

2. Dublin Institute of Technology

<i>Pre-Requisite Modules code(s)</i>	Co-Requisite Modules code(s)	ECTS Credits	Module Code	Module Title
		5	CMPU2007	Databases 1

8.2.7. Databases I

Module author: Patricia O’Byrne and Databases Group

Module Description:

The student will be introduced to the concepts and rationale behind the relational database. Data modelling and database design will be explored and the student will learn how to create and manipulate data in a relational database, ensuring data and relational data integrity. The student will apply the concepts to a case study.

Module aim

The aim of this module is to...

- Introduce the student to the concepts, justification of and rationale behind databases.
- Give the student the modelling skills to design and implement a robust data model.
- Equip the student with the ability to define and manipulate data in a relational database.

Learning Outcomes:

On completion of this module, the learner will be able to.....

- Describe and justify the rationale behind the use of relational database management systems.
- Demonstrate an understanding of the desirable features of a database management system and how they are achieved.
- Identify and distinguish between data and meta-data, and the concepts of keys.
- Design a data model suited to a business application and implement it in a relational database.
- Define tables and views with appropriate constraints to ensure data integrity and relational integrity.
- Manipulate the data in a relational database using DDL and DML aspects of SQL.
- Apply knowledge of SQL to real-world query problems.

Learning and Teaching Methods:

This module will be delivered over four hours per week for one Semester. This will include two hours laboratory session. During the lecture, new material on the theories and practices in relational databases will be disseminated. Techniques will be applied in the practical laboratory sessions, including the use of a case study. Students will work individually or in teams, as appropriate.

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Module content:

Concepts and rationale

- Discuss the content desirable features and rationale behind a database.
- Determine the data requirements for an application, judging whether given material is information, data or meta-data.

Data modelling

- Interpret, design and create Entity Relationship diagrams.
- Explain the relationship between functional dependencies and keys and give examples.
- Define entity integrity and referential integrity and give examples of user defined integrity constraints.
- Select appropriate business rules for a given scenario and apply them to the model.
- Describe the relationship between a logical model and a physical model and create both.
- Use a CASE tool to generate and reverse engineer logical and physical models.

SQL

- Create, Alter and drop single and related tables and other objects, using appropriate data types and constraints.
- Populate tables and modify and remove rows from tables, being cognizant of constraint issues.
- Formulate and test queries to return selection and projection, using functions to enhance returned data.
- Use relational operators and INNER and OUTER JOINS to query multiple tables.
- Use aggregation and sub-queries to return multi-dimensional data.
- Formulate and test simple transactions to update persistent data in the database, using COMMIT and ROLLBACK as appropriate.

Module Assessment

Module will be assessed by both non-exam and examination assessment. Students must pass the entire module. Practical work 50%, written examination 50%.

Essential Reading:

Elmasri & Navathe, 2010, 'Fundamentals of Database Systems' 6th Ed., Addison Wesley.

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Supplemental Reading:

Fehily, C. 2008 'SQL: Visual Quick Start Guide' 3rd Ed., Peachpit Press
Watson & Ramklass, 2008, 'SQL Fundamentals 1 Exam Guide', Oracle Press

Web references, journals and other:

Some references will vary, depending on the database being used.

www.oracle.com

www.sqlzoo.net

Further Details:

e.g. laboratory sessions limited to 20 – 25 by lab size. 4 contact hours per week. To be delivered in one semester.

Date of Academic Council approval