**Bachelor of Engineering (Computer Science & Engineering)**

**Course Code:** CST101 **Course Name:** Database Management Concepts

**Credits:** 03 **L-T-P:** 3-0-0

**Total Contact Hours:** 60 Hrs.

**Pre-requisite (if any):** NA

**Course Coordinator:** Er. Parul Datta

**Course Facilitator (s):** Dr. Hakam Singh, Dr. Ashutosh Kumar Dubey, Ms. Ravita Chahar, Dr. Vijay Kumar Sinha

**Assessment Components:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Evaluation**  **Component** | **Description** | **Syllabus**  **Covered**  **(%)** | **Timeline of**  **Examination** |
| Component 01# | Formative Assessment(s) | Will be notified | Will be notified |
| Component 02\* | Sessional Test 01 | 0-40% | 22-26 August 2022 |
| Sessional Test 02 | 40-80% | 17-21 October 2022 |
| Sessional Test 03 | 100% | 14-18 November 2022 |
| Component 03\*\* | End Term  Examination | 100% | As per the academic calendar |
| Note: For Assessment Pattern please refer to Annexure I. | | | |

#Mandatory component.

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

\*\*75% attendance is mandatory to appear in End Term Examination.

**Programme Outcomes (POs) and Programme Specific Outcomes (PSOs):**

|  |  |
| --- | --- |
| At the end of the programme, students will be able to: | |
| PO 1 | **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. |
| PO 2 | **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. |
| PO 3 | **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. |
| PO 4 | **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. |
| PO 5 | **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations. |
| PO 6 | **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice. |
| PO 7 | **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. |
| PO 8 | **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. |
| PO 9 | **Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. |
| PO10 | **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. |
| PO11 | **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. |
| PO12 | **Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. |

**Program Specific Outcomes (PSOs):**

|  |  |
| --- | --- |
| PSO 01 | Our students will have the ability to apply the programming skills for solving the problems. |
| PSO 02 | Our students will have the ability to develop software solutions for inter-disciplinary engineering problems. |
| PSO 03 | Our students will have the ability to integrate software & hardware components for advancement of technology. |

**Course Objectives:**

1. To justify the importance and need of unambiguous representation of organizational data by providing a comprehensive overview of various concepts and issues in database  
   management.
2. To furnish the concepts of different data modelling techniques and their justification with respect to the application software development.
3. To endow a comprehensive knowledge about the design and development of relational database management system along with administrative strategies regarding concurrency and distributed databases.

**Course Learning Outcomes (CLO):**

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

|  |  |
| --- | --- |
| CLO1 | To realize the necessity of an integrated database development and its related concepts with regard to the development of application software. |
| CLO2 | To understand the various data modelling techniques and their pros and cons during the incidence of database operations. |
| CLO3 | To elicit the process of formalization of data using different normalization forms. |
| CLO4 | To become proficient at performing data definition, data manipulation, transaction control operations. |
| CLO5 | To understand and achieve data security with the application of integrity constraints and various other techniques for performing secure database transactions. |
| CLO6 | To get to the grips of distributed databases by learning and assessing its need along with implementation details. |

**CLO-PO/PSO Mapping:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Outcomes** | **Program Outcomes** | | | | | | | | | | | | **PSOs** | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 |
| 1 | 3 | 1 | 1 | 1 | 1 | 1 | - | - | - | 1 | 1 | - | 1 | 1 | 1 |
| 2 | 3 | 2 | 1 | 1 | 1 | 1 | - | - | - | - | 1 | - | 1 | 1 | 1 |
| 3 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | 1 | - | 1 | 1 | 1 |
| 4 | 1 | 3 | 3 | 3 | 3 | 1 | - | - | - | - | 1 | - | 2 | 1 | 1 |
| 5 | 2 | 3 | 3 | 1 | 2 | 2 | 1 | 1 | 1 | - | 1 | 1 | 2 | 1 | 1 |
| 6 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | - | 1 | 1 | 1 | 1 | 1 |
| Total | 12 | 11 | 10 | 8 | 10 | 7 | 2 | 2 | 2 | 1 | 1 | 2 | 8 | 6 | 6 |
| Average | 2 | 1.83 | 1.66 | 1.33 | 1.66 | 1.16 | 1 | 1 | 1 | 1 | 1 | 1 | 1.33 | 1 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Mapping Correlation** | **Low** | **Medium** | **High** | **No** |
| 1 | 2 | 3 | - |

**Session-Wise Plan:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Module** | **Session** | **Topic** | **Readings and References** | **Pedagogy/ Activity Planned** | **CO** | **Mode of Delivery** | **Link for Online resource** |
|  | 1 | Introduction to database | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Group Discussion | CO1 | Online Synchronous  PPT and Discussion | <https://www.javatpoint.com/dbms-tutorial> |
|  | 2 | Characteristics of database approach | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Group Discussion | CO1 | Online Synchronous  PPT and Discussion | <https://www.javatpoint.com/dbms-tutorial> |
|  | 3 | Advantages  and Disadvantages of DBMS approach | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Group Discussion | CO1 | Online Synchronous  PPT and Discussion | <https://www.javatpoint.com/dbms-tutorial> |
|  | 4 | Comparison between traditional and DBMS approach | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Group Discussion | CO1 | Online Synchronous  PPT and Discussion | <https://www.javatpoint.com/dbms-tutorial> |
|  | 5 | Introduction to data models | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning | CO1, CO2 | Online Synchronous | https://www.tutorialspoint.com/dbms/dbms\_data\_models.htm |
|  | 6 | Introduction to ER model | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning | CO1, CO2 | Online Synchronous | https://www.geeksforgeeks.org/introduction-of-er-model/ |
|  | 7 | Introduction to Relational Model | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning | CO1, CO2 | Online Synchronous | https://www.javatpoint.com/dbms-relational-model-concept |
|  | 8 | Schemas, Instances, Schema architecture | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Pictionary | CO1, CO2 | PPT and Discussion | https://www.javatpoint.com/dbms-data-model-schema-and-instance |
|  | 9 | Data Independence and its types | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Pictionary | CO1, CO2 | PPT and Discussion | https://www.guru99.com/dbms-data-independence.html |
|  | 10 | Architecturefor DBMS- One Tier, Two-Tier, Three Tier Architecture | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Blended Learning | CO1, CO2 | Online Synchronous | https://medium.com/oceanize-geeks/concepts-of-database-architecture-dfdc558a93e4 |
|  | 11 | ER Model: Database design process, Entity Types, Entity sets, Attributes, Strong and Weak entity. | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual Learning | CO1, CO2 | Online Synchronous | https://www.javatpoint.com/dbms-er-model-concept |
|  | 12 | Keys  and their types, Integrity Constraints | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual Learning | CO1, CO2 | Online Synchronous | https://www.javatpoint.com/dbms-keys |
|  | 13 | ER diagrams, naming convention and design issues. | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual Learning | CO1, CO2 | Online Synchronous | https://www.javatpoint.com/dbms-er-model-concept |
|  | 14 | E.F Codd Rules, Relational Model: Basic concept, Characteristics of relations | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Think-pair-Share | CO1, CO2 | PPT and Discussion | https://www.tutorialspoint.com/e-f-codd-s-12-rules-for-rdbms |
|  | 15 | Introduction to Relational Algebra: Unary operation | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual Learning and Implementation of Problems | CO1 | PPT and Discussion | https://www.tutorialspoint.com/dbms/relational\_algebra.htm |
|  | 16 | Relational Algebra Operations from  Set Theory | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual Learning and Implementation of Problems | CO1 | PPT and Discussion | https://www.tutorialspoint.com/dbms/relational\_algebra.htm |
|  | 17 | Binary Relational Operations (Join, Division) | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual Learning and Implementation of Problems | CO1 | PPT and Discussion | https://www.tutorialspoint.com/dbms/relational\_algebra.htm |
|  | 18 | The Tuple Relational Calculus, Domain Relational Calculus. Query By Example (QBE). | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual Learning and Implementation of Problems | CO1 | PPT and Discussion | https://www.tutorialspoint.com/dbms/relational\_algebra.htm |
|  | 19 | Introduction to Normalization | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | PPT and Discussion | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 20 | Functional Dependencies (Trivial and non trivial) | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | PPT and Discussion | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 21 | Types of Functional Dependencies(Full,  Partial) | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | PPT and Discussion | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 22 | Types of Functional Dependencies (Transitive, Multi-valued & Join Dependencies) | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | PPT and Discussion | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 23 | 1stNormal Form and anomalies | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | Online Synchronous | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 24 | Inference rules and questions on proving them | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | Online Synchronous | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 25 | Closure of attribute set and closure of functional dependency set | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | Online Synchronous | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 26 | Covers and equivalence, non redundant cover, canonical cover | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | Online Synchronous | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 27 | Find candidate key, prime and non prime attributes | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | Online Synchronous | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 28 | Decomposition and its desirable properties | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | Online Synchronous | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 29 | 2ndNormal Form and conversion | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | Online Synchronous | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 30 | 3rdNormal Form and conversion | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | PPT and Discussion | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 31 | Boyce Codd Normal Form and conversion | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | PPT and Discussion | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 32 | 4thNormal Form (what is the highest normal form) | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | PPT and Discussion | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 33 | 5th Normal Form | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO3 | Online Synchronous | https://www.geeksforgeeks.org/normal-forms-in-dbms/ |
|  | 34 | Introduction to Database Security (Threats in database) | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Flipped Classroom, Group Discussion | CO4, CO5 | PPT and Discussion | https://www.brainkart.com/article/Introduction-to-Database-Security-Issues\_11579/ |
|  | 35 | Access control and its types: mandatory, discretionary, rule based, role based | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Flipped Classroom, Group Discussion | CO4, CO5 | PPT and Discussion | https://www.brainkart.com/article/Introduction-to-Database-Security-Issues\_11579/ |
|  | 36 | Introduction to transaction processing Concepts (transaction system, transaction operations) | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual learning | CO4, CO5 | Online Synchronous | https://www.javatpoint.com/dbms-transaction-processing-concept |
|  | 37 | ACID Properties (transaction state, types of failures) | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual learning | CO4, CO5 | Online Synchronous | https://www.javatpoint.com/dbms-transaction-processing-concept |
|  | 38 | Introduction to Schedules | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual learning | CO5, CO6 | PPT and Discussion | https://beginnersbook.com/2018/12/dbms-schedules/ |
|  | 39 | Types of Schedules (Serial and Non-Serial Schedule | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual learning | CO5, CO6 | PPT and Discussion | https://beginnersbook.com/2018/12/dbms-schedules/ |
|  | 40 | Introduction to Serializability (testing) | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual learning | CO5, CO6 | Online Synchronous | https://beginnersbook.com/2018/12/dbms-schedules/ |
|  | 41 | Introduction to Conflict and View serializability  (numericals) | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual learning | CO5, CO6 | Online Synchronous | https://www.gatevidyalay.com/serializability-in-dbms-conflict-serializability/ |
|  | 42 | Introduction to Recoverability, Checkpoints (recovery from transaction failure) | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual learning | CO5, CO6 | Online Synchronous | https://www.javatpoint.com/dbms-checkpoint |
|  | 43 | Cascadeless schedule, log based recovery | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual learning | CO5, CO6 | Online Synchronous | https://www.javatpoint.com/dbms-checkpoint |
|  | 44 | Deferred database modification, immediate database modification | Database System Concepts 7th Edition  by Abraham Silberschatz, Henry Korth (Author), S. Sudarshan | Visual learning | CO5, CO6 | Online Synchronous | https://www.javatpoint.com/dbms-checkpoint |
|  | 45 | Introduction to Concurrency | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO6 | PPT and Discussion | https://www.geeksforgeeks.org/concurrency-control-in-dbms/. |
|  | 46 | Problems in concurrency techniques | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO6 | PPT and Discussion | https://www.geeksforgeeks.org/concurrency-control-in-dbms/ |
|  | 47 | Introduction to Concurrency techniques | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO6 | PPT and Discussion | https://www.geeksforgeeks.org/concurrency-control-in-dbms/ |
|  | 48 | Locking, Modes of Locking (shared lock and exclusive lock) | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO6 | PPT and Discussion | https://www.javatpoint.com/dbms-lock-based-protocol |
|  | 49 | Two-phase locking protocol (growing and shrinking phase) | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO6 | PPT and Discussion | https://www.javatpoint.com/dbms-lock-based-protocol |
|  | 50 | Protocols (static, dynamic and strict) | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO6 | PPT and Discussion | https://www.javatpoint.com/dbms-lock-based-protocol |
|  | 51 | Concurrency Control based on Timestamp Ordering Protocol | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO6 | PPT and Discussion | https://www.geeksforgeeks.org/timestamp-based-concurrency-control/ |
|  | 52 | Multiple Granularity | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Visual Learning and Implementation of Problems | CO6 | PPT and Discussion | https://www.javatpoint.com/dbms-multiple-granularity |
|  | 53 | Query Processing and Optimization: Introduction | Database Management Concepts by Ashutosh Kumar Dubey | Visual Learning and Implementation of Problems | CO1, CO4 | PPT and Discussion | https://www.javatpoint.com/query-processing-in-dbms |
|  | 54 | Phases of Query Processing | Database Management Concepts by Ashutosh Kumar Dubey | Visual Learning and Implementation of Problems | CO1, CO4 | PPT and Discussion | https://www.javatpoint.com/query-processing-in-dbms |
|  | 55 | Optimization Methods (heuristic approach) | Database Management Concepts by Ashutosh Kumar Dubey | Visual Learning and Implementation of Problems | CO1, CO4 | PPT and Discussion | https://www.javatpoint.com/query-processing-in-dbms |
|  | 56 | Introduction to Distributed Database | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Group Discussion | CO6 | Online Synchronous | https://www.tutorialspoint.com/distributed\_dbms/distributed\_dbms\_database\_environments.htm |
|  | 57 | Distributed Database Design | Fundamentals of Database Systems 7th Edition  by RamezElmasri, ShamkantNavathe | Group Discussion | CO6 | Online Synchronous | https://www.tutorialspoint.com/distributed\_dbms/distributed\_dbms\_database\_environments.htm |
|  | 58 | Introduction to pluggable database | Oracle Database 11g The Complete Reference (Oracle Press) by Kevin Loney | Visual Learning and Group Discussion | CO2, CO5 | Online Synchronous | https://oracle-base.com/articles/12c/multitenant-overview-container-database-cdb-12cr1 |
|  | 59 | Introduction to Autonomous database,  NOSQL, Cloud Database | Oracle Autonomous database for dummies by Lawrence Miller | Visual Learning and Group Discussion | CO1, CO4 | PPT and Discussion | https://www.cloudmanagementinsider.com/oracle-autonomous-database-all-you-need-to-know/ |
|  | 60 | Introduction to Object Oriented Database, Temporal Database,  Mobile Database | Database Management Concepts by Ashutosh Kumar Dubey | Visual Learning and Group Discussion | CO1, CO4 | PPT and Discussion | <https://www.c-sharpcorner.com/article/what-are-object-oriented-databases-and-their-advantages2/> |

**Assessment Scheme:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl. No.** | **Assessment**  **Instrument** | **Formative/ Summative** | **Frequency** | **Weightage (%)** | **CO** |
| 1. | Formative Assessment (Assignment/Quiz) | Formative | 02 | 10 | **CO1 - CO6** |
| 2. | Sessional Tests | Formative | 03 | 30 | **CO1 - CO6** |
| 3. | End Term Examination | Summative | 01 | 60 | **CO1 - CO6** |
|  | **Total** |  |  | 100 |  |

**Proposed Course Evaluation Scheme:**

Questions for internal and ETE will be designed to evaluate cognitive skills the various educational levels (Bloom’s taxonomy) such as:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl. No.** | **Bloom’s category** | **ST1** | **ST2** | **ST3** | **ETE** |
|  | Remember | 10 | 0 | 0 | 5 |
|  | Understand | 10 | 10 | 0 | 10 |
|  | Apply | 10 | 10 | 10 | 10 |
|  | Analyze | 10 | 10 | 10 | 10 |
|  | Evaluate | 0 | 10 | 10 | 15 |
|  | Create | 0 | 0 | 10 | 10 |

**Concept Map:**

DBMS

Explains

* 1. Introduction of DBMS
  2. Tier architecture
  3. Database View and mapping
  4. Application requirement
  5. Model and Design

Equips you with

* 1. Knowledge nature of Database
  2. Knowledge of algebra and relations.

Equips you with

3.1 Basic knowledge of Normalization

3.2 Types of Normalization

3.3. Numerical Implications

Equips you with

4.1 Transaction and Management

4.2 Schedules and its types

4.3. Concurrency control techniques

4.3 Log and recovery.

Helps in

5.1 Planning

5.2. Designing

5.3. Implementation

5.4 Coding

5.5 Porting

**Annexure I: Assessment Pattern**

|  |  |  |  |
| --- | --- | --- | --- |
| **Assessment**  **Component** | **Description** | **Assessment Pattern** | **Duration of Examination** |
| Component 01 | Formative Assessment | Will be notified | Will be notified |
| Component 02 | Sessional Test 01 | 1 mark- 5 MCQ  2 marks- 5 questions  5 marks- 3 questions  10 marks- 1 question | 90 Minutes |
| Sessional Test 02 | 1 mark- 5 MCQ  2 marks- 5 questions  5 marks- 3 questions  10 marks- 1 question | 90 Minutes |
| Sessional Test 03 | 1 mark- 5 MCQ  2 marks- 5 questions  5 marks- 3 questions  10 marks- 1 question | 90 Minutes |
| Component 03 | End Term Examination | 1 mark- 5 MCQ  2 marks- 5 questions  5 marks- 5 questions  10 marks- 2 questions | 180 Minutes |

|  |  |  |
| --- | --- | --- |
| **Designation** | **Name** | **Signature** |
| Course Coordinator | Er. Parul Datta |  |
| Program in-charge | Dr. Hakam Singh |  |
| Dean (Academics) | Dr. Meenu Khurana |  |
| Date | 29-06-2022 |  |