Lectures for the course: Database Management Systems (CS43002)

Week 1

Lecture 1+2 – 02/01/2019
- Introduction to the course
- Evaluation Guidelines
- Grading policy

Week 2

Lecture 3 – 07/01/2019
- Introduction to database systems
- Need for a database management system

Lecture 4+5 – 09/01/2019
- Basic terminologies
- ER model

Week 3

Lecture 6 – 14/01/2019
- ER Diagram notations
- Representing various forms of entities, relationships
- Weak entities
- Representation of cardinality and participation
- Alternative notations

Lectures 7+8 – 16/01/2019
- Generating tables from ER diagram
- ER model design issues
- ER model extensions

Week 4

Lecture 9 – 21/01/2019
- Relational model
- Relational Algebra
Lecture 10+11 – 23/01/2019

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

Week 5

Lecture 12 – 28/01/2019

- Intermediate SQL
- Outer joins
- Views
- Constraints
- Check, Not null, Referential integrity
- Data types

Lecture 13+14 – 31/01/2019 (Compensatory)

- Authorization
- Advanced SQL
- Functions and procedures
- Triggers

Week 6

Lecture 15 – 04/02/2019

- Recursive queries
- Relational algebra extensions

Lecture 16+17 – 06/02/2019

- Tuple relational calculus
- Domain relational calculus

Week 7

Lecture 18 – 11/02/2019

- Database design
- Functional dependency
- Decomposition
- BCNF
- Dependency preserving decomposition
- 3NF
- Closure of F
- Closure of attribute

**Lecture 19+20 – 13/02/2019**

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

**Week 8**

Mid Sem Exam held

**Week 9**

**Lecture 21+22 – 27/02/2019**

- Introduction to datawarehousing
- Fact table and dimension table
- ECTL
- OLTP vs OLAP
- OLAP cubes
- OLAP operations
- Star schema and other design considerations
- Denormalization

**Week 10**

**Lecture 23+24 – 06/03/2019**

- Association rule mining basics
- A priori algorithm for association rule mining
- Analysis

**Week 11**

**Lecture 25+26 – 13/03/2019**

- Storage basics
- Disk organization
- Block access from disks
• Basic concepts of file organization
  • Fixed length and variable length records
  • Storing variable records in blocks

Lecture 27+28 – 14/03/2019 (Compensatory)

• Indexed sequential files
  • Retrieval, insert and delete

Week 12

Lecture 29 – 18/03/2019

• B+ Tree
  • Structure and search

Lecture 30+31 – 20/03/2019

• B+ Tree insert and delete
  • Hash indices
  • Dynamic hashing

Week 13

Lecture 32 – 25/03/2019

• Introduction to transaction management
  • Properties of transactions
  • Responsibilities of various components of DBMS in ensuring ACID properties
  • Schedule
  • Serializability

Lecture 33+34 – 27/03/2019

• Conflict serializable schedules
  • Testing for conflict serializability
  • Transaction dependency graph
  • Recoverable and cascadeless schedules
  • View serializability
  • Class test held