CT3532 Database Systems
Lecture 1

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Contact Details

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Details

Lecture slides to be made available weekly on canvas.

Discussion boards for any queries people may have.

Short regular exercise sheets (not graded) to help/guide study.

Assignments during the semester

Recommended Texts

Fundamentals of Database Systems by Elmasri and Navathe 005.74 ELM

Database system concepts by Silberschatz, A. 005.74 SIL

Plenty of other good database books in library – (e.g. Date and by Ullman)

Course Grading

- Assignments account for 30%
- Plagiarism of assignment work not permitted. Strictly enforced.
- Remainder awarded in examination

DESIGN

Design by synthesis

Functional dependencies

Armstrong’s axioms

Closure and cover set

Algorithm for generating design

Normal forms

Non-additive join property

DESIGN

Physical Design

Indexing strategies

Denormalisation

Choice of keys

QUERY PROCESSING

Indexing

Indexing fundamentals

B-trees; B+trees

Extendible Hashing

QUERY PROCESSING

Query execution and optimisation

Relational algebra and SQL

Heuristic optimisation

Algorithms for SQL operators

QUERY PROCESSING

Algorithms for SQL operators

Algorithms for select, project, set operators, join

Indexed based approaches

Hashing approaches

Sorting methods

Parallel approaches

TRANSACTIONS

Transactions

Properties

States

Schedules

Properties of schedules

Serializability

TRANSACTIONS

Concurrency Control

locking techniques

2 phase locking

time-stamping

multi-version timestamp control

TRANSACTIONS

Recovery

Immediate update and deferred update protocol

Algorithms for recovery under these protocols

Models

- Object Relational
- Object Oriented Databases
- Comparison of Models

Models

- NOSQL database
- Types
- Languages and models
- Advantages/Limitations

Models

- Distributed Databases
- query processing
- concurrency control (locking and time-stamping)
- recovery

Models

- Parallel Databases
- approaches
- parallel algorithms for relational operators

Models

- Graph Databases
- structure
- languages