Module (Course Syllabus) Catalogue

2024-2025

College/ Institute	College of Erbil Technical Engineering	
Department	Department of Information System Engineering	
Module Name	Database management system	
Module Code	ISA701	
Degree	Technical Diploma ☐ Bachler ■ High Diploma ☐ Master ☐ PhD ☐	
Semester	Seven	
Qualification		
Scientific Title		
ECTS (Credits)	6	
Module type	Prerequisite ☐ Core ■ Assist. ☐	
Weekly hours	4	Total Workload=(162) hrs
Weekly hours (Theory)	(2)hr Class	(53)Total hrs Workload
Weekly hours (Practical)	(2)hr Class	(109)Total hrs Workload
Number of Weeks	20	
Lecturer (Theory)	Media Ali Ibrahim Areen Jamal Hamad	
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Lecturer (Practical)	Goran Maqded	
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Websites		

Course Book

Course Description	This course is designed to provide an introduction to databases and their types. Topics cover presentation database management systems. As well as designed to provide students with basic applications in data Modelling, querying, and processing of information for a particular domain in private and public sectors.
Course objectives	This is an introductory course in databases. It will help students to develop an understanding of the role of data, database systems, DBMS in information systems
Student's obligation	Student's obligation in the computer application course is: • Attendance in all lectures. • Quizzes or homework in each course. • Exam in end of first course and second course.
Required Learning Materials	

Evaluation

Task		Weight (Marks)	Due Week	Relevant Learning Outcome
Paper Review				
Assignments	Homework	6	2	
	Class Activity	2	1	
	Report	5	1	
	Seminar	5	1	
	Essay			
	Project			
Lab Report & Activity		9	1-2	
Quiz		4	1	
Lab Quiz		4	1	

	Midterm Exam	10	1	
	Lab Midterm Exam	15	1	
	Final Exam	20	1	
	Lab Final Exam	20	1	
	Total	100		

Specific learning outcome:	• Develop an appreciation of the role of data, files and databases in information systems. • Understand the database development activities during the System Development Cycle • Be familiar with the data modelling concepts (E-R and Class diagrams) used in database design. • Be able to create databases and pose complex SQL queries of relational databases. • Develop appreciation of several DBMS's (MySQL) • Be familiar with a broad range of data management issues including data integrity and security. Utilize a CASE tool for data modelling and schema creation
Course References:	Books: A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", fifth Edition McGraw-Hill , Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning

Course topics (Theory)	Week	Learning Outcome
Introduction to Database and DBMS	1&2	• Data vs. Information • What is a Database System? • Types of Databases • Three-Levels of Abstraction in a Database System • What Is a DBMS? • Architecture of DBMS • Components of a DBMS • Functions of a DBMS • Advantages of DBMS • Disadvantages of DBMS

Fundamentals of Database Concepts Database Models	3,4	• Introduction to Data Modeling • The Entity-Relationship Model • Attributes in the E-R Model • Relationships in the E-R Model • Mapping Cardinality • Keys of an Entity Set • Primary Keys, SuperKeys and Candidate Keys • Entity Sets vs. Attributes • Weak Entity Sets vs. Strong Entity Sets • Multiway Relationships
Database Design	5,6,7	• Database Design. • Normalization. • Functional Dependency. • Types Of Normalization
Database Manipulation, Database Query Language	8,9	• Database Design. • Normalization. • Functional Dependency. • Types Of Normalization
Query Processing and Optimization	10,11	• Query Processing and Optimization. • The Steps in Query Processing. • Query Optimization. • Using Heuristics in Query Optimization.
Object-Oriented Data Model.	12	• Shortcomings of Relational Databases • The Concept of Object data Model • Object-Oriented Database Systems • Object-Relational Database Systems
Practical Topics	**Week**	**Learning Outcome**

1) Design a Database and create required tables. For e.g., Bank, College Database 2) Apply the constraints like Primary Key, Foreign key, NOT NULL to the tables. 3) Write a SQL statement for implementing ALTER, UPDATE and DELETE 4) Write the queries to implement the joins 5) Write the query for implementing the following functions: MAX (), MIN (), AVG (), COUNT () 6) Write the query to implement the concept of Integrity constrains 7) Write the query to create the views 8) Perform the queries for triggers 9) Perform the following operation for demonstrating the insertion, updating and deletion using the referential integrity constraints 10) Write the query for creating the users and their role	1-12	Design and creating database

Questions Example Design

Compositional:

1. What is a database management system? What are the advantages and disadvantages of DBMS?

   Solution

   Database Management Systems (DBMS) are software systems used to store, retrieve, and run queries on data. A DBMS serves as an interface between an end-user and a database, allowing users to create, read, update, and delete data in the database.

2. Draw a class diagram for the following scenario.

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   Solution:

   Diagram

Extra notes:

This course catalogue is prone to change, students will be informed in case.

External Evaluator

I confirm that the syllabus given the attached course book is sufficient and covers the required areas needed for the students.

Signature

Dr. Bzar Kh. Hussan

20/09/2024