



## Practical AI Use Cases

- 2 Days
- Lecture and Hands-on Labs

### Course Overview

This course provides a hands-on introduction to AI-assisted software development for technical professionals. Participants will work with modern AI coding tools including GitHub Copilot, ChatGPT Codex, and Claude Code while learning how to prompt, plan, scope, generate, review, refactor, and improve code with AI support.

The course begins with practical prompt engineering and then moves into real development workflows using AI assistants inside code editors, repositories, and command-line environments. Participants will learn how to provide useful context, explore unfamiliar codebases, plan application work, integrate new functionality, and use AI tools to support the full software delivery process.

By the end of the course, participants will understand how to use AI coding assistants effectively and responsibly in real technical workflows. They will also be introduced to advanced agentic AI patterns, including code comprehension workflows, surgical code change, and local inference for more private, customizable AI-assisted development.

Review this course online at <https://www.alta3.com/courses/00-template>

### Who Should Attend

- Developers, DevOps engineers, platform engineers, and systems administrators
- Architects and system designers evaluating AI-assisted development workflows
- Technical leaders responsible for AI coding tool adoption, governance, or enablement
- Operations and support teams who need to understand, modify, or troubleshoot code
- Product and program managers involved in scoping AI-assisted software projects

### What You'll Learn

- Understand the capabilities, limitations, and practical role of generative AI in software development workflows
- Apply prompt engineering techniques to produce clearer, more reliable technical outputs from AI models
- Structure prompts using tasks, inputs, outputs, constraints, examples, feedback, and style requirements
- Use GitHub Copilot to generate, explain, modify, and extend code inside a development environment
- Build useful project context for AI coding assistants using repositories, files, documentation, and workspace knowledge
- Configure and use GitHub Copilot, ChatGPT Codex, and Claude Code for hands-on code development tasks
- Compare the strengths, limitations, and workflow differences between major AI coding assistants
- Use AI to explore unfamiliar codebases, identify relevant files, and reason about existing application structure
- Plan and scope an application with AI before beginning implementation
- Generate, refactor, and improve code using AI-assisted development workflows

- Integrate new functionality into an existing codebase with AI support
- Build and deploy an application using an AI coding assistant
- Understand how Model Context Protocol can extend AI-assisted development workflows
- Design agentic AI workflows for code comprehension, project planning, and surgical code change
- Understand how local inference can support advanced, private, and customizable agentic AI workflows

## Outline

### Required SCM Setup

- Lecture + Lab: GitHub Account/Repository Creation
- Lecture + Lab: GitHub Copilot Account Setup
- Lecture: Introduction to GitHub Copilot

### Prompt Engineering

- Lecture: Demystifying Generative AI
- Lecture + Lab: Prompting an AI Model
- Lecture + Lab: Define Prompt Parameters: Task/Inputs/Outputs/Constraints/Style
- Lecture + Lab: Prompt Techniques: Chaining, Set Role, Feedback, Examples
- Lecture: Optimizing Prompt Strategies for Code Generation

### GitHub Copilot

- Lecture: Constructing Context for Prompts
- Lecture + Lab: Setup Copilot with VS Code
- Lecture: Model Context Protocol
- Lecture + Lab: Github MCP Server in VS Code
- Lecture + Lab: Agentic AI with Copilot
- Lecture + Lab: Building Context with GitHub Copilot Spaces
- Lecture: Plan/Scope your Application with AI
- Challenge: Build and Deploy an Application using AI Assistant

### ChatGPT Codex

- Lecture + Lab: Getting Started with ChatGPT
- Lecture: ChatGPT Codex
- Lecture + Lab: Getting Started with ChatGPT Codex
- Lecture + Lab: Generate Code with ChatGPT Codex

### Claude Code

- Lecture + Lab: Install and Configure Claude Code
- Lecture + Lab: Explore and Modify a Codebase
- Lecture + Lab: Integrate New Functionality into a Codebase
- Lecture + Lab: Refactor and Improve Code

### Agentic Driven Code Comprehension, and Use Cases

- Lecture: Why Developers Get Stuck
- Lecture: Agentic Driven Code Comprehension
- Lecture + Lab: Installing the Agent
- Lecture + Lab: The Agentic Code Development Pipeline
- Lecture: Designing Agentic AI Workflows for Surgical Code Change