Course Specification

— (Bachelor)

Course Title Advanced Database Systems	
Course Code: CIT 1404	
Program: Bachelor in Information Technology	
Department: Department of Information Technology	
College: Faculty of Computers and Information Technology	
Institution: University of Tabuk	
Version: **1.0**	
Last Revision Date: **27 July 2022**	

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:

(3 CHrs. – Three-Credit Hours)

2. Course type				
A.	☐University	☐College	☒ Department ☐Track	☐Others
B.	☒ Required		☐ Elective	

3. Level/year at which this course is offered: (Level 7/4th Year)

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4. Course general Description:

This course emphasis on advanced topics in databases and DB systems. The course begins with an overview of the associated database analysis, design, and methodology issues. Then, it highlights transaction management, query processing, distributed DBMSs and replication, and object DBMSs. In addition, the course emphases on web technology and DBMSs, semistructured data and XML. In Particular, the related business intelligence topics such data warehousing concepts, OLAP, and data mining also covered and emphasized.

5. Pre-requirements for this course (if any):

Database Systems (CIT 1305)

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

Upon the completion of this course the students will be able to:

● Identify and demonstrate profoundly advanced concepts, principles, models and issues in databases and database systems.

● Analyze, design, develop, and evaluate an integral solutions and systems in database domain.

● Explore and investigate independently advanced database topics.

● Identify, demonstrate, and correlate between the advanced DB topics and the associated interdisciplinary fields.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning		
3	Hybrid ● Traditional classroom ● E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	**45**
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		**45**

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

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Identify and define advanced concepts, principles, models and issues in databases and database systems.	K1, K2, K3, K4	Lectures. Textbooks and References. Supplemental materials. In class discussions. Office hours.	Midterm and Final exams. Assignments. Quizzes. Projects.
1.2	Recognize and characterize the database analysis, design, and methodology issues and techniques, and how they can be applied in a practical way.	K1, K2, K3		
1.3	Specify and describe the functions that a Database Management System should provide, namely transaction management, concurrency control, and recovery.	K2, K3, K4		
1.4	Recognize and examines the query processing and query optimization issues.	K2, K3		
1.5	Specify and describe distributed DBMSs and object-based DBMSs.	K2, K3		
1.6	Recognize and characterize the integration of the DBMS into the Web environment, semistructured data and its relationship to XML.	K3, K4		

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.7	Recognize and examines the main technologies associated with Business Intelligence, namely the data warehouse, Online Analytical Processing (OLAP), and data mining.	K2, K3, K4		
2.0	**Skills**			
2.1	Develop (i.e. analyze, design, and implement) an integral solutions and systems in database domain, as well as and appraise such solutions.	S1, S2, S3, S4	Lectures. Textbooks and References. Supplemental materials. In class discussions. Case studies/Tasks.	Midterm and Final exams. Assignments. Quizzes. Projects.
2.2	Demonstrate how the advanced associated models and techniques can be applied in a practical manner.	S4, S5		
3.0	**Values, autonomy, and responsibility**			
3.1	Acquire and demonstrate the professional and ethical issues in Data Management.	V1	In class discussions. Assignments/Projects Presentations.	Evaluating students' work (in the class discussions, Projects Assignments, & Presentations).
3.2	Communicate and work (effectively, ethically, and professionally) (Individually and in groups/teamwork) to accomplish the assigned tasks.	V2		

C. Course Content

No	List of Topics	Contact Hours
1.	Methodology: Conceptual, Logical, and physical DB Design.	3
2.	Methodology: Monitoring and Tuning the Operational System	3
3.	Security and Administration	3
4.	Professional, Legal, and Ethical Issues in Data Management	3
5.	Transaction Management (Part 1): Concepts and concurrency control	3
6.	Transaction Management (Part 2): DB Failures and Database Recovery	3
7.	Query Processing and Optimization (Part 1): Objectives and Concepts	3
8.	Query Processing and Optimization (Part 2): Types and Strategies	3
9.	Distributed DBMSs and Replication: Concepts and Design	3
10.	Object DBMSs: concepts and Design	3
11.	Object DBMSs: Standards and Systems	3
12.	The Web and DBMSs: Web Technology and DBMSs	3

13.	The Web and DBMSs: Semi structured Data and XML	3
14.	Business Intelligence: Data Warehouse and OLAP: An Overview	3
15.	Business Intelligence: Data Mining: An Overview	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Two Quizzes	3 and 14	10%
2.	Midterm Test-1	5 - 6	10 %
3.	Midterm Test-2	11 - 12	10 %
4.	Two Assignments	8 and 13	10 %
5.	Project	10	20%
6.	Final Exam	16-17	40 %

*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	●Database Systems a Practical Approach to Design, Implementation, and Management. 6th ed, Thomas Connolly and Carolyn Begg, Addison Wesley, 2019 (Pearson Education Limited)
Supportive References	●Ramez Elmasri, Shamkant Navathe, Fundamentals of Database Systems, 7th Edition, 2016 (Pearson Education Limited).
Electronic Materials	●Detailed Slides when necessary
Other Learning Materials	●TBD

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms
Technology equipment (projector, smart board, software)	Data Show
Other equipment (depending on the nature of the specialty)	Each student should has a laptop with the required DBMSs

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Teaching	Faculty, Program Leaders, and Advisory Board	Both Direct and Indirect
	Students	Indirect

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Students Assessment	Faculty, Program Leaders, Advisory Board, and Independent Opinion	Both Direct and Indirect
Quality of Learning Resources	Faculty, Students, and Advisory Board	Indirect
The Extent to which CLOs have been Achieved	Faculty, Program Leaders, Advisory Board, and Independent Opinion	Direct (as in section B) and Indirect/Surveys
	Students	Indirect

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	