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VERSION 2.0

PROFESSIONAL

EXPERT DATABASE MANAGEMENT IN ORACLE

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EXPERT DATABASE MANAGEMENT IN ORACLE

SR. CODE

EAPL/PROF/PRTC27

COURSE CODE

EAPED

SUB CATEGORY

DATABASE MANAGEMENT

TOTAL DURATION	THEORY TAKEN	PRACTICAL TAKEN
90 HOURS	25.5 HOURS	64.5 HOURS

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COURSE DESCRIPTION

The Oracle Database DBA course is a comprehensive training program that teaches students the skills and knowledge necessary to become a database administrator (DBA) for Oracle databases. DBAs are responsible for the day-to-day operation and maintenance of Oracle databases, including tasks such as installing and configuring databases, managing user accounts, creating and managing tables and indexes, and performing backups and restores.

COURSE GOALS

- Learn the basics of Oracle database administration
- Gain hands-on experience with Oracle tools and utilities
- Develop a deep understanding of Oracle database concepts
- Become proficient in Oracle database security
- Learn how to perform database backups and recovery
- Become proficient in monitoring and troubleshooting database performance
- Learn how to optimize database performance

FUTURE SCOPE

- The Oracle Database project is growing rapidly.
- Many large telecommunications, financial and industrial companies use Oracle databases.
- Oracle databases can be found in almost every industry because almost every business needs some form of database management.

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Basic Database Administration

01 CHAPTER

GETTING STARTED WITH DATABASE ADMINISTRATION

30 MINS | 30 MINS

1. Types of Oracle Database Users
2. Tasks of a Database Administrator
3. SQL Statements
4. Identifying Your Oracle Database Software Release
5. About Database Administrator Security and Privileges
6. Database Administrator Authentication
7. Creating and Maintaining a Database Password File
8. Data Utilities

02 CHAPTER

CREATING AND CONFIGURING AN ORACLE DATABASE

01 HRS | 02 HRS

1. About Creating an Oracle Database
2. Considerations Before Creating the Database
3. Creating a Database with DBCA
4. Creating a Database with the CREATE DATABASE Statement
5. Specifying CREATE DATABASE Statement Clauses
6. Specifying Initialization Parameters

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7. Managing Initialization Parameters Using a Server Parameter File
8. Managing Application Workloads with Database Services
9. Managing Standard Edition High Availability for Oracle Databases
10. Considerations After Creating a Database
11. Cloning a Database
12. Dropping a Database
13. Database Data Dictionary Views
14. Database Configuration Assistant Command Reference for Silent Mode

03
CHAPTER

STARTING UP AND SHUTTING DOWN

30 MINS
01 HRS

1. Starting Up a Database
2. Altering Database Availability
3. Shutting Down a Database
4. Quiescing a Database
5. Suspending and Resuming a Database
6. Delaying Instance Abort

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CHAPTER 04

CONFIGURING AUTOMATIC RESTART OF AN ORACLE DATABASE

30 MINS | 01 HRS

1. About Oracle Restart
2. Configuring Oracle Restart
3. Starting and Stopping Components Managed by Oracle Restart
4. Stopping and Restarting Oracle Restart for Maintenance Operations
5. SRVCTL Command Reference for Oracle Restart
6. CRSCTL Command Reference

CHAPTER 05

MANAGING PROCESSES

01 HRS | 02 HRS

1. About Dedicated and Shared Server Processes
2. About Proxy Resident Connection Pooling
3. Configuring Oracle Database for Shared Server
4. Configuring Database Resident Connection Pooling
5. About Oracle Database Background Processes
6. Managing Pre spawned Processes
7. Managing Processes for Parallel SQL Execution

8. Managing Processes for External Procedures
9. Terminating Sessions
10. Process and Session Data Dictionary Views

06 CHAPTER

MANAGING MEMORY

01 HRS
02 HRS

1. About Memory Management
2. Memory Architecture Overview
3. Using Automatic Memory Management
4. Configuring Memory Manually
5. Using Force Full Database Caching Mode
6. Configuring Database Smart Flash Cache
7. Improving Query Performance with Oracle Database In-Memory
8. Enabling High Performance Data Streaming with the Memoptimized Rowstore
9. Memory Management Reference

07 CHAPTER

MANAGING USERS & SECURING THE DATABASE

01 HRS
02 HRS

1. The Importance of Establishing a Security Policy for Your Database
2. Managing Users and Resources
3. User Privileges and Roles

4. Auditing Database Activity
5. Predefined User Accounts

08 CHAPTER

MONITORING THE DATABASE

30 MINS | 01 HRS

1. Monitoring Errors and Alerts
2. Monitoring Performance
3. Monitoring Quarantined Objects

09 CHAPTER

DIAGNOSING AND RESOLVING PROBLEMS

30 MINS | 01 HRS

1. About the Oracle Database Fault Diagnosability Infrastructure
2. About Investigating, Reporting & Resolving a Problem
3. Diagnosing Problems
4. Reporting Problems
5. Resolving Problems

Oracle Database Structure and Storage

10 CHAPTER

MANAGING CONTROL FILES

01 HRS
1.5 HRS

1. What Is a Control File?
2. Guidelines for Control Files
3. Creating Control Files
4. Troubleshooting After Creating Control Files
5. Backing Up Control Files
6. Recovering a Control File Using a Current Copy
7. Dropping Control Files
8. Control Files Data Dictionary Views

11 CHAPTER

MANAGING THE REDO LOG

01 HRS
02 HRS

1. What Is the Redo Log?
2. Planning the Redo Log
3. Creating Redo Log Groups & Members
4. Relocating and Renaming Redo Log Members
5. Dropping Redo Log Groups and Members
6. Forcing Log Switches
7. Verifying Blocks in Redo Log Files
8. Clearing a Redo Log File

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9. Precedence of FORCE LOGGING Settings

10. Redo Log Data Dictionary Views

12 CHAPTER

MANAGING ARCHIVED REDO LOG FILES

30 MINS

1.5 HRS

1. What Is the Archived Redo Log?
2. Choosing Between NOARCHIVELOG & ARCHIVELOG Mode
3. Controlling Archiving
4. Specifying Archive Destinations
5. About Log Transmission Modes
6. Managing Archive Destination Failure
7. Controlling Trace Output Generated by the Archivelog Process
8. Viewing Information About the Archived Redo Log

13 CHAPTER

MANAGING TABLESPACES

01 HRS

02 HRS

1. Guidelines for Managing Tablespaces
2. Creating Tablespaces
3. Consider Storing Tablespaces in the In-Memory Column Store
4. Specifying Nonstandard Block Sizes for Tablespaces
5. Controlling the Writing of Redo Records

6. Altering Tablespace Availability
7. Using Read-Only Tablespaces
8. Altering and Maintaining Tablespaces
9. Renaming Tablespaces
10. Dropping Tablespaces
11. Managing Lost Write Protection with Shadow Tablespaces
12. Managing the SYSAUX Tablespace
13. Correcting Problems with Locally Managed Tablespaces
14. Migrating the SYSTEM Tablespace to a Locally Managed Tablespace
15. Viewing Information About Tablespaces

14 CHAPTER

MANAGING DATA FILES & TEMP FILES

30 MINS
02 HRS

1. Guidelines for Managing Data Files
2. Creating Data Files & Adding Data Files to a Tablespace
3. Changing Data File Size
4. Altering Data File Availability
5. Renaming and Relocating Data Files
6. Dropping Data Files
7. Verifying Data Blocks in Data Files

8. Copying Files Using the Database Server
9. Mapping Files to Physical Devices
10. Data Files Data Dictionary Views

15 CHAPTER

TRANSPORTING DATA

30 MINS | 01 HRS

1. About Transporting Data
2. Transporting Databases
3. Transporting Tablespaces Between Databases
4. Transporting Tables, Partitions, or Subpartitions Between Databases
5. Converting Data Between Platforms
6. Guidelines for Transferring Data Files

16 CHAPTER

MANAGING UNDO

01 HRS | 01 HRS

1. What Is Undo?
2. Introduction to Automatic Undo Management
3. Setting the Minimum Undo Retention Period
4. Sizing a Fixed-Size Undo Tablespace
5. Managing Undo Tablespaces
6. Migrating to Automatic Undo Management
7. Managing Temporary Undo
8. Undo Space Data Dictionary Views

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CHAPTER 17

USING ORACLE MANAGED FILES

30 MINS | 01 HRS

1. About Oracle Managed Files
2. Enabling the Creation and Use of Oracle Managed Files
3. Creating Oracle Managed Files
4. Operation of Oracle Managed Files
5. Scenarios for Using Oracle Managed Files

Schema Objects

CHAPTER 18

MANAGING SCHEMA OBJECTS

01 HRS | 02 HRS

1. Creating Multiple Tables and Views in a Single Operation
2. Analyzing Tables, Indexes & Clusters
3. Truncating Tables and Clusters
4. Enabling and Disabling Triggers
5. Managing Integrity Constraints
6. Renaming Schema Objects
7. Managing Object Dependencies
8. Managing Object Name Resolution
9. Switching to a Different Schema
10. Managing Editions
11. Displaying Information About Schema Objects

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CHAPTER 19

MANAGING SPACE FOR SCHEMA OBJECTS

30 MINS | 01 HRS

1. Managing Tablespace Alerts
2. Managing Resumable Space Allocation
3. Reclaiming Unused Space
4. Dropping Unused Object Storage
5. Understanding Space Usage of Data Types
6. Displaying Information About Space Usage for Schema Objects
7. Capacity Planning for Database Objects

CHAPTER 20

MANAGING TABLES

01 HRS | 2.5 HRS

1. About Tables
2. Guidelines for Managing Tables
3. Creating Tables
4. Loading Tables
5. Optimizing the Performance of Bulk Updates
6. Automatically Collecting Statistics on Tables
7. Altering Tables
8. Redefining Tables Online
9. Researching and Reversing Erroneous Table Changes

10. Recovering Tables Using Oracle Flashback Table
11. Dropping Tables
12. Using Flashback Drop and Managing the Recycle Bin
13. Managing Index-Organized Tables
14. Managing Partitioned Tables
15. Managing External Tables
16. Managing Hybrid Partitioned Tables
17. Managing Immutable Tables
18. Managing Blockchain Tables
19. Tables Data Dictionary Views

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21 CHAPTER

INTRODUCTION PL/SQL

01 HRS

02 HRS

1. Getting started with PL/SQL

a. What is Oracle PLSQL?

b. Why Oracle PLSQL?

c. What can PLSQL do?

d. How PLSQL works

e. Advantages of using PLSQL

f. Websites that uses PLSQL

2. PL/SQL Software Requirements

a. Downloading Oracle Database

b. Install the Oracle Database

c. Unlock The HR Schema

d. Download and Configure Oracle SQL Developer Software

e. HR Schema Create Code

3. PLSQL Architecture

a. PLSQL Blocks

- Declare Section
- Begin Section
- Exception Section
- End Section
- Anonymous Blocks
- Named Blocks

b. PLSQL Engine

c. Database Server

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22
CHAPTER

BASICS OF PL/SQL

01 HRS
04 HRS

1.Data Types

a.Scalar data types

- Number Types
- Character Types
- Boolean
- Date/Time

b. Collection Data Types

- VARRAY
- Table
- Nested Tables

c. LOB Data Types

- BLOB
- CLOB
- NCLOB
- BFILE

d.Reference Data Types

- Cursor
- Record
- Ref Cursor
- Pointer

e. User-Defined Data Types

2. Variables

a. Introduction

b. Declare Variable

c. Naming Rules

d. Initializing Variables

e. Variable Scope

- Local Variable
- Global Variable

f. Variable Attributes

g. Delimiters and Commenting

h. Bind Variables

3. Constants

a. Introduction

b. Declare Constant

c. Literals

23
CHAPTER

CONTROL STATEMENTS

01 HRS
2.5 HRS

1. IF Statements

a. Summary

b. IF THEN

c. IF THEN ELSE

d. IF THEN ELSIF

e. Nested IF Statement

2. CASE Statements

a. Simple CASE Statement
b. Simple CASE Expression
c. Searched CASE Statement
d. Searched CASE Expression

3. Loops

a. Overview
b. Loop Types
c. Simple LOOP
d. FOR LOOP
e. FOR LOOP Counter
f. Continue, Continue When
g. Nested LOOP
h. While LOOP
i. GOTO Statement

24 CHAPTER

CURSORS

01 HRS
03 HRS

1. Introduction

a. What is Cursor
b. Types of Cursors in PLSQL
c. Using Cursors with Records
d. Looping with Cursors
e. PLSQL Cursors with Parameter
f. Cursor Attributes
g. For Update Clause

h. Where Current of Clause

i. Reference Cursors

2. Implicit Cursor

a. %FOUND

b. %NOTFOUND

c. %ROWCOUNT

d. ISOPEN

3. Explicit Cursor

a. Declaring the Cursors

b. Opening the Cursors

c. Fetching The Cursors

d. Closing the Cursors

25 CHAPTER

COLLECTIONS

01 HRS

04 HRS

a. Associative Array (index-by table)

- Indexed by String
- Indexed by PLS_INTEGER
- Declaring Associative Array Constant

b. VARRAY(Variable-size Array)

c. Nested Table

- Local Type
- Standalone Type

2. Collection Constructors

a. Introduction

b. Initializing Collection Variable To Empty

c. executing Collection

3. Assigning Values to Collection Variables

a. Data Type Compatibility

b. Assigning Null values to VARRAY or Nested Table

c. Assigning Set Operations to Nested Table

4. Multidimensional Collections

a. Introduction

b. Two Dimensional Varray

c. Nested Tables and Varrays of Integer

d. Nested Tables and Varrays of String

5. Collection Comparisons

a. Varray and Nested Table Variables to NULL

b. Nested Tables for Equality and Inequality

c. Nested Tables with SQL Multiset Conditions

6. Collection Methods

a. DELETE

b. TRIM

c. EXTEND

d. EXISTS

e. FIRST and LAST

f. COUNT

g. LIMIT

h. PRIOR and NEXT

7. Record Variables

a. Initial Values of Record Variables

b. Declaring Record Constants

c. RECORD Types

d. Declaring Items using
%ROWTYPE Attribute

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CHAPTER

DYNAMIC SQL

30 MINS
02 HRS

1. Introduction

a. What is Dynamic SQL

b. When you need Dynamic SQL

2. Native Dynamic SQL

a. EXECUTE IMMEDIATE Statement

b. OPEN FOR, FETCH, and CLOSE Statements

c. Repeated Placeholder Names

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3. DBMS_SQL Package

a. DBMS_SQL.RETURN_
RESULT Procedure

b. DBMS_SQL.GET_NEXT_
RESULT Procedure

c. DBMS_SQL.TO_REFCURSOR Function

d. DBMS_SQL.TO_CURSOR_
NUMBER Function

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CHAPTER

PLSQL SUBPROGRAMS

01 HRS

2.5 HRS

1. Introduction
2. Nested, Package and Standalone Subprograms
3. Invocations
4. Properties
5. Subprogram Parts
6. Forward Declaration
7. Subprogram Parameters
8. Subprogram Invocations Resolution
9. Overloaded Subprograms
10. Recursive Subprograms
11. Function Result Cache
12. SQL Statement can Invoke

28 CHAPTER

FUNCTIONS & PROCEDURES

01 HRS

3.5 HRS

1. What are Functions & Procedures
2. Why we Use?
3. Creating and using Stored Procedure
4. USING IN & OUT Parameter
5. Named & Mixed Notations
6. Creating and Using Functions
7. Local Sub Programs
8. Overloading the subprograms
9. Handling Exceptions in Sub programs
10. Finding & Removing the Sub programs
11. Regular & Pipelined Table Functions

29 CHAPTER

PACKAGES

30 MINS

2.5 HRS

1. What is Package?
2. Why we use Packages

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3. Package Specification

a. Appropriate Public Items

b. Creating Package Specifications

4. Package Body

5. Package Instantiation and Initialization

6. Package State

7. SERIALLY_REUSEABLE Packages

30 CHAPTER

ERROR HANDLING

30 MINS

03 HRS

1. Compile-Time Warnings

a. DBMS_WARNING Package

2. Over of Exception Handling

a. Exception Categories

b. Advantages of Exception Handlers

c. Guidelines for Avoiding and handling Exceptions

3. Internally Defined Exceptions

4. Predefined Exceptions
5. User-Defined Exceptions
6. Redeclared Predefined Exceptions
7. Raising Exceptions Expilicity
   a. RAISE Statement
      - User Defined Exception with RAISE Statement
      - Initially Defined Exception with RAISE Statement
      - Current Exception with RAISE Statement
   b. RAISE_APPLICATION_ERROR Procedure
8. Exception Propogation
   a. Propagation of Exceptions Raised in Declarations
   b. Exception Handlers
9. Unhandled Exceptions
10. Retrieving Error Code and Error Message
11. Continuing Exception after Handling Exceptions

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12. Retrying Transactions After Handling Exceptions

13. Handling errors in Distributed Queries

31 CHAPTER

TRANSACTIONS

01 HRS

2.5 HRS

1. Overview
2. Transactions and Isolation Levels
    a. READ UNCOMMITED
    b. READ COMMITED
    c. REPEATABLE READ
    d. SERIALIZABLE
3. Committing and Rolling back Transactions
    a. COMMIT
    b. ROLLBACK
4. Savepoints
    a. SAVEPOINT
    b. ROLLBACK TO
5. Explicit Locking
    a. LOCK TABLE

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32 CHAPTER

TRIGGERS

01 HRS

03 HRS

1. Overview of Triggers
2. Reasons to User Triggers
3. DML Triggers
   a. Detecting Triggering DML Statement
   b. INSTEAD of DML Triggers
   c. Compound DML Triggers
   d. Triggers for Ensuring Referential Integrity
4. System Triggers
   a. SCHEMA Triggers
   b. Database Triggers
   c. INSTEAD OF CREATE Triggers
5. Subprograms Invoked by Triggers
6. Trigger Compilation, Invalidation and Recompilation
7. Exception Handling in Triggers
8. Trigger Restrictions
   a. Trigger size Restriction
   b. Trigger LONG and LONG RAW Data Type Restrictions
   c. Mutating- Table Restriction
9. Trigger Enabling and Disabling

10. Trigger Changing and Debugging
11. Data Transfer Utilities
12. Triggers for Publishing Events

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