

## Syllabus for BSc IV Semester

Course Title: <b>Database Management System</b>	Course code: 21BSC4C2CS2L
Total Contact Hours: 52	Course Credits: 04
Formative Assessment or IA Marks: 40	Duration of SEE/Exam: 02 Hours
Summative Assessment Marks: 60	

### Course Outcomes (COs):

At the end of the course, students will be able to:

- Explain the various database concepts and the need for database systems.
- Identify and define database objects, enforce integrity constraints on a database using DBMS.
- Demonstrate a Data model and Schemas in RDBMS.
- Identify entities and relationships and draw ER diagram for a given real-world problem.
- Convert an ER diagram to a database schema and deduce it to the desired normal form.
- Formulate queries in Relational Algebra, Structured Query Language (SQL) for database manipulation.
- Explain the transaction processing and concurrency control techniques.

### DSC7: Database Management System (DBMS)

Unit	Description	Hours
1	<b>Database Architecture:</b> 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	<b>E-R Model:</b> 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	<b>Relational Data Model:</b> Relational model concepts. Characteristics of relations. Relational model constraints: Domain constraints, key constraints, primary & foreign key constraints, integrity constraints and null values. Relational Algebra: Basic Relational Algebra operations. Set theoretical	12

	operations on relations. JOIN operations Aggregate Functions and Grouping. Nested Sub Queries-Views. Introduction to PL/SQL & programming of above operations in PL/SQL	
4	<b>Data Normalization:</b> Anomalies in relational database design. Decomposition. Functional dependencies. Normalization. First normal form, Second normal form, Third normal form. Boyce-Codd normal form.	09
5	<b>Query Processing Transaction Management:</b> 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, 6<sup>th</sup> Edition, McGraw Hill, 2010.
5. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3<sup>rd</sup> Edition, McGraw Hill, 2002

Year	II	Course Code: 21BSC4C2CS2P	Credits	02
Sem.	III		Course Title: DBMS LAB	Hours
Course Pre-requisites, if any:		Knowledge of Programming		
Formative Assessment Marks: 25		Summative Assessment Marks: 25	Duration of ESA: 03 hrs.	
		<b>Practical:</b> CO: Student would be able to create tables, execute queries and PL/SQL programs. 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 DBMS Lab Examination

Assessment Criteria		Marks
Program – 1 from Part A	Writing the Program	03
	Execution and Formatting	07
Program -2 from Part B	Writing the Program	03
	Execution and Formatting	07
Viva Voice		05

## Semester End Exam Question Paper Pattern

Duration of the examination: 2hour

Max. Marks:60

### Section A

Answer any TEN from the following, each carries 2 marks:

[10X2=20]

1. -----
2. -----
3. -----
4. -----
5. -----
6. -----
7. -----
8. -----
9. -----
10. -----
11. -----
12. -----

### Section B

Answer any FOUR from the following questions each carries 5 marks.

[4X5=20]

13. -----
14. -----
15. -----
16. -----
17. -----

### Section C

Answer Any two from the following questions each carries 10 marks.

(The Question may consist two sub-questions)

[2X10=20]

18. -----
19. -----
20. -----

### **Theory Paper IA 40 Marks distribution**

	<b>C1</b>	<b>C2</b>	<b>Total Marks</b>
<b>First IA</b>	Test-1: 15marks	Assignment/Activity-1: 05Marks	<b>20</b>
<b>Second IA</b>	Test-2: 15marks	Assignment/Activity-2 : 05Marks	<b>20</b>
	<b>30</b>	<b>10</b>	<b>40</b>

### **Theory Paper IA 20 Marks distribution**

	<b>C1</b>	<b>C2</b>	<b>Total Marks</b>
<b>First IA</b>	Test-1: 10 marks	---	<b>10</b>
<b>Second IA</b>	Test-2: 5marks	Assignment/Activity-2 : 05	<b>10</b>
	<b>15</b>	<b>05</b>	<b>20</b>