Module Descriptor

Module Code: CS105.3 **Version:** 3 /June 2021

Module Title: Database Management Systems **Faculty:** Computing

Level: 1

Contact:

Module Leader	Email	VLE
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Delivery Pattern:

Credits	Contact Hours	Independent Study Hours	Total Learning Hours
3	45	105	150

Learning Outcomes:

	Module Learning Outcome (LO)	Award LO
LO1	Understand role of data in real world applications and database system concepts and architecture.	Knowledge & Understanding
LO2	Analyze data requirement of computer applications and perform data modeling using Entity Relationship model.	Application, Analysis, Synthesis
LO3	Understand relational model concepts and constraints and perform logical data modeling and relational data analysis.	Application, Analysis, Synthesis
LO4	Use SQL to develop a database and handle queries	Application

Module Details:

Indicative Content	**Introduction**: Critical role of data in an organizational or an application context, Identify the data required for a real-world application, Translate the findings into file-based approach and database terminology. **ER Model**: Entities, relationships and attributes, cardinality and participation constraints, weak and strong entities, validating the model by answering sample queries, appreciate the role of ER model in analyzing and documenting the data requirement of an application

	File-based and Database approaches: Introduction to DBMS features **Relational Model**: Data modelling at conceptual, logical and physical levels, Motivation for the relational model, terminology. **Normalization:** Normal forms up to 3NF. **Structured Query Language (SQL)**: SQL 92
Assessment Details	Continuous Assessments 40% 3 Hour Examination 60%
Learning Strategies	2 hours lectures + 1 hour tutorial per week + 2 hours practical
Prospectus Information	This module introduces students into database systems which is a core subject area in Computer Science. Students learn how to model the data requirement of an application and how to implement such requirement in a commercial database management system like MySQL. Students are introduced to ER Modelling, Relational Model and Normal Forms and ANSI SQL.
Reference Texts	Connolly, Thomas M./Begg, Carolyn Database systems: a practical approach to design, implementation and management (Refer the latest edition) Database Management Systems by Johannes Gehrke and Raghu Ramakrishnan (Refer the latest edition) Navathe, E. Fundamentals of Database Systems (Refer the latest edition)
Other Resources	DBMS software and tools (Eg. MS ACCESS, MySQL, Online ER Tool)

SESSION PLAN

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Module Title: Database Management Systems

Session	Lecture	Practical (will start after 5th session-TBC)	Tutorial
01	Introducing Database technology as a solution for data management functionalities. Database systems and basic concepts with contrasting to traditional methods	Practical 1	Tutorial 1
02	Continuation of session 01 on Introduction to Database Systems	Practical 2	Tutorial 2
03	Illustrating the use of DBMS in a database environment and introducing to DBMS functions and features. Explaining the roles of DBA, DB designer and other end users in a database environment.	Practical 3	Tutorial 3
04	Continuation of session 02 on Roles in Database environment	Practical 4	Tutorial 4
05	Continuation of session 03 on evolution in Database systems	Practical 5	Tutorial 5
06	Illustrate data models: Relational Model	Practical 6	Tutorial 6
07	Continuation of Session 04 on ANSI/SPARC 3 tier architecture	Practical 7	Tutorial 7
08	Conceptual modeling and DB designing: Conceptual designing with ER modeling. Introduction to ER model, ER standards and ER notations. ER model; entities, attributes.	Practical 8	Tutorial 8
09	Conceptual modeling and DB designing: Entity types, entity sets, value sets, keys. Relationship types, relationship sets. Relationship degree, recursive relationships.	N/A	Tutorial 9
10	Illustrate relationship types; one to one, one to many and many to many cardinality ratios; Total and partial participation constraints. Present these concepts in a given ER modeling scenario.	N/A	Tutorial 10
11	Illustrate the conversion of ER model to Relational schema using given sample database scenarios.	N/A	Tutorial 11

12	Present normalization concepts and different types of normal forms.	N/A	Tutorial 12
13	Present SQL as the language to communicate with databases. Learn basics of SQL and general SQL commands to work with.	N/A	Tutorial 13
14	Basic SQL • Creating table with SQL • Insert data to tables • Basic retrieval queries • Select, from, where structure • Distinct • Using quotes, asterisk, alias	N/A	Tutorial 14
15	SQL Cont. • Update SQL tables • Delete records • SQL order by • SQL AND/OR • SQL IN, BETWEEN • SQL MAX, MIN, COUNT, AVG, SUM	N/A	Tutorial 15

Prepared by: Manoja Weerasekara (Delivery may change with prior notification)