



<b>University of Petra</b>		
<b>Faculty of Information Technology</b>		كلية تكنولوجيا المعلومات
<b>Department of Computer Science</b>		قسم علم الحاسوب

## Course Syllabus

Year : 2017-2018

Semester: First

Course No.	Course Title	Prerequisite	Co-requisite	Credit Hours Lectures / Lab.
601281	Database (1)	601212	-	Lecture: 3 Lab : 0

Instructor Name	E-mail	Office No.	Office ext.	Office Hours
<b>Dr. Shakir Al-Farraji</b>	shussain@uop.edu.jo	7312	Ext. 7312	Posted on my office door

<b>Coordinator's Name:</b> (if applicable)	<i>Dr. Shakir Al-Farraji</i>
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<b>Short Course Description</b>	This course provides an overview of database concepts and Database Management System (DBMS). Topics covered: Introduction to the relational database model including: relational algebra, relational calculus, Structural Query Language (SQL), database design methodologies, Entity-Relationship Model (ER), integrity constraints, conceptual database design, functional dependencies and normalization
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### Course Objectives

- Explain the characteristics that distinguish the database approach from the traditional approach of programming with data files.
- Identify major DBMS functions and describe their role in a database system.
- Use a query language to elicit information from a database.
- Describe the modeling concepts and notation of the entity-relationship model including its use in data modeling.
- Explain and demonstrate the concepts of entity integrity constraint and referential integrity constraint.
- Demonstrate use of the relational algebra operations from mathematical set theory (union, intersection, difference, and cartesian product) and the relational algebra operations developed specifically for relational databases (select, product, join, and division).
- Describe what is meant by 1NF, 2NF, 3NF, and BCNF, uses and impacts.
- Demonstrate database security processes in SQL security commands

### Course Intended Learning Outcomes (ILOs) and their Alignment with Program ILOs, Teaching and Learning Methods, and Assessment Methods:

Upon successful completion of this course, students are expected to achieve the following learning outcomes:

Course ILOs	Program ILOs	Teaching and Learning Method	Assessment Method
<b>Knowledge (K)</b>			
K1. Demonstrate knowledge of relational database concepts, entities/relations and entity-relationship diagrams.	A.3	Interactive lectures	First Exam
K2. Demonstrate knowledge of integrity constraints and mapping of database design.	A.3	Interactive lectures	Second Exam
K3. Demonstrate knowledge of querying relational databases by using relational algebra.	A.1	Interactive lectures	Second Exam
K4. Demonstrate knowledge of database security.	E.4	Interactive lectures	Final Exam
<b>Intellectual Skills (I)</b>			
I1. Analyze a database request (query) and use relational algebra to implement database queries.	CS J.2	Interactive lectures Lab	LAB Sheet
I2. Analyze data requirements of an application and design a data model using entity relationship diagrams.	C.1	Interactive lectures	First Exam
I3. Analyze the status of a relation and be able to normalize it in order to avoid anomalies.	C.4	Interactive lectures	Final Exam
<b>Practical skills (P)</b>			
P1. Use a database tool to implement the SQL commands.	I.3	Interactive lectures Lab	LAB project

### **Course Schedule:**

Week	Topic Details	Course ILO number	Reference
<b>1</b>	Introduction The Database approach Actors on the scene and actors behind the scene Advantages and disadvantages of the DB approach	A.3	Ch. 1
<b>2</b>	Terminology (Data Model, Schema and Instance). 3-level Architecture and Data Independence. Database Languages and Utilities. Centralized and Client/Server architecture Classifications of Database Management Systems.	A.3	Ch. 2
<b>3-4</b>	Conceptual Models for Database Design. Entities and Attributes. Entity Types. Entity Sets.	C.1	Ch. 3
<b>5-6</b>	Relational Data Model Concepts Characteristics of Relations Relational Model Constraints and schemas. Updates, transactions and constraint violation	A.3	Ch. 5 Ch. 7

	ER-To-Relational Mapping		
<b>7-9</b>	<b>Relational Algebra:</b> Relational algebra operations	A.1 CS J.2	Ch. 6
<b>10-11</b>	<b>Functional Dependencies</b>		Ch. 10
<b>12-13</b>	<b>Normalization</b>	C.4	Ch. 10
<b>14-15</b>	<b>Database Security:</b> Specifying Privileges using Views. Revoking Privileges. Grant Option. Example SQL commands. Specifying limits on propagation of privileges. Review	E.4	Ch. 23
<b>16</b>	<b>Final Exam</b>		

### **Assessment Methods and Grading System:**

Assessment method	Grade	Comments
First Exam	<b>20%</b>	Covers topics introduced in the first 4 weeks
Second Exam	<b>20%</b>	Covers topics introduced from week 5-9
Lab	<b>20%</b>	
Final Exam	<b>40%</b>	Covers all the topics introduced in the course
<b>Total</b>	<b>100</b>	

### **Learning References:**

<b>1- Textbook (s):</b>
<i>Fundamentals of Database Systems (6th edition). Elmasri and Navathe; Addison-Wesley, 2011.</i>
<b>2- References:</b>
<ul style="list-style-type: none"> <li>• Database Systems: An Application-Oriented Approach (2<sup>nd</sup> Edition), M. Kifer, A. Bernsten, and P. Lewis; Addison Wesley, 2006.</li> <li>• Database Systems. A Practical Approach to Design, Implementation and Management (4<sup>nd</sup> Edition), Thomas Connolly and Carolyn Brgg ; Addison Wesley, 2005.</li> <li>• An Introduction to Database Systems (Vol 1, 8<sup>th</sup> Edition), Date C.J.; Addison Wesley, 2004.</li> <li>• Database System Concepts (4<sup>th</sup> edition), Silberschaetz,, Korth, and Sudarshan; MCGraw Hill 2002</li> <li>• David M. Kroenke, “Database Processing” , Prentice Hall 2000.</li> <li>• Database Principles, Programming and Performace(2<sup>nd</sup> edition), Patrick O’Neil; Morgan Kuafmann, 2000</li> <li>• Lecturer’s Notes</li> </ul>
<b>3- Other Resources:</b>
<<Labs, computer resources, lecture rooms needed for the course>>

### **Course Policies<sup>1</sup>**

- Attendance Policy: University regulations apply to attendance.
- Academic Honesty: Academic dishonesty is an unacceptable mode of conduct, and will not be tolerated in any form at University of Petra. All persons involved in academic dishonesty and plagiarism in any form will be disciplined in accordance with University rules and regulations.

- Make-up Exams: Only students with valid excuses are allowed to have make up exams. All excuses must be signed by the Faculty Dean. Student has the responsibility to arrange with his/her instructor for an exam date before the occurrence of the next regular exam.
- All assignment and class work must be submitted at the specified due date. No late work will be accepted.
- No make up for quizzes under any circumstance.

Approved by	Name	Date	Signature
Coordinator of Curriculum Committee	Dr. Shakir Al-Faraji	27-04-2016	
Faculty Dean/ Head of Department			

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<sup>1</sup> Additional information may be added in this section according to the nature of the course.