**Course On Oracle DBA(SQL)**

**Introduction to SQL/Fundamental SQL**

* Introduction
* Tools used for Develop query: PL/SQL Developer, SQL Developer, Command Line
* Install and Configure Standalone Database in Linux and Windows both.
* Brief Directory Structure of Oracle Database.
* Network Infrastructure
* Retrieving Data using the SQL SELECT Statement
* Restricting and Sorting Data
* Using Single-Row Functions to Customize Output
* Using Conversion Functions and Conditional Expressions
* Reporting Aggregated Data Using the Group Functions
* Displaying Data from Multiple Tables Using Joins
* Using Subqueries to Solve Queries
* Using the SET Operators
* Managing Tables using DML statements
* Introduction to Data Definition Language
* Introduction to Data Dictionary Views
* Creating Sequences, Synonyms, Indexes
* Creating Views
* Managing Schema Objects
* Retrieving Data by Using Subqueries
* Manipulating Data by Using Subqueries
* Controlling User Access
* Manipulating Data
* Managing Data in Different Time Zones

**Course Objectives: Oracle 12c Administration Workshop I**

**By the end of this course students will be able to:**

* Installing Oracle Software
* Creating an Oracle Database Using DBCA
* Managing Database instances and ASM instances
* Managing and controlling database network environment
* Define and devise transaction management, concurrency control, crash recovery components
* Managing storage structures
* Controlling user security
* Designing Database backup and recovery procedures
* Take Decisions related with Database Maintenance

**Course Outline Short:** **Oracle 12c Administration Workshop II**

* Oracle Database Architecture
* Database installation and creation. (use DBCA)
* Managing Database instances and ASM instances
* Oracle Network environment
* Database storage structures
* User security
* Concurrency control
* Database auditing
* Database maintenance
* Crash Recovery

**Detailed Course Outline: Administration I**

* **Oracle Linux, Environment Variables and Partitions**
  + Install Oracle Linux
  + Set Environment Variables
  + Configure Network
  + Multipath Configuration
  + Create user, group and permissions
* **Installing Oracle Software**
  + Installing Configure Grid
  + Configure ASM Disk
  + Install and Configure Database using ASM Disks

* **Creating an Oracle Database Using DBA**
* **Exploring the Oracle Database Architecture**
  + Connecting to a server
  + Oracle Database Server Architecture
  + Instance: Database Configurations
  + Memory Structures – SGA
  + Memory structures – Shared Pool
  + Memory Structures – Buffer Cache
  + Memory Structures – Redo Log Buffer
  + Memory Structures – Large Pool
  + Memory Structures – Java Pool/Streams Pool
  + Memory Structures – PGA
  + Memory Structures – Streams Pool
  + Process Structures
  + Background Processes – Database Writer Process (DBWn)
  + Background Processes – Log Writer Process (LGR)
  + Background Processes – Checkpoint Process (CKPT)
  + Background Processes – System Monitor Process (SMON)
  + Background Processes – Process Monitor Process (PMON)
  + Background Processes – Recoverer Process
  + Background Processes – Archiver Process (ARCn)
  + Process Startup Sequence
  + Database Storage Architecture
  + Logical and Physical Storage Structures
  + Segments, Extents and Blocks
  + Table Space and Data Files
  + SYSTEM and SYSAUX Table Space
  + ASM storage components
  + Interacting with an Oracle Database

* **Managing Database Instance**
  + Database initialization parameters modification
  + Stages of database startup
  + Database shutdown modes and options
  + Alert log
  + Using Trace Files
  + Dynamic performance views
  + Data Dictionary views
  + Data dictionary from SQL Expert

* **Managing ASM instances**
  + Benefits of using ASM
  + ASM instance processes and parameters
  + Interaction between database instances and ASM
  + ASM instance dynamic performance views
  + ASM system privileges
  + ASM disk groups
  + ASM disks
  + Allocation units
  + ASM files
  + Extent Maps
  + Striping granularity
  + Fine-Grained Striping
  + ASM Failure groups
  + Stripe and mirror example
  + Failure example
  + Managing disk groups
  + Adding disk to disk groups
  + Alter commands
  + ASM disk group compatibility
  + Disk Group Attributes
  + ASM Fast Mirror Resync Overview

* **Managing and Controlling Database Network Environment**
  + Creating additional listeners
  + Creating Oracle Net Service aliases
  + Configuring connect-time failover
  + Controlling the Oracle Net Listener
  + Using tnsping to test Oracle Net connectivity
  + Shared servers versus dedicated servers

* **Define and Devise Transaction Management, Concurrency Control, Crash Recovery Components**

* **Transactions**
  + Properties (ACID Rules)
  + Life Cycle
* **Concurrency Control**
  + Why do we need concurrency control?
  + Types of concurrency control mechanisms
  + Basic samples
* **Crash Recovery Components**
  + Undo and Redo Operations
  + Examples for different component behaviors
* **Deadlocks**

* **Managing Data Concurrency**
  + Locking Mechanism
  + Oracle data concurrency management
  + Enque Mechanism
  + Monitoring and Resolving Locking conflicts Managing Undo Data
  + DML and Undo data generation
  + Monitoring and administer undo data and redo data
  + Configuring undo retention
  + Undo retention guarantee
  + Undo advisor

* **Managing Storage Structures**
  + Storage of table row data in blocks
  + Oracle-Managed Files (OMF)
  + Enlarging the database

* **Controlling User Security**
  + Create and Manage database user accounts:
    - Authenticate Users
    - Assign default storage areas (tablespaces)
  + Administer Authentication
  + Grant and revoke privileges (system and object privileges)
  + Create and manage roles
  + Predefined roles
  + Create and manage profiles:
    - Implement standard password security features
    - Control resource usage by users
  + Supplied password verification function
  + Assigning quotas to users
  + Principle of least privilege
  + Protect privileged accounts

* **Implementing Oracle Database Auditing**
  + DBA responsibilities for security and auditing
  + Standard database auditing
  + DBA responsibilities for security and auditing
  + Standard database auditing
  + Specifying audit options
  + Audit information
  + Value-based auditing
  + Fine-Grained Auditing
  + FGA Guidelines
  + SYSDBA Auditing
  + Maintaining the audit trail
  + Oracle Audit Vault

* **Performance Management**
  + Use Enterprise Manager to monitor performance
  + Use Automatic Memory Management (AMM)
  + Use the Memory Advisor to size memory buffers
  + View performance-related dynamic views
  + Troubleshoot invalid and unusable objects

* **Designing Database Backup and Recovery Procedures**
  + **Backup and Recovery Concepts**
    - Types of failure that can occur in an Oracle database (statement/user process/network/User/Instance failures)
    - Flashback Technology
    - Ways to tune instance recovery (Redo Log files/Log Writer)
    - Using MTTR Advisor
    - Media failure
    - Configuring recoverability
    - Configuring the fast recovery area
    - Checkpoints, redo log files, and archive log files
    - Achiever process
    - Configuring ARCHIVELOG mode
  + **Performing Database Backups**
    - Consistent database backups
    - Oracle Secure Backup
    - User Managed Backup
    - Recovery Manager (RMAN)
    - Backing Up the Control File to a Trace File
  + **Performing Database Recovery**
    - Opening a Database
    - Keeping a Database Open
    - Loss of Control file/Redo Log file/data file /noncritical data file /system \_critical data file
    - Data failure examples
    - Data recovery advisor
    - **Recovery:**
      * Control File
      * Redo log File
      * Data File
    - **Moving Data**
      * Ways to move data
      * Directory Objects
      * Using SQL\*Loader to load data from a non-Oracle Database (user files)
      * Using external tables to move data via platform-independent files
      * General architecture of Oracle Data Pump
      * Using Data Pump Export and Import to move data between Oracle Databases
    - **Take Decisions Related with Database maintenance**
      * Managing optimizer statistics
      * Preferences for Gathering Statistics
      * Managing the Automatic Workload Repository (AWR)
      * Statistic Levels
      * Automatic Database Diagnostic Monitor (ADDM)
      * Advisory framework
      * Automated Maintenance Tasks
      * Server-generated alerts
      * Setting alert thresholds
      * Reacting to alerts
      * Alert types and clearing Alerts
    - **Enterprise Manager Support Workbench**
      * My Oracle Support
      * Log Service Requests (SR)
      * Manage Patches
        + Apply a patch
        + Stage a patch
      * Oracle Restart

**Course Objectives: Administration II**

**By the end of this course students will be able to:**

* Advance RMAN Backup and Recovery
* Oracle Flashback Technologies
* Hands on Advance Performance Tuning
* Oracle High Availability Technologies
* Oracle Supported Application Servers and REST Data Services
* Oracle Replication and Duplication

**Course Outline Short: Administration II**

* Core Concepts and Tools of the Oracle Database
* Configuring for Recoverability
* Using the RMAN Recovery Catalog
* Configuring Backup Settings
* Creating Backups with RMAN
* Restore and Recovery Task
* Using RMAN to Perform Recovery
* Monitoring and Tuning RMAN
* Diagnosing the Database
* Using Flashback Technology I
* Using Flashback Technology II
* Performing Flashback Database
* Managing Memory
* Managing Database Performance
* Managing Performance by SQL Tuning
* Managing Resources
* Automating Tasks with the Scheduler
* Managing Space in Blocks
* Managing Space in Segments
* Managing Space for the Database
* Duplicating a Database