Module Code:	**CIS2360**
Module Title:	**Relational Databases and Web Integration**
School(s) Involved in Delivery:	School of Computing and Engineering
Name of Course(s):	
Module Leader:	Ms Fiona Ogg, Department of Informatics
Location:	Queensgate
Module Type:	Core | Optional
Credit Rating:	20
Level:	I
Learning Methods:	Supervised Learning: 44 hrs Unsupervised Learning: 156 hrs
Pre-requisites:	An object-oriented programming language and a relational database language, or equivalent
Recommended Prior Study:	None
Co-requisites:	None
Professional Body Requirements:	None
Graded or Non-graded:	Graded
Barred Combinations:	None

Synopsis

The module equips students with the knowledge and skills necessary to design, implement and query a relational database from a requirements specification. Students are expected to become familiar with the needs and functionality of the Database Administrator (DBA) in supporting the creation of and subsequent maintenance of a commercial, multi-access database. Issues such as optimisation, concurrent access control, database security and recovery are included. Students will gain an understanding of the additional functionality necessary to enable HTML web pages to interact with a database. Students will become familiar with web database architecture and with both the theory and practicalities of web-database interface models.

This Module aims:

1. To enable students to understand the potential benefits offered by shared access relational databases within organisations.
2. To provide an understanding of the facilities offered by, and the importance of SQL as the main language of the relational model.
3. To expose students to the tools and techniques needed to design, implement and support relational databases.
4. To provide an understanding of the underlying data structures which support a modern database management system.
5. To provide an understanding of the administration facilities and resources required to maintain a commercially-viable multi-access database system
6. To provide an understanding of the architecture and facilities required to integrate a database with the Web.

Outline Syllabus

Advantages and weaknesses of relational database systems.
Database management systems architecture.
Schema modelling and normalisation.
Relational database implementation.
Integrity requirements: entity integrity, referential integrity, data validation; concurrency control; security; recovery.
Relational languages: relational algebra overview; SQL; graphical user interface (GUI) systems.
Physical data structures; principles of query optimisation.
Web/database integration: architectures; server-side and client-side functionality; overview of HTML; client-side and server-side scripting.

Learning Outcomes

1. Knowledge and Understanding

Upon completion of the module the learner will be able to:

1.1 Discuss the issues relating to the implementation of logical data models in a relational database.

1.2 Explain the nature of the physical structures and supporting software which a Database Administrator (DBA) needs in order to perform his/her role.

1.3 Be aware of the significance of transaction processing in the provision of concurrent access/control and database recovery.

1.4 Be aware of different architectures used to implement web-based databases, and the interaction between server and clients in these models.

1.5 Be familiar with the range of approaches and associated scripting languages available with which to integrate a database with the Web.

2. Abilities

Upon completion of the module the student will be able to:

2.1 Design a relational database for a given requirement specification.

2.2 Convert a schema into an implementable relational database model.

2.3 Build a relational database and applications to meet the requirements of a database design specification and be aware of query optimisation techniques.

2.4 Navigate a relational database using both SQL and a graphical user interface.

2.5 Integrate a relational database with the Web using a commercial-strength database with appropriate protocols and scripting.

Assessment Strategy

1. Formative Assessment

Feedback to students are given in tutorials and laboratory sessions.

2. Summative Assessment

There are two elements of assessment, both equally weighted :

a. Coursework : Design, implementation and use of a web-based management system using PHP and MYSQL/Oracle

b. Time-constrained In class tests: Two in class tests in each semester, each worth 25%

.

Assessment Tasks

1. Coursework 50%
2. In class tests 50%

Assessment Criteria

These will be based on the Subject Area's general assessment criteria.

Learning Strategy

The Blackboard virtual learning environment provides online support for independent learning. Knowledge and ability outcomes will be delivered thorugh sessions, unsupervised learning to supplement and reinforce the techniques and concepts introduced. Contact time typically consists of lectures, seminars or studio but is context specific.

The learner will be expected to make use not only of books and other learning resources, but also to become familiar with the use of technical manuals whilst learning to use database software.

Software/ hardware requirments:

- Internet browser and library facilities.
- Access for up to one hour per week (supervised) and 3 hours per week (unsupervised) to:
- Oracle relational database management system 9i/10G for practical work eg DDL, DML and SQL;
- MYSQL database engine and PHP scripting language

Appendix
Indicative References

Main reading:

Connolly T, and Begg C	Database Systems: A Practical Approach to Design, Implementation and Management, 3rd edition (Addison Wesley, 2002) (0 201 70857 4)
Earp R and Bagui S	Learning SQL - A Step-by-Step Guide to Using Oracle, (Addison Wesley, 2003) (0 201 77363 5)
Lash D A	Web Wizard's Guide to PHP, (Addison Wesley 2003) (0 321 12174 0)

Supportive reading:

Knuckles C D	Introduction to Interactive Programming on the Internet using HTML and JavaScript (Wiley, 2001) (0 471 38366 X)
Welling L and Thomson L	PHP and MySQL Web Development (SAMS, 2001) (0 672 31784 2)