

ICT330 Database Management Systems

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY SEMESTER

Synopsis:

ICT330 Database Management Systems introduces students to relational databases, data modelling and the theory of relations as applied to the representation of models of data. The aim of this course is to equip students with an understanding of database systems concepts and in particular, using and then designing both read-only and updateable relational databases. The data sublanguage SQL, covered in practical lab sessions using a database management system such as Oracle Database system, includes both SQL Data Definition Language (DDL) for the implementation of the physical database from the Logical Data Model and Data Manipulation Language (DML) for data manipulation and query. The implementation of database objects such as views, triggers and stored procedures using SQL procedural extensions to fulfill business requirements are also explored in practical lab sessions. The system administration of multi-user database systems will also be covered to address issues such as concurrency, database backup, recovery and security.

Topics:

- Functional and multivalued dependencies
- Normal forms
- Entity Relational (ER) model
- Mapping ER model to relational database
- SQL Data Definition Language (DDL)
- SQL Data Manipulation Language (Insert, Delete, Update, Query)
- Views, SQL procedural extensions for triggers and stored procedures
- ACID properties (including race condition, deadlock, serialisable transactions, 2PL)
- Overview of database system architecture
- Database recovery and security
- Big Data and NoSQL
- XML and databases

Textbooks:

David M. Kroenke and David J. Auer.: Database Processing Fundamentals, Design and Implementation (eTextbook) 14th edition Pearson.
ISBN-13: 9781292107646

Learning Outcome:

- Apply database processing concepts to solve the information requirements of organisations
- Discuss table structures according to normalisation principles
- Construct conceptual (ER diagram) and logical models from a statement requirement to solve common design problems
- Explain and apply concurrency controls, security and recovery measure
- Formulate SQL statements to implement and query database systems
- Implement business rules via views, stored procedures and triggers
- Demonstrate the basic techniques of concurrency control and ACID

Assessment Strategies (Evening Class):

Components	Description	Weightage Allocation (%)
Overall Continuous Assessment	PRE-CLASS QUIZ 1	2
	PRE-CLASS QUIZ 2	2
	PRE-CLASS QUIZ 3	2
	QUIZ 1	6
	TUTOR-MARKED ASSIGNMENT 1	18
Overall Examinable Components	Written Exam	70
Total		100