ORACLE 12c
Database Administrator (150 Horas)

En este curso, el participante obtendrá los conocimientos y habilidades necesarias para la obtención del certificado internacional Oracle Certified Associates (OCA) y Oracle Certified Professional (OCP), basado en el material oficial de Oracle bajo el convenio de Workforce Development Program (WDP). Además, el alumno aprenderá la administración del sistema operativo, la gestión de los subsistemas de almacenamiento y la administración de redes y seguridad del motor de base datos.

LOGRO DEL CURSO
Al finalizar el curso, el alumno gestionará el motor de datos Oracle 12c. Adicionalmente, estará preparado para:

• Manipular los datos y objetos de base de datos.
• Gestionar la base de datos, la instancia de base de datos y conexiones.
• Administrar una instancia de base de datos y sus recursos de red.
• Implementar procedimientos de backup, restore y recovery de base de datos.
• Gestionar la arquitectura de tenencia múltiple en Oracle 12c.

DIRIGIDO
Profesionales, egresados y estudiantes, interesados en convertirse en administradores de base de datos.

PRE-REQUISITOS
• Conocimiento de modelamiento de base de datos (nivel intermedio).
• Conocimiento de lenguaje SQL (nivel básico).
• Conocimiento de sistemas operativos (nivel intermedio).
• Conocimiento de inglés técnico (nivel intermedio).

LÍNEA DE ESPECIALIZACIÓN
Oracle 12c Database Administrator → Oracle 12c WebLogic Server Administration

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METODOLOGÍA
El programa se encuentra estructurado en sesiones teórico/prácticas, donde se propicia la participación activa en cada clase, ya sea, compartiendo experiencias del contexto laboral del grupo, así como, desarrollando laboratorios de forma guiada e individual, permitiendo la consolidación del aprendizaje del tema.

CONTENIDO TEMÁTICO

ORACLE DATABASE 12C SQL WORKSHOP (24 HORAS)

Oracle database 12c, concepts and terminologies
- Oracle Database 12c and related products.
- Relational database management concepts and terminologies.
- What is Oracle SQL Developer?
- Starting SQL*Plus from Oracle SQL Developer.

Retrieving data using SQL SELECT statement
- Capabilities of the SELECT statement.
- Arithmetic expressions and NULL values in the SELECT statement.
- Column aliases.
- Use of concatenation operator, literal character strings, alternative quote operator, and the DISTINCT keyword.
- Use of the DESCRIBE command.

Restricting and sorting data
- Rules of precedence for operators in an expression.
- Substitution variables.
- DEFINE and VERIFY command.
- Using Single-Row functions to customize output.
- Describe the differences between single row and multiple row functions.
• Manipulate strings with character function in the
  SELECT and WHERE clauses.
• Manipulate numbers with the ROUND, TRUNC and
  MOD functions.
• Perform arithmetic with date data.
• Manipulate dates with the date functions.
• Group functions.
• Creating groups of data.
• Restricting group results.

**Using conversion functions and conditional expressions**
• Describe implicit and explicit data type conversion.
• Use the TO_CHAR, TO_NUMBER, and TO_DATE
  conversion functions.
• Nest multiple functions.
• Apply the NVL, NULLIF, and COALESCE functions to
  data.
• Use conditional IF THEN ELSE logic in a SELECT
  statement.

**Displaying data from multiple tables using joins**
• Types of Joins.
• Natural join.
• Self-join.
• Non equijoins.
• OUTER join.
• Single row subqueries.
• Multiple row subqueries.

**Using the SET operators**
• Set Operators.
• UNION and UNION ALL operator.
• INTERSECT operator.
• MINUS operator.
• Matching the SELECT statements.
• Using ORDER BY clause in set operations.
• Managing tables DML statements.
  – Data manipulation language
  – Database transactions
  – Data definition language

**ORACLE DATABASE 12C INSTALL AND UPGRADE WORKSHOP (16 HORAS)**

**Oracle Database 12c overview**
• Oracle database instance configurations.
• Oracle database memory structures.
• Process structures.
• Database storage architecture.
• Logical and physical database structures.

**Installing Oracle grid infrastructure for a standalone server**
• Oracle grid infrastructure for a standalone server.
• System requirements for Oracle grid infrastructure.
• Storage for Oracle Automatic Storage Management (ASM).

**Installing Oracle grid infrastructure for a standalone server**
• Installing Oracle grid infrastructure for a standalone server.
• Upgrading oracle grid infrastructure for a standalone server.

**Installing Oracle Database software**
• Planning your installation.
• System requirements.
• Preparing the operating system.
• Using 4 KB sector disks.
• Setting environment variables.
• Checking system requirements.
• Oracle Universal Installer (OUI).
• Performing a silent mode installation.
Creating Oracle Database using DBCA
- Planning the database storage structure.
- Choosing non-CDB or CDB.
- Types of databases (based on workload).
- Choosing the appropriate character set.
- NLS_LANG initialization parameter.
- Using the database configuration assistant (DBCA).

Oracle restart process startup
- Controlling Oracle Restart.
- Choosing the Correct SRVCTL Utility.
- Oracle Restart Configuration.
- Using the SRVCTL Utility.
- Obtaining Help for the SRVCTL Utility.
- Starting Components by Using the SRVCTL Utility.

Preparing to upgrade to Oracle 12c
- Developing a test plan.
- Performance testing.
- Requirement for databases using Oracle Warehouse Builder.
- Pre-Upgrade information tool.
- Backing up the database.
- Installing the Oracle Database 12c.
- Preparing the New Oracle Home.

Upgrading to Oracle Database 12c
- Upgrading by using the database upgrade assistant (DBUA).
- Manually upgrading Oracle 12c.
- Migrating a non-CDB to a CDB.

Performing post-upgrade tasks
- Migrating a non-CDB to a CDB.
- Migrating to unified auditing.
- Migrating data by using Oracle Data Pump.
  - Migrating by using data pump.
  - Importing by using a network link.

Exploring the Oracle Database architecture
- Oracle Database Architecture.
- Oracle Database Instance Configurations.
- Connecting to the Oracle Database Instance.
- Oracle Database Memory Structures.
- Process Architecture.
- Process Structures.
- Process Startup Sequence.
- Database Storage Architecture.

Managing the Database Instance
- Introducing Oracle Database Management Tools.
- Understanding the Enterprise Manager Management Framework.
- Logging in to Oracle Enterprise Manager Database Express.
- Using the Enterprise Manager Database Express Home Page.
- Using Enterprise Manager Cloud Control.
- Using SQL*Plus.
- Using SQL Developer.
- Initialization Parameter Files.
Configuring the Oracle Network Environment
• Oracle Net Services Overview.
• Oracle Net Listener Overview.
• Establishing Oracle Network Connections.
• Tools for Configuring and Managing the Oracle Network.
• Using the Listener Control Utility.
• Using Oracle Net Configuration Assistant.
• Using Oracle Net Manager.
• Using Enterprise Manager Cloud Control.

Managing Database Storage Structures
• Understanding Storage of Data.
• Database Block Contents.
• Exploring the Storage Structure.
• Creating a New Tablespace.
• Overview of Tablespaces Created by Default.
• Managing Tablespaces.
• Viewing Tablespace Information.
• Using Oracle Managed Files.

Managing Undo Data
• Undo Data Overview.
• Transactions and Undo Data.
• Storing Undo Information.
• Comparing Undo Data and Redo Data.
• Managing Undo.
• Configuring Undo Retention.
• Guaranteeing Undo Retention.
• Changing an Undo Tablespace to a Fixed Size.

Implementing Oracle Database Auditing
• Separation of Responsibilities.
• Database Security.
• Monitoring for Compliance.
• Standard Database Auditing.
• Unified Audit Data Trail.
• Separation for Duties for Audit Administration (AUDIT_ADMIN and AUDIT_VIEWER roles).
• Configuring the Audit trail.
• Specifying Audit Options.

Performing Database Maintenance
• Database Maintenance.
• Viewing the Alert History.
• Terminology.
• Automatic Workload Repository (AWR).
• Statistic Levels.
• Automatic Database Diagnostic Monitor.
• Advisory Framework.
• Enterprise Manager and Advisors.

Managing Data Concurrency
• Overview of Locks.
• Locking Mechanism.
• Data Concurrency.
• DML Locks.
• Enqueue Mechanism.
• Lock Conflicts.

Managing Performance
• Performance Monitoring.
• Tuning Activities.
• Performance Planning.
• Instance Tuning.
• Performance Tuning Data.
• Monitoring Performance.
• Managing Memory.
Managing Performance: SQL Tuning
• SQL Tuning.
• Oracle Optimizer.
• SQL Plan Directives.
• Adaptive Execution Plans.
• SQL Advisors.
• Automatic SQL Tuning Results.
• SQL Tuning Advisor.

Managing Resources by Using Database
• Database Resource Manager.
• Using the Resource Manager.
• Default Maintenance Resource Manager Plan.
• Resource Manager Workflow.
• Specifying Resource Plan Directives.

Backup and Recovery
• Categories of Failures.
• Flashback Technology.
• Understanding Instance Recovery.
• Phases of Instance Recovery.
• Tuning Instance Recovery.
• Using the MTTR Advisor.
• Media Failure.
• Configuring for Recoverability.

Moving Data
• General Architecture.
• Oracle Data Pump.
• SQL*Loader.
• External Tables.

Automating Tasks by Using Oracle Scheduler
• Simplifying Management Tasks.
• Understanding a Simple Job.
• Core Components.
• Persistent Lightweight Jobs.
• Creating a Time-Based Job.
• Creating an Event-Based Schedule.

Working with Oracle Support
• Using the Support Workbench.
• Using Enterprise Manager.
• Working with Oracle Support.
• My Oracle Support Integration.
• Researching an Issue.
• Logging Service Requests.
• Managing Patches.
• Applying a Patch Release.

Managing Space
• Space Management Overview.
• Block Space Management.
• Row Chaining and Migration.
• Free Space Management within Segments.
• Types of Segments.
• Allocating Extents.
• Allocating Space.
• Creating Tables without Segments.
Getting started
- Core Concepts of the Oracle Database, Critical for Backup and Recovery.
- Oracle DBA Tools for Backup and Recovery.
- Connecting to Oracle Recovery Manager (RMAN).
- Quick Start: A Problem–Solution Approach.

Configuring for recoverability
- RMAN commands.
- Configuring and managing persistent settings.
- Fast Recovery Area (FRA).
- Control file.
- Redo log file.
- Archiving logs.

Using the RMAN recovery catalog
- Creating and configuring the recovery catalog.
- Managing target database records in the recovery catalog.
- Using RMAN stored scripts.
- Maintaining and protecting the recovery catalog.
- Virtual private catalogs.

Backup strategies and terminology
- Backup solutions overview and terminology.
- Balancing backup and restore requirements.
- Backing up read–only tablespaces.
- Best practices for data warehouse backups.
- Additional backup terminology.

Performing backups
- RMAN backup types.
- Incrementally updated backups.
- Fast incremental backup.
- Block change tracking.
- Oracle–suggested backup.
- Reporting on backups.
- Managing backups.

Improving your backups
- Compressing backups.
- Using a media manager.
- Creating RMAN multisession backups, proxy copies, duplexed backup sets and backups of backup sets.
- Creating and managing archival backups.
- Backing up recovery files.
- Backing up the control file to a trace file.
- Cataloging additional backup files.
- Backing up ASM disk group metadata.

Using RMAN–Encrypted backups
- Creating RMAN–Encrypted backups.
- Using transparent–mode encryption.
- Using password–mode encryption.
- Using dual–mode encryption.

Diagnosing database failures
- Reducing problem diagnosis time.
- Automatic diagnostic repository.
- Interpreting RMAN message output and error stacks.
- Data recovery advisor.
- Diagnosing data file loss (file system and ASM).
- Handling block corruption.

Restore and recovery concepts
- Restoring and Recovering.
- Instance failure and instance/crash recovery.
- Media Failure.
- Complete recovery (overview).
- Point–in–Time recovery (overview).
- Recovery through RESETLOGS.

Performing recovery, Part 1
- RMAN recovery in NOARCHIVELOG mode.
- Performing complete recovery (of critical and noncritical data files).
- Restoring ASM disk groups.
- Recovery with image files.
• Performing Point-in-Time (PITR) or incomplete recovery.
• Table recovery from backups.

Performing recovery, Part 2
• Recovery of server parameter file, control file.
• Redo log file loss and recovery.
• Password authentication file re-creation.
• Index, read-only tablespace, and tempfile recovery.
• Restoring the database to a new host.
• Disaster recovery.
• Restoring RMAN encrypted backups.

RMAN and Oracle secure backup
• Oracle secure backup overview.
• Disk and tape backup solution.
• Backing fast recovery area to tape.
• Defining Retention for RMAN Backups.
• RMAN and Oracle Secure Backup Basic Process Flow.
• Integration with Cloud Control.
• RMAN Database Backup to Tape.

Performing tape backups and restores
• Scheduling Backups with EM.
• Oracle—Suggested Backup.
• RMAN and OSB Process Flow.
• RMAN and Oracle Secure Backup Jobs.
• Managing Database Tape Backups.
• Performing Database Recovery.
• RMAN Automatic Failover to Previous Backup.

Using Flashback Database
• Flashback database architecture.
• Configuring flashback database.
• Performing flashback database.
• Best practices for flashback database.

Duplicating a database
• Using a Duplicate Database.
• Choosing Database Duplication Techniques.
• Creating a Backup—up Based Duplicate Database.
• Understanding the RMAN Duplication Operation.
• Using Cloud Control to Clone a Database.

RMAN performance and tuning
• Tuning principles.
• RMAN multiplexing.
• Diagnosing performance bottlenecks.
• Restore and recovery performance best practices.

Backup and recovery workshop
• Workshop structure.
• Workshop approach to solving failure scenarios.
• Business requirements for database availability and procedures.

Using flashback technologies
• Flashback technology.
• Flashback technology to query data.
• Flashback table.
• Flashback transaction.
• Flashback drop and the recycle bin.
• Flashback data archive.
ORACLE DATABASE 12C MANAGING MULTITENANT ARCHITECTURE (20 HORAS)

Container and Pluggable Database Architecture
- Challenges and Benefits.
- Multitenant Architecture.
- Provisioning PDBs.
- Terminology.

CDB and PDB Creation
- Using Tools.
- Configuring and Creating a CDB.
- Creating PDBs.
- Dropping PDBs.
- Migrating PDBs.

Managing a CDB and PDBs
- Connection.
- Managing a CDB and PDBs.
- Managing PDBs Open Mode and Settings.
- Configuring CDB and PDBs Initialization Parameters.

Backup strategies and terminology
- Backup solutions overview and terminology.
- Balancing backup and restore requirements.
- Backing up read-only tablespaces.
- Best practices for data warehouse backups.
- Additional backup terminology.

Managing Storage in a CDB and PDBs
- Managing Permanent Tablespaces in CDB and PDBs.
- Managing Temporary Tablespaces in CDB and PDBs.

Managing Security in a CDB and PDBs
- Managing Common & Local Users.
- Managing Common & Local Privileges.
- Managing Common and Local Roles.
- Understanding Shared and Non-Shared Objects.
- Managing Common and Local Profiles.

Managing Availability
- Managing Backups.
- Managing Recovery Operations.
- Managing Flashback Database.
- Duplicating PDBs.
- Special Situations and Views.

Managing Performance
- Managing Performance.
- Managing Resource Allocation.
- Maximizing Consolidated Database Replay.

Miscellaneous
- Exporting and Importing Data.
- Loading Data.
- Auditing Operations.
- Scheduling Jobs.
- Using Other Products.