

7-Day AI-Powered Coding Productivity Program

Build Faster. Think Better. Ship Smarter.

Designed for trainees with 6+ months experience who want to 2x productivity and improve code quality using AI tools.

Final Deliverable

By the end of 7 days, trainees will:

- Write structured, high-quality prompts
 - Use AI to design architecture before coding
 - Debug 3x faster
 - Improve code quality with AI-assisted reviews
 - Use AI inside IDE (Cursor / Copilot-style tools) effectively
 - Build a complete mini-project using AI as a co-developer
 - Validate AI-generated code with proper testing strategies
 - Create their own reusable AI prompt library
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Core Philosophy

AI is not for:

- ✗ Blind copy-paste
- ✗ Replacing thinking
- ✗ Skipping fundamentals

AI is for:

- ✓ Speeding up implementation
- ✓ Exploring better approaches
- ✓ Reviewing and improving code
- ✓ Learning faster
- ✓ Reducing repetitive work

Day-by-Day Implementation Plan

Day 1 — Master Prompt Engineering for Developers

Goal:

Learn how to talk to AI like a senior developer.

Topics Covered

- Structured prompting framework
 - Context-driven prompts
 - Role-based prompting
 - Constraint-based prompting
 - Step-by-step reasoning prompts
 - Iterative refinement technique
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Prompt Formula (Production Level)

Role: You are a senior MERN stack developer.

Context: I am building a scalable task management app.

Goal: Implement JWT authentication.

Constraints:

- Use Express middleware
- Keep code modular
- Follow production best practices
- Include error handling

Output format:

- Folder structure
 - Code snippets
 - Explanation
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Task

Take an existing feature from your project and:

- Write a weak prompt
 - Rewrite it using structured format
 - Compare output quality
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Checklist

- Clear role defined
 - Clear goal mentioned
 - Constraints added
 - Output format specified
 - Follow-up refinement done
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Day 2 — AI for System Design & Architecture

Goal:

Use AI before coding anything.

Topics

- Generating folder structure
 - Deciding state management
 - Database schema design
 - API contract planning
 - Edge case discovery
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Task

Ask AI to:

1. Design architecture for scalable job portal
2. Suggest improvements
3. Identify bottlenecks
4. Suggest caching strategy

Then manually review & refine.

⚠ Important Skill

Ask AI:

“What problems will this architecture face at scale?”

Day 3 — AI Inside IDE (Cursor, Copilot-style Workflow)

Goal:

Use AI as pair programmer.

Tools to Practice

- Cursor
 - ChatGPT
 - Groq
 - Any AI-assisted IDE tool
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Learn

- Inline refactoring
 - Function generation
 - Auto documentation
 - Test case generation
 - Code explanation mode
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Task

1. Write messy code intentionally.
 2. Ask AI to:
 - o Refactor it
 - o Improve naming
 - o Optimize performance
 - o Add error handling
 3. Compare before vs after.
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Day 4 — Debugging with AI (Advanced)

Goal:

Become an extremely fast debugger.

Learn

- Paste full error logs
 - Ask for root cause analysis
 - Ask for step-by-step debugging plan
 - Ask AI to simulate edge cases
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Powerful Prompt

Here is my error stack:

[paste error]

Explain:

1. Root cause
 2. Why it happened
 3. How to fix
 4. How to prevent in future
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Task

Break your app intentionally:

- Wrong API route
- Missing dependency
- State bug

Use AI to debug.

Day 5 — AI Code Review & Quality Improvement

Goal:

Improve code quality like senior engineer.

Learn

- Security review
 - Performance review
 - Clean code principles
 - DRY violations
 - Scalability risks
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Prompt

Review this code like a senior architect.

Check:

- Security issues
- Performance bottlenecks
- Scalability problems
- Code smell
- Best practice violations

Task

Run full project review via AI.

Day 6 — Testing + Validation of AI Code

Goal:

Never blindly trust AI.

Learn

- Unit test generation
 - Edge case generation
 - Negative test cases
 - Input validation testing
 - Security vulnerability detection
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Prompt

Generate:

- Unit tests
- Edge case tests
- Failure case tests

For this function:

[paste function]

Task

Ask AI to generate tests.

Manually run and verify.

Day 7 — Build Full Mini Project with AI Co-Developer

Goal:

Use AI correctly from start to finish.

Project Rules

- ✓ You must design first
 - ✓ Write structured prompts
 - ✓ Validate every AI output
 - ✓ Write tests
 - ✓ Ask for review
 - ✓ Optimize
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Deliverables

- Architecture doc
 - Prompt document
 - Source code
 - Test cases
 - AI review summary
 - Improvements list
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Advanced Productivity Boosters Section

1. Create Personal Prompt Library

Maintain:

- Auth prompt
- Debug prompt
- Refactor prompt

- Architecture prompt
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2. AI for Learning New Tech Fast

Prompt:

Explain Redis for backend scaling.

Give:

- Concept
 - Real-world analogy
 - Sample integration
 - Interview questions
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3. AI for Documentation

Generate:

- README
 - API docs
 - Code comments
 - Commit messages
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4. AI for Performance Optimization

Ask:

- Time complexity analysis
 - Alternative algorithms
 - Caching strategies
 - Memory optimization
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Latest & Emerging AI Tools Developers Should Know

These tools are not random — they are **high-impact tools used in real developer workflows** to speed up coding, refactoring, debugging, documentation, testing, and system thinking.

1. AI Code Assistants (Realtime Coding AI)

These are used **inside your editor or IDE** to autocomplete, suggest logic, generate functions, and refactor fast.

Tool	Why It Matters	Best Use Case
GitHub Copilot	Best AI code completion & suggestions	Auto complete logic, generate function bodies
Cursor	AI-native IDE with project states	Big refactors, multi-file changes with prompts
Tabnine	Fast AI completion in editors	Lightweight, team-friendly
Codeium	Free AI coding suggestions	Auto-complete + doc generation
Replit AI	AI coding in the browser	Quick prototypes, learning

When to use:

- You're writing repetitive logic

- Need inline explanations
 - Removing boilerplate
 - Multi-file conversions
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2. AI Research & Code Understanding Tools

These tools help you *understand codebases, search across repos, or research best practices.* Great for large projects.

Tool	Why It Helps	Best Use Case
Sourcegraph Cody	AI + Code search across entire repos	Understand legacy code fast
Phind	StackOverflow + code search	Instant dev answers w/ code context
Perplexity AI	Research-first AI	Quick exploratory searches
OpenRouter	Access multiple model APIs	Switch between models for best answers

When to use:

- You're exploring a new codebase
 - You want verified answers (StackOverflow + docs)
 - You need model flexibility
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3. AI Testing & Validation Tools

Help generate tests, find bugs, simulate scenarios, and ensure coverage.

Tool	What It Does	Best Use Case
Diffblue Cover	Auto test generation	Generate Jest tests automatically
DeepSource	Code quality scanning	Automated code smell + error detection
SonarQube + AI	Code & security scanning	Find bugs before deployment
AI-generated test scripts (ChatGPT / Groq prompts)	Write unit + integration tests	Edge case coverage, mutation tests

When to use:

- After AI-generated code
 - Before merge request
 - For large legacy modules
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4. AI Documentation Tools

Write docs, API specs, READMEs, explain code, and create interactive help.

Tool	What It Generates	Best Use Case
Mintlify	Auto docs from code	Generate docs from code comments

Swimm AI	Guided documentation	Team onboarding + knowledge base
Swagger + AI	API spec generation	Create OpenAPI docs automatically
AI README Generators	Full project READMEs	Project bootstrapping

When to use:

- Project kickoff
 - Sprint handover
 - Onboarding new team members
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5. AI DevOps and Deployment Tools

These help with CI/CD automation, configuration, and deployment intelligence.

Tool	Why It Helps	Best Use Case
GitHub Actions + AI	Auto pipeline generation	CI/CD creation from prompts
Sweep AI	Auto PR creation from issues	Convert backlog -> code changes
Pulumi + AI	Cloud infra as code	Generate infra scripts with AI

Terraform AI plugins	IaC with suggestions	Cloud provisioning automation
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When to use:

- Setting up pipelines
 - Automating staging/production deployments
 - Scaling infrastructure
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6. AI Architecture & Design Tools

These help you build system designs, diagrams, and interactive planning docs.

Tool	What It Creates	Best Use Case
Mermaid + AI	Architecture diagrams	Convert text → visuals
Whimsical + AI	UX + flow design	Visual planning
AI Prompt → Diagrams (ChatGPT + plugins)	Draw architecture from prompt	Design before coding

When to use:

- Sprint planning
 - System design interviews
 - Architecture reviews
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7. AI SQL & DB Tools

Help generate SQL queries, optimize performance, explain index suggestions.

Tool	What It Helps With	Best Use Case
AI SQL Generators (ChatGPT + Phind)	Generate & optimize SQL	Complex queries without syntax errors
dbdiagram + AI	Generate DB diagrams	Entity relationships
AI DB Query Explainers	Explain query cost	Improve performance**

When to use:

- Performance tuning
 - Query debugging
 - Schema design
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8. AI Security & Risk Tools

Catch vulnerabilities, generate threat models, produce security tests.

Tool	Why It Matters	Best Use Case
ShiftLeft AI	Code security scanning	Detect injection points
Semgep + AI	Static analysis + rules	Build custom security checks

Snyk + AI

Vulnerability insights

Dependency scanning

When to use:

- Before deployment
 - CI/CD security gating
 - Auditing legacy code
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9. AI Experiment / Learning Boosters

These are not coding tools per se — but help developers learn **faster**.

Tool

Best Use Case

ChatGPT

Explain concepts + generate memory aids

Anki + ChatGPT generator

Flashcards from code snippets

Explain Like I'm 5 (ELI5 prompts)

Concept simplification

Role-based Explainers

“Explain as senior engineer”

Which Tool to Use When?

Here's a practical workflow trainees can use daily:

Stage	Recommended Tools
Designing system	ChatGPT, Perplexity, Sourcegraph
Writing code	Copilot, Cursor, Codeium
Explaining code	ChatGPT, Claude, Phind
Debugging	ChatGPT, Groq, Cursor
Refactoring	Cursor, Copilot, ChatGPT
Writing tests	DeepSource, Diffblue, ChatGPT
Documenting	Mintlify, Swimm, ChatGPT
Deployment/CI	GitHub Actions + AI/Sweep
Security audit	Snyk + AI, Semgrep + AI