الجامعة الأهلية
AHLIA UNIVERSITY
BAHRAIN

COLLEGE OF INFORMATION TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE SYLLABUS/SPECIFICATION

CODE& TITLE:	**ITCS 323 – Database Systems: Design and Application**
WEIGHT:	**(2 - 2 - 3)**
PREREQUISITE:	**ITCS 222**
NQF Level Allocated:	**7**
NQF Notional Hours / Credits:	**120 notional hours/ 12 NQF credit**
DESCRIPTION:	This course provides a comprehensive knowledge of database (DB) development and management by using database management systems (DBMS). It details the concepts necessary for designing, implementing and using database systems. Topics include database and file system, database design, relational data model, normalization of relations and data modeling using entity-relationship diagrams.
OBJECTIVES:	1. To explain the characteristics that differentiates programming with data file approach from database approach. 2. To cite the goals, functions and models of database system. 3. To demonstrate knowledge of database management systems together with its functions and architecture. 4. To explain data modeling using EERD. 5. To recognize and describe the relational model, its terminologies and properties of database relations. 6. To design efficient and normalized database tables. 7. To explain concepts of conceptual and logical database design. 8. To demonstrate proficiency in using declarative query language, i.e. Structured Query Language to design, build and implement relational database.
SEMESTER:	**ACADEMIC YEAR:**
INSTRUCTOR:	
OFFICE TEL:	
EMAIL:	

INTENDED LEARNING OUTCOMES (ILOS)

A. Knowledge and Understanding		**NQF Descriptor/ Level**
A1	Concepts and Theories: Demonstrate an understanding of advanced concepts, principles and theories related to designing, implementing and using both Database and Database Management System.	Knowledge: theoretical understanding [Level 7]
A2	Contemporary Trends, Problems and Research: N/A	N/A
A3	Professional Responsibility: N/A	N/A
B. Subject-Specific Skills		**NQF Descriptor/ Level**
B1	Problem Solving: Identify and analyze real life information management problems in order to solve them by developing efficient database systems.	Knowledge: Practical Application [Level 7]
B2	Modeling and Design: Model business data using EER and relational models and design database systems to meet user needs.	Knowledge: Practical Application [Level 7]
B3	Application of Methods and Tools: Apply modern DB design and implementation tools such as (Power Designer) and Microsoft SQL Server.	Knowledge: Practical Application [Level 7] Communication, ICT and Numeracy Skills [Level 7]
C. Thinking Skills		**NQF Descriptor/ Level**
C1	Analytic: Analyze the efficiency of databases systems developed for solving real world problems by applying the normalization rules and implementing the best practices in database design and modeling.	Generic Problem Solving & Analytical skills [Level 7]
C2	Synthetic: Demonstrate ability to combine the entities into a unified database design.	Generic Problem Solving & Analytical skills [Level 7]
C3	Creative: NA	N/A
D. General and Transferable Skills Development)		**NQF Descriptor/ Level**
D1	Communication: The ability to express and communicate ideas in oral and written form.	Communication, ICT and Numeracy Skills [Level 7]
D2	Teamwork and Leadership: N/A	N/A
D3	Organizational and Developmental Skills: Demonstrate ability to organize ideas and effectively allocate time in given assignment or project.	Competence: Autonomy, Responsibility and Context [Level 7]
D4	Ethical and Social Responsibility: N/A	N/A

Course Structures (Outline)						
Week	**Hours**		**ILOs**	**Unit/Module or Topic Title**	**Teaching Method**	**Assessment Method**
	Lecture	**Lab**				
1	2	2	A1, B3	Syllabus, Introduction and lab demonstration	Lecture/ Lab Demonstration	
2	2	2	A1, B3, C1	**Introduction to Databases:** - Introduction. - Traditional File-Based Systems - Database Approach. - Advantages &disadvantages of DBMSs. **Lab:** - File-based approach.	Lecture/ In-Lab Supervised Work/ Class Discussion	Oral Participation/ In-Lab Exercises
3	2	2	A1, B3	**Database Environment:** - The Three-Level ANSI-SPARC Architecture. - Database Languages. - Data Models and Conceptual Modeling. - Functions of a DBMS. **Lab:** - Database implementation using Access.	Lecture/ Lab Demonstration / In-Lab Supervised Work	Oral Participation/ Quiz 1
4	2	2	A1, B2, B3	**The Relational Model:** - Terminology. - Integrity Constraints. - Views. **Entity Relationship Modeling:** - Entity Types. - Relationship Types.	Lecture/ In-Lab Supervised Work	Oral Participation/ In-Lab Exercises
5-7	6	6	A1, B1, B2, B3	**Entity Relationship Modeling:** - Strong and Weak Entity Types. - Attributes on Relationships. - Structural Constraints. - Problem with ER Model. **Lab: SQL DML** - SQL SELECT Statement - Using Single-Row Functions to Customize Output. - Using Conversion Functions and Conditional Expressions - Working with Power Designer for ER Diagram.	Lecture/ In-Class Supervised Work/ In-Lab Supervised Work	In-Class Exercises/ In-Lab Exercises/ Quiz 2 (week7)

8-9	4	4	B1, B2, B3, C1, C2, D3	**Enhanced Entity Relationship Modeling:** - Specialization/Generalization. - Aggregation. - Composition. **Lab: SQL DML** - Displaying Data from Multiple Tables. - Using Subqueries to Solve Queries.	Lecture/ In-Lab Supervised Work / In-Class Supervised Work	In-Lab Exercises / In-Class Exercises / Assignment 1
10-11	4	4	A1, B1, B2, B3, C1	**Relational Algebra** **Lab** - Structured Query Language.	Lecture/ In-Lab Supervised Work / In-Class Supervised Work	In-Lab Exercises / In-Class Exercises/ Major Test(week10)
12-13	4	4	A1, B1, B3, C1, D3	**Normalization:** - The purpose of Normalization. - How Normalization Supports Database Design. - Data Redundancy and Update Anomalies. - Functional Dependencies. - The process of Normalization (1 NF, 2 NF, and 3 NF). **Lab:** - Structured Query Language. - Using DDL Statement Create and Manage Tables.	Lecture/ In-Lab Supervised Work / In-Class Supervised Work	In-Lab Exercises/ Assignment 2 / Quiz 3 (week13)
14	2	2	A1, B1, C1	**Selected Database Issues: Security and Administration** - Efficient Entity Design. - Database Security. - Countermeasures Computer-Based Controls. **Lab:** - Structured Query Language.	Lecture/ In-Class Supervised Work	In-Class Exercises/ In-Lab Exercises
15	2	2	B1, B2, B3, C1, C2, D1, D3	**Student Projects**	Project Supervision	Evaluation of Project Presentation and Report
16	2		A1, B1, B2, C1, C2	All Topics		Final Exam

TEACHING MATERIALS:

TEXTBOOK(S): Connolly T. and Begg C. (2015) *Database Systems, A practical Approach to Design, Implementation, and Management*, 6th Edition, Pearson.

HANDOUT(S): Available on Moodle i.e. http://www.ahlia.edu.bh/moodle

REFERENCE(S):

1. Elmasri R. and Navathe S. (2015) *Fundamentals of Database Systems*, 7th Edition, Pearson.
2. Coronel C. and Morris S. (2014) *Database Systems Design, implementation and Management*, 11th Edition, Cengage Learning.
3. Coronel C. and Morris S. (2012) *Database Principles: Fundamentals of Design, Implementation, and Management*, 10th Edition, Cengage Learning.
4. Kroenke D. and Auer D. (2015) *Database Concepts*, 7th Edition, Pearson.
5. Molina H., Ullman, J. and Widom, J. (2013) *Database Systems: The Complete Book*, 2nd Edition, Pearson.

ASSESSMENTS:

Type of Assessment	Description	ILOs	Weighting
Quizzes	Three written quizzes to be conducted with different question types like: MC, and short-answer. Each quiz is for 30 minutes. The average of best two quizzes will be considered.	A1	5%
Assignments	Assignment to be given to students, worth five marks. The assignment will assess students' skills in modeling, designing a database.	B1, B2, C2, D3	5%
Project	Project consisting of several phases in which the student should design, normalize and implement a DB for an information system of his/ her choice.	B1, B2, B3, C1, C2, D1, D3	20%
Major Test	The major test is a written, in-class 90 minutes test. It will cover topics studied in the first 9 weeks. The test will include several types of questions such as: short-answer, and design and modeling.	A1, B1, B2, C1	20%
Final Exam	The final exam is a comprehensive, written exam and will be of two hours. It will consist of design and modeling, short-answer and essay questions.	A1, B1, B2, C1, C2	40%
In-Class Exercises	Exercises cover design, modeling and normalization of a database.	B2, C1	Formative
In-Lab Exercises	To assess students skills in using different	B1, B3	10%

	tools for implementing data base.		
Oral Participation	In-class participation and discussion will assess student understanding of several data base concepts and theories.	A1	Formative
Overall			**100%**

Admissions	
Minimum number of students	**5**
Maximum number of students	**20**

Ahlia University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.ahlia.edu.bh/integrity for more information).