



جمهورية مصر العربية

وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and Scientific Research



المعهد العالى للحاسبات وتكنولوجيا المعلومات
مدينة الشروق - القاهرة
شعبة علوم الحاسب

Course specification

Course Code: CS 323

Course Title: Introduction to Databases

Academic Year: /

Course specification
(CS 323 - Introduction to Databases)

Course Outline

Faculty:	<i>HICIT- (Higher Institute for Computers & Information Technology-El Shorouk Academy)</i>		
Programme(s) on which the course is given:	Undergraduate program in Computer Science		
Major or minor element of programme:	Compulsory		
Department offering the program	Department of Computer Science		
Department offering the course:	Department of Computer Science		
Level	Third Level		
Date of specification approval	--/--/2023		

Basic Information

Code:	CS 323	Title:	Introduction to Databases	
Prerequisites:	CS 103 Introduction to Information Systems			
Weekly Hours:				
Lecture: 2	Exercise: 1	Practical : 1	Total: 3 credit hours	

Professional Information

Course Aims:

The objective of CS 323 is to survey the fundamentals of database management systems and practice various steps of database-driven application development such as modeling, design, querying and implementation. This course will cover the design of database systems, important database theory, SQL, programming and relational databases.

After completing this course students must be able to:

- Understand the concepts of the data base analysis, design and some implementations.
- Understand the structural constraints of relationships.
- Understand the types of attributes, primary keys, foreign keys, super keys ... etc.
- Understand the process drawing the ER-Diagrams, EER-Diagrams, and relational schema.
- Understand how to perform the normalization process of relations.
- Apply all the process steps of the analysis and design to have successful DB system implementation.

Program ILOs Covered by Course

Knowledge and understanding	Intellectual Skills	Professional and practical skills	General and Transferable skills
A5, A9, A20, A21, A22	B3, B4, B7, B8, B10, B12, B20	C1, C3, C5, C7, C10, C18, C19	D5, D12

Intended learning outcomes of course (ILOs)

a. Knowledge and Under-Standing:

- a1. Explain the importance of database systems and the difference between file management and database. [A9]
- a2. Define the basic concepts surrounding a relational database. [A5, A9]
- a3. Recognize the concept of the entity relationship modeling. [A5, A9, A22]
- a4. Determine the normalization methods of database tables. [A20, A21]

b. Intellectual Skills:

- b1. Discover attributes, components, relationships, patterns, main ideas, and errors. [B3, B4]
- b2. Design a database system through structures, diagrams, and other appropriate design methods. [B4, B7]
- b3. Construct a range of DB-solutions and critically evaluate them. [B7, B8, B20]
- b4. Analyze a wide range of database design issues. [B10, B12, B20]

c. Professional and practical skills

- c1. Implement practical database system. [C1, C5]
- c2. Use appropriate database development methodology. [C3, C7]
- c3. Use the (DBMSs) effectively. [C10, C18]
- c4. Evaluate suitable database security and integrity levels. [C10, C19]

d. General and transferable skills

- d1. Display an integrated approach to the deployment of communication skills. [D12]
- d2. Work effectively with database owners and for database users. [D5]
- d3. Strike the balance between self-reliance and seeking help when necessary. [D5, D12]
- d4. Display personal responsibility by working to multiple deadlines in relation to the course requirements. [D12]
- d5. Write and deliver coherent and structured technical reports. [D12]

Contents

Topic	Contact Hours	
	lecture	Lab
Introduction to Databases and database systems, database models	2	2
Data Modeling Using the Entity-Relationship (ER) Model	4	4
Relational model concepts and Relational mapping	4	4
Query Languages and processing: Data Definition, Constraints, Schema Changes, Specifying Updates, and Retrieval Queries	6	6
Views and data base programming	2	2
Functional dependencies and normalization for a relational database	2	2
Selected Topics (NOSQL, DB security, Distributed DB)	4	2
Course project	2	4

Teaching and learning methods

Teaching and learning methods	Used
Lectures	√
Tutorial Exercises	
Practical Lab	√
Discussions.	√
Self – Learning (Reading material, Websites search,)	√
Self-studies	-
Group work	√
Presentation	√
Problem solving/problem solving learning based	√
Case study	√
Synchronous E-Learning	-
Video lectures	√
Asynchronous E-Learning	√

Student assessment methods & Schedule

Methods	Used	Week#
Midterm Exam	√	8
Final Exam	√	16
Course Project	√	3-14
Course Work & Quizzes	√	2-14
Practical Exam	√	15

Assessment Weight

Assessment	Weight %
Mid Term Exam	15
Practical Exam and Project	15
Final Exam	60%
Course Work & Quizzes	10%
Total	100

Course Work & Quizzes

Short Exams, Assignments, Research, Reports, Presentations
Class/Project discussion

List of references

Essential books (textbooks)	<p>FUNDAMENTALS OF DATABASE SYSTEMS, 7/E, by Elmasri /Navathe, ISBN-10: 0-13-397077-9 ISBN-13: 978-0-13-397077-7 Publication: Pearson, 2021 copyright 2016.</p> <p>“Microsoft SQL Server 2019: A Guide for the Modern DBA” by</p>
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	Johnny Chris ,2019
Course notes	E-Learning Portal
Recommended books	SQL Quick Start Guide The Simplified Beginner's Guide to Managing, Analyzing, and Manipulating Data With SQL by Walter Shields 2019 Database Design and Relational Theory: Normal Forms and All That Jazz by C. J. Date Released December 2019 Publisher(s): Apress ISBN: 9781484255407
Periodicals, website	PowerPoint presentations of all course materials All labs material [https://learn.sha.edu.eg/course/view.php?id=1362]
Videos link	Video of lectures and sections [https://drive.google.com/drive/folders/1XnKUQbF2SoYMjD5-fXMBJIWQYIXm3sz5]

Required Facilities

Tools & SW (Technology facilities):	<ul style="list-style-type: none"> - Microsoft SQL server 2019 platform - Microsoft Visual Studio 2019 and ADO.NET to connect database with c# code. - Microsoft TEAMS to create virtual classrooms for lectures, discussions for project. - Academy Portal (MOODLE) to make electronic quizzes and electronic midterm exam. - Academy Portal (MOODLE) to upload project deliverable and assignment. - Academy portal (MOODLE) to upload electronic material. 	
Teaching facilities:	Whiteboard	√
	Computer Lab	√
	Data show	√
	E-Learning	√
	Videos	√
	Website	√

Course Content/ILO Matrix

Course Contents	Knowledge & understanding				Intellectual skills				Professional and practical skills				General				
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4	d5
DB System concepts and architecture	x	X	x														
Entity-Relationship (ER) and Entity-Enhanced Relationship (EER) models	x	X	x		x	x	x	x	x	x							
Relational model concepts and Relational mapping	x	X	x		x	x	x	x		x							

Structured Query Language (SQL)											X		X						
MS SQL server as a relational DB Management System											X		X						
Functional dependencies and normalization for a relational database						X	X	X	X	X					X				
Selected Topics (NOSQL, DB security, Distributed DB))	X								X	X	X								
Course project												X	X	X	X	X	X	X	X

Learning Method /ILOs Matrix																
Learning Methods	Knowledge and understanding				Intellectual skills				Professional and practical skills				General			
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Lectures	x	x	x	x	x	x	x	x	x	x	x	x				
Tutorial Exercises					x	x	x	x	x	x	x	x				
Reading material	x	x	x	x	x	x	x	x	x	x	x	x				
Websites search	x	x	x	x	x	x	x	x		x			x	x	x	x
Research and reporting	x	x	x	x									x	x		
Problem solving							x	x								
Group work									x	x	x	x	x	x	x	x
Case study					x		x	x	x	x		x				
Practical Lab					x	x	x	x	x	x	x					
Discussions.					x	x	x	x	x	x	x	x	x	x	x	x

Assessment Methods /ILOs Matrix																	
Assessment Methods	Knowledge & understanding				Intellectual skills				Professional & practical skills				General				
	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4	d5
Mid Term Exam	x	x	x	x	x	x	x	x									
Final Exam	x	x	x	x	x	x	x	x									
Course Project	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Course Work & Quizzes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Practical Exam	x	x	x	x	x	x	x	x	x	x	x	x					

Course ILOs Vs Program ILOs

Prog ILOs Course ILOs		Knowledge & understanding					Intellectual skills						Professional and practical skills						General				
		A5	A9	A20	A21	A22	B3	B4	B7	B8	B10	B12	B20	C1	C3	C5	C7	C10	C18	C19	D5	D12	
Knowledge and Understanding	a1		√																				
	a2	√	√																				
	a3	√	√			√																	
	a4			√	√																		
Intellectual skills	b1					√	√																
	b2						√	√															
	b3							√	√														
	b4									√	√	√	√										
Professional and practical skills	c1													√		√							
	c2														√		√						
	c3																√	√					
	c4																√	√					
General skills	d1																						√
	d2																				√		
	d3																			√			√
	d4																						√
	d5																						√

Course Coordinator : Dr. Ahmed El-Abbassy ()

Head of Department : Dr. Ahmed El-Abbassy ()

Date: --/--/2023