

Applied Database Systems – 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. It focuses on the main ideas of 'Database Basics', 'Developing Database Applications', 'Data Integration', 'Database Resiliency and Security', 'Machine Learning' and 'Data Management' through lesson slides, videos, hands-on labs, section quizzes, and midterm and final exams. Oracle Academy provides 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 an Oracle Academy Cloud Program 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, projects and assessment*

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 and Database Programming with SQL
- Oracle Application Express (APEX) – 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

- Tables, Keys, SQL Basics review
- 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

- Data and Applications Introduction
- Low Code: What Is It?
- Oracle APEX Overview
- APEX Demonstration
- Hands-on Lab

Section 5 – Developing Database Applications - Beyond Tables and SQL - Other languages: Python, Node.js and unstructured data {JSON}

- Data, Workloads, Languages
- All About JSON and Its History
- JSON and SQL
- 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
- Integration Demo
- 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

Section 9 – Introduction to Machine Learning

- Machine Learning Concepts
 - How does Machine Learning Work?
 - Algorithms
- Machine Learning Process
 - Machine Learning Use Cases
 - Trends on Machine Learning and AI
- Futures
- OML Demo
- 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
- Hands-on Lab

Section 11 – Introduction to Spatial Database on Oracle

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