Title : File Organization and Fundamental of Databases

Objective :-
To understand data processing using computers
To teach basic organization of data using files
To understand creations, manipulation and querying of data in databases

Syllabus

Computer Science: Paper – II : File Organization and Fundamental of Databases		
No	Topic	Lectures
1	**File Organization** Introduction Physical / logical files Types of file organization (heap,sorted, indexed,hashed), Choosing a file organization	6
2	**Introduction of DBMS** Overview File system Vs DBMS Describing & storing data (Data models (relational,hierarchical, network)) Levels of abstraction Data independence Structure of DBMS Users of DBMS,	6

	2.8 Advantages of DBMS	
3	**Conceptual Design (E-R model)** Overview of DB design ER data model (entities , attributes, entity sets, relations, relationship sets) , Additional constraints (Key constraints, Mapping constraints, Strong & Weak entities, aggregation / generalization) Conceptual design using ER modelling (entities VS attributes, EntityVs relationship, binary Vs ternary, constraints beyond ER), Case studies	15
4	**Relational data model** Structure of Relational Databases (concepts of a table, a row, a relation, a Tuple and a key in a relational database) Conversion of ER to Relational model Integrity constraints (primary key, referential integrity, unique constraint, Null constraint, Check constraint)	6
5	**Relational algebra** Preliminaries Relational algebra (selection, projection,set operations, renaming joins, division)	7
6	**SQL** Introduction Basic structure Set operations Aggregate functions Null values Nested Subqueries Modifications to Database DDL commands with examples SQL mechanisms for joining relations (inner joins, outer joins and their types) Examples on SQL (case studies)	20
7	**Relational Database Design** Pitfalls in Relational-Database Design (undesirable properties of a RDB design like repetition, inability to represent certain information), Functional dependencies (Basic concepts, F^+, Closure of an Attribute set, Concept of a Super Key and a primary key (Algorithm to derive a Primary Key for a relation) Concept of Decomposition Desirable Properties of Decomposition (Lossless join & Dependency preservation) Concept of Normalization	20

	Normal forms (only definitions) 1NF, 2NF, 3NF, BCNF Examples on Normalization.	

References

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Beginning Databases with PostgreSQL: From Novice to Professional, Richard Stones, Neil Matthew, ISBN:9781590594780, Apress

PostgreSQL, Korry Douglas, ISBN:9780672327568, Sams

Practical PostgreSQL (B/CD),John Worsley, Joshua Drake, ISBN:9788173663925 ,Shroff/O'reilly

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