**Undergraduate Course Description Document**

**Information Management basics**

**Semester: Even Semester Year: 2020**

**Course Coordinator(s): Mr. Nitin Thapliyal**

**Course Instructor(s):**

1. Mr. Nitin Thapliyal
2. Dr. Srabanti Maji

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| 1. **Department offering the course** | **Computer Science and Engineering** |
| 1. **Course Code** | **IB202** |
| 1. **Course Title** | **Information Management Basics** |
| 1. **Credits (L:T:P:C)** | **3:0:2:4** |
| 1. **Contact Hours (L:T:P)** | **3:0:2** |
| 1. **Prerequisites (if any)** |  |
| 1. **Course Basket** |  |

**Course Summary**

To provide a knowledge of database using SQL/PLSQL,where student will be able to design and create table structure and fetch the information accordingly from database. . This course covers theory and practice in designing a relational database management system with example of a current database product of MYSQL. Students also learn about the important concepts of database integrity, security and availability with techniques like normalization, concurrency control and recoverability control.

**Course Objectives**

1. Describe use of database and types of databases.
2. Design database to store information which can be fetched latter.
3. Use of SQL/DB2
4. Concept of database integrity and security with techniques like normalization.

**Course Outcomes**

On successful completion of the course, students will be able:

CO1: To work on MySQL database management system.

CO2: To create database and query the database for information retrieval.

CO3: To design a database so that data redundancy, data inconsistency and data loss

Problems may be resolved.

CO4: Exposure to DB2 data base.

**Curriculum Content**

**UNIT 1: Introduction to Database System: (08 Lectures)**

**Introduction:** Data base System Applications, data base System VS file System, Data Abstraction, Instances and Schemas, data Models: the ER Model, Relational Model & Other Models , Database Languages, data base Users and Administrator, data base System Structure, Storage Manager, the Query Processor, Two/Three tier architecture.

**UNIT 2: E-R modeling Data Base Design: (06 Lectures)**

**E-R model:** Basic concepts, Design Issues, Mapping Constraints, Attributes and Entity sets, Relationships and Relationship sets, Keys, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R features.

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**UNIT 3:**  **Relational Model & SQL (10 Lectures)**

**Relational Model:** Structure of relational Databases, Relational Algebra, Relational Calculus, Extended Relational Algebra

**SQL:** Form of Basic SQL Query, Nested Queries, Aggregative Operators, NULL values, Logical operators, Outer Joins, Complex Integrity Constraints in SQL.

**UNIT 4: Database Design Concepts (08 Lectures)**

**Database Design:** Schema refinement, Different anomalies in designing a Database, Decompositions , Problem related to decomposition, Functional Dependency, Normalization using functional dependencies, 1NF, 2NF, 3NF & BCNF , Lossless join decomposition, Dependency preserving Decomposition , Schema refinement in Data base Design, Multi valued Dependencies, 4NF, 5NF.

**UNIT 5:** **Transaction & Concurrency (08 Lectures)**

**Transaction Management:** Transaction-concepts, states, ACID property, schedule, serializability of schedules, concurrency control techniques - locking, timestamp, deadlock handling, recovery-log based recovery, shadow paging.

**Text book [TB]:**

1. Raghurama Krishnan, Johannes Gehrke, Data base Management Systems, TATA McGrawHill 3rd Edition,2003

2. Silberschatz, Korth, Data base System Concepts, McGraw hill, 5th edition,2005

**Reference books [RB]:**

1. Peter Rob & Carlos Coronel, Data base Systems design, Implementation, and Management, 7thEdition,2006.

2. Elmasri Navate, Fundamentals of Database Systems, Pearson Education,7th edition 2016

**Teaching and Learning Strategy**

All materials (ppts, assignments, labs, etc.) will be uploaded in Moodle. Refer to your course in Moodle for details.

**Evaluation Scheme**

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| **Evaluation Instrument** | **Weightage** |
| Mid Term Test | 20% |
| Assignments/Class Test | 10% |
| Laboratory | 20% |
| Quizzes | 10% |
| End Term Exam | 40% |