Applied Database Systems using Oracle AI Database – Course Description

Overview

This course introduces students to a range of skills required to build Oracle Database Solutions by providing an overview of database topics and development, with many of the capabilities and features utilizing Oracle AI Database. It focuses on the following main ideas of 'Database Basics', 'Data Modeling Fundamentals', 'Low Code Database Application Development', 'Developing Database Applications', 'Data Integration', 'Database Security and Availability', 'Machine Learning', 'Graph and Spatial', 'Why is data so important? Data vs Real World Use Cases', 'Generative AI using Select AI', 'Vector Search' and 'Data Studio' through lesson slides, videos, hands on labs, and assessments. Oracle Academy provides you with free access to the Oracle Cloud Platform, which is a comprehensive, standards-based combination of Oracle and open-source technologies that enable users to efficiently build, deploy, integrate, secure, and manage enterprise applications. Students must be the age of legal majority in their country of residence to receive a Cloud account.

Available Curriculum Languages:

- English

Duration

- Recommended total course time: 90 hours*
- Professional education credit hours for educators who complete Oracle Academy training: 30

** Course time includes instruction, self-study/homework, practices, labs and assessments*

Target Audiences

Educators

- Technical, vocational and 2- and 4- year college and university faculty members who teach computer science, information communications technology (ICT), data science, business, or a related subject

Students

- Students who wish to gain a foundational knowledge of the Oracle Database and Development
- Novice and advanced level programmers, database administrators, developers, and data architects
- Students interested in Data Management, Architecture, Operations, or Development roles in IT

Prerequisites

Required

- General knowledge of the purpose of a database
- Basic understanding of Computing and Database uses

Suggested

- Previous experience with either database or programming fundamentals
- Database Foundations

Suggested Next Courses

- Database Design
- Database Programming with SQL
- Application Development Foundations

Section Topics and Content

Section 1 – Database Basics - Part 1 - What are databases, What do they do, What are the basic components

- Database Background
- Relational Databases
- Database Development
- Oracle Database Management System
- Hands on Lab

Section 2 – Database Basics - Part 2 - Tables, Keys, SQL Basics

- Database Refresh/SQL
- Creating Databases, Inserting, and Updating Data
- Retrieving/Conditionally Retrieving Data
- Ordering Data, Using Indexes
- Joining Tables
- Hands on Lab

Section 3 – Data Modeling Fundamentals

- Database & SQL 101
- Security trends
- Design, why?
- What is and isn't modeling
- Logical vs Relational Models
- Practical Database Design Tips
- Using Oracle SQL Developer Data Modeler

Section 4 – Low Code Database Application Development

- What is a Low-Code Application Platform?
- What is Oracle APEX?
- Product Timeline
- Use Cases
- Product Components
- Features
- Leveraging Vector Search feature Oracle Database
- Oracle APEX Training & Certification
- Hands on Lab

Section 5 – Developing Database Applications with Unstructured Data (JSON)

- JSON as a data model
- JSON, databases, SQL and application development
- Even better: JSON Relational Duality
- Oracle - JSON Demo
- Hands on Lab

Section 6 – Data Integration - The Key to Data Centric Data Management

- Three major categories of integration
- Technical aspects of each integration category
- Data Loads - Diversity and fragmentation of data
- Data Transforms - Key concepts
- Hands on Lab

Section 7 – Database Security

- What is security and why does an organization need it?
- Security trends
- Database security
- Database security controls
- Oracle Database security case study
- Hands on Lab

Section 8 – Database Availability

- Availability – A Simple Example
- High Availability → Redundancy
- The Basics: Backup & Recovery
- Standard Database High Availability Solutions
- High Availability vs. Disaster Recovery
- Some Advanced Cases
- A Glance at Planned Downtime & Summary
- Hands on Lab

Section 9 – Introduction to Machine Learning

- Machine Learning Concepts
- Machine Learning process
- Hands on Lab

Section 10 – Introduction to Graph Database and Analytics

- What is a Graph Database?
- Why Graph Databases?
- Property Graphs and RDF Graphs
- Creating Graphs
- Querying Graphs
- Analyzing Graphs
- Graphs and Machine Learning
- Hands on Lab

Section 11 – Introduction to Spatial Database on Oracle

- Spatial Basics
- Spatial Data Management
- Spatial Analysis
- Spatial in AI
- Hands on Lab

Section 12 – Why is data so important? Data vs Real World Use Cases

- What us Data Strategy
- From Vision to Reality
- Business Outcomes
- Something to Take away

Section 13 – Introduction to Generative AI using Select AI

- Artificial Intelligence and Generative AI
- Select AI in Autonomous Database and use cases
- Natural Language to SQL generation (NL2SQL)
- Select AI 'chat' action – Use Case
- Conversations
- Retrieval Augmented Generation (RAG)
- Synthetic Data Generation (SDG)
- Hands on Lab

Section 14 – Introduction to Vector Search with Oracle AI Database

- What are Vectors
- How AI Vector Search Works
- Generating and Searching Vectors
- Vector Indexes
- Retrieval Augmented Generation (RAG)
- Agentic RAG
- Integration
- Hands on Lab

Section 15 – Introduction to Data Studio

- Self-Service Analytics
- Oracle Data Studio
- Data Workflows – Use Cases
- Hands on Lab