Module 4: Relational Databases

Stage				1			
Semester				1			
Module Title				Relational Databases			
Module Number/Reference				4			
Module Status (Mandatory/Elective)				Mandatory			
Module ECTS credit				5			
Module NFQ level (only if applicable)				8			
Pre-requisite Module Titles				None			
Co-requisite Module Titles				None			
Is this a capstone module? (Yes or No)				No			
List of Module Teaching Personnel				Mr Mark Scanlon Mr Barry Denby			
Contact Hours				**Non-contact Hours**			**Total Effort (Hours)**
Lecture	**Practical**	**Tutorial**	**Seminar**	**Assignment**	**Placement**	**Independent work**	
24	18			18		40	100
Allocation of Marks (Within the Module)							
	Continuous Assessment	**Project**	**Practical**	**Final Examination**		**Total**	
Percentage contribution	50%			50%		**100%**	

Intended Module Learning Outcomes

On successful completion of this module learners will be able to:

1. Analyse the goals, functions, models, and components of database systems
2. Explain the context, phases, and techniques for designing and building databases
3. Select and apply appropriate design models to a given development environment
4. Design an efficient database system for a business functional area using an appropriate database design technique
5. Implement and manipulate a relational database using SQL
6. Connect a database to a larger software development environment

7. Critically analyse advanced topics in database systems

Module Objectives

This module teaches the learner the basic theoretical ideas that underpin modern database management systems. In parallel with this it shows the learner how to design and implement databases. They learn techniques such as entity-relationship modelling and normalisation in order to more effectively design a database. They also learn the structured query language (SQL) which allows them to implement their designs in a commercial database management system.

From a technical viewpoint they gain experience using a modern database management system such as MySQL or Oracle. The integration of databases into programming languages allows the development of large scale software solutions. In this module they learn how to create a communication between a programming language such as Java and the database itself. This leads to the development of applications following the N-tier model.

Module Curriculum

Databases

- What is a database?
- What is a database management system?
- Generalised functions of a DBMS
- Components of the DBMS

The relational model

- Relational algebra
- Entity-Relationship modelling
- Normalisation

Structured query language

- Introduction to SQL, data manipulation language (DML) and data definition language (DDL)
- Basic DML and DDL commands
- Functions: Aggregates and groups
- Joins and nested queries

Developing database applications

- Developing end-user applications using the N-tier model Database connectivity, using SQL in an embedded environment.
- Practical work with a suitable DBMS

Current developments

- Object-oriented databases
- Future developments in SQL
- Distributed databases
- Deductive databases
- The trans-relational model

Reading lists and other learning materials

Patrick, J. J., *SQL Fundamentals* (3rd Edition), Prentice-Hall, 2009

Elmasri, R. & Navathe, S. B., *Fundamentals of Database Systems* (6th Edition), Addison-Wesley, 2010

Secondary reading

Date, C. J., *An Introduction to Database Systems* (8th Edition), Addison-Wesley, 2003

Web Resources

http://dev.mysql.com/doc/

Module Learning Environment

Accommodation

Lectures are carried out in class rooms / lecture halls in the College. Lab tutorials are carried out in computer labs throughout the Campus. All have the language software required to deliver the programme.

Library

All learners have access to an extensive range of physical and electronic (remotely accessible) library resources. The library monitors and updates its resources on an on-going basis, in line with the College's Library Acquisition Policy. Lecturers update reading lists for this course on an annual basis, as is the norm with all courses run by Griffith College.

Module Teaching and Learning Strategy

The module is delivered through a combination of lectures, tutorials and practical lab programming sessions. The learners complete a series of worksheets throughout the module, which build on the learning in lectures. The emphasis is on developing practical programming skills based on sound theoretical knowledge.

Module Assessment Strategy

The module assessment consists of a series of continuous assignments and a final examination.

Element No	Weighting	Type	Description	Learning Outcome assessed
1	10%	Weekly Lab Book Submission	A series of weekly lab books designed to teach SQL and database interactions	1, 2, 5, 7
2	10%	Multiple Choice Quiz	In-class MCQ testing the basics of databases and SQL	1, 2, 3
3	30%	Assignment	Database design and implementation and database application development	1-7
4	50%	Closed Book Examination	End of Module Examination	1-7