

SAP Generative AI on BTP with AI Core and AI Launchpad

<https://www.anubhavtrainings.com/btp-gen-ai-training>

Target Audience: You are working as an SAP Consultant, Functional Consultant, or ABAP Developer, and your customers are increasingly asking about leveraging Artificial Intelligence in SAP S/4HANA or BTP-based solutions. With SAP's rapid shift towards intelligent, cloud-first solutions, clients expect you to deliver innovation using AI-powered extensions that improve productivity, automate tasks, and provide predictive insights.

Prerequisites- Basic understanding of SAP, Strong programming knowledge on any technology, good idea of data structures, Depth understanding of web architecture and services, **Complete knowledge of SAP BTP development process**, knowledge on git and git hub, working with cloud foundry environment



Duration: 40 Hours – A promise of no copy paste

▶ What you get by joining our training

- 40 Hours of Detailed Lecture with Videos
- Get access to over 20 real-time case studies projects and use cases
- Support for issues and deployment (no job support)
- Presentation and Whiteboards
- End to end BTP Basics of Python and AI/ML terminology
- Best-in-class cutting edge content with Python basics included
- Latest concepts on Business Technology Platform AI Core, AI Launchpad, LLM Models
- Integrating your use case with Fiori, S/4HANA, BTP Based applications and more
- Building chatbots for your customers integrating with GenAI from open source and SAP BTP
- Included latest Joule Studio for AI agent building

Our Course Page:

<https://www.anubhavtrainings.com/btp-gen-ai-training>

<https://www.anubhavtrainings.com/sap-build-process-automation>

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▶ About the Course

SAP AI Core is a powerful, scalable runtime environment on SAP Business Technology Platform (BTP) designed to operationalize and manage AI and machine learning models at enterprise scale. It enables data scientists and developers to deploy, monitor, and govern AI workloads using standard open-source tools while integrating seamlessly with SAP and non-SAP systems.

SAP AI Launchpad serves as the unified interface to manage and orchestrate these AI assets, offering visibility into deployed models, inference pipelines, and performance metrics. With a user-friendly UI and role-based access, it facilitates collaboration between IT, business, and data teams. Together, **SAP AI Core and AI Launchpad** form the backbone for building intelligent, AI-driven business processes across the SAP ecosystem — from automating document processing and natural language understanding to implementing advanced Retrieval-Augmented Generation (RAG) systems, agentic AI workflows, and knowledge graph-powered applications that transform how enterprises leverage generative AI.

▶ In this Training of SAP BTP Gen AI, we will:

This comprehensive course takes you on a complete journey from Python fundamentals to enterprise-grade generative AI implementation on SAP BTP. You'll start by building a strong foundation in Python programming, advance through machine learning and NLP concepts, then master cutting-edge technologies like LangChain, LangGraph, RAG (Retrieval-Augmented Generation), and agentic AI frameworks.

The course uniquely combines hands-on development with real-world business scenarios — from building intelligent chatbots and AI agents to creating RAG-powered applications with HANA Vector Engine, implementing knowledge graphs, and integrating AI capabilities with SAP S/4HANA systems. You'll work with industry-leading LLMs (GPT, Claude, Llama), implement orchestration services with content filtering and data masking, and deploy production-ready AI solutions to SAP BTP.

By the end of this course, you'll possess the complete skill set to architect, develop, and deploy sophisticated AI solutions that bridge data science innovation with enterprise operations — transforming business processes through intelligent automation and generative AI.

Key areas you'll focus on include:

1. Python Foundation to Advanced Development: Master Python programming from basics through advanced topics including pandas, database connectivity, UI development with Streamlit, and building reusable modules for enterprise applications.
2. Machine Learning and NLP Implementation: Build classification and regression models, understand neural networks, implement natural language processing with tokenization, embeddings, TF-IDF calculations, and cosine similarity for intelligent text analysis.
3. LangChain, LangGraph, and Agentic AI Architecture: Learn to build sophisticated AI agents using LangChain's framework, implement stateful chatbots with memory, create custom tools, design multi-agent workflows with LangGraph, and understand the difference between GenAI, AI Agents, and Agentic AI systems.
4. RAG (Retrieval-Augmented Generation) with HANA Vector Engine: Implement advanced RAG systems that overcome LLM limitations by combining language models with custom knowledge bases stored in HANA Cloud's vector engine, enabling context-aware responses from proprietary enterprise data.
5. SAP AI Core and AI Launchpad Mastery: Deploy and manage AI models using SAP's Gen AI Hub, create scenarios with foundation models (GPT, Claude), monitor with LangSmith traceability, and

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build production-grade microservices that integrate with SAP Business Application Studio and SAP Build Apps.

6. Knowledge Graphs and Multi-Modal AI: Work with HANA Cloud Knowledge Graph Engine (KGE), understand RDF triples and SPARQL queries, implement graph-based RAG scenarios, and process image and audio content using open-source models like Llama.
7. Enterprise Integration and Orchestration: Integrate AI capabilities with SAP S/4HANA through OData APIs, implement SAP's orchestration service for content filtering, data masking and grounding, build CAP applications with LLM plugins, and create field agent bots that execute business transactions.
8. End-to-End Deployment and Governance: Package applications using MTA (Multi-Target Applications), deploy to Cloud Foundry on BTP, implement security with app routers and destinations, manage environment variables, and establish governance frameworks for AI operations.

By the end of this course, you'll have

- **Architect and develop complete AI solutions** from scratch using Python, including data processing, ML modeling, NLP implementation, and modern generative AI applications
- **Build production-ready RAG systems** that connect LLMs with enterprise knowledge bases using HANA Vector Engine and CAP LLM plugins for context-aware AI responses
- **Create intelligent AI agents** using LangChain and LangGraph that can reason, use tools, maintain conversation history, and execute complex multi-step workflows autonomously
- **Deploy and manage AI workloads** on SAP BTP using AI Core and AI Launchpad, including model deployment, monitoring, governance, and integration with foundation models (GPT, Claude, etc.)
- **Implement knowledge graph solutions** using HANA Cloud KGE with RDF triples and SPARQL queries to power advanced reasoning and relationship-based AI applications
- **Integrate AI with SAP business processes** by connecting AI services to S/4HANA via OData APIs, building Fiori applications, and implementing field agent bots for transaction automation
- **Apply orchestration services** for enterprise-grade AI governance including content filtering, data masking, grounding, and augmented analytics
- **Deliver scalable, secure AI innovation** within a clean-core architecture using modern DevOps practices, MTA deployments, and proper security configurations on SAP BTP

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COURSE CONTENT (UNIT WISE)

Unit 1 - SAP BTP Introduction (Demo Session)

- Setting up development tools like **VS Code**
- Installing **Python** and plug-ins in VS Code for **Co-pilot, pdf viewer** along with **git**
- Create first python program and execute in console
- Working with variables, inputs and multi-line strings

Unit 2 – Introduction to Python Basics

- Setting up development tools like **VS Code**
- Installing **Python** and plug-ins in VS Code for **Co-pilot, pdf viewer** along with **git**
- Create first python program and execute in console
- Working with variables, inputs and multi-line strings
- Working with advance data variables like lists, tuples, dictionaries
- Arithmetic and Logical operations
- Functions, loops and conditions
- Working with **JSON**
- Create consumable modules and packages

Unit 3 – Python Advance Development

- Working with panda's library
- Exercise: Design a solution to print Anubhav training courses order
- Debugging code in VS Code
- Getting started with next use case, setting up python environment
- Setting up **postgres sql** database in cloud using Aiven
- Download and install pgAdmin tools
- Connect to remote database and explore tables
- Create python logic to connect to DB using connection string
- Using environment variables
- Adding reusable functions for create table, and query data

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Unit 4 – Implementing python use case with UI

- Design UI using **streamlit** module in python
- Adding business logic for use case
- Adding forms, input, submit buttons, icons and messages
- Orchestration of data flow with DB
- Generating output using pdf

Unit 5 – Working with Machine Learning

- Introduction to Machine Learning
- Types of Machine Learning
- Types of problems – Classification, regression
- ML Modelling process
- Using Logistic regression
- Determining model efficiency with Confusion matrix
- Concepts of Efficiency, Sensitivity, Specificity, Accuracy
- Getting started with python ML Library
- Adding the backend component

Unit 6 – Real time implementation of ML

- Real-time Scenario: Design model for predicting heart patient
- Training, validation and applying ML Model
- Building Services to consume the model
- Building UI to consume the service
- Deploy the application to SAP BTP

Unit 7 – Real time implementation of NLP

- What is NLP
- Core Components of NLP
- Steps to implement NLP
- Understanding data processing, feature extraction, stemming, lemmatization
- Calculation for TF-IDF matrix
- Vectorization and Embeddings
- Computation of cosign similarities

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- Implementation of NLP step by step

Unit 8 – Introduction to Transformer

- Use Case: Anubhav Training's Chatbot development using NLP
- Deploying app to SAP BTP environment

Unit 9 – Introduction to Transformer

- Real-time Scenario: Design model for predicting heart patient
- Training, validation and applying ML Model
- Building Services to consume the model
- Building UI to consume the service
- Deploy the application to SAP BTP

Unit 9 – Langchain Architecture and consumption of LLM

- Understanding need of NLP over text search Databases
- AI Jargons – AI, ML, Statistical ML, Deep Learning
- Deep learning fundamentals
- What is Neural Network and how it works
- What is LLM and how it works
- The Science of Generative AI
- Transformer architecture
- Example of Encoding and decoding
- Temperature, top-k, top-n and penalties
- Types of LLM
- Context window
- Comparison of different LLMs and their features
- Prompt Engineering
- LLM Playgrounds
- Subscribing to different LLMs like GPT, Anthropic, groq
- What is langchain and its architecture
- Why langchain benefits and differences
- Use Case: Implementation of chatbot for restaurant chain enterprise



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Unit 10 – Introduction to Langchain Features, LangGraph and AI Agent, Agentic AI

- Working with Open AI LLM – GPT Model with service keys
- Identifying the different LLM comparison
- LLM models and token calculations
- Langchain features – domain knowledge, prompts, few shot learning, Stateful chatbot
- Working with LLM and tools
- Create tool Tavily search service key
- Integrating standard langchain tools
- Difference between chain.run and chain.invoke
- Graph basics – nodes and Edges
- Langgraph introduction
- Use Cases: Query engine with custom tables, finding current affairs chatbot, chatbot with history and context, integrating with custom tools
- Use Case: Chatbot to generate custom code, translate texts
- GenAI v/s AI Agents v/s Agentic AI
- What is AI Agent and how they work?
- What is Agentic AI
- Example of Agentic AI Application
- Building blocks of Agentic AI
- Agentic AI Framework – LCNC and Code based frameworks
- Use case: AI agent with Langgraph to query LLM and internet data along with custom tool to update vendor data in SAP, debugging



Unit 11 – Manage custom tools and SAP BTP Gen AI HUB

- Difference between Langchain and Langgraph
- Traceability with Langsmith
- Create langsmith service key and tracking usage
- Use Case: Trace the Chatbot with Langsmith
- SAP HANA Cloud Setup with service key
- Setting up SAP HANA Cloud tools in BTP
- Adding environments for SAP HANA Cloud
- Add dependencies for HANA Cloud to Application
- Use Case: Create Sample DB and Load Data
- Integration with SAP HANA Cloud and LLM

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- BTP Subscription models
- Setup SAP BTP Free Tier (Pay as You Go) Account
- What is SAP GenAI HUB
- Subscribe to AI launchpad subscription
- Create AI core Service and service key
- Add AI core service key to launchpad and Create scenario for foundation model
- Create new deployment for gpt model with SAP Gen AI HUB
- Create SAP Business Application Studio Subscription
- Configure BAS to Python Development
- Add virtual Environment for BAS tool
- Test BAS tool

Unit 12 – SAP Gen AI Implementation : first llm consumption

- SAP's AI Strategy
- SAP AI portfolio
- SAP Joule offering
- Embedded AI Capabilities
- SAP BTP AI Capabilities
- What does GEN AI @ SAP offers
- Why Gen AI with SAP
- Using Gen AI and Scenarios
- AI launchpad introduction
- Roles using AI launchpad
- Roles in AI Launchpad
- SAP Help Documentation for Gen AI
- Use Case: Effective governance and public sentiment ticketing system



Unit 13 – Deploy first Scenario & Consume in SAP Build App

- Scenario and steps
- Connecting to HANA DB from local system
- Create SAP HANA schema in Cloud system
- Bind CF environment variables in python
- Prompt engineering for use case
- End to end development of scenario
- Adding Service layer, manifest, Procfile, runtime for deployment
- Troubleshooting and log
- Maintain CF parameters for Application

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- Testing service using POSTMAN tool
- SAP Build App Subscription
- Create Destination to CF service for scenario
- Starting with BAS tool for Fiori Development
- Create MTA application and add managed app router
- Add Fiori App free style module
- Make AJAX call to consume LLM Microservice
- Test application locally
- Replace binding and set default data
- Add security and app router configuration
- Package and deploy app to BTP

Unit 14 – RAG

- Challenges using LLM
- RAG Introduction
- How RAG based system works, key concepts
- Retriever Module
- Explanation in design time and Runtime
- HANA Vector Engine
- Storing Vectors in HANA VE
- Use Case: Anubhav Trainings Corporate Client Chatbot



Unit 15 – CAP LLM plugin with RAP

- CAP LLM plugin
- Usage of LLM plugin
- Use Case: Ask Anything App using company PDF
- Detailed Architecture and design for the app
- Embedding Vector size
- Implement the CAP application
- Adding dependencies on LLM, Langchain for NodeJS, CAP LLM plugin
- Adding the DB design for Conversation, Messages, Documents and Chunks
- Adding design time module for storing vector embeddings
- Link local app with HANA vector engine
- Link app with destination AI Core service with cds bind
- Adding configuration to package.json cds section

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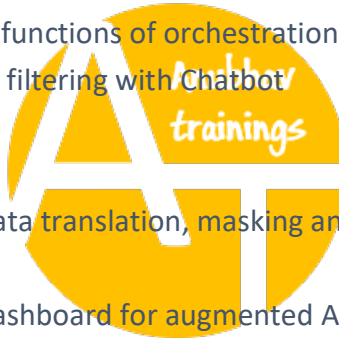
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- Test the design time by uploading sample pdf
- Generate embeddings
- Implement the runtime to inference using orchestration service
- CAP LLM plugin to find cosign similarity
- Using gpt-4 model to inference the AI response on custom vector embeddings
- Prepare and send response to user
- Test app using postman
- Adding the UI
- Adding MTA.yaml for deployment
- Deploying entire app to BTP account for testing

Unit 16 – Working with SAP orchestration service & Augmented AI

- Orchestration service in SAP BTP
- Understanding the internal functions of orchestration
- Use case: Integrate content filtering with Chatbot
- Data Masking
- Data Grounding
- Use Case: Implement the data translation, masking and grounding
- Augmented AI
- Use Case: Sales Analytics Dashboard for augmented AI



Unit 17 – Knowledge Graph

- What is graph
- Graph Type – Property Graph
- Example of Graph
- Knowledge Graph
- Example of Knowledge Graph
- Graph Database
- Where do we use graph database
- Terminologies – RDF, Triples, SPARQL
- SAP BTP with HANA Cloud offerings
- SAP HANA Cloud – A multi-model DB
- HANA Cloud KGE

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- How does HANA store and retrieve data
- Enable HANA Cloud for RDF triple store, the setup in BTP
- Prompt template for producing SPARQL
- Use Case: RAG use case for fresher's value proposition
- Reference Architecture for use case
- Step 0 – Pre-requisite and setup Amazon bedrock, Microsoft Azure
- Deploy Sonnet 3.7 and Open AI mini-4o data model
- Generate triples and store in HANA Knowledge Graph Engine
- Use Case: Scenario 2: Tabular data from S/4HANA in RAG scenario
- What is ontologies in HANA Knowledge graph
- Steps and architecture along with implementation

Unit 18 – Dynamic OData API & Open-Source Models

- NLP based GEN AI
- Components of NLP Gen AI
- NLU, NLP and NLG use cases
- Use Case: Field Agent Bot for create Sales orders in S/4HANA
- SAP Business Accelerator Hub
- S/4HANA System access with Anubhav Trainings
- Complementary OData Basic session
- SAP S/4HANA Sales order API activation
- What is CSRF token and usage, handling
- The design of use case
- Working with Open source AI LLM Models
- Download oLamma model and deploy locally
- Test the model locally
- Use Case: design app to process image and audio content

Unit 19 – Movie Recommendation system & MS Teams Integration

Unit 20 – Discover SAP Joule Studio

Unit 21 – Build AI agent and skill using SAP Joule Studio

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