MODULE SPECIFICATION

Part 1: Information			
Module Title	Introduction to Databases		
Module Code	UFCFTK-30-1	Level	Level 4
For implementation from	2018-19		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Environment & Technology	Field	Computer Science and Creative Technologies
Department	FET Dept of Computer Sci & Creative Tech		
Module Type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co-requisites	None		
Module Entry Requirements	None		
PSRB Requirements	None		

Part 2: Description

Educational Aims: See learning outcomes

Outline Syllabus: Relational Model: terminology, keys, integrity, relational algebra.

SQL: (using a suitable dbms e.g. Mysql), table creation and maintenance, queries, calculations and functions, groups and group functions, joining tables, subqueries, views.

Database Design Process: Database Design and Normal Forms

Data Modelling: entity-relationship model, use of ER diagrams in database design, relationships, keys. Conceptual and logical model. Use of UML notation for conceptual model. OO Modelling.

Normalisation: functional dependency, normal forms 1NF, 2NF, 3NF, data redundancy and update anomalies.

Transaction Management: Serialisability, concurrency control, locking, granularity, 2PL, deadlock, timestamping.

Query Processing and Optimisation Query and query trees, transformation to equivalent relational algebra expressions, comparison of rule based v. cost bases strategies. Physical consideration of optimisation: clustering and striping. Goals in optimization and summary of conditions.

Performance Tuning: Indexing and efficiency; B trees, B+trees. Denormalisation, disk storage, security and integrity.

Backup and recovery: problems, transaction logging, recovery techniques.

Weaknesses of relational DBMSs.

Alternatives to Relational databases Relational vs Non Relational approaches, Overview of NoSQL database categories and types.

Teaching and Learning Methods: Scheduled learning:

The main material in the module will be introduced in lectures. This theoretical exposure to the material will then be supplemented by practical lab sessions using a relational database, like Mysql. Also, a programming language will be introduced working with a database. The students will also get experience working with a noSQL database.

Independent learning:

In addition, students will be expected to develop independent learning approaches through directed reading, study and self-paced quizzes and exercises to reinforce, critically appraise and reflect upon concepts and techniques presented in lectures.

Part 3: Assessment

The assessment strategy will consist of one coursework assessment and one examination. The coursework assessment will be based on work covered in lectures and tutorials, with guidance offered to the students during tutorials. The examination will be based on the reading, lecture content and tutorial work.

Summative Assessment

Component A: Examination (3 hours) comprising material relating directly to all topics covered in lectures and thus to all learning outcomes.

Component B: Students will design and implement a small end-to-end database application. In the first semester, students will work on the design using suitable software development tools, and also database development. In the second semester students will work on the programming part of the application. A demonstration of the application will be scheduled and will be used to support the marking for Component B.

The Reset Component B will offer a choice of Practical or Research option. The Practical option will require the students to exercise analytical, design and development skills to create a database application. The Research option will involve research on an approved topic and a written report with results of the research.

Opportunities for formative feedback are built into module delivery. Guidance and feedback will be provided through self-directed learning, class activities, in-class discussions and also by giving feedback on Lab exercises.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	50 %	Exam (3 hours)
Practical Skills Assessment - Component B		25 %	Implementation, Testing and Evaluation of Database Application

Written Assignment - Component B		25 %	Database Application Design
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	50 %	Examination
Written Assignment - Component B		50 %	Coursework will be set to cover learning outcomes identified for component b

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	**Reference**
Understand the principles of relational databases, relational algebra and SQL rate a proficiency in writing Structured Query Language	MO1
Understand the database design steps within the systems development life cycle and be able to differentiate among conceptual, logical, and physical database design	MO2
Demonstrate knowledge of different approaches to data and object modelling by producing models for some simple problems	MO3
Acquire the necessary skills to develop an end to end application	MO4
Understand how SQL is executed internally and be able to construct query trees and understand query evaluations and optimization techniques	MO5
Have some knowledge and experience at alternative approaches to storage and also alternative approaches to relational model e.g. NoSQL databases	MO6
Demonstrate key transferable skills in the areas of: communication, working with others, self-management, problem formulation and decision making. (These will be practised in Comp B but will not formally assessed)	MO7

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	228
Total Independent Study Hours:	228
Scheduled Learning and Teaching Hours:	
Face-to-face learning	72
Total Scheduled Learning and Teaching Hours:	72
Hours to be allocated	300
Allocated Hours	300

Reading List	*The reading list for this module can be accessed via the following link:* https://uwe.rl.talis.com/modules/ufcftk-30-1.html

Part 5: Contributes Towards
This module contributes towards the following programmes of study: Computing [Sep][SW][Frenchay][4yrs] BSc (Hons) 2018-19 Forensic Computing and Security [Sep][SW][Frenchay][4yrs] BSc (Hons) 2018-19 Forensic Computing and Security {Dual} [Mar][FT][Taylors][3yrs] BSc (Hons) 2018-19 Forensic Computing and Security {Dual} [Aug][FT][Taylors][3yrs] BSc (Hons) 2018-19 Computing [Sep][FT][Frenchay][3yrs] BSc (Hons) 2018-19 Forensic Computing and Security [Sep][FT][Frenchay][3yrs] BSc (Hons) 2018-19