

Course specification

(3101 Database Systems)

Faculty: HICIT- Higher Institute for Computers & Information Technology

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: 22/9/2015

A- Basic Information

Title: Database Systems

Code: 3101

Weekly Hours:

Lecture : 3

Exercise: -

Practical : 3

Total: 6

B- Professional Information

1- Course Objectives:

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.
- a2. Define the basic concepts surrounding a relational database.
- a3. Define the concept of the entity relationship modeling.
- a4. Define the normalization methods of database tables.

b. Intellectual Skills:

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

c- Professional and practical skills

- c1. Design and implement practical database system.
- c2. Use appropriate database design methodology.
- c3. Use the (DBMSs) effectively.
- c4. Apply and evaluate suitable database security and integrity levels.

d- General and transferable skills

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

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	9	6	3
Course project	9	3	6

5- Teaching and learning methods

- 5.1 Lectures
- 5.2 Tutorial Exercises
- 5.3 Practical Lab
- 5.4 Discussions.

6 -Student assessment methods

- 6.1 Midterm Exam: To assess the knowledge and understanding achieved by the student during the previous weeks.
- 6.2 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.
- 6.3 Course Project: To allow students work in team, and to evaluate knowledge, understanding, intellectual, and transferable skills.

6.4 Course Work & Quizzes: To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.

6.5 Practical Exam: to measure the ability of students to design and implement a software program.

Assessment Schedule

Assessment	Week #
Mid Term Exam	8
Final Exam	16
Course Project	3-14
Course Work & Quizzes	2-14
Practical Exam	15

Assessment Weight

Assessment	Weight %
Mid Term Exam	5%
Final Exam	70%
Course Project	10%
Course Work & Quizzes	5%
Practical Exam	10%
Total	100

Course Work & Quizzes: (Short Exams, Assignments, Researches, Reports, Presentations, Class/Project discussion)

7 -List of references

7.1 Text Books

- FUNDAMENTALS OF DATABASE SYSTEMS, 5/E, by Elmasri/Navathe, ISBN 0-321-41506-X. Publication: Addison Wesley, July 2007.
- Fundamentals of Database Systems, 7th Edition **By Ramez Elmasri**

7.2 Internet Location :

- www.comp.lancs.ac.uk/computing/resources/IanS/
- www.sei.cmu.edu/

8- Required Facilities

8.1 Tools/Software

- .NET, MS SQL server

9- Course Matrices

9.1- Course Content/ILO Matrix

Course Contents	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					
Course project													x	x	x	x	x

9.2- Learning Method /ILOs Matrix

Learning Methods	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4	d5
Lectures	x	x	x	x	x	x	x	x	x	x	x	x					
Tutorial Exercises					x	x	x	x	x	x	x	x					
Practical Lab					x	x	x	x	x	x	x	x					
Discussion					x	x	x	x	x	x	x	x	x	x	x	x	x

9.3 Assessment Methods /ILOs Matrix

Assessment Methods	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	x	x	x	x					
Final Exam	x	x	x	x	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 Coordinator: Prof.Dr. Ahmed El-Abbassy ()

Head of Department: Dr. Farouk Shabaan ()

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