| 1st Semester | MCA01005 | Database Engineering | L-T-P 3-0-0 | 3 CREDITS |
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**Module -I** (06 Hours)

Introduction to DBMS: concept and overview of DBMS, data models, DB languages, DB users and Administrator, 3-schema architecture of DBMS, data independence, EF Codd Rule.

**Module -I I** (06 Hours)

ER Model: basic concepts, design issues, keys, ER diagram, Weak entity sets, Extended ER features. Relational model: structure of relational model, Relational algebra, Extended relational algebra Operations.

**Module – III** (08 Hours)

Relational database design: FDs, Anamolies in designing DB, Normalization using FDs, various Normal forms-1NF, 2NF, 3NF, BCNF, 4NF, 5NF.

**Module-IV** (10 Hours)

SQL and Integrity Constraints: Concepts of DDL, DML, DCL, various SQL operations: set operations, aggregate functions, constraints, view, nested sub queries, PL/SQL, cursor, trigger.

**Module – V** (10 Hours)

Internals of RDBMS: Query optimization, various optimization algorithms, Transaction processing, concurrency control and recovery management. Advanced Database: OODB, WEB based DB, Data warehousing and Data mining.

**Books:**

1) Korth, Silverschatz, Abraham," Database system concepts", Tata McGraw Hill Publication

2) R.Elmasri, S.B Navathe, "Fundamentals of Database System", Adision Wesley Publishing

3) Er.Rajiv chopra, "Database management systems, A Practical Approach", S.Chand Publishing

4) Ramkrishna, "Database management systems", Tata McGraw Hill Publication