Course specification

(3101 Database Systems)

Faculty:	*HICIT- **Higher Institute for Computers & Information Technology**-El Shorouk Academy*
Programme(s) on which the course is given:	Under graduate program in Computer Science
Major or minor element of programme:	Compulsory
Department offering the programme	Department of Computer Science
Department offering the course:	Department of Computer Science
Year / Class	3rd Year – 1st semester
Date of specification approval	1/8/2022

A- Basic Information

Title: Database Systems	***Code:** 3101*		
Weekly Hours:			
Lecture : 3	**Exercise: -**	**Practical :**3	**Total:** 6

B- Professional Information

1- Course Aims:

The objective of CS3101 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.

2- Program ILOs Covered by Course

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

3- 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. Define the concept of the entity relationship modeling. [A5,A9,A22]
a4. Define the normalization methods of database tables. [A20,A21]

b. Intellectual Skills:

b1. Identify attributes, components, relationships, patterns, main ideas, and errors. [B3, B4]
b2. Identify a range of solutions and critically evaluate and justify proposed design solutions. [B4, B7]
b3. Identify a range of DB-solutions and critically evaluate them and justify proposed design and development solutions. [B7, B8]
b4. Analyze a wide range of database design issues and provide solutions through suitable design, structures, diagrams, and other appropriate design methods. [B10, B12]

c- Professional and practical skills

c1. Implement practical database system. [C1,C5]
c2. Use appropriate database design methodology.[C3,C7]
c3. Use the (DBMSs) effectively.[C10,C18]
c4. Apply and 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]

4- Contents

Topic	Hours	Lec.	Exc/Lab
DB System concepts and architecture	6	3	3
Entity-Relationship (ER) and Entity-Enhanced Relationship (EER) models	12	6	6
Relational model concepts and Relational mapping	12	6	6
Structured Query Language (SQL)	24	12	12
MS SQL server as a relational DB Management System	6	3	3
Functional dependencies and normalization for a relational database	6	3	3
Selected Topics	3	3	-
Course project	9	3	6

5- Teaching and learning methods

Teaching and learning methods	Used
Active Learning	
Lectures	√
Tutorial Exercises	√
Practical Lab	√
Discussions.	√
Self – Learning strategy	
Reading material	√
Websites search	√
Research and reporting	√
Self-studies	-
Experimental strategy	
Group work	√
Presentation	-
Problem solving strategy	
Problem solving/problem solving learning based	√
Case study	√
Synchronous E-Learning	
Virtual lab	-
Virtual class	-
Chat Room	-
Video lectures	√
Asynchronous E-Learning	
E-Learning	√

6- Student assessment methods

Methods	Assessment	Used
Pop Quiz (Formative assessment)	Give the students a quiz at the beginning, middle, or end of a lesson that involves just 5 to 10 questions, to assess the knowledge and understanding achieved by the student during lecture	√
Think-Pair-Share(Formative assessment)	Students spend one minute individually writing down key points from what they learned. They then pair up with a partner and compare notes, to assess the knowledge ,understanding and general skills achieved by student during lecture.	√
Electronic Midterm Exam	To assess the knowledge and understanding achieved by the student during the previous weeks. (online on e-learning hub)	√

Pencil-to-Paper Final Exam	To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.	√
Course Project	To allow students work in team, and to evaluate knowledge, understanding, intellectual, and transferable skills. (online on e-learning hub , FTF)	√
Electronic Course Work & Quizzes	To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.(online on e-learning hub)	√
Practical Exam	to measure the ability of students to design and implement a software program(FTF).	√
Participation	To assess the knowledge and understanding achieved by the student during the previous weeks.	√

Assessment Schedule

Assessment	**Week #**
Pop Quiz	**weekly**
Think-Pair-Share	**weekly**
Participation	**3-14**
Electronic Mid Term Exam	**8**
Final Exam	**16**
Electronic/ hard copy Course Project	**3-14**
Electronic/ hard copy Course Work &Quizzes	**2-14**
Practical Exam	**15**

Assessment Weight

Assessment	**Weight %**
Pop Quiz	**5%**
Think-Pair-Share	
Participation	
Electronic Mid Term Exam	
Final Exam	**70%**
Electronic / hard copy Course Project	**10%**
Electronic/ hard copy Course Work &Quizzes	**5%**
Practical Exam	**10%**
Total	**100**

- Course Work &Quizzes:
  - Short Exams, Assignments, Researches, Reports, Presentations on e-learning hub
  - Class/Project discussion in a virtual classroom
  - Pop quiz
  - think-pair share

7- List of references

Essential books (text books)	• **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.** • **"Microsoft SQL Server 2019: A Guide for the Modern DBA" by Johnny Chris ,2019**
Course notes	- [www.comp.lancs.ac.uk/computing/resources/IanS/] - [www.sei.cmu.edu/]
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**]**

8- Required Facilities

To assess professional and practical skills given the following facilities:

a. Tools & SW (Technologies facilities):

- **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**

b. Teaching facilities:

	Lecture	*class*	*Lab*
Whiteboard	used	-	used

Pc/laptop	used	-	used
Data show	used	-	used
Webinars	MS TEAMS	-	MS TEAMS
Social-Media	Facebook Page for 3rd year	-	Facebook Page for 3rd year
Chat-Room	Chat-Teams	-	Chat-Teams
Videos	Stream-MOODLE	-	Stream-MOODLE
Website	MOODLE	-	MOODLE

9- Course Matrices

9.1 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	x					x	x	x									
Course project									x	x	x	x	x	x	x	x	x

9.2 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

9.3 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
Electronic Mid Term Exam	x	x	x	x	x	x	x	x									
Final Exam	x	x	x	x	x	x	x	x									
Electronic Course Project	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Electronic 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					

9.4 Course ILOs Vs Program ILOs

Course ILOs \ Prog ILOs		Knowledge & understanding					Intellectual skills						Professional and practical skills							General	
		A5	A9	A20	A21	A22	B3	B4	B7	B8	B10	B12	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: Prof**.** Dr. Ahmed El-Abbassy **(** **)**
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