

## Module specification

When printed this becomes an uncontrolled document. Please access the **Module Directory** for the most up to date version by clicking on the following link: [Module directory](#)

Module Code	COM736
Module Title	Database Systems and Data Analytics
Level	7
Credit value	20
Faculty	FACE
HECoS Code	100754
Cost Code	GACP

## Programmes in which module to be offered

Programme title	Is the module core or option for this programme
MSc Computer Science	Core
MSc Computer Science with Advanced Practice	Core
MSc Software Engineering	Core
MSc Software Engineering with Advanced Practice	Core
MSc Big Data and Data Analytics	Core
MSc Big Data and Data Analytics with Advanced Practice	Core

## Pre-requisites

N/A

## Breakdown of module hours

Learning and teaching hours	11 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	10 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
<b>Total active learning and teaching hours</b>	<b>21 hrs</b>
Placement / work based learning	0 hrs
Guided independent study	179 hrs
<b>Module duration (total hours)</b>	<b>200 hrs</b>



<b>For office use only</b>	
Initial approval date	08/11/2023
With effect from date	Sept 2024
Date and details of revision	
Version number	1

## Module aims

---

This module is designed to give students an understanding of the role of database systems in Information Management, and the theoretical and practical issues that influence the design and implementation of database management systems. The module will provide the student with the skills required to create, maintain, and interrogate a relational database management system using commercially available database software. This module aims to extend the students' knowledge of database systems and data analytics by introducing them to several advanced topics and techniques including data science and data analytics, personalised data and other advanced database topics.

## Module Learning Outcomes - at the end of this module, students will be able to:

1	Critically analyse the principles of the relational database model, data integrity and functional dependency in relation to logical data design problems.
2	Implement data manipulation and information retrieval operations using query language and stored procedures using current industrial Database Management System.
3	Critically evaluate advanced aspects of data science and data analytics encompassing the principles, research results and application of the technologies.

## Assessment

---

### Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

The assignments in this module will focus on analysing the principles of the relational database model, data integrity, and functional dependency to address logical data design problems. Students will be tasked with implementing data manipulation and information retrieval operations using query languages and stored procedures with commercially available database management system (DBMS) software.

As part of the assessment, students will delve into reviewing various database management applications and data analytics technologies. They will critically evaluate the advanced aspects of data science and the implementation of data analytics within these applications. This assessment will enable students to gain insights into the practical implementation of data



science and data analytics, as well as to assess the effectiveness and efficiency of different technologies and methodologies.

The assignments will provide students with hands-on experience in applying their knowledge of database modelling, query languages, and DBMS software to real-world scenarios. By critically evaluating the advanced aspects of data science and data analytics, students will develop a deeper understanding of the practical challenges and opportunities involved in leveraging data for decision-making and gaining valuable insights.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1,2,3	Coursework	100%

## Derogations

None

## Learning and Teaching Strategies

In line with the Active Learning Framework, this module will be blended digitally with both a VLE and online community. Content will be available for students to access synchronously and asynchronously and may indicatively include first and third-party tutorials and videos, supporting files, online activities any additional content that supports their learning.

As this module progresses, the strategies will change to best support a diverse learning environment. Initially, the module will start with a heavier reliance on engaging tutor-led lectures, demonstrations, and workshops to ensure that the students get the relevant threshold concepts. As the module continues experiential and peer learning strategies will be encouraged as the students' progress with their portfolio work.

Assessment will occur throughout the module to build student confidence and self-efficacy in relation to applied DBMS concepts.

## Indicative Syllabus Outline

- Database Systems
  - Database approaches
  - Database environments
  - Database development lifecycle
  - Relational model
- Database Development
  - Normalisation
  - Logical data structure design
  - Physical design
  - Implementation
- Database Programming
- Data Science
  - Technological Trends in data science and data analytics
  - Review of current technologies
  - Issues with current and future database management technologies

## Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.



**Essential Reads**

C. Chen and WH. Hsu, *Database Systems and Design: An Active Learning Approach*, 2024.

**Other indicative reading**

C. Coronel, S Morris, *Database Systems: Design, Implementation, & Management*.  
Cengage, 2022.

J.L. Viescas, *SQL Queries for Mere Mortals: A Hands-On Guide to Data Manipulation in SQL*. Addison-Wesley, 2018.

J.P. Isson, *Unstructured Data Analytics - How to Improve Customer Acquisition, Customer Retention, and Fraud Detection and Prevention*. CENGAGE Learning, 2018