

**DATABASE MANAGEMENT SYSTEM**  
(Effective from the academic year 2018 -2019)  
**SEMESTER – V**

<b>Subject Code</b>	18CS53	<b>CIE Marks</b>	40
<b>Number of Contact Hours/Week</b>	3:2:0	<b>SEE Marks</b>	60
<b>Total Number of Contact Hours</b>	50	<b>Exam Hours</b>	3 Hrs

**CREDITS –4**

**Course Learning Objectives:** This course will enable students to:

- Provide a strong foundation in database concepts, technology, and practice.
- Practice SQL programming through a variety of database problems.
- Demonstrate the use of concurrency and transactions in database
- Design and build database applications for real world problems.

<b>Module 1</b>	<b>Contact Hours</b>
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**Introduction to Databases:** Introduction, Characteristics of database approach, Advantages of using a DBMS, Types of Database Applications, Overview of Database Languages and Architectures: Data Models, Schemas, and Instances. Three schema architecture and data independence, database languages, and interfaces, The Database System environment. **Conceptual Data Modelling using Entities and Relationships:** Entity types, Entity sets, attributes, roles, and structural constraints, Weak entity types, ER diagrams, examples, Specialization and Generalization.  
**Textbook 1:** Ch 1.1 to 1.8, 2.1 to 2.6, 3.1 to 3.10  
**RBT: L1, L2, L3**

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**Relational Model:** Relational Model Concepts, Relational Model Constraints and relational database schemas, Update operations, transactions, and dealing with constraint violations. **Relational Algebra:** Unary and Binary relational operations, additional relational operations (aggregate, grouping, etc.) Examples of Queries in relational algebra. **Mapping Conceptual Design into a Logical Design:** Relational Database Design using ER-to-Relational mapping. **SQL:** SQL data definition and data types, specifying constraints in SQL, retrieval queries in SQL, INSERT, DELETE, and UPDATE statements in SQL, Additional features of SQL.  
**Textbook 1:** Ch4.1 to 4.5, 5.1 to 5.3, 6.1 to 6.5, 8.1; **Textbook 2:** 3.5  
**RBT: L1, L2, L3**

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**Module 3**

**SQL : Advances Queries:** More complex SQL retrieval queries, Specifying constraints as assertions and action triggers, Views in SQL, Schema change statements in SQL. **Database Application Development:** Accessing databases from applications, An introduction to JDBC, JDBC classes and interfaces, SQLJ, Stored procedures, Case study: The Internet Bookshop, Internet Applications, The three-tier application architecture, The presentation layer, The Middle Tier  
**Textbook 1:** Ch7.1 to 7.4; **Textbook 2:** 6.1 to 6.6, 7.5 to 7.7.  
**RBT: L1, L2, L3**

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**Module 4**

**Normalization: Database Design Theory –** Introduction to Normalization using functional and multivalued dependencies, normal design guidelines for relation schema, Functional Dependencies, Normal Forms based on Primary Keys, Second and Third Normal Forms, Boyce-Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form. **Normalization Algorithms:** Inference Rules, Equivalence, and Minimal Cover, Properties of Relational Decompositions, Algorithms for Relational Database Schema Design, Nulls, Dangling tuples, and alternate Relational Designs, Further discussion of Multivalued dependencies and 4NF, Other dependencies and Normal Forms

10

**Textbook 1:** Ch14.1 to 14.7, 15.1 to 15.9

1. John VenderPrie, **"Python Data Science Handbook: Essential Tools for Working with Data"**, 1<sup>st</sup> Edition, O'Reilly Media, 2016. ISBN-13: 978-1491912058
2. Charles Dierbach, **"Introduction to Computer Science Using Python"**, 1<sup>st</sup> Edition, Wiley India Pvt Ltd, 2015. ISBN-13: 978-8126556014
3. Wesley J Chun, **"Core Python Applications Programming"**, 3<sup>rd</sup> Edition, Pearson Education India, 2015. ISBN-13: 978-9332555365

  
Head of the Department  
Dept. of Artificial Intelligence & Machine Learning  
Alva's Institute of Engineering and Technology  
Shobhavani Campus, Mijar  
Maddur Road - 574 225, D.K. Karnataka, India