

University of the West of Scotland

Module Descriptor

Session: 2022/23

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Title of Module: Database Development

Code: COMP08002	SCQF Level: 8 (Scottish Credit and Qualifications Framework)	Credit Points: 20	ECTS: 10 (European Credit Transfer Scheme)
School:	School of Computing, Engineering and Physical Sciences		
Module Co-ordinator:	Carolyn Begg		

Summary of Module

Databases are now such an integral part of our day-to-day life that we are often not aware that we are using one. To illustrate this point, a range of example databases are demonstrated and discussed. The longevity and popularity of a particular type of database software called Database Management System (DBMS) is examined. The typical functions and services (including data integrity, authorisation and security) that enable DBMS to manage and secure data are discussed. Example DBMSs (e.g. Microsoft SQL Server and MySQL) are used to illustrate these services.

This module examines how a DBMS can be used to meet the needs of a particular case study. This is achieved using a structured approach to the creation of a database system, which is called the Database Systems Development Lifecycle (DSDL). The stages of the DSDL are discussed with particular attention to the earlier stages including database planning, systems definition, requirements collection and analysis and database design.

Ensuring that the database has all of the data required to meet the needs of a particular case study is key to the success of a database system. A popular database design technique used to identify the required data is called entity-relationship (ER) modelling and this technique is discussed and illustrated. The database design technique of normalisation is also explored as a means of building/validating a database.

- This module begins with a discussion on our digital environment and how recent advancements in technologies have resulted in what is commonly referred to as the 'data explosion'. Vast quantities of data (structured and unstructured) are being created and businesses are seeking ways to effectively capture, organise and secure this valuable asset. This module examines how database technologies can fulfil this role.
- There are various ways to represent data in a database however this module explores the power and simplicity of the relational data model. Through practical classes, students are introduced to a relational DBMS and learn how to create, maintain and access data using a relational database language called Structured Query Language (SQL). Examples of how relational databases can be maliciously attacked are discussed (e.g. SQL Injections).
- This module ensures that students have an excellent grounding in the fundamental knowledge (DBMS functions and services and the Database Development Lifecycle) and skills (ER modelling, normalisation and SQL programming) associated with developing database systems.
- This module will work to develop a number of the key 'I am UWS' Graduate Attributes to make those who complete this module: Universal (Critical Thinker, Ethically-minded, Research-minded), Work Ready (Problem-Solver, Effective Communicator, Ambitious) and Successful (Autonomous, Resilient, Driven).

Module Delivery Method

Face-To-Face	Blended	Fully Online	HybridC	HybridO	Work-based Learning
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✓	✓				
<p>Face-To-Face Term used to describe the traditional classroom environment where the students and the lecturer meet synchronously in the same room for the whole provision.</p> <p>Blended A mode of delivery of a module or a programme that involves online and face-to-face delivery of learning, teaching and assessment activities, student support and feedback. A programme may be considered "blended" if it includes a combination of face-to-face, online and blended modules. If an online programme has any compulsory face-to-face and campus elements it must be described as blended with clearly articulated delivery information to manage student expectations</p> <p>Fully Online Instruction that is solely delivered by web-based or internet-based technologies. This term is used to describe the previously used terms distance learning and e learning.</p> <p>HybridC Online with mandatory face-to-face learning on Campus</p> <p>HybridO Online with optional face-to-face learning on Campus</p> <p>Work-based Learning Learning activities where the main location for the learning experience is in the workplace.</p>					

Campus(es) for Module Delivery						
The module will normally be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit)						
Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
✓		✓	✓			

Term(s) for Module Delivery					
(Provided viable student numbers permit).					
Term 1	✓	Term 2		Term 3	

Learning Outcomes: (maximum of 5 statements)
<p>On successful completion of this module the student will be able to:</p> <p>L1. Demonstrate a broad knowledge of the how database management system (DBMS) software can be used to organise and secure a valuable business asset – namely data.</p> <p>L2. Demonstrate a broad knowledge of the stages of the database system development lifecycle which enables the creation of a database system to meet the requirements of users.</p> <p>L3. Demonstrate understanding of the core theories and principles associated with the relational data model.</p> <p>L4. Use a range of routine skills and techniques to produce a conceptual and logical design for a database.</p> <p>L5. Use of a range of standard functions and services provided by a relational database management system (DBMS) to implement a prototype database system.</p>

Employability Skills and Personal Development Planning (PDP) Skills	
SCQF Headings	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	<p>SCQF Level 8.</p> <p>Knowledge and understanding of the factors that have led to 'data explosion' and the consequences for the management of data.</p> <p>A broad knowledge and understanding of the key attributes and value of data and the scope and services associated with database management systems (DBMS).</p>

	<p>Knowledge and understanding of the stages of the database system development lifecycle with particular emphasis on the database design and implementation (including security) stages.</p> <p>Knowledge and understanding of the main theories and principles associated with the relational data model and language (i.e. SQL).</p> <p>Knowledge and understanding of concepts associated with database design techniques (e.g. entity-relationship (ER) modelling and normalisation).</p>
Practice: Applied Knowledge and Understanding	<p>SCQF Level 8.</p> <p>Use a range of routine skills, techniques and practices to design and implement a prototype database system using a relational DBMS.</p>
Generic Cognitive skills	<p>SCQF Level 8.</p> <p>Identify routine problems and issues (including those associated with the security and privacy of data) associated with the development and use of database systems in a business environment.</p>
Communication, ICT and Numeracy Skills	<p>SCQF Level 8.</p> <p>Use a range of routine skills associated to establish the requirements for a database system.</p>
Autonomy, Accountability and Working with others	<p>SCQF Level 8.</p> <p>Take some responsibility for the work of others and for a range of resources in undertaking the necessary activities to complete the module coursework.</p>

Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code:	Module Title:
	Other:	
Co-requisites	Module Code:	Module Title:

* Indicates that module descriptor is not published.

Learning and Teaching	
<p>This module is mostly taught using the traditional approach of lecturing to groups of students. However, lectures are periodically supplemented with tutorials to smaller groups of students to allow for the re-visiting of the more complex aspects of the syllabus. Lab (PC)-based classes complement the lectures by providing an environment to support the learning of the more practical-based aspects of the syllabus.</p>	
<p>Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:</p>	<p>Student Learning Hours (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)</p>
Lecture/Core Content Delivery	20
Tutorial/Synchronous Support Activity	8
Laboratory/Practical Demonstration/Workshop	20
Independent Study	152
	200 Hours Total

****Indicative Resources: (eg. Core text, journals, internet access)**

The following materials form essential underpinning for the module content and ultimately for the learning outcomes:

Database Systems: A Practical Approach to the Design, Implementation and Management by Thomas Connolly and Carolyn Begg. Addison Wesley Publishing Company.

A relational DBMS such as Microsoft SQL Server DBMS or MySQL DBMS.

Internet access to Moodle to allow student access to all teaching material, including slides, tutorials, coursework and lab sheets for the practical aspects of the syllabus.

(**N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)

Engagement Requirements

In line with the Academic Engagement Procedure, Students are defined as academically engaged if they are regularly engaged with timetabled teaching sessions, course-related learning resources including those in the Library and on the relevant learning platform, and complete assessments and submit these on time. Please refer to the Academic Engagement Procedure at the following link: [Academic engagement procedure](#)

Supplemental Information

Programme Board	Computing
Assessment Results (Pass/Fail)	No
Subject Panel	Business & Applied Computing
Moderator	Stephen Devine
External Examiner	T Gaber
Accreditation Details	This module is accredited by BCS as part of a number of specified programmes.
Version Number	2.13

Assessment: (also refer to Assessment Outcomes Grids below)

Formative assessment is available using on-line practice tests (on Moodle) - that allow students to test their progress and understanding of the syllabus. The first summative component of assessment is a class test worth 10% (individual) and this takes place approximately half way through the module and the third summative component of assessment is towards the end of the module and this class test is worth 30% (individual). The results for these two summative assessments are combined to give a total worth 40%.

Formative assessment is available through completion of the practical labs - that allow students to test their progress and understanding of the practical aspects of the syllabus. The second summative assessment is lab-based, group work coursework worth 60% which is undertaken in the second half of the module.

(N.B. (i) **Assessment Outcomes Grids** for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed.

(ii) An **indicative schedule** listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Handbook.)

Assessment Outcome Grids (Footnote A.)

Component 1

Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (% of Assessment Element)	Timetabled Contact Hours
Class test (written)	✓	✓	✓	✓		40	2

Component 2

Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Dissertation/ Project report/ Thesis	✓	✓	✓	✓	✓	60	0
Combined Total For All Components						100%	2 hours

Footnotes

A. Referred to within Assessment Section above

B. Identified in the Learning Outcome Section above

Note(s):

1. More than one assessment method can be used to assess individual learning outcomes.
2. Schools are responsible for determining student contact hours. Please refer to University Policy on contact hours (extract contained within section 10 of the Module Descriptor guidance note).
This will normally be variable across Schools, dependent on Programmes &/or Professional requirements.

Equality and Diversity

Nothing in the module should present difficulties for students on the basis of their gender, ethnicity, or sexual orientation. In relation to students with special needs, when a student discloses a disability the individual module tutor, in consultation with the special needs co-ordinator, will agree any appropriate adjustments to be made. Students should note that the language of instruction is English and that they will need to have a reasonable grasp of the language in order to keep abreast of the teaching materials and in submitting assessed work.

[UWS Equality and Diversity Policy](#)

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)