COURSE STRUCTURE

Course Code	BCA30010				
Course Category	Program Major				
Course Title	Relational Database Management System				
Teaching Scheme	Lectures	Tutorials	Laboratory/Practical	Project	Total
Weekly Load Hrs.	3	-	2		5
Credits	3	-	1	-	4
Assessment Schema Code	TL3				

Course Objectives:

1. To understand use of stored functions, cursors, views and triggers to interact with databases
2. To introduce concepts of database transactions and their concurrent execution
3. To introduce techniques for recovering data back after system failure

Course Outcomes:

After completion of this course students will be able to do

1. To write stored functions, cursors, views and triggers to interact with databases
2. To normalize the database in different normal forms, derive primary keys from relations
3. To derive primary keys for relations by applying algorithm
4. To analyze transactions and prepare concurrent schedules ,solve data recovery problems
5. To solve problems related to data recovery after system failure

Course Contents:

Unit 1: Advanced SQL [9]

Controlling the program flow, conditional statements, loops
Views
Stored Functions
Stored Procedures
Handling errors and exceptions
Cursors
Triggers

Unit 2: Transactions and concurrency control mechanism [9]

Describe a transaction, properties of transaction, state of the transaction.
Executing transactions concurrently associated problem in concurrent execution.
Schedules
types of schedules
concept of Serializability,
Precedence graph for Serializability.
Ensuring Serializability by locks, different lock modes, 2PL and itsvariations.
Basic timestamp method for concurrency, Thomas Write Rule.
Locks with multiple granularity, dynamic database concurrency (Phantom Problem).
Timestamps versus locking

Deadlock handling methods
Detection and Recovery (Wait for graph).
Prevention algorithms (Wound-wait, Wait-die)

Unit 3: Database Integrity and Security Concepts [8]
Domain constraints
Referential Integrity
Introduction to database security concepts
Methods for database security
Discretionary access control method
Mandatory access control
Role base access control for multilevel security
Use of views in security enforcement
Overview of encryption technique for security
Statistical database security

Unit 4: Crash Recovery [7]
Failure classification
Recovery concepts
Log base recovery techniques (Deferred and Immediate update)
Checkpoints
Recovery with concurrent transactions (Rollback, checkpoints, commit)

Learning Resources:

Reference Books:

- Database System Concepts, Henry korth and A. Silberschatz
- An Introduction to Database System, Bipin Desai
- File Structure by Michael, J. Folk, Greg, Riccardi
- Teach Yourself SQL in 14 days, Jeff Parkins and Bryan Morgan

Web Resources

Weblinks:

https://www.javatpoint.com/what-is-rdbms
https://www.w3schools.com/sql/default.asp

MOOCs: Online courses for self-learning
Courses by NPTEL and MIT Open Courseware etc

Pedagogy:

- Participative Learning,
- Discussion
- Demonstrations
- Practical
- Assignment