



T-104
2022

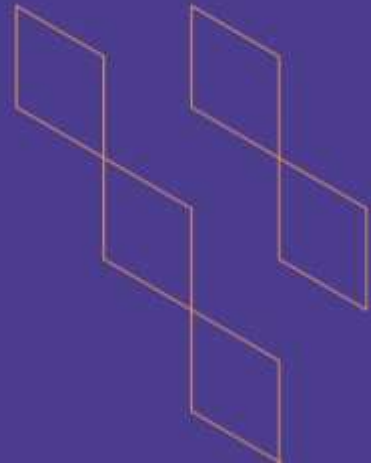
Course Specification





T-104
2022

Course Specification



Course Title: Advanced Database Systems
Course Code: 2223 CIS
Program: Information Systems
Department: NA
College: Applied College
Institution: King Khalid University
Version: 1
Last Revision Date: 12 August 2023





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A. General information about the course:

Course Identification

1. Credit hours: 2

2. Course type

a. University College Department Track Others

b. Required Elective

3. Level/year at which this course is offered: 4th Level

4. Course general Description:

The course builds upon students' basic knowledge of database modeling, design, SQL and application development to provide them the knowledge of advanced concepts to optimize their storage and retrieval performance. This course includes topics on database storage, query performance evaluation and optimization, transaction management, concurrency control, parallelism and distribution of data, and XML. The 2 contacts hours lab part of the course requires students to develop a fully functional database application using Oracle database and Oracle Form developer, in addition to the practicing of knowledge gained in the theory part.

5. Pre-requirements for this course (if any): **2322 CIS**

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

7. Course Main Objective(s):

- The main purpose of this course is to introduce improve students' understanding of database systems and provide them the knowledge of advanced database concepts including their management and optimization.
- The course will be under continuous improvement based on the outcomes of students/instructors' feedback.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	48	100
2.	E-learning		
3.	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4.	Distance learning		





2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	16
2.	Laboratory/Studio	32
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	48



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	Describe advanced database system concepts related to storage, query processing, optimization, and transaction management	k1	Lectures + Lab	Exams, Assignments, Quizzes
1.2	Recall the importance of database optimization techniques	k2	Lectures + Lab	Exams, Assignments, Quizzes
1.3	Describe advanced database system concepts related to storage, query processing, optimization, and transaction management	k1	Lectures	
1.4	Recall the importance of database optimization techniques	k2	Lectures	
2.0	Skills			
2.1	Write SQL's DDL statements to produce effective and optimized database schema	s2 s3	Lectures + Lab	Exams, Assignments, Quizzes
2.2	Analyze query execution plan and optimize it accordingly	s1	Lectures, Lab	Exams, Assignments, Quizzes
2.3	Develop and implement transaction management plan in a DBMS, functional database applications	s1 s2	Lectures, Lab	Exams, Lab Assignments, Quizzes
2.4	Evaluate the feasibility of distributing data over a network	s4	Lectures, Lab	Exams, Lab Assignments, Quizzes
2.5	Analyze query execution plan and optimize it accordingly	s1	Lectures, Lab	Exams, Lab Assignments, Quizzes
3.0	Values, autonomy, and responsibility			



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	Work in team to produce a database application	v1 v3	Presentations, Lab	Exams, Assignments and presentation

C. Course Content

No	List of Topics	Contact Hours
1	• Course overview	1
2	• Review of fundamentals database system concepts	2
3	• Data Normalization , Data storage structures	2
4	• Relational algebra	2
5	• Threats and Database Security	1
6	• Query optimization	1
7	Transaction management	2
8	Concurrency control	1
9	Parallel and distributed databases: query processing	2
10	Parallel and distributed databases: transaction processing	1
11	Revision	1
Lab Topics		
1	Labs overview and project requirements description	3
2	Review of SQL queries	3
3	Review of application development using Oracle Forms	3
4	Data indexing in Oracle	3
5	Query Processing: Tutorial and Exploration of Oracle generated query execution plans	4
6	Query Optimization: Tutorial and visualization in Oracle	4
7	Discussion of mini-project proposal and requirement specifications	3
8	Transaction management in Oracle	5
9	Supervised session for mini-project development	2
10	Revision	2
Total		48



D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz 1	4	5
2.	Midterm Exam 1	7	10
3.	Practical Assessment	1 to 16	30
4.	Midterm Exam 2	12	10
5.	Quiz 2	14	5
6.	Final Exam	After week 16	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	Modern Database Management (12 th edition), Jeffrey A. Hoffer, Ramesh Venkataraman Heikki Topi, 2016
Supportive References	Modern Database Management (12 th edition), Jeffrey A. Hoffer, Ramesh Venkataraman Heikki Topi, 2016
Electronic Materials	https://education.oracle.com Course website at Blackboard on http://lms.kku.edu.sa
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> ▪ Lecture Rooms with data show ▪ Laboratories.
Technology equipment (projector, smart board, software)	Oracle software
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Course Teacher	Direct
Quality of learning resources	Program Supervisor, Quality Unit	Direct
The extent to which CLOs have been achieved	Course Teacher	Direct
Other	Course Teacher, Quality Unit	Direct

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	





DATE

