



Develop Conversational Agents on Google Cloud

Course description

In this course, you will learn the end-to-end process of developing highly effective conversational agents on Google Cloud Platform. You will gain a deep understanding of core conversational AI concepts, master the use of Google Cloud's Dialogflow ES and Dialogflow CX for designing sophisticated conversational flows, and learn to integrate these agents with various backend systems and external APIs. The course covers practical aspects from initial design to deployment, monitoring, and optimization, while also exploring advanced capabilities like generative AI integration and voice enablement. By the end of this course, you will be equipped to design, build, and deploy intelligent virtual agents that provide seamless user experiences across multiple channels.

- Course level: Intermediate
- Duration: 2 days

Activities

This course includes presentations, hands-on labs, demonstrations, and group exercises.

Course objectives

In this course, you will learn to:

- Understand the fundamental concepts and architecture of conversational AI.
- Differentiate between Dialogflow ES and Dialogflow CX and select the appropriate tool for specific use cases.
- Design intuitive and effective conversational flows using Intents, Entities, Contexts, Pages, and Flows.
- Implement complex agent logic and integrate with external backend systems using webhooks and Google Cloud services.
- Leverage Google Cloud's Text-to-Speech (TTS) and Speech-to-Text (STT) for building voice-enabled agents.
- Integrate generative AI models from Vertex AI into Dialogflow agents for enhanced natural language understanding and response generation.
- Deploy, monitor, and optimize conversational agents for performance and user satisfaction.
- Apply responsible AI principles to ensure fair, secure, and ethical conversational agent development.

Intended audience

This course is intended for those with a foundational understanding of programming and cloud concepts:

- AI/ML Developers
- Software Engineers
- Solutions Architects
- Product Managers overseeing conversational AI initiatives
- Data Scientists interested in practical AI applications
- Cloud Engineers looking to specialize in conversational AI solutions

Prerequisites

We recommend that attendees of this course have:

- Basic programming knowledge (Python experience preferred)
- Familiarity with core cloud computing concepts
- Foundational understanding of Artificial Intelligence and Machine Learning principles
- Prior exposure to Google Cloud Platform is beneficial but not strictly required

Course outline

Module 1: Introduction to Conversational AI & Google Cloud's Offerings

- What is Conversational AI? Defining virtual agents, chatbots, and voicebots.
- Key components of a conversational AI system: NLU, NLG, Dialog Management, Knowledge Base.
- Use cases and benefits of conversational agents across industries.
- Overview of Google Cloud's Conversational AI portfolio: Dialogflow ES, Dialogflow CX, Contact Center AI (CCA), Vertex AI.
- Understanding the architectural differences and best use cases for Dialogflow ES vs. Dialogflow CX.
- Demo: Exploring the basic structure and functionality of a simple Dialogflow agent.

Module 2: Building Basic Agents with Dialogflow ES

- Deep dive into Dialogflow ES architecture: Agents, Intents, Training Phrases, Entities, Contexts.
- Designing fundamental conversational flows and user journey mapping.
- Creating and managing Intents to capture user requests.
- Defining custom entities and leveraging system entities for parameter extraction.
- Utilizing contexts to maintain state and manage multi-turn conversations.
- Providing static and dynamic responses.
- Hands-on Lab: Building a simple FAQ and information retrieval bot using Dialogflow ES.

Module 3: Advanced Conversational Design with Dialogflow CX

- Introduction to Dialogflow CX: State-machine design paradigm.
- Understanding Flows, Pages, Routes, and Event Handlers in Dialogflow CX.
- Designing complex, multi-turn conversational paths with the visual flow builder.
- Implementing robust parameter collection through form filling.
- Managing transitions between pages and flows, including conditional routing.
- Strategies for handling unexpected user inputs, disambiguation, and fallback.

- Hands-on Lab: Designing and implementing a multi-flow order management agent using Dialogflow CX.

Module 4: Integrating Agents with Backend Systems and APIs

- Introduction to Webhooks: Extending agent capabilities with custom fulfillment logic.
- Developing and deploying webhook services using Google Cloud Functions or App Engine.
- Securely connecting Dialogflow agents to external databases, APIs, and business systems.
- Dynamic data retrieval and personalized response generation.
- Sending rich responses with cards, images, and quick replies.
- Hands-on Lab: Integrating a Dialogflow CX agent with a mock inventory API using Cloud Functions for real-time stock checks.

Module 5: Deployment, Monitoring, and Optimization

- Integrating Dialogflow agents with various channels: Google Assistant, web embeds, mobile apps, social media, and custom platforms.
- Managing agent versions and environments for development, staging, and production.
- Monitoring agent performance using Dialogflow History, Google Cloud Logging, and custom metrics in Cloud Monitoring.
- Analyzing conversation logs and user interactions for identifying improvement areas.
- Iterative development and A/B testing strategies for agent optimization.
- Security best practices: IAM roles, data encryption, and network configurations for conversational agents.
- Demo: Deploying a Dialogflow CX agent to a web messenger widget and reviewing conversation analytics.

Module 6: Leveraging Generative AI and Voice Capabilities

- Introduction to Generative AI on Google Cloud: Vertex AI Generative AI Studio.
- Integrating Large Language Models (LLMs) for advanced NLU and dynamic response generation within Dialogflow agents.
- Exploring Text-to-Speech (TTS) and Speech-to-Text (STT) services for voice agent development.
- Building voice-enabled conversational agents: Design considerations for natural speech interaction.

- Overview of Google Cloud Contact Center AI (CCA) solutions: Agent Assist, CCA Insights, Virtual Agent.
- Hands-on Lab: Enhancing a Dialogflow CX agent with Vertex AI Generative AI for contextual summarization or creative response generation.

Module 7: Responsible AI Principles and Ethical Considerations

- Core principles of Responsible AI in the context of conversational agents.
- Addressing issues of bias, fairness, and transparency in agent design and training data.
- Data privacy and security considerations: PII handling, user consent, and compliance (e.g., GDPR, HIPAA).
- Strategies for mitigating harmful content, adversarial inputs, and ethical risks.
- Designing for user trust and transparent communication (e.g., clearly identifying AI agents).
- Ethical guidelines for designing human-like interactions and avoiding misrepresentation.
- Group Exercise: Scenario analysis and discussion on ethical dilemmas in conversational AI deployment.

Module 8: Course Wrap-up & Capstone Project

- Comprehensive review of key concepts, tools, and best practices for developing conversational agents on Google Cloud.
- Discussions on scalability, maintainability, and future trends in conversational AI.
- Introduction to the Capstone Project: Participants will design, implement, and plan the deployment of a full-fledged conversational agent for a specific business scenario.
- Project planning, resource identification, and next steps for continuous learning.
- Additional resources, documentation, and Google Cloud certification paths for conversational AI.
- Hands-on Lab: Capstone – Developing a comprehensive Conversational Agent solution for a provided use case, incorporating learned principles and technologies.

Your course overview ends here.
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About CloudThat

Established in 2012, CloudThat is an award-winning company and the first in India to offer cloud training and consulting services for individuals and enterprises worldwide. Recently, it won Google Cloud's New Training Partner of the Year Award for 2025, becoming the first company in the world in 2025 to hold awards from all three major cloud giants: AWS, Microsoft, and Google. CloudThat notably won consecutive AWS Training Partner of the Year (APJ) awards in 2023 and 2024 and the Microsoft Training Services Partner of the Year Award in 2024, bringing its total award count to an impressive 12 awards in the last 8 years.

CloudThat specializes in Cloud Migration, Data Platforms, DevOps, IoT, and cutting-edge technologies like Gen AI & AI/ML. As a Microsoft Solutions Partner, AWS Premier Tier Training Partner, Google Cloud Platform Partner, and collaborator with leading organizations like HPE, Oracle, Nvidia and Databricks, CloudThat has trained over 850,000 professionals across 600+ cloud certifications, empowering students and professionals worldwide to advance their skills and careers.

To know more about our cloud certification training, email at sales@cloudthat.com or call us at [+91-8880002200](tel:+91-8880002200) or [+1-8555588830](tel:+1-8555588830) for those from outside India.