هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

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Course Specification

Course Title:	*Database Fundamentals*
Course Code:	***CS 0132***
Program:	*Programming Technology*
Department:	***Applied Sciences***
College:	*Applied College*
Institution:	***Imam Mohammad Bin Saud Islamic University***
Version:	***1st version***
Last Revision Date:	**2024/01/2**

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3				
2. Course type:					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered: 3rd Level					
4. Course general Description: This course teaches the basic concepts of database design and the Entity-Relationship Model (ERM) to represent design. In addition, the course is teaching how to convert ERM to DB Shema and the basics of normalization. Throughout the semester, the course includes an integrated case study in which all previous concepts are employed to build an integrated project. This course should also be covering the following professional certification: • Oracle Database: SQL Fundamentals I 1Z0-051. • Oracle Database SQL Certified Associate.					
5. Pre-requirements for this course (if any): 101 عال					
6. Co- requirements for this course (if any): N/A					
7. Course Main Objective(s): This course aims to introduce the student to the concept of relational databases and the stages of the development life cycle from building requirements, designing an entity and relationship model (ERM) and converting it into a database schema (DB Shema) and then improving it by using standard formulas (Normalization) to obtain an intact database and error-free.					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom		
2.	E-learning		
3.	Hybrid • Traditional classroom • E-learning	33	100%
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	33
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	120
	Total	153

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Familiarity with the basic concepts of database systems.	ع1، ع2، ع3، ع5	Class lectures. Class discussion. Questions/Answers session in class. Home work. Learning by discovery. Self-education. Brainstorming. Online search. KWL learning table. Mind maps. Concept maps.	Quizzes. Homework and Assignments. Written and online exams. Writing reports. Presentations. Discussion and debate. Achievement file. Performance
1.2	Understand the components, classifications, levels and languages of database management systems and distinguish between them.	ع1، ع2، ع3، ع5		
1.3	Understand the elements of relational databases and the stages of their design and construction.	ع1، ع2، ع3، ع5		
2.0	Skills			
2.1	Analyze relational database requirements.	م1، م2، م3، م4، م7	Class lectures. Class discussion. Questions/Answers session in class. Home work. Learning by discovery. Self-education. Brainstorming. Online search. Mind maps. Concept maps.	Quizzes. Homework and Assignments. Written and online exams. Writing reports. Presentations. Discussion and debate. Achievement file. Performance tests.
2.2	Designing an entity and relationship model (ERM) scheme.	م1، م2، م3، م4، م7		
2.3	Apply the rules of the conversion algorithm for building logical tables (RDB Schema).	م1، م2، م4، م6، م7		
2.4	Apply normalization rules for a clear and error-free database.	م1، م2، م4، م5، م6، م7		
2.5	Using information and communication technology to exchange of the ideas, scientific research, and performance of the tasks and assignments.	م1,م2,م7		
2.6	Practice critical thinking and problem solving facing the learner in the course in creative ways.	م1,م2,م7		

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			
3.1	Collaboration, teamwork, and professional ethics.	ق1	Class lectures. Class discussion. Questions/Answers session in class. Home work. Learning by discovery. Self-education. Brainstorming. Online search. Mind maps. Concept maps.	Quizzes. Homework and Assignments. Written and online exams. Writing reports. Presentations. Discussion and debate. Achievement file. Performance.
3.2	Take the responsibility for continuous learning, and self-development.	ق2		
3.3	Effective and efficient time management when applying acquired knowledge and skills.	ق3		

C. Course Content

No	List of Topics	Contact Hours

1.	**Chapter 1: Introduction to Database System.**
	• Introduction.
	• Methods to access information.
	  ○ Manual files system.
	  ○ Traditional files system.
	  ○ Database system.
	• Data architecture in databases.
	• The concept of databases.
	• Database system applications.
	• Features of database system.
	• Disadvantages of database system.
	• Database system components.
	• Database management system components.
	• Database management system jobs.
	• Database system classifications.
	• Database management system levels.
	• Data independence.
	• Database management system languages.
	• Database life cycle.
		6

2.	**Chapter 2: Relational Database Design.** • The concept of relational databases. • Relational database features.	3

	• Relational database disadvantages.
	• Relational database elements.
	• Determinants in relational database constraints:
	  ○ Domain constraints.
	  ○ Key constraints.
	  ○ Referential integrity constraints.
	• The quality of relational database.	

3	**Chapter 3: Entity Relationships Diagram.**
	• The concept of entity relationships model ERM.
	• The components entity relationships model ERM.
	  ○ Entities:
	  - Types of entities.
	  - Degree of entities.
	  ○ Attributes:
	  - Types of adjectives.
	  - Null values.
	  ○ Relationships:
	  - Relationship degree.
	  - Types of relationships.
	  - Participation restrictions.
	  - A relationship has qualities.
	• Steps to design an entity relationships model ERM.
	• Entity relationships diagram requirements.
	• Examples of entity relationships model.
		9

4	**Chapter 4: Relational Database Schema:**
	• The concept of relational database schema.
	• Mapping algorithm.
	  ○ Step 1: Convert regular entities (strong).
	  ○ Step 2: Convert vulnerable entities.
	  ○ Step 3: Convert bilateral relations from type 1:1.
	  ○ Step 4: Convert bilateral relations from type 1:M.
	  ○ Step 5: Convert bilateral relations from type M:N.
	  ○ Step 6: Convert relations above bilateralism.
	  ○ Step 7: Convert adjectives for multiple values.
	• Mapping summary.
	• Examples of mapping ERD to relational schema.
		6

5	**Chapter 5: Methods of Database Normalization:** • Introduction to database normalization. • The concept of normalization. • The goal of normalization (why do we do normalization?). • Problems of data. • Normalization and functional dependencies. ○ The concept of functional dependencies.	9

	○ Functional dependencies types. • Rules of normalization. • Advantages of normalization. • Disadvantages of normalization. • Examples of RDB Normalization.	
Total		33

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Mid-Term	Week 7	20%
2.	Quizzes (2 Quizzes)	Week 5, 10	10%
3.	Exercises and Practicality	Week 2-11	15%
4	Software Project (Implement RDB Lifecycle Stages)	Week 11	20%
5	Participation	Week 1-11	5%
6	Final	Week 12	30%
7	Total Marks		100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	1. Database systems: design, implementation, & management. Coronel, C., & Morris, S. (2016). Cengage Learning. 2. Database Management System. Horizon Books. by Ayyavaraiah, M. and Gopi, A. 3. Database Management System. PHI Learning Pvt. Ltd. by Panneerselvam, R.
Supportive References	N/A
Electronic Materials	Online resources will be provided during class lectures on LMS.
Other Learning Materials	N/A

2. Required Facilities and equipment

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom – A computer lab equipped and connected to a shared printer and the internet.
Technology equipment (projector, smart board, software)	Smart board, data projector, Microsoft Visio or Edraw Max and Internet browser.
Other equipment (depending on the nature of the specialty)	N\A

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer references – students.	1.Questionnaires and referendums approved by the department. 2.Peer evaluation of faculty members. 3.Review the results of the students' evaluation.
Effectiveness of students assessment	Peer references - program leaders - faculty members – students.	1.Questionnaires and referendums approved by the department. 2.Review course descriptions and course reports periodically. 3.Peer evaluation and periodic exchange of correction and scrutiny

Assessment Areas/Issues	Assessor	Assessment Methods
		among fellow faculty members. 4.Review samples of students' work.
Quality of learning resources	Program leaders - faculty members - students	1.Questionnaires and referendums approved by the department. 2.Write-offs and monitoring.
The extent to which CLOs have been achieved	Program leaders - faculty members.	1.Review the course report. 2. Analysis of exams forms, grades, students' work and records of achievement.
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Department of Applied Sciences – Applied College
REFERENCE NO.	
DATE