

Essential Skills for Software Development

Duration: 3 days

Day 1: Foundations of Software Development

Introduction to Software Development

- Overview of software development lifecycle (SDLC)
- Key programming paradigms (procedural, object-oriented, functional)
- Common development tools and environments

Version Control with Git

- Understanding Git and its importance
- Basic Git commands (clone, commit, push, pull, branch, merge)
- Git workflows (feature branches, pull requests)
- Hands-on: Setting up and using GitHub

Problem-Solving & Logical Thinking

- Understanding algorithms and flowcharts
- Breaking down problems into smaller components
- Writing pseudocode before implementation

Hands-on Coding Challenges

- Implementing simple programs in Python/JavaScript
 - Debugging common syntax and logical errors
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Day 2: Programming and Development Best Practices

Core Programming Concepts

- Data structures (arrays, lists, dictionaries, sets)
- Control structures (loops, conditionals, functions)
- Object-Oriented Programming (OOP) principles

Writing Clean & Maintainable Code

- Code readability and documentation
- Naming conventions and best practices
- Introduction to design patterns

Debugging and Testing

- Common debugging techniques
- Writing and running unit tests
- Using debugging tools in IDEs

Mini Project

- Building a small application (e.g., To-Do List, Calculator)
 - Implementing best practices from previous sessions
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Day 3: Advanced Concepts & Real-World Applications

Working with APIs & Databases

- Introduction to REST APIs & JSON
- Making API requests using Fetch/Axios
- Introduction to databases (SQL vs NoSQL)

Web Development Basics

- Overview of HTML, CSS, JavaScript
- Basics of responsive design and accessibility

Collaboration & Agile Methodologies

- Agile and Scrum fundamentals
- Working in teams: Code reviews, Pair programming
- Using project management tools (Jira, Trello)