

H6IDMD: Introduction to Data Modelling and Databases

Module Code:	H6IDMD
Long Title	Introduction to Data Modelling and Databases APPROVED
Title	Introduction to Data Modelling and Databases
Module Level:	LEVEL 6
EQF Level:	5
EHEA Level:	Short Cycle
Credits:	10
Module Coordinator:	PAUL HAYES
Module Author:	PAUL HAYES
Departments:	School of Computing
Specifications of the qualifications and experience required of staff	This module requires a lecturer holding a Master's degree or higher, in Computer Science. Work experience in this field would be nice to have.
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
#	Learning Outcome Description
LO1	Explain the major properties of database systems and their importance in an organization
LO2	Evaluate the objectives of data modelling and distinguish different types of data models and their uses
LO3	Demonstrate competence with use of object-oriented data modelling techniques
LO4	Describe and evaluate the process of creating the relational data model from user requirements
LO5	Design, implement and administer a database system with an appropriate database package
LO6	Formulate advanced SQL commands to manipulate the structure of a database and its contents and produce value-added reporting
Dependencies	
Module Recommendations	
No recommendations listed	
Co-requisite Modules	
No Co-requisite modules listed	
Entry requirements	See section 4.2 Entry procedures and criteria for the programme including procedures recognition of prior learning.

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Module Content & Assessment			
Indicative Content			
Introduction to Databases Database Applications Database Approach Data Independence Redundancy Introduction to SQL			
Database Environment ANSI-SPARC 3-tier Architecture Types of Data Independence Functions of a DBMS Multiuser DBMS Architectures SQL Data Definition Language			
Data Modelling Types of Data Models Object Based Data Models Record Based Data Models Physical Data Models Key-Value, Document-based and Column-based SQL Data Manipulation Language			
Database System Development Lifecycle Database Planning and Scoping Requirements Capture and Analysis Stages of Database Design Implementation Test and Maintenance SQL Data Manipulation Language			
Conceptual Data Modelling High-Level Conceptual Modelling Entities, Relationships, Attributes Cardinality constraints and Participation constraints SQL Data Manipulation Language			
Mapping of Conceptual to Logical Data Model Methodology for conversion of Conceptual Model Transformation of many-to-many relationships and other features Deriving Relations Determining primary and foreign keys Advanced SQL DML			
Normalisation The Purpose of Normalisation Functional Dependencies First, Second and Third Normal Forms Boyce-Codd Normal Form (BCNF) De-normalisation impact and strategies			
Multi-Table Queries When to use a Join Computing a Join (Cartesian Product) Joins versus Subqueries Inner (Simple) and Outer Joins Right, Left and Full Joins			
Advanced SQL Integrity Enhancement Features of SQL SQL Access Control: authorisations in SQL, system and user privileges, granting and revoking privileges Views Advanced Data Definition			
Security and other issues in Data Management Security Issues Threats and Countermeasures Resilience and Contingency Legal, ethical and IP rights issues			
Assessment Breakdown			%
Coursework			40.00%
End of Module Assessment			60.00%
Assessments			
Full Time			
Coursework			
Assessment Type:	Formative Assessment	% of total:	Non-Marked
Assessment Date:	n/a	Outcome addressed:	1,2,3,4,5,6
Non-Marked:	Yes		
Assessment Description: Ongoing independent and group class activities and feedback.			
Assessment Type:	Continuous Assessment	% of total:	40
Assessment Date:	n/a	Outcome addressed:	5,6
Non-Marked:	No		
Assessment Description: Students to collaborate in teams to design, build, administer and operate a relational database management system based on user requirements. Legal, ethical and IP rights to be taken into account. May include proctored tests on Database theory and SQL to access intermediary progress on learning outcomes.			
End of Module Assessment			
Assessment Type:	Terminal Exam	% of total:	60
Assessment Date:	End-of-Semester	Outcome addressed:	1,2,3,4,5,6
Non-Marked:	No		
Assessment Description: Written proctored end of semester examination to access learning outcomes.			
No Workplace Assessment			
Reassessment Requirement			
Repeat examination <i>Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.</i>			
Reassessment Description Learners who fail this module will be required to sit a repeat module assessment where all learning outcomes will be examined.			

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Module Workload				
Module Target Workload Hours 0 Hours				
Workload: Full Time				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Classroom & Demonstrations (hours)	24	Per Semester	2.00
Tutorial	Other hours (Practical/Tutorial)	24	Per Semester	2.00
Independent Learning	Independent learning (hours)	202	Per Semester	16.83
Total Weekly Contact Hours				4.00
Workload: Part Time				
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	No Description	24	Every Week	24.00
Lab	No Description	24	Every Week	24.00
Independent Learning	No Description	202	Every Week	202.00
Total Weekly Contact Hours				48.00

Module Resources	
<i>Recommended Book Resources</i>	
Silberschatz, A., Korth, H. & Sudarshan, S.. (2019), Database System Concepts., 7th Edition. McGraw Hill, New York.	
<i>Supplementary Book Resources</i>	
KRIEV, O.,. (2017), , SQL: The Comprehensive Beginner's Guide to Learn SQL with Practical Examples, New York: Createspace Independent Publishing Platform.	
Coronel, C. & Rob, P.. (2014), Database Principles: Fundamentals of Design, Implementation, and Management, Cengage Learning, Boston.	
<i>This module does not have any article/paper resources</i>	
<i>Other Resources</i>	
[Website], https://www.thoughtco.com/databases-basics-4133457 . [Website], https://www.quackit.com/database/tutorial/New . [Website], https://www.codecademy.com/learn/learn-sql . [Website], http://www.tutorialspoint.com/mysql/mysql-administration.htm . [Website], http://www.mysqltutorial.org/mysql-jdbc-tutorial/ .	
Discussion Note:	