Prifysgol **Wrecsam**
Wrexham University

Module specification

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Module Code	COM736
Module Title	Database Systems and Data Analytics
Level	7
Credit value	20
Faculty	FACE
HECoS Code	100754
Cost Code	GACP
Pre-requisite module	N/A

Programmes in which module to be offered

Programme title	Core/Optional/Standalone
MSc Computer Science	Core
MSc Computer Science with Advanced Practice	Core
MSc Big Data and Data Analytics	Core
MSc Big Data and Data Analytics with Advanced Practice	Core
MSc Computing for Business	Core

Breakdown of module hours

Learning and teaching hours	11 hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	10 hrs
Project supervision hours	0 hrs
Active learning and teaching hours total	**21 hrs**
Placement hours	0 hrs
Guided independent study hours	179 hrs
Module duration (Total hours)	**200 hrs**

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.

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	1,2,3	Coursework	5000 Words or Equivalent	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.

Welsh Elements

This module is designed to support Welsh-speaking students in line with the Welsh Language Standards. While the primary delivery will be in English, students will have the opportunity to submit assessments, including coursework and projects, in Welsh if preferred. Relevant module materials, such as reading lists, key texts, and guidance, will be available bilingually upon request, ensuring accessibility for all students. Additionally, where possible, guest speakers, case studies, or examples may include references to the Welsh business context, especially in areas such as data use in local industries and Welsh public sector organisations.

The department encourages students to develop bilingual digital skills by incorporating Welsh-language datasets, tools, and resources where appropriate, offering an inclusive learning environment. We also support the development of bilingual visualisation techniques, enabling students to create digital outputs that reflect the Welsh language, should they wish to do so.

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, S*QL 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

Administrative Information

For office use only	
Initial approval date	08/11/2023
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Date and details of revision	March 26 addition of MSc Computing for Business programme title
Version number	2