Advanced Database Management System

Session 1: Object Oriented and Object Relational Database

1. Modeling Complex Data Semantics, Specialization, Generalization, Aggregation and Association.
2. Objects, Object Identity and its implementation, Clustering, Equality and Object Reference.
3. Architecture of Object Oriented and Object Relational databases.
4. Persistent Programming Languages, Cache Coherence.
5. Case Studies: Gemstone, O2, Object Store, SQL3, Oracle xxi, DB2.

Session 2: Parallel and Distributed Databases

1. Deductive Databases Data log and Recursion, Evaluation of Data log program, Recursive queries with negation.
2. Parallel and Distributed Databases Parallel architectures, shared nothing/shared disk/shared memory based architectures.
3. Data partitioning, Intra-operator parallelism, pipelining.
4. Distributed Data Storage – Fragmentation & Replication, Location and Fragment Transparency Distributed Query Processing and Optimization.
5. Distributed Transaction Modeling and concurrency Control.

Session 3: Advanced Transaction Processing

1. Advanced transaction models: Savepoints, Nested and Multilevel Transactions.
2. Compensating Transactions and Saga, Long Duration Transactions.
4. Transaction Processing Monitors, Shared disk systems.

Session 4: Active Database and Real-time Database

1. Triggers in SQL.
2. Event Constraint and Action: ECA Rules, Query Processing and Concurrency Control.
3. Recursive query processing, Compensation and Databases Recovery, multi-level recovery.

Session 5: Image and Multimedia Database

2. Data Structures – R-tree, k-d tree, Quad trees.
3. Content Based Retrieval: Color Histograms, Textures, etc., Image Features, Spatial and Topological Relationships.
5. WEB Database Accessing Databases through WEB, WEB Servers, XML Databases, Commercial Systems – Oracle xxi,DB2.
Book References