Modern frontend experience
* Production-ready backend skills

**MONTH 4: DATA ARCHITECTURE DEEP DIVE & SPECIALIZATION (75 Hours)**

**Week 14: "Data Architecture Deep Dive" - Advanced Database Concepts**

**May 26-30, 2025 | 30 hours**

**Learning Objectives:**

* Master multiple database paradigms
* Design complex data architectures
* Understand when to use each database type
* Implement polyglot persistence

**Daily Topics:**

* **Mon:** NoSQL deep dive - MongoDB document databases, schema design
* **Tue:** Graph databases (Neo4j) - when and why to use them
* **Wed:** Time-series databases - InfluxDB, real-time data scenarios
* **Thu:** Caching strategies - Redis, memcached, application-level caching
* **Fri:** Data architecture decision framework, polyglot persistence patterns

**Assignment:** "Multi-Database Architecture Project"

* Design and implement application using 3 different database types
* Example: PostgreSQL (transactional) + MongoDB (profiles) + Redis (caching)
* Justify each database choice with documentation
* Implement data migration scripts
* Write comprehensive architectural decision records (ADRs)
* Performance benchmarking comparing approaches

**Professional Skills Focus:** Architectural decision-making, systems design, scalability thinking

**Week 15: "Modern Development Tools" - Docker, TypeScript, & DevOps**

**June 2-6, 2025 | 30 hours**

**Learning Objectives:**

* Containerize applications with Docker
* Use TypeScript for type-safe JavaScript
* Implement professional monitoring and logging
* Understand deployment strategies

**Daily Topics:**

* **Mon:** Docker fundamentals - containers, images, docker-compose
* **Tue:** TypeScript introduction - types, interfaces, type safety in production
* **Wed:** Monitoring and logging - application observability
* **Thu:** Deployment strategies - CI/CD, blue-green deployments, feature flags
* **Fri:** Professional development workflow integration

**Assignment:** "Containerized Full-Stack Application with TypeScript"

* Convert previous project to use TypeScript (frontend and backend)
* Docker containers for all services (including databases)
* Docker Compose for orchestration
* Professional logging and monitoring setup
* Health checks and graceful shutdown
* Production-ready deployment configuration
* Complete infrastructure documentation

**Professional Skills Focus:** DevOps basics, containerization, type safety, professional deployment

**WEEKS 16-17: FINAL CAPSTONE PROJECT (45 Hours)**

**Week 16: "Professional Capstone Project" - Part 1**

**June 9-13, 2025 | 30 hours**

**Learning Objectives:**

* Apply all 15 weeks of learning in comprehensive project
* Work through complete professional development lifecycle
* Practice Agile sprint methodology
* Demonstrate professional-level full-stack development

**Daily Topics:**

* **Mon:** Project kick-off, requirements gathering, sprint planning
* **Tue:** Architecture design, technology selection (JS/Python/Both), database design
* **Wed:** Backend development, API implementation
* **Thu:** Database setup, data modeling, migrations
* **Fri:** Sprint review, retrospective, planning Sprint 2

**Assignment:** "Real-World Professional Application - Sprint 1"

* Must demonstrate both JavaScript AND Python skills
* Multiple database types used appropriately
* Professional testing suite setup
* CI/CD pipeline configuration
* Docker containerization
* Project plan and architecture documentation
* Technology stack justification

**Professional Skills Focus:** Complete project lifecycle, Agile practices, professional planning

**Week 17: "Professional Capstone Project" - Part 2 & Career Readiness**

**June 16-20, 2025 | 15 hours**

**Learning Objectives:**

* Complete comprehensive capstone project
* Finalize professional portfolio
* Prepare for job market
* Demonstrate professional communication and presentation skills

**Daily Topics:**

* **Mon:** Frontend development, component architecture
* **Tue:** Frontend-backend integration, authentication flow
* **Wed:** Testing, security hardening, performance optimization
* **Thu:** Final polish, documentation, deployment
* **Fri:** Final presentations, "Gig Ready Certification"

**Assignment:** "Final Capstone Delivery & Portfolio Finalization"

* Complete full-stack application with all features
* Comprehensive test coverage and professional documentation
* Deployed application with monitoring
* Post-mortem documentation
* Updated portfolio website with all 16 weeks of projects
* GitHub profile showcasing professional work
* LinkedIn profile optimization
* Technical presentation demonstrating professional communication
* Resume highlighting dual-language skills and professional practices

**Professional Skills Focus:** Professional delivery, portfolio presentation, career preparation

**Month 4 & Final Deliverables:**

* Production-ready capstone application
* Mastery of multiple database paradigms
* Professional DevOps and deployment skills
* Complete portfolio showcasing 16 weeks of growth
* Interview-ready materials and presentation skills

**Assessment & Evaluation**

**Continuous Assessment (60%)**

* Weekly assignments and projects (both languages)
* Code review participation
* Professional Git workflow adherence
* Documentation quality
* Agile ceremony participation
* Peer collaboration

**Major Projects (30%)**

* Month 1 Integration (Week 4 Excel-to-Code project) - 5%
* Month 2 Full-Stack Project - 5%
* Month 3 Integration Project - 10%
* Final Capstone - 10%

**Professional Skills (10%)**

* Communication in standups/retrospectives
* Code review quality
* Documentation practices
* Presentation skills
* Professional conduct

**Tools & Technologies**

**Development Environment:**

* Git & GitHub
* VS Code with professional extensions (JavaScript + Python)
* Node.js & npm
* Python (3.10+) & pip
* Excel (for Week 4 data modeling)
* PostgreSQL, MongoDB, Redis
* Docker & Docker Compose
* Cloud hosting (Vercel, Railway, Render)

**Languages & Frameworks:**

* **JavaScript:** Vanilla JS, Node.js, Express, React
* **Python:** Flask/FastAPI, SQLAlchemy, pytest
* **TypeScript:** Both frontend and backend

**Professional Tools:**

* Jira or GitHub Projects
* Slack for team communication
* Figma for design collaboration
* Postman/Insomnia for API testing
* Professional monitoring tools (Sentry, LogRocket)

**Graduate Outcomes**

Upon completion, graduates will have:

* **16+ projects** in professional GitHub portfolio (JavaScript AND Python)
* **150+ commits** demonstrating professional Git workflow
* **Dual-language expertise** - comfortable in JavaScript and Python
* **Data architecture knowledge** - from Excel metaphors to complex multi-database systems
* **Professional portfolio website** showcasing all work
* **Full-stack development skills** - frontend (HTML/CSS/React) + backend (Node.js/Flask)
* **Database expertise** - CSV, JSON, SQL (SQLite/PostgreSQL), NoSQL (MongoDB), caching (Redis)
* **Testing experience** - writing and maintaining test suites in both languages
* **Deployment experience** - containerization and cloud deployment
* **Professional practices** - Agile, code review, documentation, CI/CD
* **Interview preparation** - technical and behavioral

**Most importantly: Real professional experience working like professional developers work, with the flexibility to work in either JavaScript or Python ecosystems, and the knowledge to make intelligent architectural decisions.**

*Digital Campus Vorarlberg | Feldkirch, Austria*  
*Next Cohort: February 17, 2025*