

**1. Introduction**

**Credits: 2**

**2. Course Outline**

**UNIT - I: ER -Modelling tools**

Starting with Erwin, Adding Entity Types, Adding relationships, forward engineering, supertype/subtype example. ERWin, a popular data modeling software that allows database designers to represent Entity-Relationship diagrams and automatically generate relational SQL code to create the database in one of several commercial relational database management systems such as Oracle or Microsoft SQLServer.

**UNIT - II: Abstract query languages**

Creating the database, relational algebra interpreter, Relational Algebra Syntax, Naming of Intermediate Relations and Attributes, relational algebraic operator supported by the RA-Interpreter, Examples, Domain Relational Calculus Syntax, Safe DRC Queries, Datalog interpreter, datalog query examples. The three interpreters that can be used to execute queries in Relational Algebra, Domain Relational Calculus, and Datalog. These interpreters are part of a Java package that includes a rudimentary database engine capable of storing relations and able to perform basic relational algebraic operations on these relations. It is hoped that these interpreters will allow the student to get a better understanding of abstract query languages.

**UNIT - III: Relational Database management System- MYSQL**

Company Database, MySql utility, MySql and PHP programming, Online address book. Programming Web applications in PHP that accesses MySQL databases is introduced with a complete database browser application for the COMPANY database as well as a complete Online Address Book application.

**UNIT - IV: Database design (DBD) toolkit**

The toolkit allows the student to work with numerous concepts and algorithms that deal with functional dependency theory and data normalization. The student may use DBD to verify answers to many questions related to functional dependency theory and normalization algorithms.

**UNIT - V: Object-oriented database management Systems: DB4O**

A popular open source Object-Oriented Database Management system. Creating and populating objects in db4o is covered as well various methods to query and retrieve data from the object-oriented database is introduced.

**UNIT - VI: XML**

XML and its related technologies will be taught. Query languages XPath and XQuery are covered as well as schema specification language XML Schema.

**Projects**

Projects may be implemented in Java, PHP or any other favorite programming language and may access Oracle, MySQL or any other relational database management system.