Module Definition Form (MDF)

Module code: MOD002589	**Version:** 5 **Date Amended:** 27/Nov/2025

1. Module Title
Database Design and Implementation

2a. Module Leader
Arooj Fatima

2b. School
School of Computing and Information Sciences

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
15

4b. Study Hours
150

5. Restrictions

Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	None		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

In an increasingly data-driven world, the ability to design and manage databases is a core skill across many computing disciplines. From social media platforms and e-commerce websites to mobile apps and enterprise systems, data is at the heart of modern software, and databases are the engines that drive it.

This module introduces the fundamental principles and practices of database design and implementation. It covers how data is structured, stored, retrieved and managed using relational database systems, with a focus on real-world applications. The module also reflects the QAA Computing benchmarks which recognise databases as a specialist area and a key competency in roles such as Database Designer, Database Developer, and Database Administrator, as well as within broader roles like Software Engineer, Web Developer, Game Developer and Data Analyst.

Through a hands-on, project-based approach, you'll work collaboratively in teams to learn how to investigate the data needs of an existing system. You'll propose a database solution, design and implement it using SQL or a similar language and critically evaluate its effectiveness.

Alongside technical development, you'll build transferable skills in time management, teamwork, critical thinking and professional communication. By the end of the module, you'll be able to write efficient, purposeful queries and justify your design decisions based on business needs and best practices.

6b. Outline Content

Requirements Analysis:

Investigate and analyse the data needs of a target system (e.g., an ecommerce platform or business application). Engage with user and/or business requirements to identify the scope, key entities, data flows, and functional expectations of the database system.

Data Modelling and Design:

Develop data models using widely adopted paradigms in industrial settings, such as the Entity-Relationship (ER) model. Apply modelling techniques across different stages of the database lifecycle, with a focus on meeting design requirements.

Database Implementation:

Build and deploy a working, moderate-sized database using industrystandard tools (such as MySQL). Apply best practices for schema design, data types, integrity constraints, and indexing.

Querying and Optimisation:

Write and refine SQL queries to meet business and analytical needs, including multi-table joins, aggregations, and subqueries. Explore query performance considerations and introduce basic optimisation techniques.

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources

MySQL on server and in client mode

7. Learning Outcomes (threshold standards)		
No.	**Type**	**On successful completion of this module the student will be expected to be able to:**
1	Knowledge and Understanding	Link the flow of activity in the sequence of capturing the state of the real world in terms of data, making a model under rules using all normal Forms, mapping through to the electronic database.
2	Knowledge and Understanding	Proving the soundness of the database by querying, using advanced queries.
3	Intellectual, practical, affective and transferrable skills	Model data, and the prescriptive translation of that model to data constructs for machine purposes.
4	Intellectual, practical, affective and transferrable skills	Specify the structure of for example relations and queries for a machine-held database using a sound and advanced knowledge of a database language.

8a. Module Occurrence to which this MDF Refers				
Year	**Occurrence**	**Period**	**Location**	**Mode of Delivery**
2025/6	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	12	1,2,3,4	1 hours lecture and 2 hours practical per week.
Other teacher managed learning	24	1,2,3,4	1 hours lecture and 2 hours practical per week.
Student managed learning	114	1,2,3,4	Private study
TOTAL:	150		

9. Assessment for the above Module Occurrence					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
010	Coursework	1,2,3,4	100 (%)	Fine Grade	30 (%)
Portfolio: 3000 words. A portfolio of coursework submitted at the end of the course.					

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]