COMP 3311: Database Management Systems

Summer 2024

OVERVIEW

A database management system (DBMS) is primarily concerned with *efficiently and effectively* managing data. This course introduces the topic through lectures, which present database technology theories and concepts, and through tutorials and labs which provide practise and experience in designing, implementing and querying databases using commercial database management systems. Topics covered include analysis and representation of data requirements (entity-relationship (E-R) model, relational model, JSON); querying data using database query languages (relational and non-relational); storing, managing and processing data; safeguarding data in a multi-user environment. Experience in designing, implementing and querying databases using both relational and non-relational database technologies will be provide.

OBJECTIVES

The course provides both a theoretical and a practical foundation for understanding the capabilities and use of database management systems for managing data. The theoretical part covers the major concepts and techniques used by database management systems to manage data. The practical part provides hands-on experience in using commercial database management systems to design, implement and query databases.

TOPICS	CHAPTERS (6th ed.)	CHAPTERS (7th ed.)	LECTURES (estimated)
Database Management Systems	1	1	1
Database Design	7	2, 6	3
Relational Algebra (RA)	6	2	1
Structured Query Language (SQL)	3, 4, 5	3, 4, 5	4
Relational Database Design	2	7	2
Storage and File Structure	10	12, 13	1
Indexing	11	14	2
Query Processing	12, 13	15, 16	3
NoSQL DBMSs and MongoDB		10	3
Transaction Management	14, 15, 16	17, 18, 19	4

COURSE REQUIREMENTS AND GRADING SCHEME

	Requirement	Remarks	Value
1.	Lecture, Tutorial and Lab Exercises		10%
2.	Assignments		30%
	1. Entity-Relationship Schema Design	10% of course grade	
	2. Relational Database Creation and SQL Queries	10% of course grade	
	3. MongoDB Database Creation and MQL Queries	10% of course grade	
3.	Midterm Test		20%
4.	Final Exam		40%