VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY
JNANASAGARA CAMPUS, BALLARI-583105

Department of Studies in

Computer Science

IV Semester Syllabus

Bachelor of Science

With effect from 2022-23 and onwards

Semester-IV

DSC 4: Database Management System

Course Title: Database Management System	**Course code: 21BSC4C4CSL**
Total Contact Hours: 52	**Course Credits: 04**
Internal Assessment Marks: 40	**Duration of SEE: 02 Hours**
Semester End Examination Marks: 60	

Course Outcomes (CO's):

At the end of the course, students will be able to:
1. Explain the various database concepts and the need for database systems.
2. Identify and define database objects, enforce integrity constraints on a database usingDBMS.
3. Demonstrate a Data model and Schemas in RDBMS.
4. Identify entities and relationships and draw ER diagram for a given real-world problem.
5. Convert an ER diagram to a database schema and deduce it to the desired normalform.
6. Formulate queries in Relational Algebra, Structured Query Language (SQL) fordatabase manipulation.
7. Explain the transaction processing and concurrency control techniques.

Language / DSC 4: Database Management System

Unit	Description	Hours
1	**Database Architecture:** Introduction to Database system applications, Characteristics and Purpose of database approach. People associated with Database system. Data models. Database schema. Database architecture.Data independence. Database languages, interfaces, and classification of DBMS.	10
2	**E-R Model:** Entity-Relationship modeling: E – R Model Concepts: Entity, Entity types, Entity sets, Attributes, Types of attributes, key attribute, and domain of an attribute. Relationships between the entities. Relationship types, roles and structural constraints, degree and cardinality ratio of a relationship. Weak entity types, E -R diagram.	10
3	**Relational Data Model:** Relational model concepts. Characteristics of relations. Relational model constraints: Domain constrains, key constraints, primary & foreign key constraints, integrity constraints and null values. Relational Algebra: Basic Relational Algebra operations. Set theoretical operations on relations. JOIN operations Aggregate Functions and Grouping. Nested Sub Queries-Views. Introduction to PL/SQL & programming of above operations in PL/SQL	12
4	**Data Normalization:** Anomalies in relational database design. Decomposition. Functional dependencies. Normalization. First normal form, Second normal form, Third normal form. Boyce-Codd normal form.	09

5	**Query Processing Transaction Management:** Introduction Transaction Processing. Single user & multiuser systems. Transactions: read & write operations. Need of concurrency control: The lost update problem, Dirty read problem. Types of failures. Transaction states. Desirable properties (ACID properties) of Transactions. Concurrency Control Techniques: Locks and Time stamp Ordering. Deadlock & Starvation.	11

References:

1. Fundamentals of Database Systems, Ramez Elamassri, Shankant B. Navathe, 7th Edition, Pearson, 2015
2. An Introduction to Database Systems, Bipin Desai, Galgotia Publications, 2010.
3. Introduction to Database System, C J Date, Pearson, 1999.
4. Database Systems Concepts, Abraham Silberschatz, Henry Korth, S.Sudarshan, 6thEdition, McGraw Hill, 2010.
5. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3rd Edition, McGraw Hill, 2002

Course Title: DBMS Lab	Course code: 21BSC4C4CSP
Total Contact Hours: 52	Course Credits: 02
Internal Assessment Marks: 25	Duration of SEE: 03 Hours
Semester End Examination Marks: 25	

Course Outcomes (CO's):

At the end of the course, students will be able to:
1. Infer database language commands to create simple database
2. Analyze the database using queries to retrieve records
3. Applying PL/SQL for processing database

Practical's:

1. Execute a single line query and group functions.
2. Execute DDL Commands.
3. Execute DML Commands
4. Execute DCL and TCL Commands.
5. Implement the Nested Queries.
6. Implement Join operations in SQL
7. Create views for a particular table
8. Implement Locks for a particular table
9. Write PL/SQL procedure for an application using exception handling.
10. Write PL/SQL procedure for an application using cursors.
11. Write a PL/SQL procedure for an application using functions
12. Write a PL/SQL procedure for an application using package

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program – 1 from Part A	Writing the Program	05
	Execution	05
Program -2 from Part B	Writing the Program	05
	Execution	05
Viva Voice		05
Total		25

****