S Oracle Cloud Infrastructure AI Foundations LVC

Oracle Cloud Infrastructure

DURATION	MODULES	COURSE CODE
1 Days	8 Lectures	—

Course Overview

After completing this course, you should be able to: Describe the fundamentals of Generative AI and LLMs Differentiate between various machine learning and deep learning architectures Explore the Oracle AI stack, including infrastructure, data, ML, and AI services Describe OCI's extensive AI tools portfolio and Generative AI services Analyze ML fundamentals, focusing on supervised and unsupervised learning techniques Examine deep learning through convolutional and sequence models such as CNNs, RNNs, and LSTMs Evaluate the capabilities and applications of Generative AI models and language frameworks Leverage OCI AI Services, OCI ML Services, OCI Generative AI, Oracle 23ai, and Oracle Select AI

What You Will Learn

Module 1: Course Introduction

- OCI AI Foundations Overview
- Employees Want AI at Work
- AI Helps Break the Career Ceiling
- AI is Going Mainstream
- Target Audience: Who Should Take This Course
- Course Outline
- Get Certified for FREE!
- Course Instructors
- Maximizing Your Learning Experience
- Getting Answers and Support
- Ratings and Feedback
- Keep Progressing: Path to Success

Module 2: Introduction to AI

- Objectives
- What is Artificial Intelligence?
- Human Intelligence
- AI Examples and Terminology

- Why AI is Needed
- AI Domains and Examples
- AI Tasks and Data
- Commonly Used AI Domains
- Language-Related AI Tasks & Text as Data
- Language AI Models
- Speech-Related AI Tasks & Audio as Data
- Audio and Speech AI Models
- Vision-Related AI Tasks & Images as Data
- Vision AI Models
- Other AI Tasks
- AI vs. ML vs. DL
- Relationship Between AI, ML, and DL
- Machine Learning Basics
- Using ML for Predictions, Insights, and Clustering
- Deep Learning and Neural Networks
- Generative AI Overview

Module 3: Machine Learning Foundations

- Objectives
- What is Machine Learning?
- Machine Learning Examples and Applications
- ML Model Inputs and Outputs
- ML Example: Classifying Cats and Dogs
- Data Types
- Flavors of Machine Learning
- When ML is Not the Optimal Solution
- Supervised Learning: Classification & Regression
- Logistic Regression
- Evaluation Metrics
- Regression Models & Training
- Unsupervised Learning: Clustering
- Similarity Measures
- Unsupervised Workflow
- Clustering Algorithms (K-Means)
- Machine Learning Use Cases

Module 4: Deep Learning Foundations

- Objectives
- Deep Learning Fundamentals
- What and Why of Deep Learning
- Brief History of Deep Learning
- Types of Deep Learning Algorithms
- Artificial Neural Networks (ANN)
- Building Blocks

- Handwritten Character Recognition Example
- Network Architecture
- Training ANNs
- Sequence Models: Recurrent Neural Networks (RNN) and LSTM
- Convolutional Neural Networks (CNN)
- CNN Layers Overview
- Robotic House Inspection Example
- Feature Extraction and Limitations
- Applications of CNN

Module 5: Generative AI and LLM Foundations

- Objectives
- Introduction to Generative AI
- How it Works
- Difference from Other AI Approaches
- Types and Applications
- Introduction to Large Language Models (LLMs)
- Examples and Features
- Model Size and Parameters
- Transformers
- Recurrent Neural Networks vs. Transformers
- Attention Mechanism
- Encoder-Decoder Architecture, Tokens, Embeddings
- Transformer Model Types
- Prompt Engineering
- LLM Alignment and Instruction Following
- In-Context Learning, Few-Shot Prompting, Chain-of-Thought Prompting
- Hallucination and Customization with Your Data
- Retrieval-Augmented Generation (RAG)
- LLM Fine-Tuning and Inference

Module 6: OCI AI Portfolio

- Objectives
- AI Services Overview for the Enterprise
- Oracle AI Stack
- Ways to Access OCI AI Services
- Language, Vision, Speech, Document Understanding, Digital Assistant
- ML Services Overview
- OCI Data Science: Core Principles, Features, and Terminology
- Data Labeling and Its Use in AI/ML Lifecycle
- Oracle Machine Learning in Databases
- AI Infrastructure
- GPU Architecture
- OCI GPU Instances (A100 80GB Deep Dive)
- Cluster Networking and Storage

- AI Infrastructure Case Study
- Responsible AI
- Trustworthy AI Principles
- Ethical Requirements
- Healthcare AI Challenges

Module 7: OCI Generative AI Service

- OCI Generative AI Introduction
- How OCI Generative AI Service Works
- Pretrained Foundational Models & Fine-Tuning
- Dedicated AI Clusters
- AI Vector Search in Oracle Database 23ai
- Vector Embedding Generation
- Vector Datatype, Distance Function, SQL
- Vector Index Syntax and Search
- Similarity Search and Gen AI Pipelines
- Natural Language Queries with Select AI
- Demonstration and Chat with Your Data
- Translate Language to Oracle SQL
- Developing Apps with Select AI
- Easy Configuration for Natural Language Queries
- SQL Query Generation Flow
- Key Takeaways

Module 8: OCI AI Services

- Objectives
- OCI Language Services
- OCI Speech Services
- Console Walkthrough
- OCI Vision Services
- Image Analysis and Console Walkthrough
- Document Understanding / Document AI
- Oracle AI APIs and SDKs