



## Faculty of Computer Studies (FoCS)

**Course Name: Relational Database Management System**

**(UG/PG): PG**

**Number of Credits: 3**

**Level: 4**

### **Learning Objective(s):**

The course aims to provide the mathematical base to understand the relation; along with the various operations on data through SQL; which includes transactions and recovery. It will also guide the path to change the dirty data to structured one through Normalization.

### **Pedagogy:**

- Lectures
- Class discussion followed by practical
- Problems

### **Course Outline**

<b>Sr. No.</b>	<b>Topic</b>	<b>Hours</b>
1	Relational Database Architecture View Database Modeling Data Model: Concept, Applications Types of Data models: Hierarchical, Network, Relational, Object-oriented Entity Relationship model: concepts of entity, entity set, attributes, domains Existence dependency Keys: candidate, primary, composite Strong and weak entities Cardinality E-R Model: symbols, Specialization, Generalization, Aggregation	7
2	Relational Algebra Operations <ul style="list-style-type: none"><li>• Unary Operations</li><li>• Operations from Set Theory</li></ul>	8

	<ul style="list-style-type: none"> <li>• Binary Relational Operations</li> </ul> <p>Relational Model and Relational Algebra</p> <ul style="list-style-type: none"> <li>• Fundamental Concept of Relational Schema</li> <li>• Translation ER Schema-&gt;Relational Database Schema</li> <li>• Fundamental Concept of Relational Algebra</li> </ul>	
3	Normalization and Data Driven Applications 1NF, 2NF, 3NF, BCNF, Case Studies	5
4	Retrieval, Manipulation, Modification of Data and Respective Definition using Structure Query Language	10
5	Transaction Management and Concurrency Control Transaction: Properties (ACID), states, Commit, Rollback Concurrency: serialization ,Control, Lost update problems, Locks, two phase locking	6
6	Database Recovery Need for recovery Techniques: log based recovery , check point, differed and immediate updates, Shadowing Catastrophic and non-catastrophic failures Recovery in multi-database environments <ul style="list-style-type: none"> <li>• Two phase commit protocol</li> </ul>	6
7	Introduction to current trends in Databases. Parallel databases, spatial databases, Distributed Databases, Introduction to DWD	3
	<b>Total</b>	45

### Books Recommended

- Database Systems – A practical approach to Design, Implementation and Management – Thomas Connolly and Carolyn Begg – Third Edition – Pearson Education Publications.
- Database Systems Concepts – Silberschatz, Korth and Sudarshan – Fourth Edition – McGraw Hill Publications.
- Fundamentals of Database Systems – Elmasri, Navathe – Third Edition – Pearson Education Asia.
- An Introduction to Database Systems – Bipin C.Desai – 2001 – Galgotia Publications.

### Suggested Evaluation Methods:

- Lab based Evaluations
- Assignments
- Presentation

**Parallel/Similar courses the existing curriculum:**

S.No.	Name of the course	Institute where it was offered
1	Relational Database Management System	University of Pune
2	Advanced Database Management System	Sikkim Manipal University
3	Relational Database Management System	University of Berkeley

Name of Member	Prof. Harshad Gune	Tejaswini Apte			
Designation	Associate Professor and Dy. Director	Assistant Professor			
Org. / Inst.	SICSR				
Signature					

Name of the Expert:

Signature:

Date: