

2024 / 25

School of Science and Computing

☎ +353 (0)51 302037

✉ Eleanor.Reade@setu.ie

🌐 www.wit.ie/schools/science_computing



**SE
TU**

Ollscoil
Teicneolaíochta
an Oirdheiscirt

South East
Technological
University

Module Descriptor

Database Design and Implementation (Computing and Mathematics)

Database Design and Implementation (A36101)

Short Title: DB Design and Implementation
Department: Computing and Mathematics
Credits: 5

Level: Advanced

Description of Module / Aims

This module will introduce the student to the principles and practice of designing and implementing database systems. The student will gain competence in designing relational databases using Entity Relationship Modelling. They will implement relational databases using SQL data definition language. They will query the relational database using SQL data manipulation language. The students will be introduced to the concepts and use of NoSQL databases.

Programmes

			stage/semester/status
COMP-0621	HDip in Science in Agri-Food ICT Systems (WD_SAFICT_G)		5 / 1 / M
COMP-0621	Higher Diploma in Science in Business Systems Analysis (WD_KBUSY_G)		1 / 1 / M
COMP-0621	Higher Diploma in Science in Computer Science (WD_KCOSC_G)		1 / 1 / M
COMP-0621	HDip in Science in Data Analytics (WD_KDAAN_G)		1 / 1 / M

Indicative Content

- Database Environment
- Database Analysis and Design: Relational Modelling, Normalisation, NoSQL databases, CAP theorem
- Physical Database Design: Implementation descriptions of physical database
- Database Implementation

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Appraise the role of a database and its management system.
2. Construct Entity Relationship (ER) diagrams from business scenarios and reproduce those diagrams into normalised relations ready for database implementation.
3. Construct a physical database design.
4. Create a relational database using SQL Data Definition Language (DDL).
5. Construct queries on a relational database using SQL Data Manipulation Language (DML).
6. Assess the suitability and use of NoSQL databases.

Learning and Teaching Methods

- The lectures will introduce the theory content to the student. The student will be encouraged to participate in class discussions and ask questions to support their learning process.
- The practical classes facilitate the student in implementing the theory learned in the lectures using incremental steps to accomplish a skill.
- The continuous assessment will require the student to apply the theory and practical knowledge to a new business scenario.
- For online delivery, the lectures and practicals will be a combination of comprehensive rich media instructional content (notes), interactive synchronous video (live webinars/classes) and asynchronous interactive video playback (on-demand).

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	24	24
Practical	24	24
Independent Learning	87	87

Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	100%	
Assignment	70%	1,2,3,4,5
Assignment	30%	1,3,6

Assessment Criteria

- <40%: Unable to interpret and describe key concepts of the Database design and implementation domain.
- 40%–49%: Be able to interpret and describe key concepts of the Database design and implementation domain, particularly the use of ER diagrams for the design of relational databases and SQL DDL for the implementation of the relational database.
- 50%–59%: Ability to discuss key concepts of the Database design and implementation domain and ability to discover and integrate related knowledge in other knowledge domains. To design and develop a suitable relational database system for a business scenario.
- 60%–69%: Be able to solve basic business analytics problems by experimenting with the appropriate skills and tools. To design and develop a suitable relational database system for a business scenario to a level that includes an enhanced ER diagram and suitable queries appropriate to the business scenario.
- 70%–100%: All the above to an excellent level. Be able to analyse, design and implement solutions to a high standard for a range of both complex and unforeseen problems through the use and modification of appropriate skills and tools.

Supplementary Material(s)

- Connolly, T. and C. Begg. *Database Systems: A Practical Approach to Design Implementation and Management*. 6th ed.. NY: Addison Wesley, 2014.
- Sadalage, P. and M. Folwer. *NoSQL Distilled A Brief Guide to the Emerging World of Polyglot Persistence*. NY: Addison-Wesley Professional, 2012.

Requested Resources

- Computer Lab: BYOD Lab