**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**LESSON PLAN - DATABASE MANAGEMENT SYSTEMS**

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| **FACULTY NAME: Mrs. T. DEEPTHI** | **YEAR/SEM: II-II** | **ACADEMIC YEAR**: **2017-18** |

 **w.e.f. 14.12.2017**

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| **S.No** | **Name of the Topic** | **Reference****Book** | **No .Of Lectures required** | **Delivery Method** | **Date** |
|  | **UNIT-I** |  |  |  |  |
| 1 | Introduction, Data base System Applications | T2: 1.1 | 1 | Chalk & Talk | 14.12.2017 |
| 2 | Purpose of data base Systems. | T2:1.2 | 1 | Chalk & Talk | 15.12.2017 |
| 3 | View of Data – Data Abstraction, Instances and Schemas | T2: 1.3 | 1 | Chalk & Talk | 16.12.2017 |
| 4 | Database Languages – DDL – DML Database Access for applications Programs | T2: 1.5 | 1 | Chalk & Talk |  19.12.2017 |
| 5 | Transaction Management  | T2: 1.7 | 1 | Chalk & Talk | 19.12.2017 |
| 6 | Data Storage and Querying | T2:1.8.1 | 1 | Chalk & Talk | 20.12.2017 |
| 7 | Database architecture | T2: 1.8 | 1 | Chalk & Talk |  21.12.2017 |
| 8 | Database users and administrators,  | T2:1.6 | 1 | Chalk & Talk |  22.12.2017 |
| 9 | History of database systems | T2: 1.10 | 1 | Chalk & Talk | 23.12.2017 |
| 10 | Introduction to database design, ER Diagrams Beyond ER design | T1: 2.1 | 1 | Chalk & Talk | 27.12.2017 |
| 11 | Entities, Attributes and Entity Sets  | T1: 2.2 | 1 | Chalk & Talk | 28.12.2017 |
| 12 | Relationships and relationship sets | T1: 2.3 | 1 | Chalk & Talk |  29.12.2017 |
| 13 | Additional features of ER model | T1: 2.4 | 2 | Chalk & Talk | 02.01.2018 03.01.2018 |
| 14 | Conceptual design with ER model | T1: 2.5 | 1 | Chalk & Talk | 04.01.2018 |
| 15 | Conceptual design for large enterprises | T1:2.6 | 1 | Chalk & Talk | 05.01.2018 |
| 16 | Relational Model: Introduction to the Relational Model | T1: 3.1 | 1 | Chalk & Talk | 06.01.2018 |
| 17 | Integrity Constraint Over relations | T1: 3.2 | 1 | Chalk & Talk | 06.01.2018  |
| 18 | Enforcing Integrity constraints – Querying relational data –  | T1:3.3 | 1 | Chalk & Talk | 08.01.2018 |
| 19 | Logical data base Design | T1:3.5 | 1 | Chalk & Talk | 09.01.2018 |
| 20 | Introduction to Views – Destroying | T1:3.6 | 1 | Chalk & Talk | 10.01.2018 |
| 21 | Altering Tables and Views | T1:3.7 | 1 | Chalk & Talk | 11.01.2018 |
| 22 | E-R Diagrams(**T**) | T1:2.5 | 1 | Chalk & Talk | 19.01.2018 |
|  | **UNIT-II** |  |  |  |  |
| 23 | Relational Algebra and Calculus: Relational Algebra –  | T1: 4.1 | 2 | Chalk & Talk | 20.01.201822.01.2018 |
| 24 | Selection and projection | T1:4.2.1 | 1 | Chalk & Talk | 23.01.2018 |
| 25 | set operations – renaming, Joins – Division | T1: 4.2.2 -4.2.5 | 1 | Chalk & Talk | 24.01.2018 |
| 26 | Relational calculus – Tuple relational Calculus –  | T1:4.3 | 2 | Chalk & Talk | 25.01.201827.01.2018 |
| 27 | Domain relational calculus Expressive Power of Algebra and calculus. | T1:4.4 | 1 | Chalk & Talk | 29.01.2018 |
| 28 | Form of Basic SQL Query – Examples of Basic SQL Queries | T1: 5.2 | 2 | Chalk & Talk | 30.01.201831.01.2018 |
| 29 | Introduction to Nested Queries – Correlated Nested Queries, Set- Comparison Operators, | T1: 5.4 | 1 | Chalk & Talk | 01.02.2018 |
| 30 | Aggregative Operators | T1: 5.4.3, 5.5 | 1 | Chalk & Talk | 02.02.2018 |
| 31 | NULL values – Comparison using Null values , Logical connectivity’s – AND, OR and NOT | T1: 5.6 | 1 | Chalk & Talk | 03.02.2018 |
| 32 | Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases | T1: 5.7, 5.8 | 2 | Chalk & Talk | 05.02.201806.02.2018 |
| 33 | Relational Algebra(**T**) | T1:4.1 | 1 | Chalk & Talk | 12.02.2018 |
|  | **UNIT-III** |  |  |  |   |
| 34 | Introduction to Schema refinement – Problems Caused by redundancy | T1: 19.1 | 1 | Chalk & Talk | 13.02.2018 |
| 35 | Decompositions – Problem related to decomposition | T1:19.1.3 | 1 | Chalk & Talk | 15.02.2018 |
| 36 | Functional dependencies, reasoning about FDS – FIRST, SECOND Normal forms | T1: 19.4 | 1 | Chalk & Talk | 19.02.2018 |
| 37 | THIRD NF, BCNF, FOURTH & FIFTH Normal Forms | T1:19.4 | 1 | Chalk & Talk | 20.02.2018 |
| 38 | Lossless join Decomposition – Dependency preserving Decomposition | T1: 19.5 | 2 | Chalk & Talk | 21.02.201823.02.2018 |
| 39 | Schema refinement in Data base Design | T1: 19.7 | 2 | Chalk & Talk | 24.02.201826.02.2018 |
| 40 | Multi Valued Dependencies | T1:19.8.1 | 1 | Chalk & Talk | 27.02.2018 |
| 41 | Forth Normal Form, Join dependencies, Fifth Normal Form, | T1: 19.8.2 -19.8.4 | 1 | Chalk & Talk | 28.02.2018 |
|  | **UNIT-IV** |  |  |  |  |
| 44 | Transaction Management: Transaction Concept – Transaction State | T2: 15.1, 15.2 | 1 | Chalk & Talk | 01.03.2018 |
| 45 | Implementation of Atomicity and Durability | T2:15.3 | 1 | Chalk & Talk | 02.03.2018 |
| 46 | Concurrent Executions, Serializability Recoverability, | T2: 15.4 - 15.6 | 1 | Chalk & Talk | 03.03.2018 |
| 47 | Implementation of Isolation,  | T2: 15.7 | 1 | Chalk & Talk | 05.03.2018 |
| 48 | Testing for Serializability | T2:15.9 | 1 | Chalk & Talk | 06.03.2018 |
| 49 | Concurrency Control: Lock-Based Protocols  | T2:16.1 | 1 | Chalk & Talk | 07.03.2018 |
| 50 | Time Stamp Based Protocols | T2:16.2 | 1 | Chalk & Talk | 08.03.2018 |
| 51 | Validation Based Protocols – Multiple Granularity. | T2:16.3, 16.4 | 1 | Chalk & Talk | 09.03.2018 |
| 52 | Recovery System-Failure Classification-Storage Structure | T2:17.1, 17.2 | 1 | Chalk & Talk | 12.03.2018 |
| 53 | Recovery and Atomicity | T2:17.3 | 1 | Chalk & Talk | 13.03.2018 |
| 54 | Log Based Recovery | T2:17.4 | 1 | Chalk & Talk | 14.03.2018 |
| 55 | Recovery with Concurrent Transactions  | T2: 17.6  | 1 | Chalk & Talk | 15.03.2018 |
| 56 | Buffer Management-Failure with loss of Non Volatile Storage  | T2: 17.7, 17.8  | 1 | Chalk & Talk | 19.03.2018 |
| 57 | Advance Recovery Systems-Remote Backup Systems  | T2: 17.9, 17.10  | 1 | Chalk & Talk | 20.03.2018 |
| 58 | Concurrency Control(**T**) | T2:16.1 | 1 | Chalk & Talk | 21.03.2018 |
|  |  **UNIT-V** |  |  |  |  |
| 59 |

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| Overview of Storage and Indexing: Data on External Storage  |

 | T1: 8.1  | 1 | Chalk & Talk | 22.03.2018 |
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| File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes  |

 | T1: 8.2 | 1 | Chalk & Talk | 23.03.2018 |
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| Index data Structures – Hash Based Indexing  |

 | T1: 8.3.1  | 1 | Chalk & Talk | 24.03.2018 |
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| Tree base Indexing |

 | T1: 8.3.2 | 1 | Chalk & Talk | 26.03.2018 |
| 63 | Comparison of File Organizations | T1:8.4 | 1 | Chalk & Talk | 27.03.2018 |
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| Tree Structured Indexing: Intuitions for tree Indexes  |

 | T1: 10.1  | 1 | Chalk & Talk | 28.03.2018 |
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| Indexed Sequential Access Methods (ISAM)  |

 | T1: 10.2  | 1 | Chalk & Talk | 29.03.2018 |
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| B+ Trees: A Dynamic Index Structure-Search, insert, Delete  |

 | T1: 10.3 - 10.6  | 1 | Chalk & Talk | 30.03.2018 |
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| Hash Based Indexing: Static Hashing – Extendable hashing  |

 | T1: 11.1, 11.2  | 1 | Chalk & Talk | 31.03.2018 |
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| Linear Hashing –Extendable vs. Liner hashing  |

 | T1: 11.3, 11.4  | 1 | Chalk & Talk | 02.04.2018 |

**Important Questions in exam point of view**

**Unit-1**

1. Compare and contrast File Processing Systems with Data Base Systems.
2. Define Data Abstraction and discuss levels of Abstraction.
3. Discuss about different types of Data Models.
4. Explain different roles of database users.
5. Define key constraint, participation constraints and weak entity set with an example.
6. Draw and explain detailed structure of DBMS.
7. Explain dbms applications.
8. Give short notes on Views.
9. Explain about different types of integrity constraints.
10. Discus about ER-Model.

**Unit-2**

1. Explain basic operations of Relational algebra with an example.
2. Explain set operations of Relational algebra with an example.
3. Explain different types of join in Relational algebra with an example.
4. Discuss domain relational calculus in detail.
5. Discuss tuple relational calculus in detail.
6. Define trigger, its three parts and differentiate row level and statement level triggers.
7. Illustrate Group by and Having clause with an example.
8. Explain independent and correlated nested queries with an example.
9. Explain aggregation and specialization.
10. Explain the following.
11. Binary relationship
12. Ternary relationship

**Unit-3**

1. Define normalization. Explain 1NF,2NF and 3NF.
2. Compare BCNF and 3NF.
3. Explain properties of decomposition.
4. Explain about schema refinement in database design.
5. Explain MVD and 4NF with an example.
6. Discuss about JD and 5NF with an example.
7. What is FD? Explain Types and properties of FD.
8. Explain about lossless join decomposition.

**Unit-4**

1. Explain ACID properties through example.
2. Draw transaction state diagram and describe each state that a transaction go through during its execution.
3. Explain in detail about timestamp based concurrency control technique.
4. Discuss about serializability and its types with an example.
5. What is 2-Phase Locking protocol? Compare 2PL with strict 2PL.
6. Discuss about transaction recovery techniques (log based recovery and ARIES.)
7. Discuss about validation based locking protocols.
8. Explain Buffer management.
9. Write in detail about remote backup systems.

**Unit-5**

1. What is the use of indexing? And compare primary and secondary indexing.
2. What is B+ Tree? And explain the basic operations on it.
3. Differentiate ordered indexing with hashing.
4. Write in detail about hash based indexing and tree based indexing.
5. Explain the following
6. Static hashing
7. Dynamic hashing
8. Extendible hashing
9. Linear hashing
10. Explain in detail about ISAM.
11. Explain in detail about file organization.

**Text books:**

1. Raghurama Krishnan, Johannes Gehrke (2003), Database Management Systems, 3rd edition, Tata McGraw Hill, India.
2. Database System Concepts, A. Silberschatz, H.F.Korth, S.Sudharshan, Mc Grab hill, 5th Edition, 2006

**References:**

1. Database systems, 6th edition, Ramez Elmasri, Shamkant, B.Navathe, Pearson Education, 2013

2. Database system concepts, Peter rob and carles coronel, cengage learning 2008

3. Introduction to database management ML Gillenson & others, Willey student edition

**Web Searches:**

 W1. [www.studytonight.com/**dbms**/](http://www.studytonight.com/dbms/)

W2:[www.**tutorials**point.com/**dbms**/](http://www.tutorialspoint.com/dbms/)

W3:holowczak.com/**database**-**management**-**systems**-course-**notes**/