COURSE TABLE OF CONTENTS

InMemorySessionService (Google ADK Agent Development & Patterns)

OEM: Koenig Original • Duration: 3 Days (24 hrs)

COURSE MODULES & TOPICS

Module 1: Introduction to Google ADK

- Overview and capabilities of Google Agent Development Kit
- Google ADK resources and environment setup

Module 2: Building Your First Agent

- Create agent application with Gemini models
- Add Tavily search tool and API server for testing

Module 3: Testing and Streaming with API Server

- API server for testing
- Streaming with Server-Sent Events (SSE)

Module 4: Context and State Management

- Conversation context management with include_contents
- Google ADK sessions and state management
- Four types of state: scope and persistence

Module 5: Direct API Calls and Manual Agent Execution

- Direct API calls to models without Google ADK agent
- Run agents manually without adk web or adk run

Module 6: Stateful Agent Development

- Build a stateful translation agent
- End-to-end exercises

Module 7: Agent Delegation and Composition

- Automatic agent delegation to subagents
- Sequential, parallel, and loop agents

Module 8: Safety and Security in AI Agents

- Guardrails for AI agents

Module 9: Integrating MCP Servers

- Integrate MCP servers with Google ADK agents
- Custom MCP server exposing filesystem tools

Module 10: Config-Based Agent Development

- Build AI agents using config-based approach
- Multi-agent tutor architecture with YAML configurations

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Module 11: Agent Delegation Patterns
- Delegation pattern with sub-agents

Module 12: Design Patterns and Best Practices
- Google ADK design patterns and best practices
- Two main categories of agentic patterns
- Pattern-to-ADK component mapping

Module 13: Agent Architecture and Workflow
- Agent classes, hierarchy, and workflow agents
- Key design principles of Google ADK

Module 14: Agent Architecture Patterns
- Solo agent design pattern
- Agent roles design pattern

Module 15: Agent Process and Interaction Patterns
- Prescribed plan design pattern
- Agent-to-agent handoff design pattern
- Using agents as tools
- Multi-agent orchestration design pattern

Module 16: Advanced Agent Patterns
- Reflexion design pattern
- ADK agent as MCP server
- Human-in-the-loop design pattern
- Hierarchical multi-agent/task decomposition
- Review/critique design pattern

Module 17: Applying Patterns and Principles
- Selecting patterns for ADK applications
- Principles for successful agentic apps

Module 18: 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
- A2A protocol, MCP integration, HITL, Streamlit UI
- Quality refinement loops, Pydantic schemas, SQLite database
- ADK runner, session setup, policy documents
- InMemorySessionService, basic authentication, project creation with uv
- Approval gate, testing, and documentation