

" حيث تصبح الرؤية واقعاً "
"When Vision Becomes
Reality"

" عراقة وجودة "
Tradition and Quality

Detailed Course Description - Course Plan Development and Updating Procedures/ Software Engineering Department	QF01/0408-3.0E
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Faculty	Science and Information Technology	Department	Software Engineering
Course number	0114341	Course title	Database (1)
Number of credit hours	3	Pre-requisite/co-requisite	Data structure 0114212

Brief course description

This course emphasizes on database design methodology that is explicitly divided into three phases: conceptual, logical, and physical. This course focuses on an introduction to database systems design implementation and management issues, as well as an extensive treatment of database languages and standards.

Course goals and learning outcomes

Goal 1	To learn and understand the database management
Learning outcomes	1.1 The student should know the definition of Database. 1.2 The student should know the concepts and architectures of database management system (DBMS). 1.3 The student should be able to realize the difference between the database approach and the file-based approach.
Goal 2	To study and understand relational model and Languages.
Learning outcomes	2.1 The student should be able to understand the concepts behind the relational model. 2.2 The student should know the most popular data model at present. 2.3 The student should be able to understand the relationship with mathematical relations, the relational integrity rules, entity integrity, and referential integrity.
Goal 3	To learn and understand relational algebra
Learning outcomes	3.1 Illustrating all operations of relational algebra 3.2 The student should know how to use relational algebra to retrieve data.
Goal 4	To learn and understand SQL and data manipulation
Learning outcomes	4.1 The student should be able to understand the SQL data types and the data definition statements. 4.2 The student should be able to write SQL statements. 4.3 The student should know the main concepts of these SQL statements.
Goal 5	To learn and understand entity relationship modeling
Learning outcomes	5.1 The student should be able to understand entity relational diagram (ERD). 5.2 To learn how to enhance ERD and relational model. 5.3 To learn how to convert ERD into relational model.

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Goal 6	To learn and understand normalization
Learning outcomes	6.1 The student should understand the normalization process. 6.2 To be able to know and examine the concepts behind normalization. 6.3 To know how to transition a design from one normal form to another. 6.4 To know how to use normalization to analyze a hardcopy report in order to produce a relational model.
Goal 7	Object-oriented DBMS concepts.
Learning outcomes	7.1 The student should be able to understand Object Oriented DBMS and its concepts
Textbook	1- Ramez Elmasri and Shamkant B. Navathe “Fundamentals of Database Systems” (7th Edition) ISBN-10: 0133970779 (2017)
Supplementary References	1- Thomas Connolly and Carolyn Begg “Database Systems: A Practical Approach to Design, Implementation, and Management” (6th Edition) ISBN-10:0132943263 (2014) 2- David M. Kroenke , David J. Auer “Database Concepts” (7th Edition) ISBN-10: 0133544621 (2014) 3- Database Systems design, Implementation and Management (12th Edition) by Carlos Coronel, Steven Morris, Publisher: Cengage Learning, (2016)

Course timeline				
Week	Number of hours	Course topics	Pages (textbook)	Notes
01	1	Chapter 1 : Introduction to Databases <ul style="list-style-type: none"> • An Example of Database. • Characteristics of database approach 	34 - 40	
	1			
	1			
02	1	<ul style="list-style-type: none"> • Actor on the scene • Advantages of using DBMS 	40 - 52	
	1			
	1			
03	1	<ul style="list-style-type: none"> • A brief history of Database application • When not to use a DBMS 	53- 57	
	1			
	1			
04	1	Chapter 2: Database System Concept and Architecture <ul style="list-style-type: none"> • Data Model, Schema and Instance. • Three schema architecture and data independence • Database languages and Interfaces 	62-71	
	1			
	1			
05	1	<ul style="list-style-type: none"> • The Database System Environment • Classification of DBMS 	72- 83	
	1			
	1			
06	1	Chapter 3: Data modeling using ERD <ul style="list-style-type: none"> • A Sample Database Application • Entity Types, Entity Set , Attributes and Keys 	90-110	
	1			
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07	1 1 1	<ul style="list-style-type: none"> Relationship Types, Relationship sets, Roles and constraints. Weak entity. 		
08	1 1 1	Chapter 4: The Enhanced ERD <ul style="list-style-type: none"> Subclasses , Superclasses and Inheritances Specialization and Generalization. Constraints and characteristics of specialization and generalization. Modeling UNION Types using categories. 	138 - 151	
09	1 1 1	Chapter 5 : The Relational Data Model and Relational Database Constraints <ul style="list-style-type: none"> Relational model concepts Relational model constraints and relational database schema 	180-194	
10	1 1 1	Chapter 6 : Basic SQL <ul style="list-style-type: none"> SQL data definition and data types Create ,Alter ,Drop , Rename and Truncate Statements 		
11	1 1 1	<ul style="list-style-type: none"> Specifying Constraints in SQL Basic Retrieval Queries in SQL 	209-232	
12	1 1 1	<ul style="list-style-type: none"> Insert , update and Delete Statements in SQL Additional features of SQL 		
13	1 1 1	Chapter 8: The Relational Algebra and Relational Calculus. <ul style="list-style-type: none"> Unary Relational Operation : SELECT and PROJECT Binary Relational Operation JOIN and DIVISION Additional Relational Operations 	271 - 294	
14	1 1 1	Chapter 9: Relational Database Design by ER and EER to Relational Mapping <ul style="list-style-type: none"> Relational database design using ER to relational mapping Mapping EER model constructs to relations 	320 - 333	
15	1 1 1	Chapter 12 : Object and Object Relational Database <ul style="list-style-type: none"> Overview of Object Database Concepts Object Database Conceptual Design 	395 - 437	

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16	1 1 1	Chapter 14: Basics of Functional Dependencies and Normalization for Relational Databases	491-516
		<ul style="list-style-type: none"> Informal design guidelines for relation schemas Functional dependencies Normal forms based on primary keys. General definitions of second and third normal forms 	

Theoretical course evaluation methods and weight	Participation = 10% First exam 20% Second exam 20% Final exam 50%	Practical (clinical) course evaluation methods	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%
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Approved by head of department	Dr. Ahmad	Date of approval	
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Extra information (to be updated every semester by corresponding faculty member)

Name of teacher	Dr. Dara Aqel	Office Number	
Phone number (extension)	327	Email	d.aqel@zug.edu.jo
Office hours	12-1 (Sunday, Tuesday, Thursday) 11-12.30 (Monday, Wednesday)		