

Lectures for the course: Database Management Systems (CS43002)

Week 1

Lecture 1 – 03/01/2018

- Introduction to the course
- Evaluation Guidelines

Lecture 2 – 04/01/2018

- Introduction to database systems

Week 2

Lecture 3 – 10/01/2018

- Introduction to database systems

Lecture 4 – 11/01/2018

- Introduction to database systems
- ER Diagram
- Generating tables from ER diagram

Lectures 5+6 – 12/01/2018

- Generating tables from ER diagram
- ER model design issues

Week 3

Lecture 7 – 17/01/2018

- Extended ER features
- Alternative notations

Lecture 8 – 18/01/2018

- Relational model
- Relational Algebra
- Basic SQL

Lectures 9 – 19/01/2018

- Basic SQL
- DDL
- Basic SQL query structure
- Additional basic operations like join

Week 4

Lecture 10 – 24/01/2018

- Basic SQL
- Aggregate functions
- Nested Subqueries
- Insert, Delete, Update

Lecture 11 – 25/01/2018

- Intermediate SQL
- Outer joins
- Views

Week 5

Lecture 12 – 31/01/2018

- Intermediate SQL
- Constraints
- Check, Not null, Referential integrity
- Data types
- Authorization

Lecture 13 – 01/02/2018

- Authorization
- Advanced SQL
- Functions and procedures
- Triggers

Lecture 14 – 02/02/2018

- Triggers
- Recursive queries
- Relational algebra extensions

Week 6

Lecture 15 – 07/02/2018

- Tuple relational calculus
- Domain relational calculus

Lecture 16 – 08/02/2018

- Database design
- Functional dependency
- Decomposition
- BCNF

Lecture 17 – 09/02/2018

- Dependency preserving decomposition
- 3NF
- Closure of F
- Closure of attribute

Week 7

Lecture 18 – 07/02/2018

- BCNF decomposition

Lecture 19 – 08/02/2018

- BCNF decomposition
- 4NF decomposition
- Other topics in normalization

Week 8

Mid-sem exam held

Week 9

Lecture 20 – 28/02/2018

- Introduction to datawarehousing
- Fact table and dimension table
- ECTL
- OLTP vs OLAP

Lecture 21 – 01/03/2018

- OLAP cubes
- OLAP operations
- Star schema and other design considerations
- Denormalization

Week 10

Lecture 22 – 07/03/2018

- Use of datawarehousing
- Association rule mining basics

Lecture 23 – 08/03/2018

- A priori algorithm for association rule mining
- Analysis

Lecture 24 – 09/03/2018

- Storage and file structure
- Disk organization – platters, tracks, sectors
- Blocks/Pages
- File organization
- Fixed length record
- Variable length record
- Fitting records in blocks

Week 11

Lecture 25 – 14/03/2018

- Organization of records in files
- Indexed sequential files
- Database buffers
- Indexing and hashing
- Ordered index

Lecture 26 – 15/03/2018

- Dense and sparse index
- Primary and secondary indexes
- Multilevel indexes

- Index update

Lecture 27+28 – 16/03/2018

- Class test held
- B+ tree
- Organization and querying

Week 12

Lecture 29 – 21/03/2018

- B+ tree select, insert, delete

Lecture 30 – 22/03/2018

- Hash indexing
- Dynamic hashing

Lecture 31+32 – 23/03/2018

- Transactions properties
- Database components responsible for ensuring various properties
- Basic concepts of schedules
- Mid-sem scripts shown

Week 13

Lecture 33 – 28/03/2018

- Conflict serializable schedules
- View serializable schedules
- Precedence graph
- Determining conflict serializability and view serializability
- Cascadeless schedule and recoverable schedule

Week 14

Lecture 34 – 04/04/2018

- Lock based protocols
- Basic concept of locking
- 2PL
- Lock conversion and lock upgrade

- Deadlock in 2PL
- S2PL and R2PL

Lecture 35 – 05/04/2018

- Timestamp based protocol
- Tomas' write rule

Lecture 36+37 – 06/04/2018

- Validation based protocol
- Weak levels of consistency
- Concurrency control with user interaction
- Types of failure
- Basic concept of recovery

Week 15

Lecture 38 – 11/04/2018

- Stable storage
- Data access
- Commit and abort
- Immediate and deferred modification
- Concurrency control and recovery
- Log based recovery basic concepts
- Redo and undo logs

Lecture 39 – 12/04/2018

- Checkpoints
- Log based recovery algorithm
- Log record buffering
- WAL
- Database buffering

Lecture 40 – 13/04/2018

- Query processing – basic concepts about cost
- External sorting