**Bachelor Of Engineering In Information Technology**

**2nd Year 1st Semester**

**Subject Name –(IT/PC/B/T/213) Database Management Systems**

**Syllabus**

**Introduction:** History of Evolution of DBMS and advantages over traditional file system, Three-schema architecture of DBMS and Data Independence. Introduction to DDL and DML. Ideas about different kind of users of DBMS and available databases in market. (6Hrs.)

**Data Model:** Introduction to Relational data model and object oriented data model; Keys, Entity-Relationship Model, Relational Algebra , Tuple and Domain Relational Calculus (6Hrs.)

**Database Design:** Conceptual database design, Different types of dependencies, Theory of normalization, preservation of dependencies, Lossless decomposition, Armstrong’s axioms, Views, Database security. (6Hrs.)

**SQL:** Introduction to SQL, Stored Procedures and Triggers, Application development using SQL and embedded SQL programming. (8Hrs.)

**Data Storage and Querying:** Physical data structure ,Evaluation of Relational Algebra expressions; Query equivalence and Query Optimization, Join algorithm(s) (6Hrs)

**Transaction Management:** Transaction Processing, Concurrency control and Recovery management ,Transaction Model Properties and State , Serializability, Lock-based and Time-stamped based Protocols, Two-phase Locking. (10Hrs.)

**Advanced Topics:** Brief introduction to Distributed database systems, Temporal databases, Object oriented and object-relational database, Data warehousing, Data mining. (4Hrs.)

**Suggested Books:**

1. Database Systems Concepts ( 4th Edition ) – Korth et. al. – MH International Edition.

2. Database Management Systems ( 2nd Edition ) – Ramakrishnan et. al. – MH International Edition .

3. An Introduction to Database Design – Date – Narosa

4. Fundamentals of Database Systems – Elmasri and Navathe – Addison Wesley.