COURSE TABLE OF CONTENTS

Google Agent Development Kit (ADK) Fundamentals

OEM: Google • Duration: 5 Days (40 hrs)

COURSE MODULES & TOPICS

Module 1: Introduction to Google ADK
- Overview of Google Agent Development Kit
- Capabilities of Google ADK

Module 2: Environment Setup and Resources
- Google ADK resources
- Setting up Google environment for coding

Module 3: Building Your First Agent Application
- Create agent application with LLM (Gemini Models)

Module 4: Integrating Tools and API Servers
- Add Tavily search tool
- API server setup for testing
- Streaming with SSE

Module 5: Context and Conversation Management
- Context management with include_contents
- Conversation handling

Module 6: Direct Model API Calls and Manual Agent Runs
- Direct API calls to models without ADK agent
- Run agents manually without adk web or adk run

Module 7: Sessions and State Management
- Google ADK sessions
- State management concepts
- Four types of state: scope and persistence

Module 8: Building Stateful Agents
- End-to-end exercises: stateful translation agent

Module 9: Agent Delegation and Subagents
- Automatic agent delegation to subagents
- Delegation pattern with sub-agents

Module 10: Sequential, Parallel, and Loop Agents
- SequentialAgent usage
- ParallelAgent usage
- LoopAgent usage

Module 11: Safety and Security Guardrails
- Implementing guardrails for AI agents

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Module 12: Integrating MCP Servers
- MCP server integration with ADK agents
- Custom MCP server exposing filesystem tools

Module 13: Config-Based Agent Development
- Building agents using config-based approach
- YAML agent configurations

Module 14: Multi-Agent Architectures
- Multi-Agent Tutor architecture
- Multi-agent orchestration design pattern
- Hierarchical multi-agent/task decomposition

Module 15: Design Patterns and Best Practices
- Google ADK design patterns
- Best practices for agentic apps
- Two main categories of agentic patterns
- Pattern-to-ADK component mapping

Module 16: Agent Classes and Hierarchies
- Agent classes and hierarchy
- Workflow agents
- Key design principles

Module 17: Agent Architecture Patterns
- Solo agent design pattern
- Agent roles design pattern

Module 18: Agent Process and Interaction Patterns
- Prescribed plan design pattern
- Agent-to-agent handoff
- Agents as tools
- Review/critique design pattern

Module 19: Advanced Agent Patterns
- Reflexion design pattern
- ADK agent as MCP server
- Human-in-the-loop design pattern

Module 20: Implementing Agentic Principles
- Selecting patterns for ADK applications
- Principles for successful agentic apps

Module 21: Capstone Project: Multi-Agent Corporate Travel Management System
- Root coordinator agent and auto-delegation
- Sequential pipelines and parallel research
- Session state, callbacks, guardrails
- Artifact service and A2A protocol
- MCP integration and HITL
- Streamlit UI and quality refinement loops

- Pydantic schemas, SQLite database, ADK runner
- Policy documents, authentication, approval gate, testing, documentation