



Course Specifications

Course Title:	Advanced Database Management Systems
Course Code:	512PMDS-3
Program:	Professional Master of Data Science
Department:	Computer Science
College:	Collage of Computer Science and Information Systems
Institution:	Najran University

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A. Course Identification

1. Credit hours:
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input type="checkbox"/> Elective <input checked="" type="checkbox"/>
3. Level/year at which this course is offered: Year 1/ Level 2
4. Pre-requisites for this course (if any):
5. Co-requisites for this course (if any):

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	50	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	20
3	Tutorial	
4	Others (specify)	
	Total	50

B. Course Objectives and Learning Outcomes

1. Course Description

In this course, students will acquire knowledge to develop, secure, optimize, and administer database systems. The topics include query processing, implementation, and optimization, data relations, storage and file systems, database backup and recovery, self-tuning database systems, data stream systems, concurrency control protocols, transactions creation and maintenance, relational and non-relational databases, database security, data management problems, and distributed database.

2. Course Main Objective

After successful completion of this course students should be able to:

- Explain the fundamental theories and algorithms that are used to build centralized DBMSs, distributed DBMSs, and database machines.
- Develop database systems and apply various techniques to improve database security and queries performance.
- Be familiar with the recent improvements in database systems in term of design, performance, and security.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Describe the fundamental theories and requirements impacting the design of modern database systems.	K1
1.2	Explain the concept of transactions and describe fundamental transaction processing, concurrency and recovery control issues associated with database management systems.	K2
2	Skills :	
2.1	Design advanced database systems and implement the concepts of ER diagrams, integrity constraints, normalization, and advanced database system elements like user defined functions (UDF), procedures and triggers.	S1, S2
2.2	Use PL/SQL programming with DBMS and to design database applications using database client APIs.	S1, S2, S3
2.3	Implement different techniques to optimize the database queries, security, and authorization.	S1, S2, S3
2.4	Acquire experience by using and improving commercial relational database products.	S1, S2, S3
3	Values:	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Query Processing	15
2	Data Storage, Data Warehouses, Database Optimization	15
3	Concurrency Control	10
4	Recovery	10
5	Current Trends in Database	10
Total		50

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Understand the fundamental theories and requirements impacting the design of modern database systems.	<p>TS-1: Relate Course Learning Outcomes (CLOs) to the topics</p> <p>TS-2: Lectures: using PPT presentation and other software to address verbally in front of students the concepts associated with examples with taking help of writing on the board as needed.</p> <p>TS-3: Communication: Given to students the main requirements of the project's reports and presentation</p> <p>TS-4: Encourage students to read different journals, seminars or websites at their leisure time to have better understanding about the current developments in Database Management Systems.</p> <p>TS-5: Recall the topics of last lecture and the critical issues based on different topics, which certainly helps students to recall memory frequently and store that topic in their memory for long term</p>	Assignment, Midterm Exam, Project and presentation
1.2	Define the concept of transactions and describe fundamental transaction processing, concurrency and recovery control issues associated with database management systems.		
...			
2.0	Skills		
2.1	Design advanced database systems and implement the concepts of ER diagrams, integrity constraints, normalization, and advanced database system elements like user defined functions (UDF), procedures and triggers.	<p>TS-1: Relate Course Learning Outcomes (CLOs) to the topics</p> <p>TS-2: Lectures: using PPT presentation and other software to</p>	Assignment, Midterm Exam, Lab Assessment

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.2	Use PL/SQL programming with DBMS and to design database applications using database client APIs.	address verbally in front of students the concepts associated with examples with taking help of writing on the board as needed.	
2.3	Implement different techniques to optimize the database queries, security, and authorization.		
	Acquire experience by using and improving commercial relational database products.	<p>TS-3: LAB Work: Every student in the lab is using a separate PC. Practically showing them how to create a databases.</p> <p>TS-4: Tutorial: In the tutorials, we ask students to solve some problems in front of each other's and give them some comments and the right answers.</p> <p>TS-5: Communication: Given to students the main requirements of the project's reports and presentation</p> <p>TS-6: Recall the topics of last lecture and the critical issues based on different topics, which certainly helps students to recall memory frequently and store that topic in their memory for long term.</p>	
3.0	Values		
3.1			
3.2			
...			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Project, presentation and Quiz	Week 4, 9 and 10	10%
2	Mid Term	Week 7 th	20%
4	Lab Activity	Weeks 1-10	10%
5	Lab Assessment 1	Week 10 th	10%
6	Final Lab Exam	11th week	10%
7	Final Theory Exam	12 or 13th week	40%
8	Total		100%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Each faculty member should set up to 10 hours weekly as office hours in their time tables.
- Academic advisors are assigned to advice and support students.
- Instructors set specific office hours for each course he is teaching. The teaching load of staff members are available in the front of their offices.
- Instructors arrange and provide tutorials to students.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Carlos Coronel, and Steven Morris (13th Edition). Database Systems: Design, Implementation, & Management
Essential References Materials	A good reference for concurrency control and recovery is by Bernstein, Hadzilacos, & Goodman, Concurrency Control and Recovery.
Electronic Materials	
Other Learning Materials	N/A

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> • Lecture Rooms with appropriate number of seats, Projector with Screen and a white board or a smart board. • All the computers in all the laboratories should be installed with the latest version of the required software.
Technology Resources (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> • One PC and one projector and data show in the lecture room • Number of PCs according to strength of students in the lab room
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	MySQL

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Student	Online course survey: By the end of each semester, students give their opinions about many factors in the course. They give feedback about the teaching strategies, assessment methods, textbooks, instructor, etc.
Effectiveness of Teaching	Student	Feedback about Course Learning Outcomes (CLOs): A course survey is distributed to students to take their opinions about the CLOs.
Assessment	Course coordinator	Checks all exams and make sure that they are related to CLOs and appropriate for the course

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Science Departmental Council
Reference No.	14440203-0185-00002
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