THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY | HKUST Summer School

COMP 3311 – Database Management Systems

School:	**School of Engineering**
Subject Area:	**Computer Science and Engineering**
Course Credit:	**3**
Instructor:	**LOCHOVSKY Frederick Horst**
Pre-requisite/co-requisite:	**Details Here**

Notes:

- The syllabi provided here is for reference only and may be subject to changes and adjustments as determined by the course instructors.

COMP 3311: Database Management Systems

OVERVIEW

A database management system (DBMS) is primarily concerned with *efficiently and effectively* managing data. This course introduces the topic through lectures, tutorials and by providing hands-on experience in designing, implementing and querying a database using a commercial database management system. The first half of the course focuses on how to analyze and represent the (structured) data requirements of an application using the entity-relationship (E-R) model and the relational model as well as how to query relational data using structured query language (SQL). The second half of the course focuses on the key services provided by a relational database management system to store, query and safeguard data in a multi-user environment. Recent technologies for managing less-structured data are briefly discussed.

OBJECTIVES

The course provides students with both a theoretical and a practical foundation for understanding the capabilities and use of a database management system. For the theoretical part, students learn the major concepts and techniques used by a database management system to manage data. For the practical part, students use a commercial DBMS to design, implement and query a database to support the data requirements of a small application.

OUTCOMES

On successful completion of this course, students are expected to be able to do the following.

- Explain important database management system concepts including: database system architecture; data models; logical and physical database design; query languages and query processing; database services including transaction management, concurrency control, data integrity and database recovery.
- Apply database theories and techniques to practical database applications.
- Analyze the data requirements for a real-world application, design a database for the application and implement appropriate queries for the application using a major commercial database management system.

SYLLABUS

LECTURE TOPIC	*LECTURES (estimated)*
Database Management Systems	1
Entity-Relationship (E-R) Model and Database Design	3
Relational Algebra (RA)	1
Structured Query Language (SQL)	3
Relational Database Design	2
Storage and File Structure	1
Indexing	3
Query Processing	3
Query Optimization	2
Transactions	1
Concurrency Control	2
Recovery System	1
NoSQL Databases	1

TEXTBOOK

Database System Concepts, 7th Edition A. Silberschatz, H.F. Korth, and S. Sudarshan, McGraw-Hill, 2020.

GRADING SCHEME

	Item	*Value*
1.	Exercises (lecture, tutorial, lab)	10%
2.	Project	30%
3.	Midterm Test	20%
4.	Final Exam	40%