AI for Software Engineers Program

INTRODUCTION

Artificial Intelligence is reshaping the future of software engineering and this bootcamp is your gateway to leading that transformation.

AI for Software Engineers is a **14-week, project-based program** designed to equip developers with the practical skills to integrate AI across the entire software development lifecycle. This course prepares learners to take **Microsoft Azure AI Fundamentals certification exam.**

Whether you're writing smarter code, automating DevOps, generating technical documentation, or deploying intelligent systems, this course empowers you to work with AI, not compete against it.

Through immersive hands-on modules, capstone projects, and real-world use cases, you'll gain proficiency in tools like large language models (LLMs), retrieval-augmented generation (RAG), prompt engineering, multi-agent systems, and cloud-based AI services from Microsoft and Google. You'll also explore ethical considerations, model governance, and the strategic decisions behind AI adoption in production environments.

Whether you're building with AI, building for AI, or collaborating with AI-powered tools, this bootcamp prepares you to innovate with confidence in today's AI-accelerated development landscape.

Duration and Format

DURATION

14 Weeks

SKILL LEVEL

Intermediate

(ideal for developers with working knowledge of software engineering fundamentals)

FORMAT

Video-Based Lessons + Assignments + 2 Projects + Final Exam

PROJECT

Week 5 and Week 13

FINAL EXAM

Week 14

What Will You Be Ready For?

> By the end of the **AI for Software Engineers bootcamp**, you won't just understand AI, you'll be ready to **build with it**.

This isn't just another technical course. It's a future-forward program designed to prepare you for the real-world challenges of AI-integrated software development. You'll graduate with not only skills, but also the confidence to lead innovation in any technical team.

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You'll be equipped to:

- Embed AI across the software development lifecycle—from coding to deployment
- Use LLMs and prompt engineering to automate tasks and boost productivity
- Design and build AI-augmented systems, tools, and internal developer platforms
- Evaluate ethical, performance, and governance concerns in real-world environments
- Translate AI strategy into action for technical and non-technical stakeholders
- Confidently present, deploy, and scale intelligent tools in cloud-based ecosystems

Bootcamp Curriculum Overview

Learning Objectives

- Identify opportunities to integrate AI across the full software development lifecycle (SDLC)
- Leverage generative AI tools for ideation, prototyping, testing, documentation, and deployment
- Evaluate ethical, operational, and security concerns of deploying AI in production
- Communicate AI strategies clearly across product, engineering, and leadership teams
- Apply frameworks for prompt engineering, multi-agent collaboration, and cloud-scale LLM deployments

Who This Bootcamp Is For

Product Managers

Shorten cycles and enhance roadmap delivery with AI integration

Startup Founders

Use AI to rapidly develop, test, and scale MVPs

Software Team Leads & Architects

Communicate AI value and integration needs across DevOps

Innovation & IT Leaders

Lower costs and increase velocity across SDLC

CXOs (CTO, CIO, CPO)

Make informed, strategic AI investment and roadmap decisions

AI for Software Engineers Bootcamp Structure

Over the course of 14 weeks, you will engage with video-based lessons, real-world assignments, and two hands-on projects.

The program is designed to provide flexibility through self-paced learning while offering ongoing support via instructor-led sessions and peer discussions.This course prepares learners to take **Microsoft Azure AI Fundamentals certification exam.**

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Learning Experience

Online Modules

Learn at your own pace through structured weekly modules hosted on our digital learning platform. Each module includes interactive content, AI tool demos, coding exercises, and real-world implementation projects.

Weekly Office Hours

Every week, instructors will host live office hours to answer your questions, provide feedback, and help troubleshoot technical challenges. These sessions are a great opportunity to engage with instructors and your peers.

Q&A Sessions

Bring your toughest questions about code, tools, or concepts. Get expert-level answers and hear insights from fellow learners facing similar challenges.

Review Sessions

Each week concludes with a brief review session, recapping key concepts, clarifying expectations for upcoming modules, and offering guidance on applying what you've learned.

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Course Outline

Module 1: AI Foundations in Software Development

Learn how AI is reshaping modern development workflows. Compare traditional vs. Alassisted coding and explore tools like Codeium and Bito.

- The AI software tool landscape
- Speed vs. quality in AI coding
- Intro to debugging and ethical AI use

Module 2: AI-Powered Code Writing & Refactoring

Understand how to work side-by-side with AI in daily coding tasks. Learn to refactor, optimize, and improve code quality using AI tools.

- Writing and explaining code with LLMs
- Refactoring for readability, performance, and maintainability
- Generating tests alongside code

Module 3: Debugging, Testing, and Quality Assurance with AI

Explore how AI enhances bug detection, test case generation, and intelligent code reviews.

- Auto-generating unit/integration tests
- Smart debugging agents and error tracing
- AI-powered QA workflows

Module 4: DevOps & Automation with AI Tools

Automate DevOps workflows using AI-driven platforms. Use assistants to manage CI/CD, test gates, and rollout strategies.

- GitHub Actions AI plugins
- Continuous testing and deployment
- Release monitoring and rollback triggers

Module 5: Project 1: Build an AI-Assisted CLI Tool

Apply your skills by building a working command-line interface (CLI) tool powered by AI.

- Project scoping
- AI-assisted code generation and debugging
- Demo presentation and submission

Module 6: Introduction to Generative AI and LLMs

Develop foundational knowledge of generative models and prompting techniques.

- How LLMs work
- Zero-shot, few-shot, and system prompts
- Using GPT-based tools effectively

Module 7: Prompt Engineering for Software Engineers

Go deeper into crafting effective prompts for code generation, task automation

- Prompt patterns for technical teams
- Prompt tuning and chaining
- Evaluating LLM responses for accuracy

Module 8: Retrieval-Augmented Generation (RAG) for Engineers

Learn how to integrate external knowledge with AI models for contextual and reliable outputs.

- Embeddings and vector databases
- Chunking and indexing docs
- Designing a basic RAG system

Module 9: Multi-Agent AI Systems for Engineering Workflows

Use AI agents to simulate team-like coordination across engineering tasks.

- Multi-agent orchestration basics
- Designing developer assistants
- Common failure modes and guardrails

Module 10: Scaling and Optimizing LLMs for Engineering Tasks

Understand the performance and cost dynamics of running LLMs at scale.

- Latency, caching, batching
- Model compression and quantization
- Managing API usage across teams

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Module 11: Cloud AI Tools: Azure and Google Cloud

Get hands-on with Microsoft and Google's AI tools for developers.

- Azure AI Studio and OpenAI integration
- Google Vertex AI and BigQuery ML
- Deploying no-code/low-code AI services

Module 12: Ethics, Bias, and Governance in AI Development

Tackle the responsible use of AI in software engineering, from hallucinations to compliance.

- Fairness, accountability, transparency
- Red-teaming and model cards
- GDPR and AI-specific regulations

Module 13: Project 2

Design and present a full-stack, AI-augmented engineering solution aligned with real-world constraints.

- End-to-end AI workflows
- Cloud deployment and testing
- Ethical and performance evaluation

FINAL STAGE

Module 14: Final Exam and Wrap-Up

Conclude the program with a final exam assessing your understanding of AI tools, systems, and best practices. This module also includes project review, reflection, and guidance on transitioning into AI-driven software roles.

- Reviewing Project 2
- Capstone project choices and Q&A