Module Specification
CSCK542 – Databases and Information Systems

Contents

1.   Module Details

Module Title:	Databases and Information Systems

Short Title:	Databases and Information Systems

Module Code:	CSCK542

Marketing Module Synopsis:	The module examines database development and current approaches and techniques to provide robust and trustworthy information systems appropriate to modern business needs. Key phases of database development are examined from design to implementation and maintenance. Information system interrogation techniques are explored for multiple query handling and transaction control. The module also examines the key competing database paradigms and architectures.

Credits:	15

Level:	Level 7

Delivery Location(s)	Online

Semester:	Whole Session
Academic Year:	2021-22
Faculty:	Faculty of Science and Engineering
School/Institute (Level 2):	School of Electrical Engineering, Electronics and Computer Science
Curriculum Board (level 1):	Computer Science PGT
Module Coordinator:	Keith Dures
Other staff:	Helen Mattocks, Frans Coenen
External Examiner(s):	Neil Gordon, Dan Neagu
Pre-requisites:	N/A
Co-requisites:	N/A
Barred Combinations:	N/A
CE/CPD Provision:	No
Overview:	This module examines database technology and information systems; and the ways in which data is stored, manipulated, queried and maintained in the modern work pace. Students will gain a critical understanding of the paradigms and technologies used, and the importance of the design, implementation and maintenance of database systems in the context of the modern workplace.
Notes:	21/22 Modification is minor and needs no further scrutiny.

	20/21 Online module provided in collaboration with Kaplan Open Learning. Core for MSc Computer Science conversion. generalist programme.

Maximum Places:	250

Subject:	

HESA Cost Centre(s):	MUST BE COMPLETED FOR APPROVAL

Status:	Modification Approval

The table below is automatically completed from programme data held in Curriculum Manager; during 2019/20 it is likely to have no data or incomplete data until all programme records are in Curriculum Manager.

In Programmes:	Programme Validation Status	Module Status:	Programme Stage / Group / / Sub-group
Computer Science Master of Science (MSc) 2021-22	Validated	Mandatory	Online Flexible Learning Y1 Online Flexible Learning Y1 Mandatory Module 3
Data Science and Artificial Intelligence Master of Science (MSc) 2021-22	Validated	Required	Online Flexible Learning Y1 Online Flexible Learning Y1 Required Module 4

The table below must be completed for module approval, including confirmation that there are zero costs to the student.

Student Cost(s)

				Costs range:	
Cost Type:	Description:	Value type (exact, approximate or max/min range):	Cost (exact or approximate):	Minimum Cost:	Maximum Cost:
Student Cost	Over the anticipated 8 week module period, an estimated average cost of £12.50 per week for internet access and contribution to the cost of a personal computer (global variations may apply).	Approximate	100.00		

2. Aims and Content

Educational Aims:

1. To provide a critical understanding of the design and realisation of database systems.
2. To provide in-depth understanding of operation and usage of databases systems.
3. To provide a comprehensive understanding of the administration and maintenance of database systems.
4. To provide comprehensive insight into a range of database paradigms.

Outline Syllabus:

Week 1: Evolution and Fundamentals of Database Systems

Types of database model, Database Management Systems (DBMS). Legal, Social, Ethical and Professional considerations. Risk factors.

Week 2: The Relational model

The well established relational database model, relational algebra, use of operators.

Week 3: Analysis and Design of Database Systems

Theory and practice of analysing database requirements and designing database systems covering both logical and physical considerations. Security and maintenance of database systems.

Week 4: Transaction Management

Data base transaction properties. Atomicity, Consistency Isolation and Durability (the ACID test). Transaction states, concurrency and deadlock.

Week 5: Query Languages

Examination of popular query languages, their advantages and disadvantages and their usage. Presentation of results, data visualisation.

Week 6: Database connectivity

Client-server issues, connection pooling, database connectivity using bespoke Application Programmer interfaces (APIs).

Week 7: Web technology and DBs

Web-enabled systems, web-like databases, the semantic web, the concept of ontology.

Week 8: Alternative Database Paradigms

NoSqL databases, graph databases.

Reading lists and resources:			
Type	**Category**	**Title**	**Description**

3. Module Outcomes (learning outcomes, skills and other attributes)

Ref No.	Learning Outcome / Skill:	Category:
M1	A deep and critical insight into database systems and computer information systems.	Learning Outcomes: Master's
M2	A comprehensive ability to implement a functioning database using current tools and structures, and employing current design practices.	Learning Outcomes: Master's
M3	Demonstrate a critical understanding of database querying via analysis of results.	Learning Outcomes: Master's
M4	Integrate appropriate security and backup in planning database maintenance and administration.	Learning Outcomes: Master's
S1	Communication skills in electronic and written form.	Skills

Ref No.	Learning Outcome / Skill:	Category:
S2	Self-direction and originality in tackling and solving problems.	Skills
S3	An ability to act autonomously and professionally when planning and implementing solutions to computer science problems.	Skills
S4	Experience of working in development teams, respecting others, co-operating, negotiating/persuading, awareness of independence with others.	Skills

4. Assessments

Assessment Strategy:

The module features two broad categories of assessment: discussion questions and practical assessments. The first has a focus on moderated active learning, where the faculty member responsible for the module posts discussion questions to which students respond individually and then consider each other's responses. Each discussion question runs over a three-week period. At the end of the first week each student posts a 500 word "initial response". During the second week each student selects two or three responses, made by other students in the first week, and writes a 500 word "follow-up" response. In the third week each student reviews the initial and follow-up responses from the previous two weeks and submits a 500 word executive critical summary with respect to the main themes identified by the responses. Practical assessment adopts the principle of authentic assessment where the assessment tasks to be undertaken are aligned with the kinds of task that students would be expected to undertake in a professional setting.

1. Due to nature of the on-line mode of instruction work is not marked anonymously.

2. Reassessment opportunities offered in line with Code of Practice on Assessment.

3. Penalties for late submission will be in line with Code of Practice on Assessment.

All fields in the table below must be completed for module approval.

Method	Description	Type	Units of Length	Length	Min	Max	Description (re length)	Weighting	Assessment period(s)	Group Work	Must Pass	Final Assessment
Practical assessment	Group Presentation: Database and information systems' group project resulting in a demonstrable system and group video report (10 minutes) describing and analysing the approach taken and the system developed	Summative	Hours	12	N/A	N/A	Software solution and video report	30 %	Wk08	Yes	Yes	Yes
Practical assessment	Programming: Practical database and information systems exercise resulting in a demonstrable system and supporting analysis in the form of a brief report (500 words)	Summative	Hours	12	N/A	N/A	Software solution and report	30 %	Wk05	No	Yes	No
Coursework	Discussion Question 2: Actively participate in online discussion on a module-specific topic, contributing original thought and understanding of key areas.	Summative	Words	N/A	1000	1500	N/A	20 %	Wk07	No	Yes	No

Method	Description	Type	Units of Length	Length	Min	Max	Description (re length)	Weighting	Assessment period(s)	Group Work	Must Pass	Final Assessment
Coursework	Discussion Question 1: Participate actively in an online discussion to critically discuss experiences and opinions within the cohort regarding the nature of database and information systems.	Summative	Words	N/A	1000	1500	N/A	20 %	Wk03	No	Yes	No

Please see Appendix 1 for details of the outcomes tested by the above assessments.

Module Specification Appendix 1: Assessments and the Outcomes Tested

Module Title	Databases and Information Systems
Module Code	CSCK542

In the table below, all fields should be completed for approval, except for the **Weighting** field for a **Formative Type** assessment method.

Assessment Method	Type	Weighting	Marked out of	Pass Mark	Learning Outcomes / Skills Tested
Practical assessment	Summative	30 %	100	50	M2, M3, M4, S4
Practical assessment	Summative	30 %	100	50	M1, M2, M3, S2, S3
Coursework	Summative	20 %	100	50	M1, S1
Coursework	Summative	20 %	100	50	M1, S1

Assessment Method	Type	Weighting	Marked out of	Pass Mark	Learning Outcomes / Skills Tested

5.   Learning and Teaching Methods

Summary of Learning and Teaching Methods:
The mode of delivery is by online learning, facilitated by a Virtual Learning Environment (VLE). This mode of study enables students to pursue modules via home study while continuing in employment. Module delivery involves the establishment of a virtual classroom in which a relatively small group of students (usually 10-25) work under the direction of a faculty member. Module delivery proceeds via a series of eight one-week online sessions, each of which comprises an online lecture, supported by other eLearning activities, posted electronically to a public folder in the virtual classroom. The mode of learning includes a range of required and optional eLearning activities, including but not limited to: lecture casts, live seminars, self-assessment opportunities, and required and suggested further reading and try-for-yourself activities. Communication within the virtual classroom is asynchronous, preserving the requirement that students are able to pursue the module in their own time, within the weekly time-frame of each online session. An important element of the module provision is active learning through collaborative, cohort-based, learning using discussion fora where the students engage in assessed discussions facilitated by the faculty member responsible for the module. This in turn encourages both confidence and global citizenship (given the international nature of the online student body).

The following table must be completed for module approval, accounting for all hours associated with the credit value of the module, e.g. for 15 credits there should be 150 hours of learning and teaching activity, including independent learning.

Learning and Teaching Method:	Length (Minutes):	Times per Week (if applicable):	Number of Weeks (if applicable):	Calculated Hours (if applicable):	Hours:
Self-Directed Learning	N/A	N/A	N/A	N/A	62
Assignment	N/A	N/A	N/A	N/A	40
E-lecture	N/A	N/A	N/A	N/A	24
Online Discussions	N/A	N/A	N/A	N/A	24

6. Supplementary Information

If a risk assessment is required for this module for students under 18, please record a summary of the risks:	N/A