KINGDOM OF SAUDI ARABIA
IMAM MOHAMMAD IBN SAUD ISLAMIC UNIVERSITY
COLLEGE OF COMPUTER AND INFORMATION SCIENCES
INFORMATION SYSTEMS DEPARTMENT
BACHELOR IN INFORMATION SYSTEMS

المملكة العربية السعودية
جامعة الإمام محمد بن سعود الإسلامية
كلية علوم الحاسب والمعلومات
قسم نظم المعلومات
بكالوريوس نظم المعلومات

SYLLABUS

IS 321: Database Management Systems

PREREQUISITE	*IS 220*	CREDIT HOURS	3(2+2)

Instructor:

Contact information and office hours

Office No: 2A- 240

Office Hours: Monday 8:00-12:00

E-mail: alalanazi@imamu.edu.sa

COURSE DESCRIPTION

This course is intended to give students a solid background in database management systems and database maintenance. Such systems will be examined from two perspectives: 1. as a database system user, and 2. as a database system administrator. First, the course will cover the basic structure and capabilities of a database system and will examine the process of designing a database and using a database system. Second, the course will teach student to understand the implementation of database system.

The students will be familiar with centralized systems, client–server systems, parallel and distributed architectures, and network types. Its main focus is towards the fundamentals of a transaction-processing system, including transaction atomicity, consistency, isolation, and durability, as well as the notion of serializability. It also provides an overview of the methods used to ensure these properties and helps students to apply different recovery management techniques, including log-based recovery.

Students will be exposed to the concurrency control mechanism and several techniques for ensuring serializability, including locking, time stamping, and optimistic (validation) techniques. They will also be learning deadlock issues like deadlock detection and deadlock recovery.

Students will get acquainted with indexing techniques for files, including Basic Concepts, Ordered Indices, B+-Tree Index Files, B+-Tree Extensions, Hash Indices.

At the end of the course, students are expected to be familiar with database administration and creating and configuring an Oracle database using oracle database express edition. Particular attention will be paid towards managing users and securing the Database as

well as monitoring database operations. Database maintenance is also another main focus of the course.

COURSE LEARNING OUTCOMES (CLOs)		Aligned SOs
1	**Knowledge and Understanding**	
1.1	*Describe the different database system architectures and their advantages and disadvantages*	1(P)
1.2	*Define transaction processing and recognize the manner in which database systems support atomicity, concurrency, isolation and durability.*	1(I)
1.3	*Recognize the various concurrency control protocols.*	1(P)
1.4	*Describe different recovery management techniques.*	1(P)
1.5	*Describe the different Indexing and Hashing techniques*	1(I)
2	**Skills :**	
2.1	*Summarize the basics of database management and administration*	2(P)
2.2	*Apply basic level functionality provided by typical database management systems, to an extent sufficient to select and utilize a DBMS to support real world applications.*	6(P)
2.3		
3	**Values:**	
3.1		
3.2		
3.3		

TEACHING Strategies
Lectures Self-Study

No	List of Topics	Contact Hours
1	*DBMS Architecture- classroom teaching* *Examples:self-learning*	*6+1*
2	*Transactions - classroom teaching* *Examples: self-learning*	*6+1*
3	*Concurrency Control- classroom teaching* *Examples: self-learning*	*12+2*
4	*Recovery Management- classroom teaching* *Examples: self-learning*	*6+1*

5	*Indexing Structures- classroom teaching* *Examples: self-learning*	*2+1*
6	*Oracle Database Administration and Project Discussions - classroom teaching* *Practice: self-learning*	*16+2*
Total		*48+8(SL)*

TEXT BOOK

- 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

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.

Course Assessment Methods

No	Assessment Method	Due Week	%Total Assessment
1	**Quiz**	6	10
2	**Assignment**	8	10
3	**Midterm**	7	20
4	**Project / Lab Exam**	11	20
5	**Final Exam**	13	40