

Module Plan

Module Title:	Database Design		
Module Code:	CO558AY	Academic Year:	2016-2017
Tutor(s):	John Terry	Semester:	One
Tutor's Email:	jterry@aylesbury.ac.uk	Level:	Five
Tutor's Telephone	01296 588615		

Learning Outcomes:

The module will provide the student with a general grounding in the fundamental theories of relational database design and management. The main areas covered are relational data analysis and entity relationship modelling, techniques of data normalisation, the use of SQL DML (Structured Query Language: Data Manipulation Language) to query a relational database, and a basic introduction to database transaction processing and concurrency control.

Assessment Summary:

<u>Assessment Task</u>	<u>Key Dates</u>
Time Controlled Assessment (TCA) 100%	TCA – Wk 17 Feedback – Wk 20

Week by Week Guide:	
Teaching Week #	Topics
Week 1: beginning 26/09/16	<p>Introduction to the Relational Database</p> <p>Introductions, Effective Learning, Module plan, Reading list, Assessment schedule.</p> <p>Learning Objectives <i>Understand effective learning methods</i> <i>Concisely define key terms regarding a Relational Database.</i> <i>Name several limitations of conventional file processing systems.</i> <i>Explain at least 10 advantages of the database approach.</i> <i>Identify several costs and risks of the database approach.</i></p> <p>Quiz</p> <p>Read: Anderson-Lehman (2004) "Continental Airlines flies high with real-time business intelligence".</p>
Week 2: beginning 03/10/16	<p>The Database Environment And Development Process</p> <p>Review of Week One</p> <p>Learning Objectives <i>List components of database environment Identify categories of database applications Describe database system development life cycle</i> <i>Explain prototyping and agile development approaches</i> <i>Explain roles of individuals</i> <i>Explain the three-schema architecture for databases</i></p> <p>Quiz</p> <p>Read: Chapter One of Modern Database Management by Hoffer, Ramesh and Topi.</p>
Week 3: beginning 10/10/16	<p>Modelling Data In The Organization</p> <p>Review of Week Two</p> <p>Learning Objectives <i>Understand importance of data modelling</i> <i>Write good names and definitions for entities, relationships, and attributes</i> <i>Distinguish unary, binary, and ternary relationships</i> <i>Model different types of attributes, entities, relationships, and cardinalities</i> <i>Draw E-R diagrams for common business situations</i></p> <p>Case Study: Mountain View Community Hospital</p> <p>Quiz</p> <p>Read: Chapter Two of Modern Database Management by Hoffer, Ramesh and Topi.</p>

<p>Week 4: beginning 17/10/16</p>	<p>Entity Relationship Modelling and Resolving Many to Many Relationships</p> <p>Review of Week Three</p> <p>Learning Objectives <i>Understand use of supertype/subtype relationships</i> <i>Understand use of specialization and generalization techniques</i> <i>Specify completeness and disjointness constraints</i> <i>Develop supertype/subtype hierarchies for realistic business situations</i></p> <p>Quiz Read: Chapter Three of Modern Database Management by Hoffer, Ramesh and Topi.</p>
<p>24/10/16</p>	<p>Half-Term Break</p>
<p>Week 5: beginning 31/10/16</p>	<p>Entity Relationship Modelling – Practical</p> <p>Review of Week Four</p> <p>Learning Objective <i>Understand how to analyze data, identify entities, attributes, relationships and cardinality</i></p> <p>Case Studies <i>The Company</i> <i>The Car Park</i> <i>The Sailing Club</i> <i>DVD Rental Shop</i> <i>The Job Agency</i></p> <p>Quiz</p>
<p>Week 6: beginning 07/11/16</p>	<p>Normalization</p> <p>Review of Week Five</p> <p>Learning Objectives <i>How the technique of normalization is used in database design.</i> <i>How tables that contain redundant data can suffer from update anomalies, which can introduce inconsistencies into a database.</i> <i>The rules associated with the most commonly used normal forms, namely first (1NF).</i></p> <p>Case Study <i>Dream Home</i></p> <p>Quiz</p> <p>Read: Chapter 13 Database Systems by Thomas Connolly and Carolyn Begg</p>

<p>Week 7: beginning 14/11/16</p>	<p>Normalization Continued</p> <p>Review of Week Six</p> <p>Learning Objectives <i>How the technique of normalization is used in database design. How tables that contain redundant data can suffer from update anomalies, which can introduce inconsistencies into a database. The rules associated with the most commonly used normal forms, namely first (1NF), second (2NF), and third (3NF).</i></p> <p>Case Study <i>Dream Home</i></p> <p>Quiz</p>
<p>Week 8: beginning 21/11/16</p>	<p>Logical Database Design and the Relational Model</p> <p>Review of Week Seven</p> <p>Learning Objectives <i>List five properties of relations State two properties of candidate keys Define first, second, and third normal form Describe problems from merging relations Transform E-R and EER diagrams to relations</i></p> <p>Quiz</p>
<p>Week 9: beginning 28/11/16</p>	<p>Introduction to SQL</p> <p>Review of Week Eight</p> <p>Learning Objectives <i>Purpose and importance of SQL, the main language for querying relational databases. How to retrieve data using the SELECT statement.</i></p> <p>Quiz</p>
<p>Week 10: beginning 05/12/16</p>	<p>SQL – Further Practical</p> <p>Learning Objectives <i>How to retrieve data using the select statement. How to insert data using the insert statement. How to update data using the update statement. How to delete data using the delete statement.</i></p> <p>Quiz</p>
<p>Week 11: beginning 12/12/16</p>	<p>Advanced SQL</p> <p>Learning Objectives <i>Write single and multiple table sql queries Define and use three types of joins Write non-correlated and correlated subqueries</i></p> <p>Quiz</p>

Winter Break	
Week 12: beginning 02/01/17	<p>Data and Database Administration and Transaction Management</p> <p>Review of Week Eleven</p> <p>Learning Objectives <i>List functions and roles of data/database administration</i> <i>Describe role of data dictionaries and information repositories</i> <i>Compare optimistic and pessimistic concurrency control</i> <i>Describe problems and techniques for data security</i> <i>Understand role of databases in Sarbanes-Oxley compliance</i> <i>Describe problems and facilities for data recovery</i></p> <p>Quiz – Week Twelve</p> <p>Read: Chapter Eleven of Modern Database Management by Hoffer, Ramesh and Topi.</p>
Week 13: beginning 09/01/17	Revision for Exam/TCA
Week 14: beginning 16/01/17	TCA
Core Texts	
<p>Modern Database Management (11th Edition) by Jeffrey Hoffer, V Ramesh, Heikki Topi, published by Pearson Education Limited (2013).</p> <p>Database Systems (6th Edition) Thomas Connolly, Carolyn Begg, published by Pearson Education Limited (2015).</p> <p>Database Management Systems (2nd Edition) Patricia Ward, published by Cengage Learning EMEA (2008).</p> <p>Databases Illuminated (3rd Edition) Catherine Ricardo, published by Cengage Learning EMEA (2015).</p>	
Additional reading:	
<p>Key Website(s): http://sqlzoo.net/- for an on-line SQL tutorial Linda.com www.mysql.com www.w3schools.com</p>	