

**Subject Name: Database Administration (040020211)**
**M.Sc. (CA) (2nd Semester)**  
 Teaching Schedule

**Objective:** To develop database administration skill by providing knowledge of configuring and securing database server, and thorough understanding of backup & recovery operations.

**Course Outcomes:** Upon the completion of the course students shall be able to

CO1: Configure & manage working environment of data.

CO2: Manage and use appropriate database objects.

CO3: Describe DB2 storage model.

CO4: Describe importance of roles & privileges for authorization & authentication.

CO5: Use locking attributes and set desirable isolation levels.

CO6: Define strategy for backup & recovery operations.

Unit	Sub Unit	No. of Lecture (s)	Topics	Reference Chapter/Additional Reading	Teaching Methodology to be used	Evaluation Parameters
			<b>1. Database Environment</b>			<b>[8 Hours]</b>
	1.1	1	Profile Registry	BZ #2 Page no. 98-100	Chalk and Talk	
	1.2		Environment variables	BZ #2 Page no. 100-102		
	1.3	1	Configuration parameters	BZ #2 Page no. 100-102	Practical Demonstration	
	1.4	1	Instance: Start, stop and administer	BZ #2 Page no. 107-112	Practical Demonstration	
	1.5	1	DB2 Administration Sever(DAS)	BZ #2 Page no. 112-114	Chalk and Talk	
	1.6	1	DB2 Client: DB2 Runtime Client and DB2 client	BZ #3 Page no. 118	Chalk and Talk	
	1.7	1	Automated configuration using DB2 Discovery	BZ #2 Page no. 130-137	Chalk and Talk, Practical Demonstration	
	1.8	2	Manual Configuration using Command Line Processor	BZ #2 Page no. 151-159	Practical Demonstration	
			<b>2. Database Objects</b>			<b>[10 Hours]</b>
	2.1	1	Understanding Database objects	BZ #2 Page no. 227-234	Chalk and Talk	
	2.2	2	Managing Database objects	BZ #2 Page no. 235-271	Powerpoint Presentation	
	2.3	3	Tables: Physical DB2 tables, compressed tables and range clustered tables	BZ #2 Page no. 271-285, BZ #2 Page no. 298-300	Powerpoint Presentation	
	2.4	2	Views	BZ #2 Page no. 301-307	Chalk and Talk	

	2.5	2	Indexes	BZ #2 Page no. 311-316	Chalk and Talk	Unit Test 1
<b>3. Data Storage Management</b>						<b>[6 Hours]</b>
	3.1	1	Processor, Memory and Disk Considerations	BZ #11 Page no.626-628	Chalk and Talk	
	3.2	2	DB2 Storage Model	BZ #11 Page no. 628-639	Chalk and Talk, Practical Demonstration	
	3.3	1	Table Space Design	BZ #11 Page no. 640-664	Chalk and Talk	
	3.4	1	Automatic Storage	BZ #11 Page no. 664-666	Powerpoint Presentation	
	3.5	1	Table Space Maintenance	BZ #11 Page no. 666-673	Powerpoint Presentation	Quiz
<b>4. Controlling Data Access</b>						<b>[8 Hours]</b>
	4.1	2	Overview of Security	BZ #04 Page no. 168-170	Chalk and Talk	
	4.2	2	Authentication	BZ #04 Page no. 170-194	Chalk and Talk	
	4.3	2	Authorization	BZ #04 Page no. 184-194	Chalk and Talk	
	4.4	2	Privileges	BZ #04 Page no. 194-205	Chalk and Talk	
<b>5. Concurrency</b>						<b>[8 Hours]</b>
	5.1	1	Concurrency anomalies	BZ #10 Page no. 600-607	Powerpoint Presentation	
	5.2	2	Isolation Levels	BZ #10 Page no. 607-610	Powerpoint Presentation and Group Discussion	
	5.3	2	Locking : Lock attributes, Lock Conversion, Lock Escalation	BZ #10 Page no. 610-614	Powerpoint Presentation	
	5.4	2	Lock wait behavior, Lock table statement and Locksize parameter	BZ #10 Page no. 614-616	Powerpoint Presentation, Practical Demonstration	
	5.5	1	Changing the locking level	BZ #10 Page no. 616-618	Powerpoint Presentation	Unit Test 2
<b>6. Recovery</b>						<b>[8 Hours]</b>
	6.1	1	Types of recovery	BZ #13 Page no. 794-795	Chalk and Talk	
	6.2	1	Recovery strategies	BZ #13 Page no. 795-797	Chalk and Talk	
	6.3	2	Use of Log file : Log buffers, primary and secondary log file, types of logging, Log file usage	BZ #13 Page no. 797-804	Powerpoint Presentation	
	6.4	2	Version recovery using Backup and Restore	BZ #13 Page no. 805-825	Powerpoint Presentation, Practical Demonstration	
	6.5	1	Roll Forward Recovery	BZ #13 Page no. 827-837	Powerpoint Presentation	
	6.6	1	Managing Log files	BZ #13 Page no. 837-838	Powerpoint Presentation	Assignment

Textbook:

Baklarz, G. and Zikopoulos, P. - DB2 9 for Linux, UNIX, and Windows DBA Guide, Reference, and Exam Prep - Pearson.

References:

1. Sanders, R. (2010). DB2 9 Fundamentals Certification Study Guide, SPD
2. Grant A. (2008). Beginning DB2 From Novice to Professional, APress
3. Powell, G., et. al. (2008). Oracle 10g Database Administrator- Implementation and Administration, Cengage Learning India Edition.
4. Loney, K., Bryla, B. (2010). Oracle Database 10g- DBA Handbook, Oracle Press.
5. Chip Dawes, C., Bryla, B., et. al. (2005). OCA- Oracle 10g Administration I Study Guide (1Z0-042), Sybex.
6. Thomas, B. (2009). OCA- Oracle Database 11g Administrator Certified Associate-Study Guide, Wiley-India Pvt. Ltd.

Course Objectives and Course Outcomes Mapping:

Database administration skill by providing knowledge of configuring and securing database server: CO1,CO2, CO3,CO4,CO5

Deciding a best strategy for backup & recovery operations: CO6

Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcome					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Database Environment	✓					
2	Database Objects		✓				
3	Data Storage Management	✓		✓			
4	Controlling Data Access				✓		
5	Concurrency					✓	
6	Recovery			✓			✓

Modes of Transaction (Delivery):

- ❖ Lecture method along with various appropriate audio-visual aids for all units.
- ❖ Apart of lecture method, assignment activity and hands-on activity should be designed for all units.
- ❖ Seminars should be conducted to enhance their communication and presentation skills.

Activities/Practicum:

The following activities shall be carried out by the students.

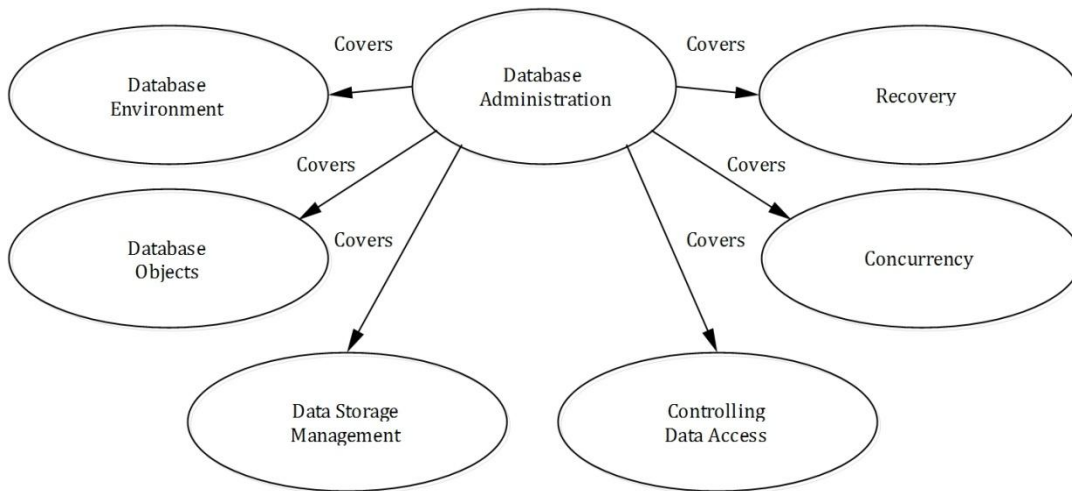
- ❖ Database Architecture of MS-SQL Server.
- ❖ Database Architecture of Oracle.
- ❖ Use of Oracle Enterprise Manager for Oracle Administration.

The following activities shall be carried out by the teacher.

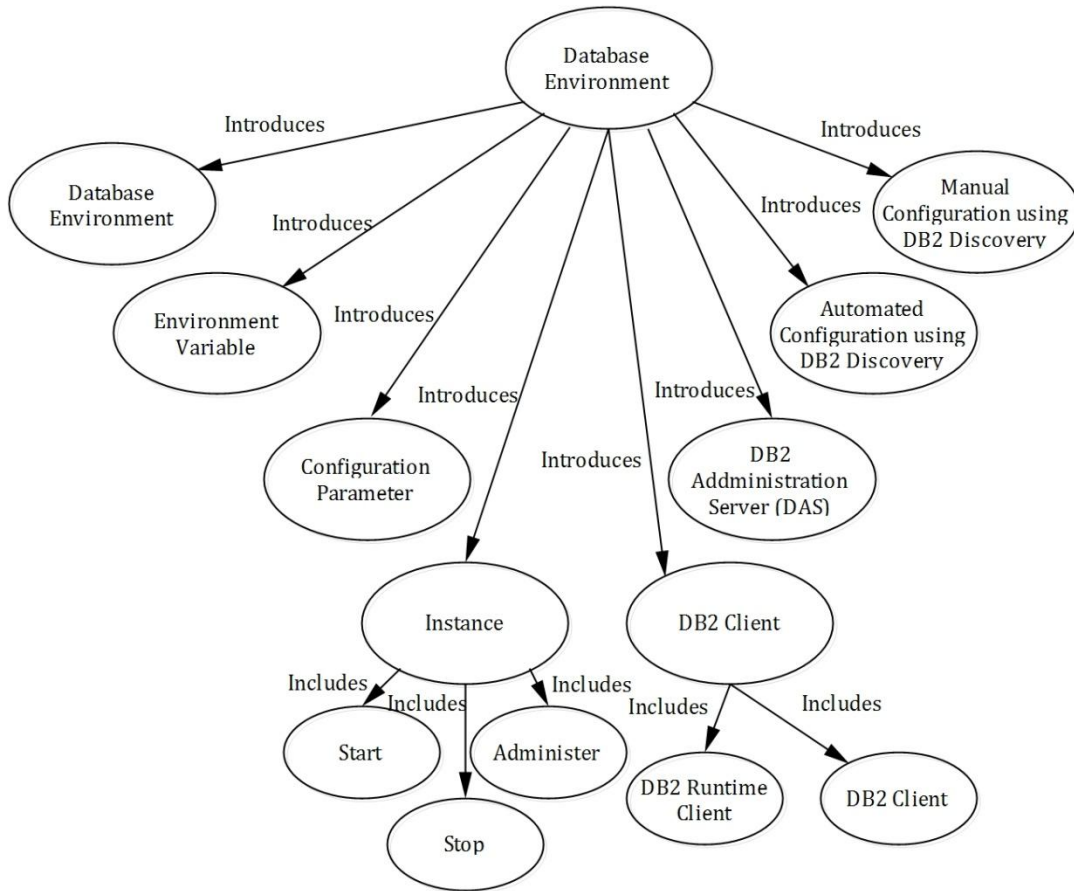
- ❖ Demonstration of controlling data access by showing usage of GRANT and REVOKE statement.
- ❖ Demonstrate the effect of different isolation level on select and update queries.
- ❖ Show the usage and importance of sysibm tables(DB2 catalog) from administrators point of view.

Concept Map:

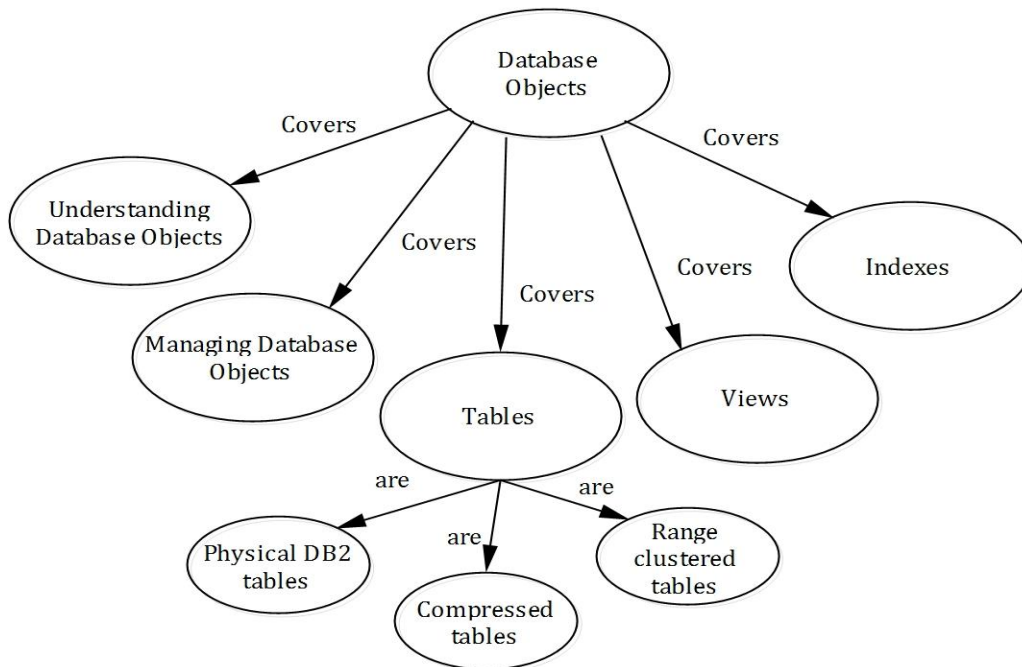
Database Administration



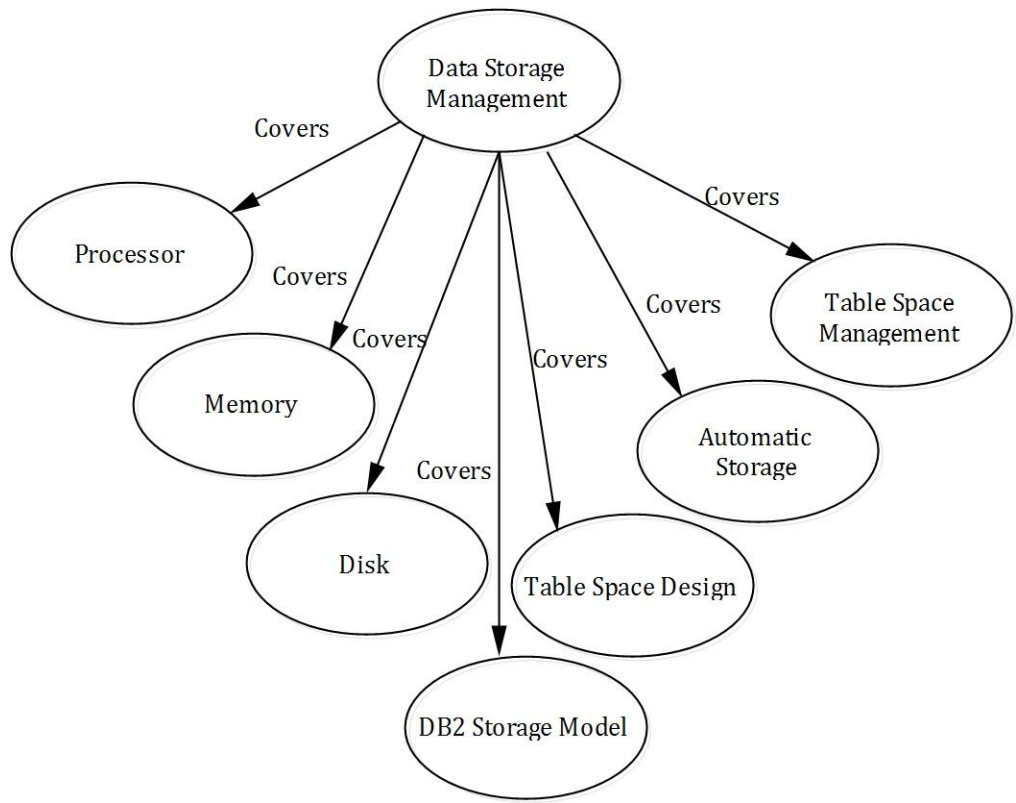
Unit-1: Database Environment



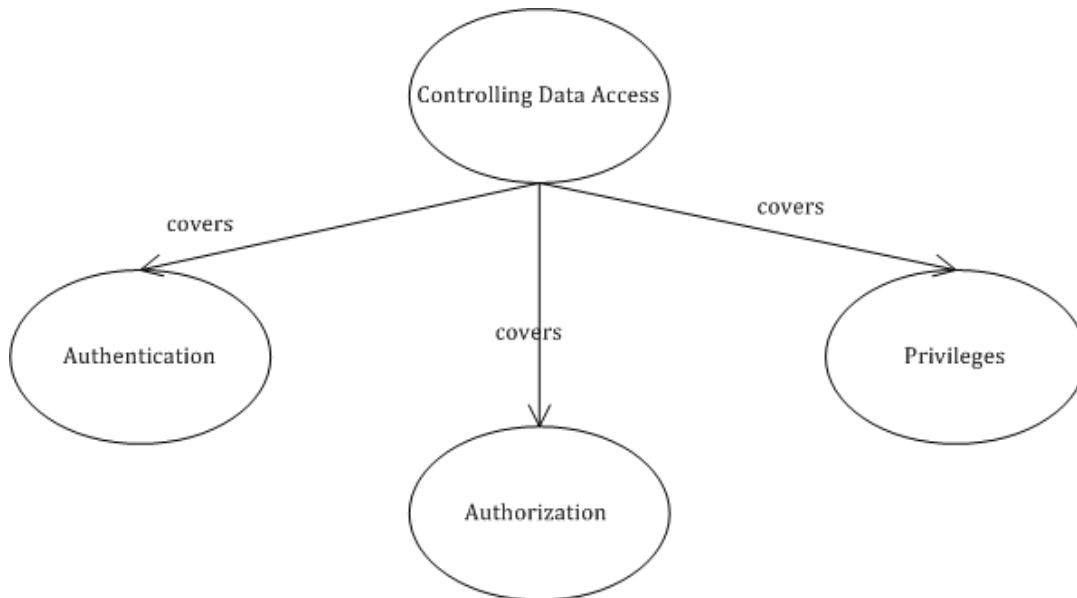
Unit-2: Database Objects



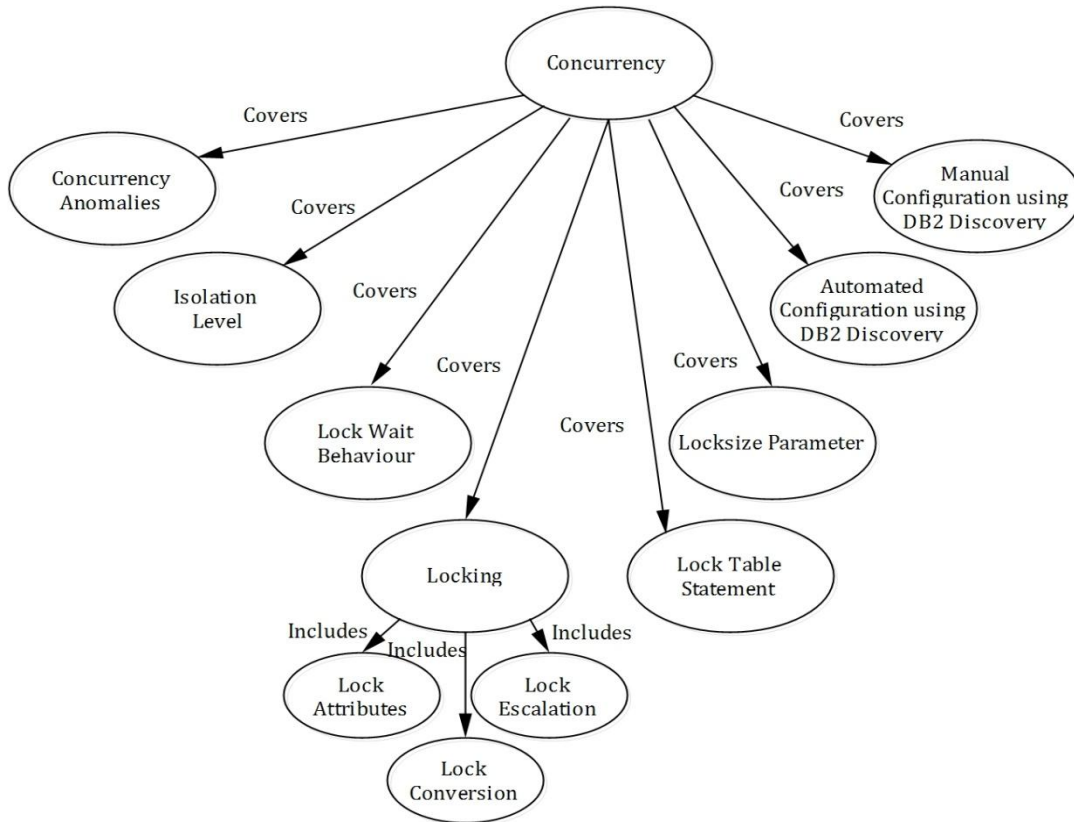
Unit-3: Data Storage Management



Unit-4: Controlling Data Access



Unit-5: Concurrency



Unit-6: Recovery

