



Course Specification

(Bachelor)

Course Title: Database Management Systems
Course Code: IS1321
Program: Bachelor of Information Systems
Department: Information Systems
College: College of Computer and Information Sciences
Institution: Imam Mohammad Ibn Saud Islamic University
Version: 2
Last Revision Date: July 28 th , 2025



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A. General information about the course:

1. Course Identification

1. Credit hours: 4 credit hours (lectures 3, Lab 1+1)

2. Course type

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

3. Level/year at which this course is offered: 3rd Year

4. Course general Description:

This course provides students with a comprehensive foundation in the principles and practices of Database Management Systems (DBMS), emphasizing both user-level interaction and administrative tasks. The course is structured to equip students with the necessary knowledge and skills to design, implement, and manage database systems in real-world scenarios.

Students will explore the architecture of database systems, including centralized, client-server, parallel, and distributed models, and understand how data is organized, accessed, and managed within these environments. The course covers advanced SQL functionalities for data manipulation and retrieval, along with practical exposure to designing and querying relational databases.

A significant portion of the course focuses on transaction processing concepts—highlighting atomicity, consistency, isolation, and durability (ACID)—and examines concurrency control protocols and recovery techniques that ensure database integrity. Topics such as serializability, locking mechanisms, timestamping, and deadlock detection and recovery are discussed in detail.

In addition, students will gain hands-on experience with indexing techniques such as B+-tree structures and hash-based indexing to enhance database performance. The course culminates in database administration practices using Oracle database, where students will learn how to configure databases, manage users and roles, secure data, monitor operations, and perform routine maintenance tasks.

By the end of the course, students are expected to demonstrate competence in both developing business logics for database applications and managing database environments securely and efficiently, with an appreciation for the professional responsibilities involved in handling organizational data.

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





IS1220 Introduction to Databases

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

No Co-requisites

7. Course Main Objective(s):

The main objective of this course is to provide students with a comprehensive understanding of database management systems, covering both theoretical foundations and practical skills. Students will learn about various database architectures, including centralized, client-server, distributed, models, as well as advanced SQL techniques. The course emphasizes core concepts such as transaction processing, concurrency control, recovery mechanisms, and indexing strategies to ensure data integrity and performance. Additionally, students will gain hands-on experience in database administration using Oracle database, focusing on tasks such as user management, security, system monitoring, and maintenance. By the end of the course, students will be able to design, implement, and manage business logics for database systems effectively in real-world environments.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 hours/week (Lecture) 2 hours/week (Lab)	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	30
3.	Field	
4.	Tutorial	





5.	Others (specify)	
Total		75

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 the different database system architectures and their advantages and disadvantages.	K1(P)	Class Lectures	Final Exam, Quiz 1, Midterm Exam
1.2	Define transaction processing and recognize the manner in which database systems support atomicity, concurrency, isolation and durability.	K1(P)	Class Lectures	Final Exam, Quiz 1, Midterm Exam
1.3	Recognize the various concurrency control protocols.	K1(P)	Class Lectures	Final Exam, Midterm Exam
1.4	Describe different recovery management techniques.	K3(I)	Class Lectures	Final Exam, Quiz 2
1.5	Describe the different Indexing and Hashing techniques	K1(P)	Class Lectures	Final Exam, Quiz 2
2.0	Skills			
2.1	Able to manage and administer basic database management tasks.	S1(P)	Class Lectures with practical session	Lab Assignment-1, Project
2.2	Apply advanced SQL functionalities provided by typical database management systems, to an extent sufficient to select and utilize a	S4(P)	Class Lectures with practical session	Lab-Assignment-2, Project





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	DBMS to support real world applications.			
3.0	Values, autonomy, and responsibility			
3.1	Work effectively as teamsto utilize a DBMS to suppor t real world applications.	V1(P)	Group Project	Project

C. Course Content

No	List of Topics	Contact Hours
1	DBMS Architecture	10
2	Transactions	10
3	Concurrency Control	10
4	Recovery Management	10
5	Indexing Structures- classroom teaching	5
6	Oracle Database Administration (Theory plus Labs)	10
7	Advanced SQL (Theory plus Labs)	15
8	Review + Project Discussion	5
Total		75

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz	5,10	10%
2.	Midterm Exam	7	20%
3.	Assignment (Lab based)	12,14	10%
4	Group Project	15	20%
5	Final Exam	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	- Database System Concepts, 7/E, Abraham Silberschatz, Henry Korth, S. Sudarshan, McGraw-Hill , Pub. Company, 2019. ISBN-13: 978-0078022159. - Oracle Database 11g The Complete Reference (Oracle Press, Kevin Loney, McGraw-Hill Osborne, 2009, ISBN-10: 0071598758 , ISBN-13: 978-0071598750
Supportive References	- Fundamentals of Database Systems, 7/E, RamezElmasri and Shamkant Navathe, Pearson, 2015. ISBN-13: 9780133970777. - Expert Oracle Database 11g Administration, 1/E, Sam R. Alapati, Apress, 2010. ISBN: 978-1430220176.
Electronic Materials	Blackboard - http://www.oracle.com - http://docs.oracle.com/cd/B28359_01/server.111/b28310/toc.htm
Other Learning Materials	N/A

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1. At least 30 seats 2. A projector connected to a PC preferably with Internet connection 3. Sliding board
Technology equipment (projector, smart board, software)	
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	Students	Indirect using course evaluation survey
Effectiveness of Students assessment	Faculty members	Direct method using TOS file
Quality of learning resources	Students and Faculty	Indirect using course evaluation survey and faculty survey



Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	Faculty members	Direct method using TOS file
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	IS CURRICULUM APPROVAL & DEVELOPMENT COMMITTEE IS QAC / / IS COUNCIL
REFERENCE NO.	
DATE	

