



AI ENGINEER + FULL STACK DEVELOPER COURSE STRUCTURE 2026

PROGRAMMING LANGUAGE FUNDAMENTALS: PYTHON **70 hours**

Basics · Hardware and Software Architecture · Computer and Networking Basics · Software Infrastructure and Applications · Numbering Systems Notation · Open Source and Open Standards · Development Platforms · Integrated Development Environment (IDE) Basics · Compiler and Builder · Programming Language Basics · Data Types · Operators · Statements · Functions · Symbol Presentation and Coding · Array · Basic Programming Patterns · Practicing · Sequential and Binary Search · Sorting · Reversing · Merging · Classes and Objects · Practicing in Python · Using AI tools for programming and training

AI-ASSISTED FRONT-END DEVELOPMENT **100 hours**

Front-End Foundations · JavaScript · TypeScript · React · Nextjs Framework · Front-End Security Principles · NextAuth Authentication · AI Code Generators Practice · Prompt Engineering for UI Code

AI DEVELOPMENT & PYTHON **63 hours**

Advanced Python & Algorithm Complexity · Sorted Containers & NumPy Arrays · AI Principles: Neural Networks, Weights, GPU Computing · Ollama & OpenAI Local LLM Models · AI RAG Agent Development · LangChain & LangGraph · Python Functions as AI Agent Tools · MCP (Model Context Protocol) Tools

DATABASES & AI **27 hours**

SQL (PostgreSQL) · Vector Databases for ML & RAG Agents · MongoDB · DynamoDB · Data Analysis Principles · Building Complex Queries with AI

BACK-END & AI INTEGRATION **48 hours**

Node.js Intro · Node Express & Fastify Frameworks · Python FastAPI · Authentication, Authorization, Accounting (AAA) & Security · AI RAG Agent Integration · Backend Services with AI Integration

AWS CLOUDING & AI LLM MODELS **62 hours**

AWS Introduction · IAM Principles · Basic AWS Services · Serverless Application Model · Microservices Architecture · AWS Bedrock (LLM Models, MCP Server)

TOTAL THEORETICAL HOURS **370 hours**

REAL PROJECT DEVELOPMENT (frontend and backend application) **80 hours**

Full development process of an AI-integrated full-stack application, including design, coding, version control with Git, and deployment on AWS Cloud.

TOTAL HOURS **450 hours***

* — Tel-Ran Educational Center may adjust program content based on technology updates while maintaining the total study hours. Changes may occur without prior notice to students.

Free Weekly Webinars. We run additional free webinars every week, reinforcing class topics and reviewing homework. These sessions are not included in the core syllabus and are provided at no cost.