City University of Hong Kong
Course Syllabus

offered by Department of Information Systems
with effect from Semester B 2024 / 2025

Part I Course Overview

Course Title:	Database Management Systems
Course Code:	IS5413
Course Duration:	One Semester (13 weeks)
Credit Units:	3
Level:	P5
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	Nil
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	Nil
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

This course aims to introduce the basic concepts of database systems. It covers the methods and tools for the conceptual and logical design of database applications, and relational database models and languages for the physical design and implementation of database systems.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Explain the role of database users and understand the concepts of database systems, and architectures of database applications.	25%			
2.	Design a small database application using entity-relationship method and relational database design theory.	50%	✓	✓	
3.	Implement the database application using relational database management system (DBMS), write SQL codes and define integrity constraints.	25%	✓	✓	
		100%			

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Learning and TeachingActivities (LTAs)

(LTAsdesigned to facilitate students' achievement of the CILOs.)

LTA	Brief Description	CILO No.			Hours/week (if applicable)
		1	2	3	
LTA1. Lecture	Students will learn the concepts relating to databases and database users, DBMS concepts and its architecture, record storage and file organisation, index structures for files.	✓			
LTA2. Demonstrations	Students will apply the methods and techniques of database modelling using extended entity-relationship (EER) method, functional dependencies and normalisation for relational databases, relational database design methods and design process.		✓		
LTA3. Lab Workshops	Students will learn hands-on skills on developing the relational database model, SQL- a relational database language, and other database models.			✓	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.			Weighting	Remarks
	1	2	3		
Continuous Assessment: 30 %					
AT1: Coursework A group project, which includes a project report and presentation, will be allocated to let students apply the modelling concepts and database programming techniques learnt in class to solve practical problems	✓	✓	✓	30%	
Examination: __70_% (duration: one 2-hour exam)					
AT2: Examination A written examination is developed to assess student's competence level of the taught subjects.	✓	✓	✓	70%	
				100%	

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
AT1: Coursework	Ability to explain the role of database users and features of database systems, and architecture of database systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to design a small database application using entity-relationship method and relational database design theory.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to implement the database application using relational database management system (DBMS), write SQL codes and define integrity constraints.	High	Significant	Moderate	Basic	Not even reaching marginal levels
AT2: Examination	Ability to explain the role of database users and features of database systems, and architecture of database systems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to design a small database application using entity-relationship method and relational database design theory.	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to implement the database application using relational database management system (DBMS), write SQL codes and define integrity constraints.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
AT1: Coursework	Ability to explain the role of database users and features of database systems, and architecture of database systems.	High	Significant	Moderate	Not even reaching marginal levels
	Capability to design a small database application using entity-relationship method and relational database design theory.	High	Significant	Moderate	Not even reaching marginal levels
	Capability to implement the database application using relational database management system (DBMS), write SQL codes and define integrity constraints.	High	Significant	Moderate	Not even reaching marginal levels
AT2: Examination	Ability to explain the role of database users and features of database systems, and architecture of database systems.	High	Significant	Moderate	Not even reaching marginal levels
	Capability to design a small database application using entity-relationship method and relational database design theory.	High	Significant	Moderate	Not even reaching marginal levels
	Capability to implement the database application using relational database management system (DBMS), write SQL codes and define integrity constraints.	High	Significant	Moderate	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

- Database environments including the basic concepts, definitions and database approaches. Architectures and components of database systems.
- Database development process and conceptual database design using Enhanced Entity-Relationship approach.
- The relational database model and its languages. Three-layer relational database architecture. Business benefits of the relational database model.
- Logical database design concepts, theory and techniques. Normalisation of relations and business considerations in data normalization.
- Physical database design process and techniques. Designing physical records and de-normalization, file organizations, using and selecting indexes, performance improvements.
- Database Definitive and Data Manipulation Languages in relational database management systems (RDBMS). Techniques in writing SQL statements. Choice of RDBMS from user perspectives.
- Advanced topics on SQL, triggers, stored procedures, embedded SQL, dynamic SQL and XML.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Jeffrey A. Hoffer, Ramesh Venkataraman, Heikki Topi. Modern Database Management, 13th Edition by Pearson. (2019).

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Elmasri, R. and Navathe, S.B., Fundamentals of Database Systems, The Benjamin/Cummings, Co. Inc., 7th edition (2022).
2.	Silberschatz, A. and Korth, H.F., Database System Concepts, McGraw-Hill, Inc. (2019)