Lok Jagruti Kendra University
University with a Difference

Diploma in Cloud Computing & Big Data

LJ Polytechnic

Course Code: 025100404

Advanced Database Management System

Programme / Branch Name			Diploma in Cloud Computing & Big Data			
Course Name	Advanced Database Management System				**Course Code**	025100404
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses BSC: Basic Science Courses
ESC: Engineering Science Courses PCC: Program Core Courses
OEC: Open Elective Courses PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

Teaching Hours / Week / Credits				**Evaluation Scheme**			
L	**T**	**P**	**Total Credit**	**CCE**	**SEE (Th)**	**SEE (Pr)**	**TOTAL**
3	0	4	5	50	50	50	150

Legends:
L: Lectures T: Tutorial P: Practical
CCE: Continuous & Comprehensive Evaluation
SEE (Th): Semester End Evaluation (Theory)
SEE (Pr): Semester End Evaluation (Practical)

2. Prerequisites

- ✓ Students should have basic knowledge about fundamentals of Database.
- ✓ Basic problem-solving capability.
- ✓ Students should have fundamental knowledge about Structured Query Language.

3. Rationale

Advanced Database Management Systems (ADBMS) is associated with the designing of Enterprise Database. The students will develop the skills to design relational database systems for scientific, business and engineering applications.PL/SQL will help them improve database security and reusability. The course focuses on the advanced knowledge of relational database management systems and Normalization will help their ability to optimize the database.

4. Objectives

- ✓ This course aims to help the students to attain the following industry-identified competency through various teaching-learning experiences.
- ✓ Designing and Implementation of relational database management system.
- ✓ Development of programming & coding ability using ‘SQL’ and ‘PL/SQL’.

5. Contents

Unit No.	Unit Name	Topics	Learning Outcomes	% Weightage	Hours
1	**Function Dependency & Decomposition**	1.1. Introduction 1.2. Functional Dependency 1.3. Fully Functional Dependency 1.4. Decomposition and its types	• Basics of Function Dependency (FD) • Fully Function Dependency (FFD) • Armstrong's Axioms for Function Dependency • Concept of Decomposition and types of Decomposition	10	6
2	**Normalization**	2.1.Introduction 2.2.Normalization 2.3.Types of Normal Forms	• Normalization • Various Types of Normal Forms i.1st Normal Form ii.2nd Normal Form iii.3rd Normal Form	10	6
3	**Advanced SQL**	3.1.Introduction 3.2.Transaction Control Language (TCL) 3.3.Data Control Language (DCL) 3.4.Database Objects: View, Sequence, Index, Synonym	• Transaction Control Language Commands: Commit, Rollback, SavePoint • Data Control Language Commands: Grant, Revoke • View • Sequence • Index • Synonym	30	10
4	**PL/SQL Concept**	4.1. Introduction 4.2. Datatype 4.3. Control Structures 4.4. Exception 4.5. Cursor 4.6. Trigger 4.7. Package 4.8. Procedure & Function	• Basics of PL/SQL • Datatype • Merits of PL/SQL • Control Structure: Conditional, Iterative, Sequential • Exception and its types • Cursor and its types • Trigger and its types • Package Specification, Package Body, Advantages of Package	30	12

			• Procedure: Stored Procedure vs Function		
5	**Transaction Processing**	5.1.Introduction 5.2.Concurrency Control 5.3.Methods of Concurrency Control	• Concept Of Transaction • Transaction Properties • Concurrency Control • Deadlock • Methods of Concurrency Control: i. Locking method ii.Time-Stamp method iii.Optimistic method	20	8
				Total Hours	**42**

6. List of Practicals / Exercises

The practical/exercises should be properly designed and implemented in an attempt to develop different types of skills so that students can acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

Sr. No.	Practical / Exercises	Key Competency	Hours
1	Practice on Function Dependencies.	Basics of Function Dependency.	4
2	Practice on various Normal Forms using SQL.	Several Normal Forms using SQL.	4
3	Implement SQL queries to perform Data Control Language (DCL) and Transaction Control Language (TCL) Commands.	Execution of Data Control Language and Transaction Control Language Commands.	4
4	Implement SQL queries to perform various types of Locks.	Various types of Locks using SQL.	4
5	Execute SQL queries to various operations of View.	Various operations on View.	2
6	Execute SQL queries to various operations of Sequence.	Several operations of Sequence.	2
7	Execute SQL queries to various operations of Index.	Various operations of Index.	2
8	Execute SQL queries to various operations of Synonym.	Various operations of Synonym.	2
9	Implement various types of Control Structure using PL/SQL.	Several types of Control Structure such as Iterative,	4

		Conditional and Sequential using PL/SQL.	
10	Implement Exception handling using PL/SQL.	Predefined and User defined Exception Handling using PL/SQL.	4
11	Implement PL/SQL programme using Cursor.	Implementation of cursor using PL/SQL.	4
12	Implement PL/SQL programme using Trigger.	Concept of Trigger and various types of Triggers.	6
13	Execute various operations on Package.	Several operations on Package using PL/SQL.	4
14	Implement Procedure and Functions using PL/SQL.	Function and Procedure using PL/SQL.	6
15	Practice on Transaction Processing.	Fundamental of Transaction Processing.	4
		Total Hours	**56**

7. Suggested Specification Table for Evaluation Scheme

Unit No.	Unit Name	Distribution of Topics According to Bloom's Taxonomy					
		R %	U %	App %	C %	E %	An %
1	Function Dependency & Decomposition	25	40	20	0	10	5
2	Normalization	20	25	30	10	10	5
5	Advanced SQL	20	25	40	10	5	-
4	PL/SQL Concept	20	25	40	5	5	5
5	Transaction Processing	30	30	20	10	5	5

Legends: R: Remembering U: Understanding
App: Applying C: Creating
E: Evaluating An: Analyzing

8. Textbooks

1) Database System Concept, Design and Applications by S.K.Singh,Pearson Education.
2) SQL-PL/SQL by Ivan Baryons,Bbp Publication.

9. Reference Books

1) Database System Concepts, Silberschatz, Korth and Sudarshan, McGraw Hill Education.
2) Oracle 11g: Complete reference, Kevin Loney, McGraw Hill Education.
3) Mastering SQL, Martin Gruber, Bbp Publication.

10. Open Sources (Website, Video, Movie)

1) https://www.coursera.org/learn/database-management
2) https://www.sqlcourse.com/
3) https://www.tutorialspoint.com/dbms/index.htm
4) https://nptel.ac.in/courses/106/106/106106220/