Kadi Sarva Vishwavidyalaya
Master of Computer Application (MCA)
Year – II (Semester – IV) (W.E.F. January 2015)
Subject Name: Database Administration (DBA) – MCA404 (B)

Sub Total Credit	Teaching scheme		Examination scheme				
	(per week)		MID	CEC	External		Total
	Th	Pr	Th	Th	Th.	Pr.	Marks
5	3	4	25	25	50	50	150

Learning Objectives:
- To introduce the basics of Database Administration.
- To give a detailed understanding of how to maintain a database quickly & accurately.
- The students will be able to design and manage the Database Server to solve the issues related to the Database Server.

Prerequisites:
- Knowledge of DBMS.
- Knowledge of SQL & PL/SQL is desirable.

Detailed Syllabus

Unit 1	**Oracle Overview and Architecture:**	20%

An overview of databases and instances
- Components of an Oracle database and detailed architecture
- Oracle Logical Storage Structures (Table spaces, Blocks, Extents, segments)
- Oracle Physical Storage Structures(Data files, Redo Log files, Control Files, Archived Log Files, Backup Files, Oracle Managed Files, Password Files)
- Oracle memory structures (System Global Area, Program Global Area, Software Code Area, Oracle background processes)

Software Installation
- Overview of Licensing and Installation Options
- Using OUI to Install the Oracle Software
- Using the DBCA to Create a Database
- Manually Creating a Database

Unit 2	**User Administration and Security**	20%

- Non-database Security
- Create and manage database user accounts
- Assign default storage areas (tablespaces)
- Grant and revoke privileges
- Database Authentication Methods(Database Authentication, Database Administrator Authentication, Operating System Authentication,
- Network Authentication, 3-tier Authentication, Client-Side Authentication,
- Oracle Identity Management, User Accounts)
- Database Authorization Methods(Profile Management, System Privileges,
- Object Privileges, Creating, Assigning, and Maintaining Roles)

Unit 3   Backup & Recovery in Database   20%
- Database backup,Recovery Concepts
- Recovery Techniques Based on Deferred Update
- Recovery Techniques Based on Immediate Update
- Shadow Paging
- The ARIES Recovery Algorithm
- Recovery in Multidatabase Systems
- Database Backup and Recovery from Catastrophic Failures

Unit 4   Database Tuning   20%
- Brief overview of tuning methodology, General   tuning   concepts
- Tuning Application Design(Effective Table Design, Distribution of CPU requirements, Effective Application Design)
- Tuning SQL(Impact of Order on Load Rates, Additional Indexing Options, Generating Explain Plans)
- Tuning Memory Usage(Specifying the Size of the SGA, Using the Cost-Based Optimizer)
- Tuning Data Access(Locally Managed Tablespaces, Identifying Chained Rows, Increasing the Oracle Block Size, Using Index-Organized Tables)
- Tuning Physical Storage(Using Raw Devices)

Unit 5   Indexing Structures for Files   20%
- Types of Single Level Ordered Indexes (Primary Index, Cluster Index, Secondary Index)
- Multilevel Indexes
- Dynamic Multilevel Indexes Using B-Tress and B+-Tress
- Indexes on Multiple Keys
- Other Types of Indexes

Text Books:
1. Kevin Loney, Bob Bryla, "Oracle 10g, DBA Handbook", Oracle Press, TMGH Publications
2. Ramesh Elmasari, Shamkant B. Navathe, "Fundamentals of Database Systems", Pearson Education, 5th Edition

Chapter wise Coverage from Text book(s):

Book #	Unit#	Contents
1	Unit I	Chp. 1(Pgs. 4-29, 32-36, 47-68)
	Unit II	Chp. 10(Pgs. 325-351)
	Unit IV	Chp. 8(Pgs. 280-297,303)
2	Unit III	Chp. 19(Full)
	Unit V	Chp. 14(Full)

1 Create database manually using server manager utility.

2 Create database using Oracle Configuration Assistant

3 Predefined Administrative Accounts
   Predefined Non-Administrative User Accounts
   Predefined Sample Schema User Accounts
   Create User, Roles, Grant different objects and system privileges to
   users. Grant different roles to users.

4 Managing Table space
   - Creating a Table space
   - Modifying a Table space
   - Dropping a Table space
   - Reclaiming Unused Space

5 Add, Move, and Resize, Datafiles in different table spaces.

6 Managing Rollback Segments

7 Work on different backup & recovery options

8 Work on different Import/Export options.

9 Work of at least 5 tuning options.

   - Use of auto trace
   - Explain plan
   - SQL Tuning Advisory
   - Use Of Indexing