**Course Handout (Student)**

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| Institute/School/College Name | Chitkara University Institute of Engineering & Technology | | |
| Department/Centre Name | Department of Computer Science & Engineering | | |
| Programme Name | Bachelor of Engineering (B.E.)-Computer Science & Engineering | | |
| Course Name | Database Management System | Session | 2018-19 |
| Course Code | CSL4206 | Semester/Batch | 4th /2017 |
| Lecture/Tutorial (Per Week) | 3-1-0 | Course Credit | 3 |
| Course Coordinator Name | Ms. Nidhi | | |

1. **Scope & Objective of the Course:**

The main objectives of the course are:

* To introduce the students to Basic DBMS Concepts.
* To provide a comprehensive foundation for designing, building, and working with the databases, enabling the students to participate in the development process, to recover the data and secure the data from unauthorized users.
* To understand the fundamental concepts necessary for designing, implementing database system by using Relational Database Management System practically and its real life applications.

1. **Course Learning Outcome:**

* **CLO01:** Infer various database concepts for database management software.
* **CLO02:** Analyse database requirements to determine the entities involved in the system and their relationship to one another.
* **CLO03:** Implement major DBMS components and their function.
* **CLO04:** Differentiate between various data models.
* **CLO05:** Use database recovery management for maintaining database integrity.
* **CLO06:** Model an application’s data requirements using conceptual model tools like ER diagrams.

1. **Recommended Books (Reference Books/Text Books):**
   1. **B01:** ‘Database Systems’, Ramez.Z.Elmasri, Shamkant B.Navathe, Seventh Edition, Pearson Education.
   2. **B02:** ‘Database System Concepts’, Abraham Silberscatz, Henry F.Korth, Sudharsan , Fifth Edition, McGraw-Hill.
   3. **B03:** 'An Introduction to Database Systems', C.J.Date ,Eighth Edition, O'Reilly Media.
   4. **B04:** 'An Introduction to Database Systems', Bipin.C.Desai, Eleventh Edition, West Group Division, 1990.
2. **Other readings & relevant websites:**

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| S.No. | **Link of Journals, Magazines, websites and Research Papers** |
| 1. 1. | http://www.nptelvideos.in/2012/11/database-management-system.html |
| 1. 2. | <http://freevideolectures.com/Course/2668/Database-Management-System> |
| 1. 3. | <http://www.help2engg.com/dbms/dbms-introduction> |
| 1. 4. | http://dbms-tutorials.blogspot.in/ |
| 1. 5. | <https://onlinecourses.nptel.ac.in/noc15_cs14/preview> |
| 1. 6. | beginnersbook.com/2015/05/normalization-in-dbms/ |
| 1. 7. | <https://www.tutorialspoint.com/dbms/pdf/database_normalization> |
| 1. 8. | <https://www.tutorialspoint.com/dbms/dbms_transaction.htm> |
| 1. 9. | <https://www.tutorialspoint.com/dbms/dbms_concurrency_control.htm> |
| 10. | <https://www.tutorialspoint.com/dbms/er_diagram_representation.htm> |

1. **Course Plan:**
   1. **Lecture Plan**

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| **Lecture Number** | Topics | **Text Book / Reference Book / Other reading material** |
| **1** | Introduction to database and Characteristics of Data Base approach. | B01, Class Notes |
| **2** | Advantages and Disadvantages of DBMS approach. | B01 |
| **3** | Introduction to Data Models: Hierarchical Model, Network Model, ER Model, Relational Model. | B01 |
| **4** | Schemas, Instances,3 Schema architecture and Data Independence | Class Notes |
| **5** | Client Server Architecture for DBMS | Class Notes |
| **6** | ER Model: Data base design process, Entity Types, Entity sets, Attributes, keys and their types | B01 |
| **7-8** | Weak entity types, ER diagrams, naming convention and design issues | B01 |
| **9-11** | E.F Codd Rules, Relational Model: Basic concept, Characteristics of relations | B01 |
| **12-13** | Relational Algebra: Unary operation Relation, Relational Algebra Operations from Set Theory. | B01,B03 |
| **14-15** | Binary Relational Operations(Join, Division) , Aggregate Functions and Grouping, The Tuple Relational Calculus, Query by example | B01,B03 |
| **16** | Introduction to Normalization, their practical uses. | B01,B02 |
| **17-18** | Functional Dependencies  (Fully,Transitive, Multivalued, Join Dependencies) | B01,B02 |
| **19** | 1st Normal Form | B01,B02 |
| **20** | 2nd Normal Form | B01, B02 |
| **21** | 3rd Normal Form | B01,B02 |
| **22** | Boyce Codd Normal Form(BCNF) | B01,B02 |
| **23** | 4th Normal Form, Introduction to 5th & 6th Normal Form | B01,B02 |
| **24** | Introduction to Transaction and its desirable properties.  System Log. | B01 |
| **25** | Characterizing Schedules  Based on Recoverability and Serializability | B01 |
| **26** | Introduction to Concurrency Control Techniques. | B01 |
| **27-28** | Two Phase Locking Techniques for  Concurrency Control. | B01 |
| **29-30** | Concurrency Control based on Timestamp Ordering | B01 |
| **31** | Dealing with Deadlocks | B01 |
| **32-33** | Introduction to Database Recovery Techniques | B01 |
| **34-35** | Recovery techniques based on Deferred update and recovery techniques based on Immediate Update. | B01 |
| **36-37** | Introduction to Checkpoints and Shadow Paging | B01 |
| **38-39** | Introduction to Database Security, Discretionary access control based on granting and revoking privileges. | B01 |

1. **Evaluation Scheme & Components:**

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| **Evaluation Component** | **Type of Component** | **No. of Assessments** | **Weightage of Component** | **Mode of Assessment** |
| Component 1 | MCQ based on Tutorial | 02 | 10% | Offline |
| Component 2 | Sessional Tests (STs) | 03\* | 30% | Offline |
| Component 3 | End Term Examinations | 01 | 60% | Offline |
| **Total** | | **100%** | | |

\*Out of 03 STs, the ERP system automatically picks the best 02 STs marks for evaluation of the STs as final marks.

**Details of Evaluation Components:**

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| --- | --- | --- | --- | --- |
| **Evaluation Component** | **Description** | **Syllabus Covered (%)** | **Timeline of Examination** | **Weightage (%)** |
| Component 01 | MCQ based on Tutorial | Up to 40 % | 5th Week of Semester | 10% |
| MCQ based on Tutorial | 41% - 80% | 10th Week of Semester |
| Component 02 | ST 01 | Up to 40% | As defined in Academic Calendar | 30% |
| ST 02 | 41% - 80% | As defined in Academic Calendar |
| ST 03 | 100% | As defined in Academic Calendar |
| Component 03 | End Term Examination\* | 100% | At the end of the semester | 60% |
| Total | | |  | 100% |

\*As per Academic Guidelines minimum 75% attendance is required to become eligible for appearing in the End Semester Examination.

**7. Syllabus of the Course:**

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| **Subject: Database Management System** | **Subject Code: CSL4206** |

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| **S.N.** | **Topic (s)** | **No. of Lectures** | **Weightage %** |
| **1** | Introduction to database and Characteristics of Data Base approach. Advantages and Disadvantages of DBMS approach. Introduction to Data Models: Hierarchical Model, Network Model, ER Model, Relational Model. Schemas, Instances,3 Schema architecture and Data Independence Client Server Architecture for DBMS ER Model: Data base design process, Entity Types, Entity sets, Attributes, keys and their types Weak entity types | 7 | 17% |
| **2** | ER diagrams, naming convention and design issues E.F Codd Rules, Relational Model: Basic concept, Characteristics of relations Relational Algebra: Unary operation Relation, Relational Algebra Operations from Set Theory. Binary Relational Operations(Join, Division) , Aggregate Functions and Grouping, The Tuple Relational Calculus, Query by example Introduction to Normalization, their practical uses. | 9 | 23% |
| **3** | Functional Dependencies(Fully, Transitive, Multivalued, Join Dependencies)1st Normal Form 2nd Normal Form 3rd Normal Form Boyce Codd Normal Form(BCNF)4th Normal Form, Introduction to 5th & 6th Normal Form  Introduction to Transaction and its desirable properties. System Log. | 8 | 21% |
| **4** | Characterizing Schedules Based on Recoverability and Serializability Introduction to Concurrency Control Techniques. Two Phase Locking Techniques for Concurrency Control. Concurrency Control based on Timestamp Ordering Dealing with Deadlocks. | 7 | 17% |
| **5** | Introduction to Database Recovery Techniques Recovery techniques based on Deferred update and recovery techniques based on Immediate Update.  Introduction to Checkpoints and Shadow Paging Introduction to Database Security, Discretionary access control based on granting and revoking privileges. | 8 | 21% |

**This Document is approved by:**

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| **Designation** | **Name** | **Signature** |
| **Course Coordinator** | **Ms. Nidhi** |  |
| **Dy. Dean** | **Dr. Shaily Jain** |  |
| **Date (DD/MM/YYYY)** | **28/12/2018** |  |